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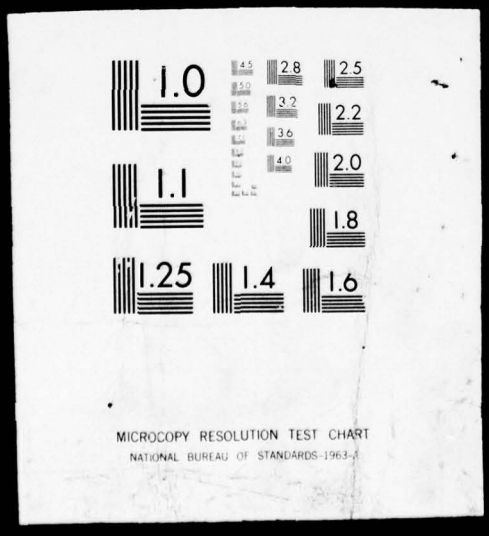

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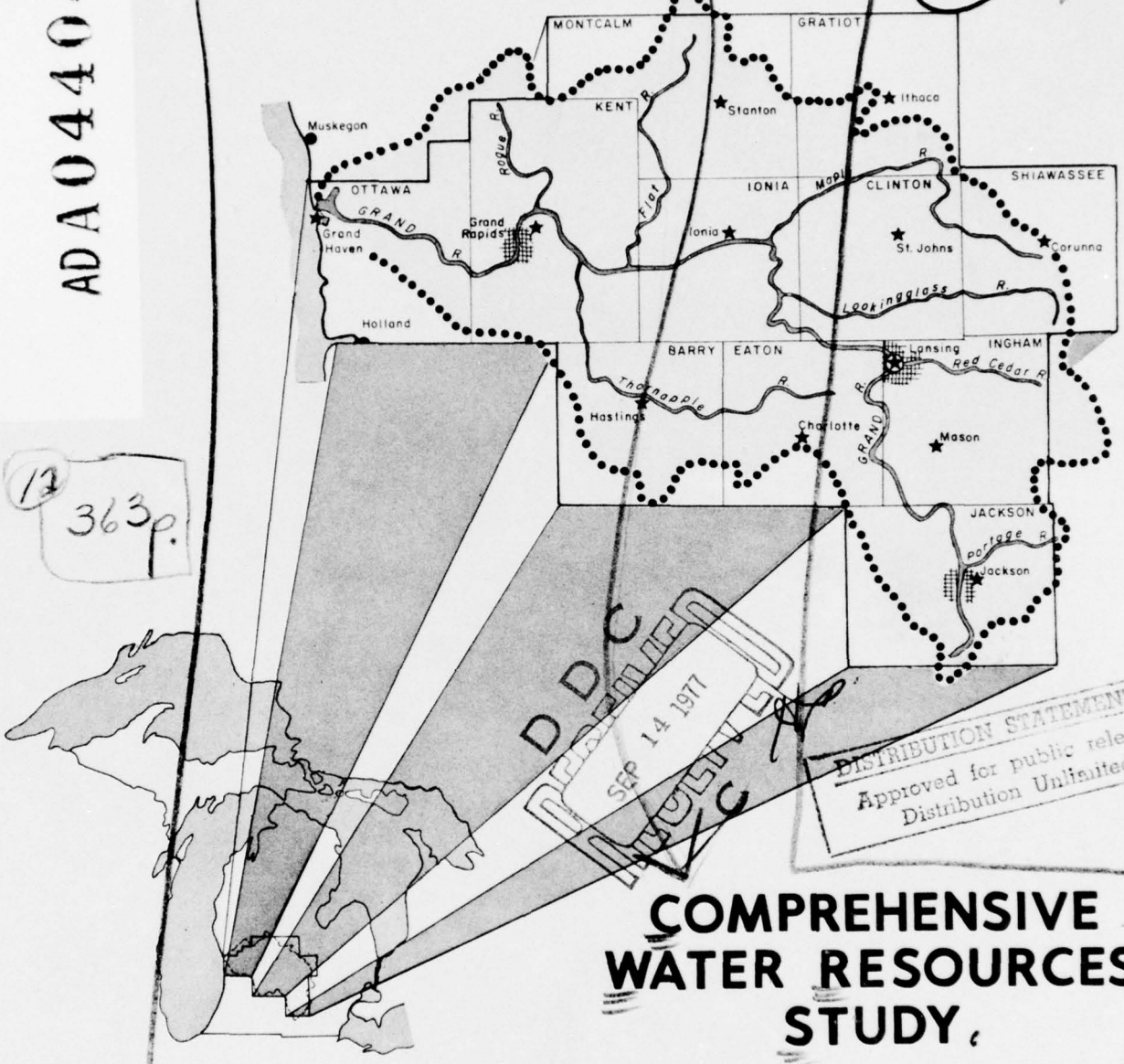

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COMPREHENSIVE WATER RESOURCES STUDY

VOLUME II

APPENDIX A - HISTORY OF INVESTIGATION
APPENDIX B - BASIN DESCRIPTION

Prepared Under Supervision of the
GRAND RIVER BASIN COORDINATING COMMITTEE
Chairmanship: U. S. Army Engineer District, Detroit

May 1972

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VOLUME INDEX

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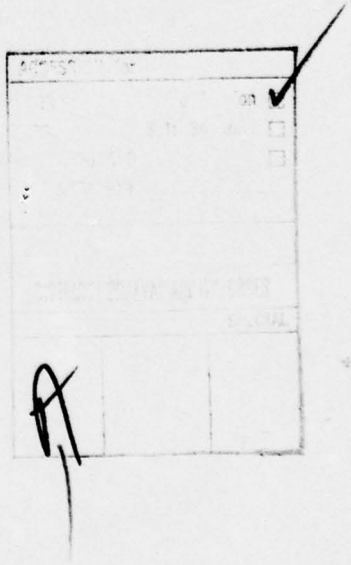

APPENDIX A

HISTORY OF INVESTIGATION

COMPREHENSIVE PLANNING STUDY

OF THE

GRAND RIVER BASIN, MICHIGAN

Prepared by the
U.S. Army Engineer District, Detroit
Corps of Engineers
Detroit, Michigan

May 1972

APPENDIX A
HISTORY OF INVESTIGATION

COMPREHENSIVE PLANNING STUDY
OF THE
GRAND RIVER BASIN, MICHIGAN

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COMPREHENSIVE PLANNING STUDY
OF THE
GRAND RIVER BASIN, MICHIGAN

SUMMARY

1. Introduction. The Grand River Basin Comprehensive Water Resources Planning Study was authorized in 1962 and included in the 1963 Civil Works budget. The primary objectives of the study were to determine the short-term (10- to 15-year) and long-term (2020) water and related land resource problems and needs of the basin; to develop alternative plans to provide for the best use, or combination of uses, of the resources of the basin to meet these problems and needs; to select one of these alternative plans on the basis of its economic and environmental feasibility; and to determine what programs of the selected plan should be developed within the next 10- to 15-years.

2. Organization. The Grand River Basin Coordinating Committee, composed of representatives of the Departments of Agriculture; Army; Commerce; Health, Education, and Welfare; and the Interior; the Federal Power Commission; and the State of Michigan, was formed in 1963 to provide guidance for conducting the study and to coordinate the efforts of the Federal, State, and local agencies concerned. The District Engineer, Detroit District, Corps of Engineers, was Chairman of the Committee. In 1966, the Department of Transportation became a member of the Coordinating Committee, and the Michigan Grand River Watershed Council, which represents local governments within the basin, began to participate fully in the study. In 1969 and 1971, the Great Lakes Basin Commission and the Environmental Protection Agency, respectively, became members of the Coordinating Committee.

To determine the water and related land resource problems and needs of the basin and to perform other specialized missions, the Coordinating Committee formed a Hydraulics and Hydrology Subcommittee, a Fish and Wildlife and Recreation Advisory Subcommittee, a Basin Plan Formulation Subcommittee, and an Economic Base Study Informal Advisory Board. In 1968, a Public Information Subcommittee was created to devise and manage a public information program; and in 1971, a subcommittee was formed to prepare a draft of the environmental impact statement on the recommended plan in accordance with the National Environmental Policy Act (P.L. 91-190).

3. The Grand River Basin. The Grand River basin drains an area of approximately 5500 square miles. The six major tributaries of the Grand River are the Rogue, Flat, Maple, Lookingglass, Thornapple, and the Red Cedar Rivers. Approximately 1.3 million persons resided in the basin in 1970. Three of Michigan's eleven Metropolitan Statistical Areas; Grand Rapids, Lansing, and Jackson are located in the basin. Its chief industry is the manufacture of automobiles and automobile parts. Furniture, bakeries, rubber, electrical machinery, and household refrigerators and freezers are other products manufactured in the basin. About 3,500,000 acres of level to rolling farmland are used for dairy farming and for the production of corn, hay, fruit, and vegetables.

4. Problems and Needs and Solutions Considered. The basin's water and related land resource problems and needs including water quality, water supply, flood control, navigation, electric power, land treatment, drainage, irrigation, recreation, and fish and wildlife were identified; and alternative plans were developed to meet these problems and needs.

In developing the alternative plans, consideration was given to national income, environmental enhancement, and the well-being of the people. Both the problems and needs and the alternative plans developed are discussed in the appendices of the study report. The appendices include detail data concerning specific disciplines and features of the Grand River basin. The recommended plan is described in Appendix Q and in the Main Report. The history of the study is described in Sections I through XII and in Attachments Nos. 1, 2, and 3 herein. Attachment No. 1 is a digest of the proceedings of the 10 December 1963 public hearing; Attachment No. 2 includes the minutes of the Coordinating Committee meetings; and Attachment No. 3 is a "Report on the Public Involvement in the Comprehensive Water Resources Planning Study for the Grand River Basin".

SECTION I

INTRODUCTION

1. Comprehensive River Basin Planning. In 1959 the Senate Select Committee on National Water Resources was formed to study the relation of water resources activities in the United States to the national interest and the extent and character of water resources activities, both governmental and non-governmental, that will be required to take care of needs for water for all purposes, now and in the future. The Senate Select Committee, held nationwide hearings from 1959 through 1961. The Committee found that there were serious water problems across the nation and recommended detailed and comprehensive water resource development plans be developed cooperatively by Federal and State agencies at the earliest practicable time.

The United States Congress and the Administration accepted the Senate Select Committee report and adopted the policy of studying and resolving water and related land resources problems on a river basin basis. For such study purposes, the continental United States was divided into 16 major river basins and the State of Michigan falls entirely within the Great Lakes Basin.

In 1965 the U.S. Congress enacted the "Water Resources Planning Act" (PL 89-80) which established the Water Resources Council and provided for the establishment of river basin commissions. The chairman of the Council is appointed by the President and the Council membership consists of the Secretary of the Interior; Secretary of Agriculture; Secretary of the Army; Secretary of Health, Education and Welfare; Secretary of Transportation; and the Chairman of the Federal Power Commission. The Secretary of Commerce, Secretary of Housing and Urban Development, and the Administrator of the Environmental Protection Agency are associate members of the Water Resources Council. The function of the Council is to assure that the Comprehensive Basin Planning Program is accomplished in an orderly, efficient, and coordinated manner.

In the State of Michigan two comprehensive river basin studies are being undertaken; one a regionally coordinated study for the Great Lakes Region, and the other an individual river basin study for the Grand River. The Grand River basin was designated by the Interdepartmental Staff Committee of the then Ad Hoc Water Resources Council as a sub-basin of the Great Lakes Drainage Basin to be studied under the national planning act.

2. Authorization of Study. The comprehensive study for the Grand River basin, Michigan, is one of the original 16, later reduced to 15, Type II studies for the United States which were selected by the Interdepartmental Staff Committee of the Ad Hoc Water Resources Council in 1962 and included in the 1963 fiscal year Civil Works budget. These studies were scheduled for completion in 1970.

Since all water and related land resources needs were to be considered, the direct participation and contribution of a number of Federal agencies were required. Therefore, all agencies represented on the Water Resources Council were authorized to participate in the study. The Corps of Engineers, Department of the Army, was designated as study leader; a plan of investigation was developed, outlining scope, agency responsibilities, and schedules; and coordinated budget estimates were submitted through the Water Resources Council.

Federal agencies participated in accordance with their pertinent statutory responsibilities. Authorities are cited in the individual agency appendixes to this report. All agencies worked closely with their State counterparts in conducting their studies.

3. Grand River Basin Coordinating Committee. In 1962, the Secretary of the Army, the Honorable Cyrus R. Vance, in accordance with Water Resources Council agreements, requested that a coordinating committee be formed under the chairmanship of the Department of the Army. The Grand River Basin Coordinating Committee was formed in 1963 and its membership consisted of one representative each from the Departments of Agriculture; the Army; Commerce; Health, Education and Welfare; and the Interior; the Federal Power Commission; and the State of Michigan. The Committee's initial meeting was held in Detroit on 6 and 7 August 1963. To deal with several specialized missions of the study, the Coordinating Committee formed a Hydraulics and Hydrology Subcommittee, a Fish and Wildlife and Recreation Advisory Subcommittee, a Basin Plan Formulation Subcommittee, and an Economic Base Study Informal Advisory Board.

In 1966 the Department of Transportation became a member of the Coordinating Committee, and the Michigan Grand River Watershed Council, which represents local governments within the Basin, began to participate fully in the study. In 1968 a Public Information Subcommittee was created to devise and manage a public information program. In 1969 and 1971, the Great Lakes Basin Commission and the Environmental Protection Agency, respectively, became members of the Coordinating Committee.

SECTION II

PRIOR REPORTS AND EVENTS*

4. 1881 through 1932. In the 46 years between 1881 and 1921, 12 reports, of which three were special reports and five preliminary examination reports, were prepared by the Corps of Engineers on the Grand River and its tributaries. All of the reports were basically concerned with channel improvement for navigation between Grand Haven on Lake Michigan and Grand Rapids, the head of navigation.

A report on the Grand River is published as House Document No. 80, 73rd Congress, 1st Session, made under the provisions of House Document No. 308, 69th Congress, 1st Session. The report was submitted to Congress on 27 October 1932, and covered all phases of water resources development in the Grand River Basin, Michigan, concluding that improvement of the stream by the Federal Government for flood control, navigation, irrigation, power development, or any combination thereof, was not justified at that time.

5. 1947 and 1949. The Committee on Public Works of the United States Senate on 15 July 1947 requested that the Board of Engineers for River and Harbors review the report on the Grand River published as House Document No. 80, 73rd Congress, 1st Session, with a view to determining whether any modifications to the recommendations contained therein were advisable.

Public hearings were held at Grand Ledge and Grand Rapids on 28 and 29 September 1949 respectively. Flood control measures were requested by local interests. Drainage and soil conservation problems and needs were also discussed. Contacts with State, municipal and other local agencies and with the general public were carried out subsequent to these hearings.

6. 16 August 1950. The Committee on Public Works of the House of Representatives, United States, on 16 August 1950 adopted an authorizing resolution. The resolution is as follows:

> WHEREAS, The Chief of Engineers has completed a preliminary examination pursuant to a resolution adopted by the Committee on Public Works of the House of Representatives, United States, on March 15, 1949, requesting a review of reports on the Grand River, Michigan, published as House Document No. 80, 73rd Congress, 1st Session, with a view to determining the feasibility of improving Grand River and its tributaries for flood control and otner purposes; and

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* All of the reports and events described in this section were Federally sponsored. However; the city of Grand Rapids, subsequent to the 1904 flood, retained a consulting engineer to analyze and report on the local flood problem and to design a flood protection system. As a result of that investigation, the city expended about $1 million for local flood protection works.

"WHEREAS: The Chief of Engineers, after a favorable finding by the Board of Engineers for River and Harbors, has recommended by letter, dated August 14, 1950, directed to the Chairman of the Committee on Public Works, that a survey be made;

Now, therefore, Be it Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors be, and is hereby, authorized to proceed with the preparation of a survey report thereon."

7. 14 May 1956. A flood control project on the Grand River at and in the vicinity of Lansing, Michigan was authorized on 3 July 1958 and is described in Senate Document No. 132, 84th Congress, 2nd Session, dated 14 May 1956. The authorized project, which to date has not been funded, provides for flood protection along the Grand River and its tributaries at and in the vicinity of Lansing, Michigan, to consist generally of: Excavation and clearing of the Red Cedar River Channel to provide for an enlarged channel from the vicinity of East Lansing downstream through Lansing Township to its confluence with the Grand River in Lansing; cleaning out of the existing Grand River Channel from its confluence with the Red Cedar River downstream through Lansing to about 1 mile below the North Waverly Road Bridge; construction of a diversion dam in the Grand River upstream from Lansing and new cutoff channel between Millett and Delta Mills to bypass major Grand River flood discharges around the city; riprapping and paving the channels at critical locations where the velocity of flood flow might be high enough to cause scouring damage; constructing new and reinforcing existing highway and railroad bridges as required; and making alterations to existing utilities and highways as necessary to meet the conditions of the proposed channels, all with a view to passing such peak flood discharges in the individual channels as would cause, when combined, a discharge of approximately 25,000 second-feet below the confluence of the Grand River and the Grand River cutoff.

8. 1962. A report prepared by the Federal Departments of Agriculture; Army; Interior; and Health, Education and Welfare; dated 29 May 1962, is published as Senate Document No. 97, 88th Congress, 2nd Session. The report pertains to the standardization of procedures in the formulation, evaluation, and review of river basin studies. Study criteria developed for the Grand River Basin Comprehensive Water Resources Planning Study is based on procedures described in Senate Document No. 97.

Secretary of the Army, the Honorable Cyrus R. Vance, on 4 December 1962, requested that a coordinating committee be formed for the Grand River Basin Study as described in paragraph 3 of Section I heretofore.

SECTION III

1963 STUDY ACTIVITIES AND EVENTS

9. January through March 1963. The first quarterly status report on the Grand River Basin Comprehensive Planning Study was issued at the end of the third quarter of fiscal year 1963 by the Corps of Engineers, Detroit District. The following subparagraphs relate the activities of the Detroit District, Corps of Engineers, during the period January through March 1963.

a. Letters were sent to U.S. Senators and concerned Congressional representatives from Michigan informing them of funding for the comprehensive study. These letters stated the need for resolution of water resource problems in the Basin, and stated that a Coordinating Committee would be formed.

b. A letter was sent to all agencies contributing to the comprehensive study, directing each agency to appoint a member to serve on the Coordinating Committee. A similar letter was sent by the District Engineer to the Governor of Michigan.

c. Preliminary drafts of the following were prepared by the Corps:

(1) A preliminary Plan of Survey.

(2) A Public Information Bulletin.

(3) A Basin display-type map.

d. A preliminary Program Evaluation and Review Technique (PERT) program was developed; included in the program were a PERT flow chart, event titles, estimates of elapsed time, and priorities of the preliminary time schedule. Since 31 March 1963 the Corps has compiled quarterly status reports on the Grand River Comprehensive Planning Study. The initial reports deal mostly with the activities of the Corps of Engineers.

10. 3 April 1963. House Document No. 157, Eighty-eighth Congress, first session, an interim report by the Corps of Engineers on the Grand River at Grandville, Michigan, was submitted to the Eighty-eighth Congress, first session. The report contains the following syllabus:

> The District Engineer finds that flood occurs on the Grand River at Grandville virtually every year, causing direct and indirect damages to residences and to commercial and industrial establishments. He has studied methods of alleviating these losses and finds that they can be reduced approximately 65 percent by the construction of a levee system and associated interior-drainage works on the left bank of the river, embracing the

area of concentrated development. He further finds that the tangible benefits which can be expected to accrue from such an improvement exceed the estimated cost of making the improvement by the ratio 1.2 to 1.0. The District Engineer therefore recommends that the project be constructed at an estimated Federal first cost of $1,373,100, provided that local interests meet certain requirements of local cooperation.

The United States Congress approved the recommendation by the District Engineer and authorized the Federal part of construction in Section 1 of Public Law 534, Seventy-eighth Congress, and Public Law 85-624. The local authorities of Grandville have not acted favorably on their share of the cost and, therefore, construction of the levee system has not been initiated.

11. July through September 1963. The Coordinating Committee held its first meeting on 6-7 August 1963 in Detroit. A digest of the minutes of this meeting is in Attachment 2. The more important accomplishments of the first quarter of fiscal year 1964 are related in the following subparagraphs:

a. The U. S. Geological Survey initiated field investigations and made some low-water-flow determinations.

b. The Public Health Service and the Fish and Wildlife Service initiated inventories of existing conditions and available data relative to their study.

c. A contract with Battelle Memorial Institute for Phase I of an economic base study was executed.

12. October through December 1963. The second Coordinating Committee meeting was held on 11 December 1963 in Lansing, Michigan. A digest of the minutes of this meeting is in Attachment 2. In October 1963, the Economic Base Study Informal Advisory Board was established by the Coordinating Committee for review of Appendix O - "Economic Base Study". The following agencies were represented on the advisory board: Department of the Army; Economic Research Service, Department of Agriculture; Federal Power Commission; Department of Economic Expansion, State of Michigan; Federal Water Pollution Control Administration, Department of the Interior; and Department of Commerce. A public hearing on the Grand River Basin Comprehensive Planning Study was held at Lansing, Michigan, on 10 December 1963. A digest of the proceedings is contained in Attachment 1 of this appendix. The major events of the period are summarized as follows:

Datatron processing of 18 stream gaging station records for the Basin, covering 302 station-years, was purchased from the U. S. Geological Survey, and the Geological Survey continued operation of 22 low-flow partial record stream gaging stations and established 15 new observation posts for water wells.

13. January through March 1964. Battelle Memorial Institute and the Economic Base Study Informal Advisory Board held two meetings during the third quarter of fiscal year 1964. Complete reports were furnished to all agencies by Battelle.

The Corps began hydrology, hydraulics, and stream regulation studies. Additional information in the form of maps and flow data were distributed by the Corps to participating agencies. The Economic Research Service, Department of Agriculture, furnished its preliminary report to Battelle Memorial Institute. A composite quarterly status report was started by departments and bureaus funded in the study. The quarterly status reports include a resume of work on the study completed during each three-month period and are divided into sections for each department, agency, or commission. These later reports include the activities of most of the agencies participating in the comprehensive study. Content is restricted to the important key events.

14. April through June 1964. The Economic Base Study Informal Advisory Board held two meetings with Battelle Memorial Institute; Battelle furnished reports titled "Structure of the Economy of the Grand River Basin Service Area and Subareas" and "Identification and Analysis of the Key Industries within the Grand River Basin Service Area and Subareas". The Coordinating Committee established the Hydraulics and Hydrology Subcommittee in May 1964 to review Appendices C, D, and E. The member agencies were as follows: Department of the Army; Soil Conservation Service, Department of Agriculture; U. S. Geological Survey, Bureau of Mines, and Federal Water Pollution Control Administration, Department of the Interior: Federal Power Commission; State of Michigan; and Department of Commerce. The following subparagraphs relate the more important accomplishments of the participating agencies in the Grand River Basin Comprehensive Planning Study.

a. Department of the Army. The Corps of Engineers initiated a program for evaluating potential reservoir sites; stage-volume, stage-area curves, and stage-cost relationships were developed for each potential reservoir site.

b. Department of Health, Education, and Welfare. The Department completed an inventory and coding of waters and waste waters in the Basin. Two sections of the Grand River were sampled and intensively tested for two days to determine the assimilation of oxygen by the stream.

15. July through September 1964. The Coordinating Committee met for the third time on 22 September 1964 in Detroit. A digest of the minutes of this meeting is in Attachment 2. The Economic Base Study Informal Advisory Board held one meeting with Battelle Memorial Institute to review

the report titled "Proposed Method for Projecting the Economy of Michigan, the Grand River Basin Service Area, and Planning Subareas." The Hydraulics and Hydrology Subcommittee held its first meeting on 4 August 1964; each participating agency stated the guidelines needed to pursue its segment of the comprehensive study. The following subparagraphs relate the more important accomplishments of the participating agencies for the first quarter of fiscal year 1965.

a. Department of the Army. The Corps of Engineers completed a preliminary inventory of potential reservoir sites; data were gathered and developed in the form of stage-volume, stage-area, and stage-cost relationships, including dams and appurtenant facilities.

The original contract with Battelle Memorial Institute for an Economic Base Study was modified and executed to include Phase II work.

b. Department of Agriculture. During the first quarter of fiscal year 1965, the Economic Research Service completed a detailed soils breakdown by county for the study area. Acreage was adjusted for trends of urbanization and served as a basis for projection of crop yields, fertilizer use, and production expenses.

SECTION V

1965 STUDY ACTIVITIES AND EVENTS

16. January through March 1965. During the third quarter of fiscal year 1965, two Economic Base Study Informal Advisory Board meetings were held; the general topics of discussion were the projections for the Basin made by Battelle Memorial Institute, and the outline form for the final economic report in Appendix O. The following subparagraphs relate the more important accomplishments of departments participating in the comprehensive study.

a. Department of the Army

(1) Battelle Memorial Institute submitted preliminary projections for the Basin to the Corps of Engineers; the basic framework of the economic study was concluded; and the writing of a detailed report was begun.

(2) The Corps of Engineers continued hydrology, hydraulics and stream regulation studies; work was continued on the draft of the appendix on climatology.

b. Department of Agriculture

(1) The Forest Service completed its inventory study on the Maple River and began work on the Upper Grand River tributaries and the Portage River.

(2) During this quarter, the Economic Research Service completed studies and projections of average farm size, rural farm population, and agricultural labor force; preliminary working tables of these projections were developed.

c. Department of the Interior

(1) U. S. Geological Survey. The Geological Survey placed emphasis on the collection of ground water data during the quarter. Data on quality of water were obtained for Kent, Ottawa, and Jackson Counties; and well yield, construction costs and geologic data were obtained for most of the municipal wells.

(2) Bureau of Outdoor Recreation. The Bureau established guidelines for collection and development of data for each subarea in the Basin. A study of recreation needs and capacities of existing resources was made for the Jackson subarea, and work was begun for the five other subareas in the Basin.

17. April through June 1965. During the fourth quarter of fiscal year 1965, the fourth Coordinating Committee meeting was held at East Lansing on 18-19 May 1965. A digest of the minutes of this meeting is in Attachment 2. Two Economic Base Study Informal Advisory Board meetings were held; the ninth meeting centered around automotive production projections and the tenth meeting concerned review by local planning officials. In June 1965, the Coordinating Committee established the Fish and Wildlife and Recreation Advisory Subcommittee. The purpose of this subcommittee was to review Appendices J and K. Member agencies of the Subcommittee were: Bureau of Outdoor Recreation, Federal Water Pollution Control Administration, and Bureau of Sport Fisheries and Wildlife, Department of the Interior; Department of Conservation and Water Resources Commission, State of Michigan; Soil Conservation Service and United States Forest Service, Department of Agriculture; and the Department of the Army. The following subparagraphs relate the more important accomplishments of the participating agencies.

a. Department of the Army. The Corps of Engineers reported on reservoir studies, identifying seventy-six potential sites. The study was accompanied by county maps with color overlays indicating maximum water surface elevation for each site.

b. Federal Power Commission. A map of the Grand River service area, showing existing electric facilities, was completed; data on power requirements and supply were gathered; and revisions of electric-facility maps of the Grand River basin to date were made.

18. July through September 1965. During the first quarter of fiscal year 1966, the Fish and Wildlife and Recreation Advisory Subcommittee met for the first time; the agenda included progress reports from member agencies and discussion of future business. In September 1965, the Coordinating Committee established the Basin Plan Formulation Subcommittee for the purpose of reviewing Appendices P and Q. The member agencies were the following: Department of the Army; Bureau of Sport Fisheries and Wildlife, Bureau of Recreation, and Federal Water Pollution Control Administration, Department of the Interior; Soil Conservation Service, Department of Agriculture; Water Resources Commission, State of Michigan; and Federal Power Commission. The following subparagraphs relate the more important accomplishments of participating agencies in the comprehensive study.

a. Department of the Army

(1) A draft of the revised PERT Network Analysis System was prepared by the Corps and submitted to all participating agencies, who were to review it and add their scheduled target dates and costs by activity. Replies were received and integrated into the working document.

(2) The Corps continued flood damage studies, updating previous studies by using office data. Field reconnaissance was conducted at Grand Rapids to update flood damage studies.

b. Department of Agriculture. The Economic Research Service distributed draft copies of the report, "Agricultural Activity in the Grand River Basin 1970-2020: A Projective Study," to participating agencies for review. The Economic Research Service began a study of the costs and economic benefits to be derived from drainage of certain areas.

19. October through December 1965. During the second quarter of fiscal year 1966, the Coordinating Committee held its fifth meeting on 1-2 December 1965 at Grand Rapids, Michigan. A digest of the minutes are recorded in Attachment 2. The first two Basin Plan Formulation Subcommittee meetings were held in Detroit, Michigan; the agenda centered around a statement of the Subcommittee's mission and review of the first draft of Appendix Q. The second Hydraulics and Hydrology Subcommittee meeting was held on 9 November 1965 at East Lansing, Michigan; included in the discussion was water quality, frequency curves, and irrigation. The following subparagraphs describe the more important accomplishments of agencies participating in the comprehensive study.

a. Department of the Army. The Corps of Engineers' evaluation of reservoir sites for single-purpose flood control was continued. Potential reservoir sites were evaluated for flood reduction potential in damage-prone (index) cities using a full range of hypothetical floods. The resulting evaluations were converted to modified discharge-frequency relationships at the index cities using one, two, or three reservoirs for holdouts. Evaluation of resulting benefits at the index cities was begun, using computer techniques.

b. Department of Agriculture

(1) During the quarter, estimates of rural domestic and livestock water requirements for current and future periods in the Grand River basin were made.

(2) The Economic Research Service developed data to determine relationships between crop yields and certain weather variables in order to assess the potential response to irrigation.

c. Department of the Interior. The Bureau of Sport Fisheries and Wildlife prepared per capita participation curves for hunting and fishing from 1960 to 2020; the curves were based on six socio-economic factors and show the estimated gross hunting and fishing demands in man-days for each subarea. The 1960 production of the eight major species of game, together with pounds of sport fish produced, were estimated for each planning subarea.

SECTION VI

1966 STUDY ACTIVITIES AND EVENTS

20. January through March 1966. During the third quarter of fiscal year 1966, the Coordinating Committee established the Hydrology Task Group within the Hydraulics and Hydrology Subcommittee. The member agencies of the Hydrology Task Group were: Department of the Army; U. S. Geological Survey and Federal Water Pollution Control Administration, Department of the Interior; Soil Conservation Service, Department of Agriculture; and the Water Resources Commission, State of Michigan. The purpose of the Hydrology Task Group was to develop an acceptable technique for determining water storage requirements for low-stream-flow augmentation. Two meetings of the Basin Plan Formulation Subcommittee were held, the first on 25-26 January 1966, and the second on 8 March 1966, with efforts concentrated on development of Appendix P - "Basin Plan Formulation Criteria". The following subparagraphs relate the more important accomplishments of participating agencies from January through March 1966.

a. Department of the Army. Final coordination for preparation of Appendix O - "Economic Base Study" was completed, and the report was published and distributed to all participating agencies. Discussion of the Economic Base Study with local planners was begun.

b. Department of Agriculture

(1) An economic base study report, "Agricultural Activity in the Grand River Basin, 1970-2020: A Projective Study", was completed, reproduced, and incorporated in Appendix O.

(2) The Forest Service provided information on the present and projected forest industry water requirements and identified the trees and plants associated with water, common to the Grand River Basin.

c. Department of Health, Education, and Welfare. The Federal Water Pollution Control Administration calculated, by means of a mathematical model, the total amount of streamflow required for water quality control in the Jackson and Lansing reaches of the Grand River.

21. April through June 1966. During the fourth quarter of fiscal year 1966, the Coordinating Committee held its sixth meeting at Grand Haven, Michigan. A digest of this meeting is in Attachment 2. The fifth and sixth Basin Plan Formulation Subcommittee meetings were held at East Lansing, Michigan, and Detroit, Michigan, respectively. Two Hydrology Task Group meetings were held, with discussion centered around low-water-flow requirements and water storage needed to meet the requirements. The major accomplishments of the quarter are described in the following subparagraphs.

a. Department of the Army

(1) A contract with Mr. Ralph J. Stephenson for assistance in development of a working network analysis system for the study was executed.

(2) Action was initiated to develop a standardized format for the study report and appendices.

b. Department of Agriculture. Inventories of the flood-prevention and drainage-problem areas in the basin were completed, and copies of the summaries were provided to all study participants.

c. Department of the Interior. The Federal Water Pollution Control Administration completed a working draft of a report titled "A Comprehensive Water Pollution Control Program for the Lake Michigan Basin - Grand River, Michigan." The draft was then used as the basis for Appendix G of the comprehensive study.

22. July through September 1966. During the first quarter of fiscal year 1967, two Basin Plan Formulation Subcommittee meetings were held, the seventh on 26 July 1966 at Detroit, Michigan, and the eighth on 14 September 1966 at East Lansing, Michigan. The agenda for the seventh meeting consisted primarily of progress reports from participating agencies; the eighth meeting centered around a color coding system for evaluation of the PERT network.

23. October through December 1966. The seventh Coordinating Committee meeting was held during the second quarter of fiscal year 1967, on 6-7 December 1966 in East Lansing, Michigan. A digest of the minutes is in Attachment 2. Two Basin Plan Formulation Subcommittee meetings were held at East Lansing, Michigan; discussion pertained to particular agency progress and evaluation of scheduling. The third Hydrology Task Group meeting was held on 5 October 1966 in Lansing, Michigan; methods for determination of minimum low-water-flow requirements were discussed and approved. The following subparagraphs relate the more important accomplishments from October through December 1966.

a. Department of the Army

(1) The Corps distributed to all participating agencies "Report and Preparation Standards", intended for use as a guide in the preparation of the main report and its appendices.

(2) Hydrology, hydraulics, and stream regulative studies continued and were incorporated in Appendix D - "Surface Water, Hydrology, and Hydraulics, and Fluvial Sediments". Work continued on Appendix D, with particular attention to the problem areas on the main stem and principal tributaries.

b. Department of Health, Education, and Welfare. The Public Health Service compiled water laws, policies, and procedures of the Department of Health, Education, and Welfare for inclusion in Appendix N - "Water Laws".

SECTION VII

1967 STUDY ACTIVITIES AND EVENTS

24. January through March 1967. During the third quarter of fiscal year 1967, three Basin Plan Formulation Subcommittee meetings were held; the eleventh on 17 January 1967, the twelfth on 21 February 1967, and the thirteenth on 28 March 1967. Discussion of all three meetings was centered on the progress and formulation of techniques of study for the appendices. The following subparagraphs relate the major accomplishments of this quarter.

a. Department of the Army.

(1) The Corps submitted the Federal Law portion of the advance draft of Appendix N - "Water Laws", to the Coordinating Committee for updating, revision, and comment prior to preparation of the first study draft.

(2) The draft of Appendix H - "Flood Control" with particular attention to problem areas of the main stem and principal tributaries, was distributed for review and comment.

b. Department of Agriculture. A working subcommittee met in February to organize and prepare the second draft of Appendix M - "Agriculture"; agricultural data were revised, recompiled, and edited.

c. Department of the Interior. The Bureau of Sport Fisheries and Wildlife revised projections of hunting and fishing demands to include the effects of user ingress and egress on Basin resources.

25. April through June 1967. During the fourth quarter of fiscal year 1967, the eighth Grand River Basin Coordinating Committee meeting, five Basin Plan Formulation Subcommittee meetings, and one Hydraulics and Hydrology meeting were held. A digest of the minutes of the Coordinating Committee meeting is in Attachment 2.

a. Department of the Army. Contained in the following subparagraphs are the more important accomplishments of the Corps of Engineers during this quarter.

(1) Hydrology, hydraulic, and stream regulation studies were continued in conjunction with the preparation of the first draft of Appendix D. Four interim papers were published and distributed; the titles are:

(a) "Stream Flow and Routing".

(b) "Discharges for Ungaged Areas within the Grand River Basin".

(c) "Estimating Evapotranspiration Losses within the Grand River Basin".

(d) "Regulation of a Reservoir System".

(2) Studies were continued on development of data for evaluating multi-purpose reservoirs, with efforts centered on use of computer-oriented techniques.

b. Department of Agriculture. Contained in the following subparagraphs are the more important accomplishments of the Department of Agriculture during this quarter.

(1) A review draft of Appendix M - "Agriculture" was assembled and distributed to State and Federal agencies for review and comment.

(2) Assistance, in varying amounts, was provided for drafts of Appendices D, H, N, and P.

c. Federal Power Commission. The first draft of Appendix L - "Power", was completed and distributed to other agencies and departments for review and comment.

d. Department of the Interior. Contained in the following subparagraphs are the accomplishments of the Bureaus of the Department of the Interior during the fourth quarter of fiscal year 1966.

(1) Bureau of Mines. The Bureau published the first draft of Appendix F - "Mineral Resources" for comments and review. The Bureau also completed personal inspection of most reservoir sites inventoried in the Basin.

(2) U. S. Geological Survey. The Geological Survey submitted the first draft of Appendix E - "Geology and Ground Water" to the Hydraulics and Hydrology Subcommittee for review and comment.

(3) Federal Water Pollution Control Administration. The FWPCA submitted the first draft of Appendix G - "Water Use and Stream Quality", for review and comment.

(4) Bureau of Sport Fisheries and Wildlife. The Bureau investigated proposed reservoir sites and made comments in the second draft of Appendix K - "Fish and Wildlife".

(5) Bureau of Outdoor Recreation. The Bureau published and distributed its first draft of Appendix J - "Recreation" for review and comment.

26. July through September 1967. During the first quarter of fiscal year 1968, three Basin Plan Formulation Subcommittee meetings and one Hydraulics and Hydrology Subcommittee meeting were held. The Hydraulics and Hydrology Subcommittee discussed Appendices C, D, and E. The Basin Plan Formulation Subcommittee continued to update planning formulation for the Basin. The following subparagraphs describe notable events occuring during this quarter.

a. Department of the Army

(1) The second draft of Appendix H - "Flood Control", with particular attention to problem areas of the main stem and principal tributaries was drafted with incorporated comments.

(2) A scheme of reservoirs was agreed upon by the Basin Plan Formulation Subcommittee to satisfy 1985 needs upstream of Lansing; detailed site, soil, and real estate data were outlined for evaluation of the multi-purpose reservoir.

b. Department of the Interior. The National Park Service initiated a study through Michigan State University for identifying and evaluating the national, historic, and archeological resources of the Basin.

The Bureau of Sport Fisheries and Wildlife completed the second draft of Appendix K - "Fish and Wildlife". The Bureau also did extensive study on selection of reservoirs which would best satisfy fishing and hunting needs.

27. October through December 1967. The ninth Coordinating Committee meeting was held on 29-30 November 1967 in East Lansing, Michigan, during the second quarter of fiscal year 1968. A digest of the minutes is in Attachment 2. Two Basin Plan Formulation meetings were held: the twentieth on 24 October 1967, and the twenty-first on 14 December 1967; business centered around study formulation of proposed reservoir sites. The following subparagraphs contain noteworthy events of this quarter.

a. Department of Agriculture. Drafts of three watershed investigation reports were prepared for areas of potential development in the next fifteen years.

b. Department of the Interior. The National Park Service received from Michigan State University the report on the natural, historic, and archeological resources of the Grand River Basin.

SECTION VIII

1968 STUDY ACTIVITIES AND EVENTS

28. January through March 1968. During the third quarter of fiscal year 1968, three Basin Plan Formulation Subcommittee meetings were held: the agenda for the meetings centered around agency progress and formulation of future study. The first meeting of the Agency Associate Group for Environmental Quality was held on 12 March 1968. The following subparagraphs relate the principal accomplishments of agencies in the comprehensive study during this quarter.

a. Department of the Army. The Corps initiated a program entitled "Flood Routing Through a Reservoir System of Seven Sites or Less" attempting to maintain non-damaging flows at a downstream damage point. A second program was also initiated, entitled "Routing Monthly Streamflows Through a Reservoir System of Seven Sites or Less" attempting to meet flow demands at a single downstream index point.

b. Department of Agriculture. The Economic Research Service incorporated adjusted land use data affecting projections of cropland and pasture acreage.

c. Department of the Interior. The Bureau of Outdoor Recreation initiated detailed studies on the proposed Sandstone, Onondaga, Minard, Okemos, Williamston, and Doan Creek reservoir sites.

29. April through June 1968. The tenth Coordinating Committee was held on 21-22 May 1968 in Grand Rapids, Michigan, during the fourth quarter of fiscal year 1968. A digest of the minutes is in Attachment 2. Two meetings of the Basin Plan Formulation Subcommittee were held: the twenty-fifth on 23 April 1968, and the twenty-sixth on 10-14 June 1968. The Agency Associates Group for Environmental Quality held its second meeting in May of this quarter. The following subparagraphs relate the principal accomplishments of agencies in the comprehensive study during this quarter.

a. Department of the Army. The Corps of Engineers continued studies on development of data for evaluating multipurpose reservoirs. Efforts were centered on use of computer oriented techniques whenever possible. The second draft of Appendix H - "Flood Control", with particular attention to the main stem and principal tributaries problem areas has been re-drafted.

b. Department of Agriculture. The revision of Appendix M - "Agriculture" was continued. All comments on the second draft of the appendix were considered and changes made where necessary. A review of and comments on other draft appendices were made.

c. Federal Power Commission. Draft No. 2 of Appendix L - "Power", was reviewed by all agencies and again by the FPC. No changes appear to be necessary.

d. Department of the Interior. Contained in the following subparagraphs are the accomplishments of the Bureaus of the Department of Interior during the fourth quarter of the fiscal year 1968.

(1) National Park Service. A contract was awarded for the indepth study of two areas in the Grand River Basin. This study will be made by Michigan State University and will relate to the natural, historical, and archeological values of the study areas.

(2) Bureau of Sport Fisheries and Wildlife. The final report draft of Appendix K - "Fish and Wildlife", was distributed and comments received from some agencies. There are no anticipated major changes in the final report.

(3) Bureau of Mines. Part III, Mineral Production and Reserves, Appendix O - "Economic Base Study", was completed and published. Appendix B - "General Basin Description", was completed and forwarded. Appendix F - "Mineral Resources", was completed and transmitted to the Corps of Engineers.

30. July through September 1968. During the first quarter of fiscal year 1969, three Basin Plan Formulation Subcommittee meetings were held; the twenty-seventh on 8-12 July 1968, the twenty-eighth on 12-16 August 1968 and the twenty-ninth on 18-19 September 1968. A meeting was held on 25 September 1968 to explain the Basin Study and status to municipal planners in the Basin. The following subparagraphs describe notable events occurring during this quarter.

a. Department of the Army

(1) Studies were continued on development of hydrologic and regulation data for evaluating multipurpose reservoirs. Efforts were centered on use of computer-oriented techniques whenever possible.

(2) A scheme of projects was agreed upon by the Basin Plan Formulation Subcommittee to satisfy 1985 needs and demands for the Basin. Detailed site, soils and real estate data were obtained for evaluating two multipurpose reservoir complexes in these studies.

b. Department of Agriculture. Work was accomplished on structure site list as a contribution to Appendix H - "Flood Control". Revision of Appendix M - "Agriculture" was continued. Work was continued on Watershed Investigation Reports.

c. Federal Power Commission. Studies were made of potential hydroelectric power projects in connection with multipurpose reservoirs. None of the potential hydroelectric power projects were found economically feasible. Drafts of appendices prepared by other agencies for the study were reviewed and comments prepared as appropriate.

d. Department of the Interior. Contained in the following subparagraphs are the accomplishments of the Bureaus of the Department of the Interior during the first quarter of fiscal year 1969.

(1) National Park Service. The indepth study of the natural, historical, and archeological resources of areas I and II of the Basin is 65% complete. Michigan State University was granted an extension of submission date from 1 September 1968 to 1 January 1969.

(2) Bureau of Sport Fisheries and Wildlife. The final draft of Appendix K - "Fish and Wildlife", was distributed and comments have been received from some agencies. Major changes in the final report are not anticipated.

(3) Bureau of Mines. Preliminary mineral evaluation studies on two proposed reservoir sites were typed and forwarded to the Corps of Engineers.

(4) U. S. Geological Survey. Appendix E - "Geology and Ground Water", was reviewed and approved for publication by the Corps of Engineers and by the Director of the Geological Survey. Reports on two reservoir sites were completed and forwarded to the regional headquarters for review.

31. October through December 1968. The eleventh Coordinating Committee was held on 3-4 December 1968 at Grand Rapids, Michigan, during the second quarter of fiscal year 1968. A digest of the minutes is in Attachment 2. The thirtieth Basin Plan Formulation Subcommittee meeting was held on 22-23 October 1968. The third Agency Associate Group meeting was held on 3 December 1968. The following subparagraphs describe notable events occurring during this quarter.

a. Department of the Army. Final transfer funds were made in November 1968 to scheduled study recipients in accordance with the last Coordinated Budget Estimate. The first published draft of Appendix Q - "The Basin Plan of Development", was assembled and distributed. Studies continued on development of computerized data for

evaluating certain reservoir complexes incorporating results of latest 4-foot contour mapping and synthetic monthly generated river flows for optimizing the site.

b. Department of Agriculture. The continued revision of Appendix M - "Agriculture", and continued work on Watershed Investigation Reports were carried on in conjunction with re-evaluation of Land Treatment Programs for Appendix Q - "The Basin Plan of Development".

c. Federal Power Commission. The final printing of Appendix L - "Power", was prepared and furnished to the Chairman of the Coordinating Committee.

d. Department of the Interior. The Bureau of Sport Fisheries and Wildlife reviewed Appendix Q - "The Basin Plan of Development", and made the editorial changes necessary for Appendix K - "Fish and Wildlife".

SECTION IX

1969 STUDY ACTIVITIES AND EVENTS

32. January through March 1969. During the third quarter of fiscal year 1969, three Basin Plan Formulation Subcommittee and one Public Information Subcommittee meetings were held. The Basin Plan Formulation Subcommittee meetings were held on 21-23 January 1969, 20 February 1969 and 18 March 1969. Their efforts continued on the preparation of Appendix Q - "The Basin Plan of Development". The Public Information Subcommittee meetings were held on 7 January 1969, 6 February 1969 and 25 March 1969. Implementation of the public information program developed by the Public Information Subcommittee was initiated on 24-25 March 1969 by releasing the preliminary Basin Plan to local planners, State legislators and news media. The following subparagraphs describe notable events occurring during this quarter.

a. Department of the Army. Selection and contacts were made with the three Environmental Quality Consultants. Tentative agreement to their employment was obtained. Studies were completed on the development of a computerized simulation model for two major reservoir complexes proposed in the Basin Plan.

b. Department of Agriculture. Continued revision of Appendix M - "Agriculture".

c. Federal Power Commission. The final draft of Appendix L - "Power", was prepared and furnished to Committee members for comments. The Chairman of the Coordinating Committee was informed of the required changes for the final printing of the appendix.

d. Department of the Interior. Contained in the following subparagraphs are the accomplishments of the Bureaus of the Department of the Interior during the third quarter of fiscal year 1969.

(1) Bureau of Mines. All scheduled work has been completed. Portions of the basin development plan appendix were reviewed.

(2) National Park Service. The only work remaining consists of reviewing and commenting on appendices submitted to the National Park Service.

(3) Bureau of Outdoor Recreation. All work has been completed except for the preparation of Draft III of Appendix J - "Recreation".

33. April through June 1969. During the fourth quarter of fiscal year 1969, the twelfth meeting of the Coordinating Committee was held on 6-7 May at Jackson, Michigan. The thirty-fourth, thirty-fifth and thirty-sixth Basin Plan Formulation Subcommittee meetings were held on 10 April 1969, 20 May 1969 and 11 June 1969, respectively. The fourth meeting of the Public Information Subcommittee was held on 21 April 1969. An extensive public information program was conducted within the Basin by the Michigan Grand River Watershed Council, to inform the public and to obtain popular reaction to the plan. A report on the public information program is Attachment 3 of this appendix. The first two of five sections of Appendix Q - "The Basin Plan of Development", were drafted by the Corps of Engineers.

34. July through September 1969. During the first quarter of fiscal year 1970, the thirteenth and fourteenth meetings of the Coordinating Committee were held on 1 August 1969 and 17-18 September 1969, respectively. Digests of the minutes of the meetings are in Attachment 2. The thirty-seventh, thirty-eighth and thirty-ninth meetings of the Basin Plan Formulation Subcommittee were held on 25 July 1969, 4 September 1969, and 30 September 1969, respectively. Discussion of all three meetings was centered on the progress and finalization of Appendix Q - "The Basin Plan of Development". The Corps of Engineers completed work on Sections I and III of Appendix Q. The participating Federal agencies reviewed and commented on various appendices as they were distributed for review.

35. October through December 1969. During the second quarter of FY 1970 critiques of the Basin Plan, from an environmental quality point of view, were received from two environmental quality consultants and taken under advisement by the Coordinating Committee members. Appendices B, C, E, F, H, K, L, and O were prepared in final form and have been or are in the process of being printed. The participating Federal and State agencies reviewed, commented on, and continued work on the remaining appendices which were not finalized for printing. The Corps continued work on appendices A, D, I, P, and Q. The FWQA continued work on appendix G. The BOR continued work on Appendix J. The USDA continued work on appendix M. The State of Michigan is compiling a 1968 Supplement to Appendix N.

SECTION X

1970 STUDY ACTIVITIES AND EVENTS

36. January through March 1970. During the third quarter of FY 1970, the fifteenth meeting of the Coordinating Committee was held on 25 March 1970. The fortieth and forty-first Plan Formulation Subcommittee meetings were held on 5 and 12 March respectively. The participating Federal and State agencies continued work on the remaining appendices. The State of Michigan submitted the 1968 supplement to Appendix N - Water Laws and Appendix N was printed in final form.

The Corps finalized Appendix I - Navigation and it was printed in final form. The Federal Water Quality Administration continued work on Appendix G. The Bureau of Outdoor Recreation continued work on Appendix J. The United States Department of Agriculture continued work on Appendix M. The Corps continued work on Appendices A, D, P, and Q. The Corps drafted an outline of the main report in March and submitted it to the participating agencies for review and comment.

37. April through June 1970. During the fourth quarter of FY 1970 the Coordinating Committee conducted three public hearings at Grandville, Lansing and Jackson on 7, 8 and 9 April 1970 respectively. Transcripts of the public hearings were prepared and copies are available at the Corps' District office. The sixteenth meeting of the Coordinating Committee was held on 8 May 1970. The meeting centered around discussion and evaluation of the public hearings. The forty-second Plan Formulation Subcommittee meeting was held on 11 May 1970. At this meeting the members re-evaluated the proposed plan of development and formulated recommended changes to be presented to the Coordinating Committee. The FWQA submitted Appendix G - Water Use and Stream Quality and it was printed in final form. The BOR submitted Appendix J - Recreation and it was printed in final form. The USDA submitted Appendix M - Agriculture and it was printed in final form. Participating agencies submitted their comments regarding the recommended outline for the Main Report. The Corps continued work on appendices, A, D, P and Q. In June of 1970 Colonel Myron D. Snoke replaced Colonel James T. White, Jr., as Chairman of and the Department of the Army's representative on the Coordinating Committee.

38. July through September 1970. Several individuals and interest groups of the basin expressed opppsition to the basin plan of development through their correspondence with members of the Michigan State Legislature, the two U.S. Senators from Michigan, and with U.S. Representatives whose Congressional Districts lie within the basin.

The Corps continued work on the preliminary draft of the Main Report and on Appendices A, D, P, and Q.

39. October through December 1970. A special Michigan State Legislative Committee, chaired by State Representive Jelt Sietsema of the Wyoming-Grand Rapids area, held hearings concerning the Grand River Basin Study suggested plan of development in Lansing and Grand Rapids, Michigan, on 7 and 15 December 1970 respectively. Two hearings were held at each location. Persons attending the hearings expressed opposition to various features of the plan, particularly the proposed reservoir impoundments.

The seventeenth Coordinating Committee meeting was held on 18 December 1970. During the meeting, consideration was given to deleting all proposed single purpose recreation and fish and wildlife reservoirs from the basin plan of development. However, at this meeting, the Coordinating Committee agreed to not delete the proposed reservoirs from the basin plan.

SECTION XI

1971 STUDY ACTIVITIES AND EVENTS

40. January through March 1971. The eighteenth, nineteenth and twentieth Grand River Basin Coordinating Committee meetings were held on 15 January, 12 February and 30 March 1972 respectively.

During the eighteenth meeting, it was brought out that because of its possible social and political impacts, the suggested basin plan of development was largely unacceptable to the people of the basin. The Coordinating Committee agreed to consider three additional alternative plans, each of which provided fewer water based recreational benefits than the plan presented at the April 1970 public hearings. The Basin Plan Formulation Subcommittee was charged to prepare a time and cost estimate necessary to develop an alternative plan which would be included in Appendix Q. The Coordinating Committee agreed that the current plan would remain in Appendix Q and that the alternative plan would become the Addendum to Appendix Q.

During the nineteenth and twentieth Coordinating Committee meetings, the Basin Plan Formulation Subcommittee presented an outline of the alternative plan and a time and cost estimate necessary to prepare it. Both the outline and time and cost estimate were indorsed by the Coordinating Committee. The Coordinating Committee agreed to inform the public by letter of its decision to prepare the alternative plan.

41. April through June 1971. The twenty-first, twenty-second and twenty-third Coordinating Committee meetings were held on 19 April, 14 May and 30 June 1971 respectively.

Work continued on the Addendum to Appendix Q. The Coordinating Committee agreed to refer to the alternative plan as Plan B and the previous plan as Plan A. During the twenty-second meeting, Colonel Myron D. Snoke, Chairman of the Coordinating Committee disclosed a letter addressed to him from Governor William D. Milliken of Michigan and also a news release signed by the Governor. Both the letter and news release pertained to the Grand River Basin Study plan of development. The Governor stressed the importance of the plan being socially acceptable and ecologically sound. During the twenty-third meeting, the Coordinating Committee reviewed, revised and generally adopted preliminary drafts of Appendix Q including Plan B and the Main Report.

42. July through December 1971. The twenty-fourth Coordinating Committee meeting was held on 14 July 1971 and the twenty-fifth meeting was held on 9-10 December 1971. During its twenty-fourth meeting, the Coordinating Committee formulated recommendations which would be included in the Main Report. During its twenty-fifth meeting, the Committee briefly reviewed December 1971 revised drafts of Appendix Q and the Main Report. The Committee also agreed on the procedure and timetable for distributing and reviewing the Grand River Basin Study Report.

SECTION XII

1972 STUDY ACTIVITIES AND EVENTS

43. January through May 1972. Work on the final drafts of Appendix Q and the Main Report continued. Comments on the December 1971 drafts of reports were received from Coordinating Committee members and incorporated into the final drafts.

In May 1972, the Coordinating Committee prepared an information brochure which listed the main features of the recommended plan included in the summary (Main Report) report. Copies of the brochure were widely distributed to the public in connection with the Michigan Grand River Watershed Council's annual public information meetings which commenced on 11 May 1972. The Chairman of the Coordinating Committee, Colonel Myron D. Snoke, participated in the Council's initial public information meeting and covered the highlights of study's recommended plan.

SECTION XIII

REFERENCES

1. Grand River Basin Study Plan of Investigation.
2. House Document No. 80, 73rd Congress, 1st session.
3. Minutes of the meetings of the Grand River Basin Coordinating Committee.
4. Grand River Basin Study Quarterly Status Reports.
5. Senate Document No. 132, 84th Congress, 2nd Session.
6. House Document No. 157, 88th Congress, 1st Session.
7. Minutes of the meetings of the Grand River Basin Study Economic Advisory Board.
8. Senate Document no. 97, 87th Congress, 2nd Session.
9. Grand River Basin Study Hydrology and Hydraulics Subcommittee.
10. Minutes of the meetings of the Grand River Basin Study Plan Formulation Subcommittee.
11. Digest of the Proceedings of the 10 December 1963 Public Hearing.

ATTACHMENT 1, APPENDIX A

DIGEST OF THE PROCEEDINGS OF THE
10 DECEMBER 1963 PUBLIC HEARING

DIGEST OF PROCEEDINGS
OF THE
PUBLIC HEARING ON THE GRAND RIVER
BASIN COMPREHENSIVE PLANNING STUDY
HELD AT
LANSING, MICHIGAN
ON
10 DECEMBER 1963

U. S. ARMY ENGINEER DISTRICT, DETROIT
CORPS OF ENGINEERS
150 MICHIGAN AVENUE
DETROIT, MICHIGAN 48231

DIGEST OF PROCEEDINGS
PUBLIC HEARING ON THE GRAND RIVER
COMPREHENSIVE BASIN PLANNING STUDY
HELD AT LANSING, MICHIGAN ON 10 DECEMBER 1963
AFTERNOON SESSION

1. A public hearing was held on Tuesday, 10 December 1963 at the U. S. Army Reserve Center, Lansing, Michigan. The purposes of the hearing were to; inform those attending as to the objectives of the study; to identify known problems; and to indicate needs for and interest in water resources developments in the basin. The hearing was attended by 160 persons representing Federal, state and local governments, as well as private interests.

2. Participating officials included:

Colonel Jeff W. Boucher*[1] - U.S. Army, Corps of Engineers
Mr. Albert A. Applegate[1] - Administrative Asst. to Governor Romney
Mr. Loring F. Oeming*[2] - Michigan Water Resources Commission
Mr. Nicholas V. Olds[2] - Michigan Attorney General's Office
Mr. Russell G. Hill[2] - Michigan Soil Conservation Committee
Mr. John E. Vogt[2] - Michigan Department of Health
Mr. Stanley Quackenbush[2] - Michigan Department of Agriculture
Mr. William Colburn[2] - Michigan Department of Conservation
Dr. Paul A. Herbert[2] - Michigan Department of Economic Expansion
Mr. Earl E. Fenton[3] - U.S. Department of Agriculture
Mr. Harry Krashen[3] - U.S. Department of Commerce
Mr. William Q. Kehr[1] - U.S. Dept. of Health, Education & Welfare
Mr. Harold C. Jordahl, Jr.[1] - U.S. Department of Interior
Mr. Orel E. Haukedahl[3] - U.S. Federal Power Commission
Mr. George W. Reschke - U.S. Army, Corps of Engineers

*Chairman
[1]Member Grand River Basin Coordinating Committee.
[2]Member Michigan State Inter-Agency Coordinating Committee.
[3]Alternate Member Coordinating Committee.

3. Colonel Boucher stated the authorization for the study, the purpose of the hearing, and briefly summarized the procedural steps to accomplish the study. He then itemized the specific items of local cooperation usually required as a step toward construction of Federal projects.

4. Mr. Albert A. Applegate, Office of the Governor, stated that the state of Michigan stands ready for consultation, for supplying of information, and for close cooperation in the carrying out of the study. He referred the Federal agencies to the State Inter-Agency Coordinating Committee for assistance, consultation, and participation in the studies.

5. Mr. Loring F. Oeming, Executive Secretary of the Michigan Water Resources Commission stated that the Commission is composed of the heads of the Departments of Agriculture, Conservation, Health, and Highway, and representatives of industry, municipalities, and conservation groups. The Commission's duties and responsibilities are to cooperate and negotiate with other governmental units and agencies in matters concerning the water resources of the state. The Commission has conducted river studies of waste assimilation capacities and has issued a report on water resources conditions and uses in the Upper Grand River basin and has, nearing completion, a report on the lower portion of the basin.

6. Mr. N. V. Olds, Assistant State Attorney General, described and distributed copies of a recent study of the constitutional provisions, statutes, and some of the common law rights, or court decisions, in respect to the state and Federal laws. He stated that a series of decisions has established what the Supreme Court calls the Public Trust Document. Namely, that the State, representing all of the people, has a public trust in all of its waters. He further stated that the study presented was not an exhaustive study but it provided a general idea of what legal rights might be affected by water improvements in the basin. It is a general concept of the Michigan laws and it was not intended as an opinion or decision-making document.

7. Mr. Russell G. Hill, Executive Director of the State Soil Conservation Committee, stated that the entire basin is included within Soil Conservation Districts. The Districts have the authority to enter into agreements with landowners in their respective jurisdictions to carry out soil and water conservation practices. Many areas in the basin are experiencing considerable damage from excess surface water and inadequate soil drainage. A desire for relief through the Small Watershed Protection and Flood Prevention Act, Public Law 566, has been expressed by some local communities.

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8. Mr. John E. Vogt, Director of Engineering, Michigan Department of Health, stated that his agency's direct interest in the study stems from its specific as well as general legal responsibility for protecting the public health. His office has assembled a great deal of useful data in carrying out their responsibility, which will be made available as needed for the study. The problem areas which the Department of Health view as needing attention are: (1) the delimiting of flood plains with attendant flood plain zoning, (2) evaluation of effectors of overflows from combined sewers in relation to other practical means for sewerage service and control of discharge from combined sewers, (3) a sufficiently complete appraisal of ground water supply to determine if this source need be augmented, (4) quality of surface water anticipated for crop irrigation and affect on planned waste assimilative capacities, (5) need to evaluate other significant sources of contaminants from tributary land areas (i.e. fertilizers, insecticides, etc.) and their effect on water quality, (6) water quality of potential recreational areas - both physical and bacteriological quality, and (7) comprehensive site studies for impoundments to determine their value for multipurpose use.

9. Mr. Stanley Quackenbush, Deputy Director for Inter-County Drains, Michigan Department of Agriculture, stated that the Department's inter-county drain responsibility originates from the Michigan Drain Code. Under this law, the Director of Agriculture is Chairman of all inter-county drainage boards. The Department will welcome any plans developed during the comprehensive study to provide drainage, flood control or water management projects. The Department will also be concerned with any plans which might jeopardize established drains. The Department has initiated steps to secure assistance for construction of the Maple River Drain under PL 566. Other current interests, concerning major drainage and flood control, include the Cedar River, Lookingglass River, and the Portage River and Grand River Drains.

10. Mr. William Colburn, Michigan Department of Conservation, stated that the Department, through its statutory authority and responsibility to protect and conserve the natural resources of the State, has an established interest in the water resources of the Grand River basin. Though extensive improvements have been made for fish, wildlife, and recreation, many improvements remain to be accomplished. The comprehensive study should allow full consideration to be given to the appropriate utilization of the basin's resources for recreational purposes.

11. Dr. Paul Herbert, Director, Research Division of the Department of Economic Expansion, stated that his Department would coordinate the economic base study of the Grand River Basin Service Area being made by Battelle Memorial Institute with an economic base study they were undertaking for the state of Michigan.

12. Mr. Oeming stated there was one more agency represented on the State Committee, the Waterways Commission, represented by Keith Wilson. Mr. Wilson was unable to attend.

13. Mr. Earl E. Fenton, Assistant State Conservationist, Soil Conservation Service, U.S. Department of Agriculture, cited Section 6 of Public Law 566, 83rd Congress, as the Department's authority for participation in the study. The study will be coordinated by a Field Advisory Committee composed of representatives of the U.S. Forest Service, Economic Research Service, and Soil Conservation Service. Each of these three agencies will contribute technical personnel to a study team. Some of the major responsibilities of the Department were reiterated. It was pointed out that a brief statement summarizing the agricultural aspects of the study will be found on page twelve of the Information Booklet.

14. Mr. Harry Krashen, Planning & Research Engineer, Bureau of Public Roads, U.S. Department of Commerce, discussed the responsibilities of the Department's Weather Bureau, Coast and Geodetic Survey, and Bureau of Public Roads in the study. He indicated the desirability that future plans of basin development should consider river and flood forecasting services to cover daily and long range forecast of streamflow for water supply, pollution abatement, recreation, and other water resources requirements.

15. Mr. William Kehr, Project Director of the Public Health Service's Great Lakes-Illinois River Basin Project, Department of Health, Education and Welfare, stated that the Service has an active comprehensive water quality study currently underway encompassing the Great Lakes and Illinois River basins. This study, which includes the Grand River basin, is scheduled for completion in 1965. He also stated that through the Construction Grants Program, the Public Health Service has assisted, or is currently assisting, the communities of Grand Rapids, Grant, Wyoming, Grandville, Fowlerville, Mason, Jackson, Meridian Township, Fowler, Portland and Woodland to construct sewage treatment works.

16. Mr. Harold Jordahl, Jr., Regional Coordinator, U.S. Department of the Interior, stated that the overall objective of the Department in the formulation of plans for development of water and related land resources requires full consideration of; (a) development of resources as an aid to national and regional economic development (b) preservation of resources, as appropriate, to insure they will be available for the best use when needed; and (c) the well-being of people. The participation and responsibilities of the Office of the Assistant Secretary for Water and Power Development; U.S. Geological Survey; Bureau of Mines; Fish and Wildlife Service; Bureau of Outdoor Recreation; and the National Park Service were presented.

17. Mr. Orel Haukedahl, Deputy Regional Engineer, Federal Power Commission, discussed the Commission's general responsibilities and interests and its specific responsibility in the comprehensive study. The Commission's National Power Survey to estimate 1980 power requirements and supply will be published in 1964. This forecast and the economic base study will be utilized to extend the forecast beyond 1980 for incorporation into the comprehensive study.

18. Mr. George W. Reschke, Chief, Engineering Division, U.S. Army Corps of Engineers, Detroit District, summarized the Corps' responsibility and participation in the comprehensive study. The individual studies of the Corps and other agencies will identify needs and will be incorporated into a plan which will propose various means for satisfying these needs. The plan will be flexible enough to provide for future changes in needs; incremental solutions of acute needs; and possible development of alternative solutions to the needs.

19. Mr. Robert Young, Executive Secretary of the Tri-County Regional Planning Commission, offered the Commission's cooperation and assistance in conducting the study. He then presented a summary of the information available at the Commission's office on past studies, current work, and going programs. He requested that the Commission's work be fully considered and utilized by the Coordinating Committee and that the Commission be given an opportunity to utilize information gathered by the Committee. He further suggested that the Committee include both state and local governments and agencies having significant planning functions within the basin. The Commission has requested the Corps of Engineers to conduct Flood Plain Information Studies for the urbanized and urbanizing portion of the Region. When information is available, the Commission intends to implement the studies by recommending detailed flood plain zoning and subdivision regulation policies to affected local governments for their consideration and action.

20. Mr. A. Walter Ruscett, Director of the County Water Utilities, Ottawa County, Grand Haven, presented a statement from the Ottawa County Board of County Road Commissioners, the official agency for developing water supply and sewage disposal facilities in Ottawa County. He stated that the Grand River had been considered as a water supply source for the Grand Valley State College but was rejected because of the reportedly unsuitable sanitary and chemical characteristics. He further stated that he could not substantiate the foregoing statement with sampling data but it is believed that such data has been collected and was available. He also stated that the river is reported to be essentially devoid of fish life for a distance of about eleven miles downstream of the east county line. He felt that a complete and comprehensive study relative to water use is both necessary and desirable.

21. Mr. Raymond Guernsey, Director of Planning, City of Lansing, stated there is dire need for information and basic data on which to base land use controls. He also stated that other types of tools or ordinances were needed to carry out long range objectives and development of the river basin. He further stated that the Lansing Planning Board was at the present time considering a new ordinance on flood plain zoning.

22. Honorable Henry Koster, Mayor of the city of Grandville, stated that the City is interested in the river from the standpoint of navigation, recreation, and conservation. As far as recreation is concerned, he referred to the half-million population in Kent and Ottawa Counties. He read two letters from commercial interests requesting a navigation channel from the Grand Rapids area to Lake Michigan. He further stated the City is in the process of putting in a marina in conjunction with construction of a sewage treatment plant. The City would also like a cleanup of the Grand River for wildlife aspects. He also indicated his belief that the Water Resources Commission should have more enforcement power to abate pollution of the streams.

23. Mr. Russ Fink, Chairman of the Lansing Planning Board, summarized the city of Lansing's interests into five points. First a determination of river flow adequate to assimilate treated sewage over the high and low flow periods of the River; second, water quality control which is directly related to providing water for Lansing and future metropolitan growth; third, the need for flood control as related to land uses through zoning; fourth, recreation; and fifth, future growth and industrial expansion.

24. Mr. Penuga, representing the Lansing City Government, stated that consultation with local governments and special interest groups would bring most effective results from Federal and state activities in river recreation and improvement.

25. Mr. Kevin, Chairman of the River Improvement Committee of city of Lansing, stated his committee was interested in the recreational aspects of the river.

26. Mr. Al Boyd, Lansing Chamber of Commerce, pointed out that the greater Lansing area has an economic base developed on industry, State government, Michigan State University, and distribution. As a member of the Delta Township Planning Commission, he strongly supported the updating and expansion of an economic study prepared by the Tri-County Regional Planning Commission to include other portions of the Grand River basin. The Delta Township Planning Commission is also concerned about ground water supply, flood plains, sewage disposal, parkways, and recreational developments. In closing, he expressed an opinion that the Coordinating Committee should include local representation.

27. Mr. James L. Rouman, Executive Director of the Michigan United Conservation Clubs, stated that member clubs are anxious to work with all agencies in comprehensive water resources studies. Decisions will have to be made concerning pollution control; irrigation; the detention of flood waters for drouth - time industrial purposes; multipurpose water storage projects; dredging and filling in inland lakes, streams, and flood plains; diversion of water for essential purposes; management of retired hydro-power reservoirs; and improved navigation, and such devisions must consider all water uses. He pledged the organization's support in the studies.

28. Mr. Carl W. Brakeman, Treasurer of the Lansing Boat Club, spoke of obstructions in the river and the yearly increasing numbers of small pleasure boats. He also mentioned that if the water quality were improved, the river would be safe for swimming and water skiing.

29. Mr. Clarence Manning, Soil Conservation Director of the Clinton County Soil Conservation District, indicated the District's desire to assist and cooperate in the study and listed what information the District has presently available. He encouraged the definition of flood plains; requested consideration of water quality improvements in the watershed within the District; and expressed interest in the improvement of small tributaries for agricultural drainage and flood control.

He believed several flood control recreational structures were possible on the Maple, Stoney Creek and Lookingglass River. He suggested that the directors of the District be invited to sit in as observers at future Coordinating Committee meetings.

30. Mr. M. S. Harvey, Consumers Power Company, stated that the Company has conducted studies of the economic feasibility of hydroelectric development within the Grand River basin and has concluded that additional hydro-power development would not be economically feasible. Further, the Company is considering retirement of one or more of its existing plants. He offered the assistance and cooperation of the Company but pointed out that they felt the electric energy requirements of the Grand River basin are now being adequately and reasonably met by present suppliers and these requirements will continue to be met in the future.

31. Mr. John R. Snell, Consulting Engineer, stated there was a need for multipurpose studies and the consulting engineers were ready to help. Important items to be considered are recreation, fish and wildlife, flood control, water supply, waste water treatment and pollution abatement, soil conservation, navigation, and power aspects, including the cooling waters needed for thermo plants. In a later statement, Mr. Snell requested that local views be fully considered in the studies and suggested that a Grand River Valley Authority be formed to implement these views. He also outlined a reservoir scheme that could be used for water supply, recreation, and flood control, and would alleviate problems created by low flows.

32. Mr. Huntley DeLano, representing the city of Grand Rapids, indicated the City was interested in; the river as a supplemental water supply source; flood control; and recreation. Water from the Grand River is used to supplement the City's primary water supply from Lake Michigan. He urged that flood control studies be conducted for a distance of about ten miles upstream and downstream from Grand Rapids. He also felt the studies should be concerned with the aesthetic effects that the River has on urban renewal and park development in Grand Rapids.

33. Mr. Allan F. Rowley, representing the Michigan Railroad Association, introduced Mr. George VanKoevering, Mr. Hutton, and Mr. Chabot. He stated that their comments would be representative of the problems facing the railroad companies. Mr. VanKoevering, Manager of the Michigan Railroads Association, stated that the railroads were very much interested in furthering the development and prosperity of the state of

Michigan and surrounding areas in a manner consistent with the protection of the taxpaying public and private enterprise. They are desirous of responding more specifically when details of proposed improvements are made known and stated that, insofar as navigation improvements are concerned, the existing rail and motor carriers provide adequate service at reasonable rates in the Grand River basin area.

34. Mr. Frank Hutton, Chief Engineer of Grand Trunk Western Railroad, expressed concern for the effects of proposed improvements on existing railroad facilities and stated that the Railroad considers proper compensation be provided for damages and resulting costs from such works. He also stated that the only serious flood damages to the Railroad's facilities have occurred near Saranac, Ionia, and Muir. Further, any extension of commercial navigation would provide uneconomic excess transportation capacity which would be a burden on the public taxpayers and detrimental to the existing railroad transportation system.

35. Mr. G. H. Chabot, Assistant to the Chief Engineer of the Chesapeake and Ohio Railroad, read a letter from Mr. T. F. Burris, Chief Engineer, voicing objections to river improvements for navigation as the costs would exceed any benefits and the existing rail and motor carriers provide adequate service at reasonable rates.

The hearing was then adjourned until 7:30 P.M. that evening.

EVENING SESSION

36. Mr. G. W. Reschke, Chief, Engineering Division, U.S. Army Engineer District, Detroit, called the evening session of the hearing to order. The following participating officials were introduced:

Mr. Loring F. Oeming	Michigan Water Resources Commission
Mr. Earl E. Fenton	U.S. Department of Agriculture
Mr. Harry Krashen	U.S. Department of Commerce
Mr. William Kehr	U.S. Dept. of Health, Education & Welfare
Mr. Orel Haukedahl	Federal Power Commission
Mr. Harold C. Jordahl, Jr.	U.S. Department of the Interior

Next, Mr. Oeming introduced members of the State Inter-Agency Coordinating Committee:

Mr. Russell G. Hill	Michigan Soil Sonservation Committee
Dr. Paul A. Herbert	Michigan Dept. of Economic Expansion
Mr. John E. Vogt	Michigan Department of Health
Mr. William Colburn	Michigan Department of Conservation

Mr. Reschke reiterated the Congressional authorization for the study; the purpose of the hearing; the study's objectives; the procedure for their accomplishment; and necessary local cooperation for flood control and related projects. He then gave a very brief summary of the statements submitted at the afternoon session by the officials represented on the Federal and State Committees.

37. Mr. Philip McCallister, Chief, Basin Planning Section, U.S. Army Engineer District, Detroit, then summarized the statements presented from the floor at the afternoon session.

38. Approximately 60 persons attended the evening session. The following views and interests were expressed.

39. Mr. Donald D. Rutter, Chairman, Mayors River Committee, Lansing, stated that something needs to be done about the river and made inquiries concerning the status of the study; its total approximate cost; and the extent of evaluation by local interest that the recommended plan will receive prior to its submission to Congress. He also expressed his opinion that local interests could be more adequately involved if citizen groups, similar to that being organized as the Grand River Valley Civic Authority, could work closely with the Committee.

40. Mr. Wayne Walter, distributor for Amway Sales Corporation, stated that his relationship with the public, as a distributor of cleaning products, has indicated that the public is largely unaware of the extent of water pollution in the United States. In response to his question concerning legislative control of water pollution, Mr. Oeming explained that the Michigan Water Resources Commission and the Departments of Health and Conservation have statutory authority; also, that a bill is in Congress that would require detergents marketed after 1965 to contain biodegradeable substances.

41. Mr. Carl Kevwitch, salesman for Amway Corporation, referred to a recent article in the State Journal concerning detergent pollution of the Grand River in the vicinity of Lansing. He also referred to a UPI news release that indicated some presently available detergents do not contribute to water pollution. It was his belief that the public should be informed of the seriousness of the detergent pollution problem and also that detergents are available that do not contribute to the problem.

42. Mr. Robert Harmon, landowner on the Maple River, indicated that the reach of the Maple River flowing through his land was badly polluted and wished that something could be done to restore fish and wildlife to the river.

43. Mr. Gordon Hornby, representing the city of Grand Haven, indicated the City to be interested in; the river's water pollution problem; further development of recreational boating and navigation facilities; and improvement of waterfowl habitat. He also discussed conflicts between drainage and flooding for waterfowl. He further requested, and received clarification on contemplated power studies and jurisdiction of aids to navigation.

44. Mr. Charles Harmon, landowner on the Maple River, questioned, and was advised, that even though the Federal Government may participate in some river improvement, the State will continue its efforts to abate water pollution. In response to his statement concerning water quality of the Maple River, Mr. L. Oeming suggested that Mr. Harmon continue to present his problems to the Water Resources Commission.

The hearing was adjourned at approximately 9:15 P. M.

DIGEST OF PROCEEDINGS
PUBLIC HEARING ON THE GRAND RIVER
COMPREHENSIVE BASIN PLANNING STUDY

APPENDIX A
A SUMMARY OF THE
LETTERS SUBMITTED FOR THE RECORD

1. Veril Baldwin & Sons, Grower and Shippers of Farm Produce, Stockbridge, Michigan, stated they are very much interested, first, in proper drainage from the Portage Lake Drain to the Onondaga area and, second, in water controls to hold water for conservation and irrigation purposes.

2. Mr. Kelley E. Carter, President of the village of Elsie, Michigan, stated the Village is actively supporting a plan to clean up and restore the Maple River for recreational uses and approves any logical plan that would improve the River for recreation and pollution control.

3. Mr. Robert Moore, President of the Elsie Lions Club, stated that the club maintains the Mill Sight Dam on the Maple River. Existing water recreational facilities are crowded and the Maple River and its tributaries can provide much more recreation, flood control, and drainage advantages than exist under present conditions. He stated that Elsie Lion Club and others in the community stand ready to assist.

4. Mr. V. W. Langworthy, Editor, Water and Sewage Works, expressed a need for a careful study of water quality, ground water resource and the most economic use of the regions water resources. He recommended the appointment of an authoritative resident of the region to the Coordinating Committee.

5. Mrs. H. A. Stringham, landowner on the Grand River downstream of Jackson, expressed concern with the condition of the river. Previously, the river was used for swimming, but the banks are now covered with "muck-slime". Past dredging stopped at her farm and, as a result, flooding occurs each spring.

CROSS INDEX OF TESTIMONY AT PUBLIC HEARING

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ATTACHMENT 2, APPENDIX A

MINUTES OF THE COORDINATING COMMITTEE
MEETINGS NOS. 1 THROUGH 25

GRAND RIVER BASIN COORDINATING COMMITTEE

FIRST MEETING - 6, 7 AUGUST 1963

DETROIT, MICHIGAN

1. Opening remarks - by Colonel Boucher, Chairman.

The first meeting was called to order at 10:00 A.M. by the Chairman, Colonel Boucher, District Engineer, U. S. Army Engineer District, Detroit.

a. All participants were welcomed. At this time the Colonel stated his responsibility of conducting the Grand River basin comprehensive study and named his alternate as Captain T. A. Kiernan, Deputy District Engineer.

b. Coordinating Committee members, alternates and participants present were introduced. A list of attendance is provided as inclosure 1.

c. Colonel Boucher briefly summarized the historical background of basin planning and identified the relationship of the Grand River basin comprehensive study to the current national comprehensive planning program.

d. In conducting the studies for the basin the following philosophy was suggested for adiption: (1) the ultimate goal of river basin development is to achieve the maximum possible net gain in the nation's wealth and the welfare of its people, (2) the plan should be viewed as a plan for the advancement of industry, transportation, agriculture, other fields of economic activity, and for recreation and fish and wildlife protection and enhancement, (3) basin planning is a team job, and (4) basin programs should produce maximum net benefits to the basin economy.

e. The Grand River basin Coordinating Committee was stated by the Colonel as having been established to provide for the active participation of the several interested Federal departments and agencies and the state of Michigan in meeting the objectives of the comprehensive planning program as best possible.

f. The main functions of the Coordinating Committee as stated by Secretary of the Army Cyrus R. Vance in his 4 December 1962 letters to the Federal departments represented at this first meeting was quoted by the Colonel. These proposed functions were also set forth in the Corps 26 December 1962 letter to the then Governor-elect, Honorable George Romney of Michigan.

Minutes are not verbatim

2. Decription of basin - by G. W. Reschke.

A general description of hydrology, physical, and economic features were given. Physical features including river characteristics, topography, climatology, geological and economic features, describing dominant industries, agriculture, mineral resources and population growth were summarized. A movie was then shown, titled "The River Grand." This movie was obtained from the state of Michigan. Mr. Billings pointed out that this film was produced by the Education Committee of the state. Conservation Department. He indicated that pollution in the grand River was less serious than depicted by the film.

3. Statements by the Committee Members.

Statements were presented by agency representatives of activities in the basin.

a. Corps of Engineers - by Mr. P. McCallister.

Completed studies prepared by the Corps consist of: (1) "a 308 report on the Grand River", House Document No. 80, 73rd Congress, 1st Session published in 1933 which discussed the problems of navigation, water power, flood control, and the needs of irrigation, (2) a survey report on flood control in Lansing, published in 1956 as Senate Document 132, 84th Congress, (3) an interim survey report favorable to a flood control project at Grandville, issued in 1962, presently under review by the Bureau of the Budget and (4) a navigation study, House Document No. 661, 76th Congress, 1st Session, March 1940.

Studies and survey reports initiated and presently suspended consist of: (1) reservoir studies delineating fifteen reservoir sites considered suitable for reducing stages of flood flows in areas susceptible to high flood damages, (2) an unpublished interim survey report draft in 1959, indicating that improvements for major drainage (putlet-channel) on the Portage River and the Grand River near Jackson were not warranted at that time, (3) flood control studies at Grand Rapids and Plainfield Township and for reservoirs within the Grand River basin, (4) reservoir routing studies and (5) regional frequency studies. The Corps is presently authorized to review Senate Document No. 88, 71st Congress, for recreational navigation studies.

Water and related land resource problems exist in the basin for flood control, major drainage, navigation, water supply, water quality control, hydroelectric power, fish and wildlife conservation, and recreation.

b. State of Michigan - by Mr. Albert A Applegate.

The completed studies, the studies underway and known problems pertaining to water resource matters in the basin were presented. Among completed studies are the "Report on Water Resource Conditions and Uses in the Upper Grand River Basin", and "Oxygen Relationships of Grand River, Lansing to Grand Ledge", both by the Water Resources Commission. The Commission also cooperated with Dr. Clarence Velz of the University of Michigan, School of Public Health, in a study reported as "Drought Flow of Michigan Streams." An investigation of Oxygen Relationships in the Grand River below Jackson has been made, and field data analyzed. A report will be forthcoming in the immediate future. In still a third study of the Grand, at Grand Rapids, field work has been completed and the data are being analyzed. A report on this study will be issued early in 1964. Field work is underway in studies which will be reported as "Water Resource Conditions and Uses in the Lower Grand River Basin."

The Geological Survey Division of the Department of Conservation is the repository for all oil well and water well logs and its staff is in possession of considerable first hand information on local ground water conditions. Other Divisions of the Department have extensive data on their respective interest areas. Municipal water supply and sewage disposal departments maintain data under the supervision and surveillance of the State Department of Health, which is in itself an important source of local water resources information. Considerable information on drainage conditions is available in offices of the County Drain Commissions.

Water pollution conditions seen in the movie and in the Tentative Plan, are under corrective action. The three reaches of streams where significant pollutional conditions exist are the subject of extensive improvements that are now underway at Jackson, and scheduled for early initiation at East Lansing and Lansing. One of the principal problems now facing us is stream flow augmentation to provide for industrial growth and population expansion. A growing problem which is not limited to the Grand River basin nor even to Michigan is the need for establishing an equitable and workable system for handling water rights, particularly with reference to consumptive uses.

c. Department of Interior - Mr. H. C. Jordahl.

(1) Mr. Jordahl speaking for the various services under the Department of Interior expressed their willingness to work on this comprehensive program.

(2) The paper, "Role of the Department of the Interior in River Basin Planning", prepared by Henry P. Caulfield, Jr., Assistant Director, Resources Program Staff, Office of the Secretary, Department of the Interior, at Corps of Engineers Seminar on River Basin Planning Seminar on 28 May 1963 was quoted.

(3) Functions of all bureaus were explained, as a part of Mr. Caulfield's paper. The Bureau of Commercial Fisheries will not be involved in the Grand River Basin Planning Program. Mr. Jordahl stressed the importance of the Bureau of Mines activities on economic considerations of a basin, particularly as related to an economic base survey.

(4) The Joint Report by Corps of Engineers and Missouri Basin Region, Department of Interior, on Water and Related Land Resources Development for Missouri River, Fort Peck Reservoir to Vicinity of Fort Benton, Montana, was recommended for reading.

(5) The Assistant Secretary's Office, Department of Interior wishes to be advised of the progress of the studies in the Grand River basin. (No power agency functions in the area and agency responsibility is assigned to the Assistant Secretary's Office).

(6) Mr. DeGalleke of the National Park Service presented a summary of his agency's organization and work assignments.

(7) Mr. Ash of USGS passed out prints showing locations at which hydrologic data is available and location of observation wells and area ground water wells studies in the basin. Data available is presented in the Work Plan submitted by USGS.

d. Department of Agriculture - by Mr. E. E. Fenton.

There are three general headings under which Department of Agriculture activities are carried out.

(1) Land treatment. The Soil Conservation Service has a memorandum of understanding with the 22-23 soil conservation districts that are active in the Grand River basin. Under this memorandum the SCS provides technical assistance in the form of:

(a) Land Stabilization Service.

(b) Forest Service.

(c) Farmer's "Homeowners" Administration.

(2) Development of Survey Report for Major Drainage - completed surveys include those for the Lookingglass River, Stony Creek, and Portage River and extensions thereof. A report will soon be completed for the Red Cedar. Field survey work is essentially complete for the Maple River study; studies may be halted by objections by local interests to the study. Two unfavorable reconnaissance reports were completed. One for the Flat River and the other for the Thornapple River.

(3) PL 566 Studies. The Muskrat Creek Watershed (Clinton County) project has structural work completed. Field survey work and a rough draft of flood prevention scheme has been completed for the Fowlerville Drain Watershed (Livingston County). The Muskrat Creek Watershed (Clinton County) project has completed all construction. Applications are still pending on two PL 566 studies, one is the Libhart Creek Watershed (Ionia County) and the other is Catlin-Waters Watershed (Clinton County).

e. Department of Commerce - by Mr. Harry Krashen.

(1) Coast and Geodetic Survey. Geodetic control, both horizontal and vertical, are located at various intervals throughout the Grand River basin. The controls provide data for engineering and mapping purposes.

(2) U. S. Weather Bureau. The Weather Bureau is responsible for collecting, processing, publishing and storing hydroclimatic data (precipitation, evaporation, humidity, temperature, wind, solar radiation, etc.) which are vital for basic water-related studies. Records of these data are available. The Weather Bureau anticipates that comprehensive basin studies will require further processing, compilation and analysis of hydrometeorological data, and reevaluation of the Flood Warning program.

(3) Bureau of Public Roads. Trunk lines have been and are being constructed in the Grand River basin. These trunk lines were designed to satisfy the transportation needs until the year of 1980. All the engineering and survey data are available.

f. Federal Power Commission - by Mr. Orel E. Haukedahl.

The Commission has not been very active in the Grand River basin. The topography of the basin does not offer much for hydropower developments. The undeveloped water power sites of the basin have been inventoried. Several flood control projects were investigated by the Commission for potential hydro-power development - the results were negative. Under the Federal Power Act, interests developing a reservoir site for hydro-power generation must investigate the recreational potential of the site when the installed capacity of generating units reaches a predetermined magnitude, before a license can be issued by the Federal Power Commission.

4. Plan of Investigation.

Mr. Goelzer described the tentative Plan of Investigation and the tentative appendix which was sent out prior to the meeting to all concerned. It was pointed out that this plan is intended to be a constantly changing and living document by which we should conduct our studies. In this respect it is important that our Plan as approved and reviewed by all agencies should be one which represents our best efforts, particularly when it is to be formulated for a study which will last at least four years. The primary use of the Plan will be for management direction, time schedules and coordination and will be a constantly changing one to suit circumstances as they arise.

5. Economic Base Study - by Mr Goelzer

The proposed appendix to the economic base study contract which describes the scope of work has been mailed to all departments concerned. Mr Goelzer stated that negotiations are being conducted

with an economic consultant for the study and provided a brief description of events leading to the negotiations. Extracts from a paper, "Economic Base Surveys", presented by Mr. Bach, of the Corps of Engineers, at the Corps of Engineers Seminar on River Basin Planning were quoted

It was suggested that the appendix to the proposed contract be made available to all agencies. Mr. McCallister pointed out that copies had been mailed out and field level coordination had been conducted with interested agencies. Further agency comments to the appendix should be forwarded to the Corps prior to 22 August 1963.

It was further mentioned that direct contact with the economic consultant and interested agencies was to be provided, but in order to facilitate managing the contract, which was the Corps function, the Corps would like to have a representative present at these meetings.

6. Public Hearings.

a. Colonel Boucher presented the need for a public hearing and described the procedures used by the Corps in conducting these hearings.

b The number of hearings, location and time was opened to discussion. It was mutually decided to hold a meeting at Lansing, approximately one month after funds have been appropriated by Congress. It was suggested that this hearing not be held during the period 14-30 November 1963. The experiences encountered, as a result of this first hearing would determine the desirability of more hearings.

c. The "Information Booklet", previously mailed to those present, was discussed. It was agreed that all comments would be submitted to the Corps by participating agencies prior to 15 September 1963 The Corps will mail copies of the expected mailing list for Public Notice of Hearing to all agencies with a request for comments for additions to the list. A final revised version of the "Information Booklet" would be inclosed with the letter announcing the hearing. Mr Collins offered his SCS newsletter as a means of notifying a substantial segment of the farm populus.

7. Work Proposed for FY 64.

a. Work proposed for FY 64 was presented by all department and agency representatives present. The proposed work efforts are as described in the agencies justification statements which form a part of the Coordinated Budget Estimates for Comprehensive Studies. (This budget estimate has been furnished to Coordination Committee members).

b. Mr. McCallister presented and explained the function of the "Data Book". The USGS will furnish, under contract to the Corps, low-flow characteristic data in tabular form. Representatives present felt it would be desirable to include this data in the Data Book. The number of copies of Data Books desired by Coordinating Committee members are to be given to the Corps. He further explained that the PERT program is presently being updated to meet the new time schedule.

He also suggested that any additional names for the address list, (distributed during this meeting), should be submitted to the Corps for preparation of a revised list. This is a list of all individuals from Coordinating Committee members to field office personnel who will be directly involved in the comprehensive studies.

8. Funding.

Funding has been fairly well discussed and reviewed between the Corps and Federal agencies during individual meetings. The Coordinated Budgets Estimate Sheet was presented for review. Revision, attachments, and comments, as proposed by participating agencies, were noted. The Coordinated Budget Estimates for the Grand River study was finalized as the result of this discussion.

INCLOSURE 1

LIST OF ATTENDANCE

FIRST MEETING
OF
GRAND RIVER BASIN COORDINATING COMMITTEE
ON
6-7 AUGUST 1963

DEPARTMENT OF THE ARMY

*Jeff W. Boucher, Chairman, Col., Corps of Engrs., Dist Engr.
**Thomas A. Kiernan[1], Capt., Corps of Engrs., Deputy Dist Engr.
George W. Reschke, Chief, Engineering Division
Vernon G. Goelzer, Chief, Basin Plng. & Proj. Plng. Br.
Philip McCallister, Chief, Basin Planning Section
Carl Argiroff, Basin Plng. & Proj. Plng. Br.

DEPARTMENT OF COMMERCE

**Mr. Harry Krashen, Planning & Research Engineer

DEPARTMENT OF AGRICULTURE

*Mr. A. J. Collins[2], State Conservationist, U.S. Soil Cons. Service
**Mr. E. E. Fenton, Asst. State Cons., U.S. Soil Cons. Service

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

*Mr. William Q. Kehr, Div. of Water Supply & Pollution Control
**Mr. Charles R. Ownbey, Div. of Water Supply & Pollution Control

DEPARTMENT OF THE INTERIOR

*Mr. Harold C. Jordahl, Jr., Regional Coordinator
Mr. Arlington D. Ash, Dist. Engr., U.S. Geological Survey
Mr. P. DeGelleke, National Park Service
Mr. George Haynes[2], Bureau of Outdoor Recreation
Mr. George W. Webber[2], Rec. Planner, Bureau of Outdoor Recreation

FEDERAL POWER COMMISSION

**Mr. Orel E. Haukedahl, Deputy Regional Engineer

STATE OF MICHIGAN

*Mr. Albert A. Applegate[1], Office of the Governor
Mr. N. Billing, Asst. Executive Secretary, Mich. Water Resources Comm.

[1] Attended 6 August
[2] Attended 7 August

*Member Coordinating Committee
**Alternate Member Coordinating Committee

GRAND RIVER BASIN COORDINATING COMMITTEE
SECOND MEETING - 11 DECEMBER 1963
STEVENS T. MASON BUILDING
LANSING, MICHIGAN

1. Opening Remarks

The meeting was called to order at approximately 9:00 A.M. by Colonel Jeff W. Boucher, Committee Chairman.

After welcoming those present (see inclosure 1), the public hearing of 10 December 1963 was briefly discussed. The present need of scheduling another public hearing in the western part of the basin was considered. Mr. Oeming indicated that the State was not aware of any other interested parties that desired to present their views at another public hearing. He indicated that by holding future hearings, we could possibly better inform the public and continue their interest in the study.

Mr. Jordahl also agreed that the necessity for another hearing to receive information on water related problems and needs, was not apparent. He suggested, and received Mr. Kehr's concurrence, that the public could be kept informed of the study's progress by issuing interim reports.

Colonel Boucher indicated that the primary purposes of the 10 December 1963 public hearing, to inform the public of the study and to hear their views, has been accomplished. It was the concensus of opinion that future hearings and public contacts will be considered as the study progresses and when their necessity becomes apparent.

2. Funding

a. Status of the Coordinated Budget was presented by Mr. V. G. Goelzer. The Corps has received an unofficial report that the Bureau of the Budget has approved the Corps' total direct appropriation amounts but had received no information of the appropriations for the other Federal agencies. The Corps' FY-65 funds have been reduced by $100,000. Of this total reduction, $90,000 would be absorbed by the Corps and $10,000 would not be available to the U. S. G. S. This necessitates postponement of some of the Corps' efforts and extends the completion of the study into FY-68. The Chief's Office and Budget Bureau apparently concur with the extension of the study.

Minutes are not verbatim

During the first week of December, the Corps was requested to evaluate the impact of a $60,000 reduction in the FY-64 appropriation ($140,000 in lieu of $200,000). Our evaluation indicated the necessity of the following:

(1) No transfer of funds to:

Bureau of Mines	$2,000
Bureau of Outdoor Recreation	5,000
Subtotal	$7,000

(2) Reduce transfer of funds to:

Public Health Service	$3,000
Forest Service	1,000
U.S.G.S.	3,000
Subtotal	$7,000

(3) Reduce Corps' Effort by	$46,000
Total Reduction	$60,000

This will also extend the study further into FY-68.

Mr. Jordahl indicated that the coordinated budget has been resolved by the various agencies and had been sent to the Bureau of the Budget. He also indicated that his information has been so qualified that knowledge of the amounts would be of little value to the Committee.

Mr. Goelzer read an article from the Wall Street Journal that indicated the Senate Appropriations Committee was dissatisfied with the costs of some comprehensive basin planning studies and the duplication of effort that has occurred by various agencies.

b. Needs of agencies

(1) State of Michigan - Loring F. Oeming

The cooperation and participation in the study by State agencies will continue to the extent that their normal work program and budgets will allow. Without additional available funds, from either Federal or State sources, the agencies' participation may not be as extensive as they would desire.

(2) U. S. Department of Agriculture - Earl E. Fenton

Requirements to be included with presentation of work status.

(3) U. S. Department of Commerce - Harry Krashen

The funds requirement of the Weather Bureau remain unchanged pending resolution of the coordinated budget.

(4) Federal Power Commission - Orel E. Haukedahl

Funding requirements have not changed. Prompt transfer of funds from the Corps of Engineers is definitely required for the timely accomplishment of FY-64 work.

(5) Health, Education and Welfare - William Q. Kehr

Some of the work by the Public Health Service may have to be delayed due to uncertainty of the amount of FY-64 funds.

(6) Department of the Interior - Harold C. Jordahl, Jr.

The apparent needs of the various participating agencies of the Department of the Interior remain unchanged. Resolution of the coordinated budget will establish these needs. The resolved coordinated budget may provide for direct funds for the participation of the Bureau of Outdoor Recreation and the Bureau of Sport Fisheries in comprehensive basin planning studies.

3. Work status and work proposed for balance of FY-64

a. State of Michigan - Loring F. Oeming

Previously completed studies and reports, applicable to the study, are available for incorporation into the comprehensive study. As future items are completed, they will also be made available. The normal work of the departments of Health, Conservation, and Parks and Recreation will place as much emphasis as practicable upon phases of their work that will benefit the comprehensive study.

Mr. Oeming indicated that State funds are available for installation of additional surface water stations. A few could be located in the Grand River basin. Matching Federal funds would be required. Mr. Ash of USGS indicated some Federal funds were available for cooperation with the State Conservation Department.

b. U. S. Department of Agriculture - Earl E. Fenton

The Soil Conservation Service and the Forest Service will continue to assemble and compile known data relative to the economic base study. The Economic Research Service will continue its support of the economic base study. The extent that these agencies will be able to provide support will be determined by resolution of the funds to be transferred from the Corps and direct appropriations.

c. Department of Commerce - Harry Krashen

Existing highway data, pertinent to the economic base study, is being assembled and will be available for utilization by Battelle Memorial Institute.

d. Federal Power Commission - Orel E. Haukedahl

Pertinent data have been extracted from the National Power Survey being conducted by the FPC and furnished for use in the economic base study. Data included projected rate of peak load growth, and electric utility energy requirements and peak loads for the Grand River basin area. Additional data will be compiled and furnished for use in the study. The load forecast data will be assembled on the basis of the Basin and Service Areas.

e. Department of Health, Education and Welfare - William Q. Kehr

Participation in the Informal Advisory Board for the economic base study, and review of existing data to determine the present quality of water, its uses and waste loads, will continue to the extent practicable within the available funds. Public Health Service may accomplish some limited amount of sampling.

f. Department of the Interior - Harold C. Jordahl, Jr.

The participation of Geological Survey will continue. The Bureau of Mines will extract and furnish pertinent data from their study of natural water needs and requirements. The Park Service and Bureau of Outdoor Recreation have not been able to actively participate due to limitation of funds. The Bureau of Sport Fisheries and Wildlife will cooperate with the State Conservation Department to inventory fish and wildlife. They are proceeding in accordance with their original work plan.

g. Corps of Engineers - G. W. Reschke

The Corps of Engineers, with the cooperation of all committee members and their staffs, prepared and distributed the Information Booklet and public hearing notice. A contract was awarded to Battelle Memorial Institute for the preparation of an economic base study and an informal advisory board was established to assist in its progress.

4. Plan of investigation - Vernon G. Goelzer

a. As the matter of receiving committee members' comments and proposed revisions to the Plan was considered by the Corps, the more it became apparent that it would be virtually impossible to revise the Plan satisfactorily at the meeting. This is especially true since the Coordinated Budget is not resolved. In view of this, the Corps proposed that an Ad Hoc committee be appointed to consider this matter as soon as the budget is resolved.

Discussion of the Ad Hoc proposal indicated it more desirable for the Federal agencies to submit their recommendations on the Plan to the Corps; and the Corps would evaluate and coordinate these recommendations with those of the State in a similar manner as the Information Booklet was resolved.

b. It was also proposed to eliminate the dollar amounts from the Plan in order to allow its distribution to agencies and others outside of the Committee participants.

5. Supporting documents - Ned H. Hogan

a. PERT Program will be revised when the work plans of each Federal agency are correlated with the resolution of the Coordinated Budget. At that time, the cooperation of each Federal agency will be requested to; subdivide their new work plans into "activities" and "events"; determine the inter-relationship of these "activities"; and to determine valid optimistic, normal and pessimistic periods of time required for their accomplishment.

6. Other business

a. State:

(1) Michigan water law had been discussed at the public hearing by Mr. N. V. Olds, Assistant Attorney General. In view of this, Mr. Oeming offered to furnish additional copies of the SUMMARY OF CONSTITUTIONAL, STATUTORY AND COMMON LAW RIGHTS IN WATER.

(2) Michigan Conservation Department views and interests in the Grand River basin study were presented. Mr. William H. Colburn discussed the prepared statement which was furnished to those present.

(3) Copies of the Michigan Waterways Commission's views on the basin's navigation needs were distributed and discussed by Director Keith Wilson. The extent of existing channel improvements and the nature of existing commercial and recreational navigation uses of the Grand River were presented. Existing commercial navigation improvements are considered adequate at this time. Future recreation navigation improvements, based upon present and anticipated usage, were also suggested.

7. Economic base study* - Philip McCallister

Mr. McCallister introduced Dr. Lund, who is presently directing Battelle Memorial Institute's preparation of the economic base study. He then summarized the items discussed, to that time, at the Informal Advisory Board meeting (being held concurrently with the Committee Meeting).

8. Other business

a. Status of topographic mapping by the U.S.G.S. within the Grand River basin was presented by Mr. N. Hogan. A tabulation of existing maps and those currently being prepared for publishing in 1966 was distributed. A statement, PLANNING THE NATIONAL TOPOGRAPHIC MAPPING PROGRAM, furnished by Mr. Earle J. Fennell, Acting Chief Topographical Engineer, U.S.G.S., was read.
Federal and State map-using agencies furnish annual priority statements which are ranked for relative importance and urgency. Although completion of the National Topographic Map Series is a Federal responsibility, cooperative financial arrangements are mutually advantageous inasmuch as the Federal program is augmented and the cooperating state or municipality is able to expedite the mapping of an area in which it is interested.

INCLOSURE 1

LIST OF ATTENDANCE
SECOND MEETING
OF
GRAND RIVER BASIN COORDINATING COMMITTEE
ON
11 DECEMBER 1963

Name	Representing
Colonel Jeff W. Boucher, Chairman[1]	U.S. Army Engr Dist, Detroit
George W. Reschke	
Vernon G. Goelzer	
Philip McCallister	
Ned H. Hogan	
Richard V. Meland	U.S. Army Engr Div, No Central
Earl E. Fenton[2]	U.S. Dept. of Agriculture, Soil Conservation Service
Richard E. Larson	Forest Service, Reg. 9
A. L. Richey	Forest Service, Reg. 9
Harry Krashen[2]	U.S. Dept. of Commerce, Bureau of Public Roads
William Q. Kehr[1]	U.S. Dept. of Health, Education & Welfare, Public Health Service
Raymond E. Johnson	Public Health Service
Harold C. Jordahl, Jr.[1]	U.S. Dept. of the Interior
Arlington D. Ash	Geological Survey
Orel E. Haukedahl[2]	Federal Power Commission
Maurice Rapkin	Federal Housing Administration
Loring F. Oeming[3]	Michigan State, Water Resources Commission
Norman Billings	Water Resources Commission
William H. Colburn[3]	Department of Conservation
Keith Wilson[3]	Waterways Commission
Donald M. Pierce[3]	Department of Health
Stanley Quankenbush	Department of Agriculture
Robert N. Young	Tri-County Regional Planning Comm.

[1]Member Coordinating Committee.
[2]Alternate Member Coordinating Committee.
[3]Member Michigan State Inter-Agency Grand River Basin Study Coordinating Committee.

MINUTES
OF
GRAND RIVER BASIN COORDINATING COMMITTEE
THIRD MEETING - 22 SEPTEMBER 1964
DETROIT, MICHIGAN

1. OPENING REMARKS.

The third meeting was called to order at 10:00 A.M. and participants were welcomed by the Chairman, Lt. Colonel Bruce, District Engineer, U. S. Army Engineer District, Detroit. A list of attendance is provided as inclosure 1. Colonel Bruce expressed pleasure for the opportunity to lead the Grand River basin comprehensive study and stated that he was sure to enjoy working in this coordinated task as did his predecessor, Colonel Boucher. Mr. Reschke continued, as substitute chairman.

2. FUNDING.

a. Mr. Goelzer discussed the September 1964 Coordinated Budget package, just completed in accordance with procedures laid down by the Interdepartmental Staff Committee of the Ad Hoc Water Resources Council.

b. The problem of time limitations for preparation of coordinated budgets, imposed by the Ad Hoc Water Resources Council, was raised from the floor. It was the consensus that all agencies were accustomed to short deadline dates, but when such deadlines include discussions of grievances and consultation with other members of the Committee, it becomes an almost impossible task. It was desired by the Committee that the minutes reflect the "sense of the Committee" on this matter. Then, each Committee member could present to the Ad Hoc Council, through his Department representative, a description of the difficulties encountered this year.

3. DISCUSSION BY PROFESSOR VELZ, UNIVERSITY OF MICHIGAN ON "ROLE OF WASTE ASSIMILATION CAPACITY IN MULTIPURPOSE DEVELOPMENT."

a. Mr. Reschke introduced Professor Velz, who presented a discussion on the subject of the role of waste assimilation capacity in multipurpose development.

4. DISCUSSION BY MR. JOHNSON, PUBLIC HEALTH SERVICE, ON "INFORMATION ON WATER QUALITY SAMPLING PROGRAM, IN PROGRESS."

a. Mr. Johnson presented information on the status of the water quality sampling program in progress by the Public Health Service. At present there are sampling programs in two stretches of the Grand River as part of the Great Lakes - Illinois River Basin Project (GLIRBP).

Minutes are not verbatim

5. DISCUSSION BY CORPS OF ENGINEERS ON "INFORMATION ON POTENTIAL RESERVOIR SITES".

a. Mr. Argiroff presented the status of Corps studies to date on preliminary screening of reservoir sites in the Grand River basin. An inventory has been prepared listing all potential reservoir sites on the main stem and its tributaries. Approximately 150 sites have been inventoried, including 90 existing, or previously existing dam sites. For 72 potential sites curves have been developed to provide information on stage vs: capacity, area, and cost.

The presentation included a discussion on sources of data, coordination to date, and methods used in developing curves. Information on each site would be made available to the Hydraulic - Hydrology Subcommittee, if the Coordinating Committee so desires.

The question was raised whether State or local agencies could reserve sites which, based on preliminary analysis, appear to offer storage potentials that may become imperative to the success of a Grand River development program. Mr. Granger discussed the status of such legislation in Michigan.

It was concluded that there is at present no legislative means by which reservoir sites can be reserved. The Committee decided that a formal statement should be prepared and transmitted to the State on the need for legislation that would permit reserving of reservoir sites. Discussion was had on possibly presenting the statement to the Governor's Task Force on Water, possibly by inviting the Chairman, Mr. Erickson, to attend the next Coordinating Committee meeting.

6. WORK STATUS AND WORK PROPOSED - FY 1965.

a. State of Michigan. Mr. Granger mentioned two items which he felt would be of interest. First, a study is currently underway by the Park Section of the Michigan Department of Conservation to develop additional water recreational sites to serve the Lansing Metropolitan Area. The Park Section envisions the development of at least 10 major sites over a period of about 10 years. Next, he discussed the Water Resource Commission's report, "Lower Grand River Basin Water Resources Uses and Conditions", which will be a companion to the Upper Grand River Basin report, published by the Water Resources Commission.

b. Department of Agriculture. Mr. Fenton discussed participation by the Economic Research Service and the Forest Service in the economic base study. Mr. Overstreet, leader of the Department of Agriculture's Basin survey party, reported on recent accomplishments, as follows: preparing of a work outline during the 6 - 7 July 1964 field Advisory Committee meeting; subdividing of the Basin into eleven subbasins for ease of analysis and routing; initiating evaluations of the Red Cedar tributary, scheduled for completion during the latter part of October 1964; and staffing of all but two positions in the survey party. For

the remainder of the fiscal year, inventory analyses and consultation with various interested Federal, State, and local agencies will continue.

c. Department of Commerce. Mr. Krashen commented that, due to the nature of their participation, Commerce agencies had no report at this time. However, the Weather Bureau, the Bureau of Public Roads, and the Department of Coast and Geodetic Survey are service agencies which are ready to provide services for the Grand River study, when required.

d. Federal Power Commission. Mr. Tower discussed the Federal Power Commission's cooperative efforts to date with other participating agencies. The Commission's major contribution to date has been in connection with the Informal Advisory Board, in assisting the economic base study, and in the Hydraulics and Hydrology Subcommittee.

e. Department of Health, Education and Welfare. Mr Megregian described in detail the collection activities performed to date by the Public Health Service. Field work was carried on to determine water quality of Basin streams. Recently, a detailed sampling program was carried on to obtain data for use in the mathematical model . Prior to this, the Public Health Service prepared a water and waste inventory. In addition, a preliminary economic study was prepared, which will prove useful to supplement Battelle Memorial Institute's study. Information obtained for the water and waste inventory could be provided for the Grand River Data Book after coordination with the State, and after similar studies for other basins were completed.

f. Department of Interior. Mr. Jordahl briefly summarized activities of the various Interior bureaus during the last quarter. The Bureau of Outdoor Recreation began their collection of basic inventory data, maps, etc. The Bureau of Mines has worked closely with the economic base study's Informal Advisory Board and is currently working on mineral employment productivity data for use by Battelle. They have agreed to make projections on mineral production data. The Bureau of Sport Fisheries and Wildlife, working with the Michigan Conservation Department has determined there is a need for additional surface water resources in the Basin to provide fishing and hunting opportunities. The Bureau has contacted Michigan State University personnel in conjunction with determinations of the economic aspects of fishing and hunting in the Basin.

On future plans, the Bureau of Mines will make projections of future mineral production data in the Grand River basin service area and will assist in the determination of water use, needs, and supplies by participation in the Hydraulic and Hydrology Subcommittee. The National Park Service is not actively involved in the study this year. The Bureau of Outdoor Recreation will initiate their study to determine the availability of potential recreational sites. Also, studies will be made to evaluate future recreational needs and to determine factors affecting use and requirements in non-

urban recreational areas. The Bureau of Sport Fisheries and Wildlife will continue to collect and catalog Basin data; will start work on the economic aspects of hunting and fishing in the Basin; and will determine needs for fishing and hunting.

Next, Mr. Morgan stated that the Secretary's Office for Water and Power Development is concerned with the marketing of power related to Corps of Engineers' projects. He explained that hydropower might be found economically feasible for the Grand River basin. His office obtains funds directly from the Secretary's office.

Mr. Ash described the work accomplished and proposed by the Geological Survey. They are: continuing the study of the hydrology of the Basin; inventorying ground water levels in the Thornapple Subbasin by contacting well drillers and checking field data; collecting water samples; and continuing measurements at low flow stream gaging stations at 22 sites for which they have obtained 29 miscellaneous measurements. For future activities, they will continue activities along similar lines as in the past. During the week of 11 October 1964 there is a special "time-of-travel" study scheduled between Lansing and Portland using a dye solution. This is being coordinated with the Public Health Service, who at the same time will be taking water samples.

g. Corps of Engineers. Mr. McCallister summarized the work accomplished by the Corps of Engineers since 30 June 1964 as follows:

The sixth meeting of the Economic Base Study Informal Advisory Board was held with Battelle, and minutes have been prepared and distributed. Battelle has furnished the last of its Phase I reports entitled, "Proposed Method for Projecting the Economy of Michigan, the Grand River Basin Service Area, and Planning Subareas", copies of which have been distributed.

The first meeting of the Hydraulics and Hydrology Subcommittee was held 4 August 1964. Minutes of the meeting have been prepared and distributed to interested parties.

The Corps has continued hydrology, hydraulic, and stream regulating studies.

The Corps' preliminary inventory of potential reservoir sites has been completed. Data have been compiled and developed in the form of stage vs. capacity, pond area, and cost curves (including dams and appurtenant structures).

The contract with Battelle Memorial Institute for an economic base study was modified and executed to include Phase II work, which will complete the required projections.

A revised coordinated budget for FY 1966, dated September 1964, was jointly prepared with participating agencies and submitted to the Interdepartmental Staff Committee of Ad Hoc Water Resources Council, Corps units, and participating agencies.

Projections of future construction activities have been prepared by the Corps and will be provided to the Bureau of Mines for their use in projecting mineral production in the Basin Service Area.

In future work the Corps will: distribute a revised Plan of Investigation to Coordinating Committee members, for their comments; commence flood damage studies, updating previous studies; continue hydrologic, hydraulic, stream regulation, and reservoir screening studies; continue efforts to complete the economic base study; and continue coordination of work efforts of participating agencies.

7. REPORT OF SUBCOMMITTEES.

a. Mr. McCallister discussed activities on the two subcommittees. Since the last Coordinating Committee meeting, the economic base study Informal Advisory Board has held four meetings with Battelle at various locations, and has worked together to solve the problems encountered in collecting data. The Corps has an addition to its staff, Mr. Thomas Odle, Economist, who has been designated as Mr. McCallister's assistant on the Informal Advisory Board and represents the Corps from a technical standpoint. Mr. McCallister will continue to handle the administrative affairs and moderate the group. By far the biggest effort to date has been completion of Phase I of the economic base study. The Corps has successfully negotiated for Phase II of the study with Battelle, effective 22 September 1964. The contract is scheduled to continue for sixteen months. Copies of the contract (supplemental agreement) were distributed to participants. The data of primary interest to the Committee is the due date of the preliminary report by Battelle, 22 April 1965, seven months from the effective contract date. Arrangements have been made with Interior's Bureau of Mines, Agriculture's Economic Research Service, and the Federal Power Commission to furnish input data by 22 January 1965 for Battelle's socio-economic model. The excellent progress on the study was attributed to cooperation of the Committee members, in arranging their economists availability. Thus, it has been possible to proceed without being concerned that some agency was not properly informed.

b. On the activities of the Hydraulics and Hydrology Subcommittee, the first meeting was held 4 August 1964 at Agriculture's East Lansing, Michigan office.

8. PLAN OF INVESTIGATION.

Mr. Goelzer discussed the status of the Plan of Investigation. An advance draft of the Plan has been submitted to North Central Division for review, incorporating all of the comments which were received on the July 1963 Tentative Plan. When approved, copies of the Plan will be distributed to all participating agencies. Mr. Goelzer reiterated that the Plan should explicitly describe the proposed activities of each agency. If the proposed activities differ from statements in the Plan, the Corps should be notified.

9. OTHER BUSINESS.

Mr. Tower brought up the matter of procedures in preparation of minutes of meetings. A statement printed in the minutes of the Hydraulics and Hydrology Subcommittee meeting differed from the actual presentation. He suggested that drafts of minutes be prepared and distributed for review, by participants present at the meeting, before the final printing.

The consensus of the Committee members was that minutes of all Coordinating Committee meetings should be distributed in draft form for review by the members. A time limitation of ten days was agreed upon for this review, after which, the draft would be construed as being acceptable to all non-respondents. It was the consensus of the Committee members that the position on this matter to be adopted by various Subcommittees should be left to the discretion of the groups.

LIST OF ATTENDANCE
GRAND RIVER BASIN COORDINATING COMMITTEE
THIRD MEETING - 22 SEPTEMBER 1964
DETROIT, MICHIGAN

DEPARTMENT OF THE ARMY

*Edward C. Bruce, Chairman, Lt. Col., C of E, Dist. Engr., Detroit Dist.
George W. Reschke, Chief, Engineering Division, Detroit District
Vernon G. Goelzer, Chief, Basin Plng. & Proj. Plng. Br., Detroit Dist.
Philip McCallister, Chief, Basin Planning Section, Detroit District
Carl Argiroff, Asst. Chief, Basin Planning Section, Detroit District
James S. King, Basin Planning Branch, North Central Division
Richard V. Meland, Basin Planning Branch, North Central Division

DEPARTMENT OF AGRICULTURE

**Mr. E. E. Fenton, Asst. State Cons., U. S. Soil Conservation Service
Mr. C. L. Overstreet, Head, Grand River Survey Party, Soil Cons. Service

DEPARTMENT OF COMMERCE

**Mr. Harry Krashen, Planning & Research Engr., Bureau of Public Roads
Mr. A. H. Eichmeier, State Climatologist, U. S. Weather Bureau

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

Mr. Raymond E. Johnson, Project Engr., Public Health Service
Mr. Stephen Megregian, Dep. Proj. Engr., Public Health Service, Chicago

DEPARTMENT OF THE INTERIOR

*Mr. Harold C. Jordahl, Jr., Regional Coordinator
Mr. Joseph M. Morgan, Gen. Engineer, Department of Interior
Mr. A. D. Ash, District Engineer, U. S. Geological Survey
Mr. Robert H. Myers, Recreation Planner, Bureau of Outdoor Recreation

FEDERAL POWER COMMISSION

Mr. Kenneth G. Tower, Regional Engineer, Federal Power Commission

STATE OF MICHIGAN

Mr. Dale W. Granger, State Water Resources Commission

GUEST SPEAKER:

Professor C. J. Velz, Chmn, Dept. Env. Health, University of Michigan

*Member Coordinating Committee
**Alternate Member Coordinating Committee

Inclosure 1

GRAND RIVER BASIN COORDINATING COMMITTEE
FOURTH MEETING - 18-19 MAY 1965
EAST LANSING, MICHIGAN

1. The meeting was called to order at 1:10 P.M. on 18 May, followed by a welcome by the Chairman, Colonel E. C. Bruce and an introduction of all participants. A list of those attending is provided as Inclosure 1.

2. There were no comments on minutes of the third meeting.

3. A summary of events of interest since the third meeting was furnished, as follows:

a. In February 1965, distribution of the Plan of Investigation (dated November 1964) was made.

b. Four meetings of the Economic Base Study Informal Advisory Board were held and minutes for all except the last (held 14 May 1965) were distributed.

c. The draft of the Economic Base Study report, prepared by Battelle Memorial Institute, was distributed to all Coordinating Committee members and the Informal Advisory Board members on 29 April 1965.

d. The Coordinated Budget Package for FY 1967 was drafted and distributed to all committee members (Federal agencies).

e. Tabulation and mapping of potential reservoir sites was completed by the Corps and county maps identifying each site were prepared. Preliminary data including rough cost estimates for each site has been tabulated and advance copies prepared. The maps and cost data were furnished at the meeting. Formal distribution will be made by the Corps in the near future.

f. Individual agencies initiated and continued their particular efforts, as outlined in the 31 March 1965 Status Reports.

4. Discussion of Plan of Investigation (as published and dated 1 November 1964):

a. In the Interdepartmental Staff Committee memorandum dated 16 April 1965, Coordinating Committees were directed to utilize Network Analysis Systems (PERT) as management tools for Basin studies. Previously, the Corps prepared a network analysis which was rather complicated. The Corps now proposes preparation of a simple network

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Minutes are not verbatim

analysis. This would be drafted by the Corps in cooperation with all agencies. A tentative Corps-prepared flow chart was presented which agrees with the Plan of Investigation as now published. This would now also be revised to agree with the proposed single-purpose plan appendix changes. It was agreed that the Corps should revise the flow chart into a PERT format after individual discussion with each agency. Then, the new chart would be distributed for review and insertion by each agency of its time and funding requirements. The changes would be returned to the Corps, who would incorporate all the individual data into a composite network chart and distribute, to be used as a management tool for all.

5. Discussion of reserving reservoir sites was presented by Mr. McCallister. Three booklets had been distributed earlier to all agencies covering the subject. A brief summary on these booklets was given, mainly covering Mr. Goddard's paper "Environmental Considerations in Preserving Reservoir Sites", and it outlined Mr. Olson's original study. The summary included and recommended that: property rights for protecting a site can be controlled by (1) fee purchase, (2) easements, (3) coordination of programs, (4) tax policy, and (5) land use regulations. Past history indicated no specific Federal legislation. However, a definite need for advance acquisition is pointed out. The report concluded that:

a. Federal agencies should plan in coordination with the State to identify needs.

b. States should identify general development objectives, cooperate with the Federal government and local interests by advance purchase, encourage multiple use of land, control location of facilities, administer tax policies, use zoning controls in potential sites, and assist local communities in planning and financing.

c. Local communities should plan overall development, acquire sites by purchase, use zoning controls or tax policies and control utilities and guide development in the area.

d. Consideration should be given to a legislative program that would fully utilize (1) policy declaration, (2) authority delegation, (3) method of preserving sites, (4) standards and regulations, (5) management of property, (6) intergovernmental regulations, (7) enforcement, and (8) financing. General discussion followed, highlighted by Mr. Granger, who outlined the State of Michigan's review of the subject. Each state agency was queried and a summary of their findings was read. It was concluded that local governments, cities, villages, and townships in Michigan have some limited authority to acquire land for reservoir sites in advance.

The general consensus of their poll was to act now if a definite need had been established. The State requested further help in research of existing regulations or information on what other agencies or states had done or are doing along this line.

6. Presentation by Mr. John Wilkinson, Resources Program Staff, Department of the Interior, on the Administration - Proposed HR 5269 entitled, "Federal Water Project Recreation Act".

7. REPORT OF PARTICIPATING AGENCIES

a. State of Michigan - Mr. D. Granger: The State has and will continue participation with all Federal agencies in the Basin study, utilizing its own funds. Of interest is a new State artificial lake development program for creation of new recreation lakes, to be developed by the Department of Conservation.

Mr. W. Colburn: It is proposed that 50 lakes in the lake-less area of Central Michigan will be developed; some of these will be in the Grand River Basin. These lakes will be more or less single-purpose recreation projects. Presently, two small lakes are being developed for fish and wildlife and recreation purposes. These are the Ionia Recreation Area and the Sleepy Hollow State Park.

b. Department of Commerce - Mr. H. Krashen: To date, no work has been accomplished as part of the Grand River Basin Study. Funds for any work we would initiate would be our in-house responsibility. However, any request from other agencies for our services should expect a billing for services rendered.

c. Department of Agriculture - Mr. A. Collins: Individual reports from each of the participating services were requested and presented.

Mr. M. Cotner reported for Economic Research Service, stating that their study was on schedule and their report on agricultural projections would be available soon for the economic base study.

Mr. C. Overstreet reported for Soil Conservation Service, describing how the Service had divided the Basin into eleven sub-basins. To date, their work has concentrated on the upper basin. For each of the sub-basins where work has been accomplished, a report was given as to size of drainage area, number of potential dam sites, acreage of inadequate drainage, and number of miles of channel improvements on the tributary.

Mr. R. Kerr reported for the U. S. Forest Service, stating that their inventory on forest resource data was complete and is available in tabular form.

Mr. E. Fenton reported on costs and funding requirements for the Department.

d. Federal Power Commission - Mr. O. E. Haukedahl: The forecast for electrical energy requirements and production in the study area was completed. A map is being prepared and will be distributed shortly showing existing electric facilities in the Grand River Basin. This will show plants, transmission lines, power dams, etc. It is considered doubtful that additional hydroelectric power will be found economically feasible due to the topography. However, studies of potential sites will be made. It appears impractical to show the locations of future steam plants on the map except where they have been scheduled by a power company. FPC annual regional forecasts through 1985 will be available in November 1965 and will make possible projections for the Grand River study area. A Planning Status Report for the Grand River Basin showing a Water Resource Appraisal for hydroelectric licensing will be printed in the near future. Copies will be furnished each member of the Coordinating Committee.

e. Department of Health, Education, and Welfare - Mr. C. Ownbey: The GLIRB Project has completed its intensive sampling program in the Basin. Inventories of municipal water supplies and municipal and industrial waste loads have been completed and submitted to the State for review. A list of members of GLIRB Project's Technical Committee and the four Water Quality Work Groups was made available to all members at the meeting. The Committee has grouped uses of public waters into eleven categories based primarily on similarities in quality requirements.

The work groups are attempting to establish criteria and objectives on the suitability of water for each particular use. Three of the four groups have completed their studies and meetings and are now writing reports. The fourth group (Municipal) has scheduled a June 1965 meeting which Coordinating Committee members could attend, if desired.

It was pointed out that the Federal Water Pollution Control Act states the policy of the Congress that primary responsibility, for exercising jurisdiction over the prevention and control of water pollution in the waterways of the Nation, is vested in the states. Therefore, any standards or objectives established by the Coordinating Committee for the Basin could be vetoed by the State. The GLIRB Project is working closely with Michigan and other states in the Great Lakes drainage basin, to develop mutual agreements on this subject. It is suggested that the Coordinating Committee await the results of this effort and review those results.

f. Department of the Interior - Mr. H. C. Jordahl, Jr.: Activities of the various Interior Bureaus were summarized. Geological Survey efforts continued on collection and cataloguing of ground-water quality data from selected wells in the Basin. Measurements at observation wells and at stream gaging stations continued.

Bureau of Sport Fisheries and Wildlife continued collection of basic data for their report, mainly on habitat capacity and present utilization. Further formulation of a fish and wildlife plan will be continued, beginning with summer field work.

Bureau of Mines concentrated on projections of mineral production data, by commodity, for the economic base study portion of the basin report.

Bureau of Outdoor Recreation developed a tentative recreation plan for the Jackson subarea and work has started on setting up the other four subareas for study and plan development.

Office of Water and Power Development and the National Park Service had no work to report.

g. Department of Army, Corps of Engineers - Mr. P. McCallister: The work accomplished since the last meeting was summarized as follows:

Coordination of work efforts with all participating agencies continued. The revised working Plan of Investigation was distributed to all agencies. Minutes of the 3rd Coordinating Committee meeting and the 7th, 8th, and 9th Economic Base Study Informal Advisory Board meetings were compiled and distributed. Preliminary reservoir screening studies were completed and eleven county maps were overprinted with the 79 site locations and brief descriptions. Hydrologic, hydraulic, and stream regulation studies were continued. Flood routing studies and utilizing computer programming methods were developed and found acceptable for use in the study. Coordination with all agencies and supervision of Phase II efforts by Battelle Memorial Institute in preparing the draft report of the Economic Base Study continued. The draft report was distributed to all agencies in April 1965. Flood damage studies continued, mainly on the updating of prior studies. The Coordinated Budget Package for FY 1966 was prepared and submitted in September 1964 and the FY 1967 package was drafted and distributed to all Federal agencies prior to this meeting. Upon arrival, the FY 67 Budget Package will be finalized, submitted to higher authority, and distributed.

8. Dinner Speaker - Presentation by Dr. Raleigh Barlowe, Staff of Michigan State University, entitled "Michigan's Changing Land Use Picture".

9. REPORT OF SUBCOMMITTEES

a. Economic Base Study Informal Advisory Board - Mr. P. McCallister stated that the 7th, 8th, and 9th Board meetings were held to coordinate efforts and to assist the Corps in supervising Battelle Memorial Institute in preparation of the Economic Base Study. Various projections of population and employment were discussed and adopted after agreement. The reports on minerals, electric energy and agriculture by Federal agencies will appear as attachments to the economic base study draft, which was submitted recently to all agencies. The 10th meeting of the Board was held after distribution of the Battelle report and general concurrence with the major finding of the report was established. It is anticipated that the final report will be completed and distributed on or before 29 January 1966. The Board has discussed pros and cons of the Corps' proposal of distribution of the report draft to selected local planning officials and has referred approval of this action to the Coordinating Committee.

b. Hydraulics and Hydrology Subcommittee - Mr. P. McCallister stated that no report was presented as no further meetings have taken place since the first meeting, held in August 1964.

c. Proposed Subcommittees -

(1) Recreation and Fish and Wildlife Advisory Subcommittee.

Mr. H. Jordahl reported that the Subcommittee has been established, to be co-chaired by Mr. Michael C. Beaudry of the Bureau of Outdoor Recreation and Mr. A. G. Baldwin of the Bureau of Sport Fisheries and Wildlife. All agencies were invited to appoint members to the Subcommittee. Formal letter requests, to each agency, for their appointments will follow. An initial meeting is tentatively planned for late June or early July 1965, after designation of members.

(2) Power Subcommittee

Mr. Haukedahl stated that, due to lack of hydro-electric power potential in the Basin, a specific subcommittee was not required at this time.

10. The proposed Coordinated Budget Package for FY 1967 had been distributed earlier to the Federal agencies for their review and comment. The Package, as submitted, was approved by the Committee for printing and distribution. It was noted by Mr. Goelzer that the excellent cooperation by all had permitted the Corps to complete the Package within the allotted time.

11. Presentation by Mr. Loring F. Oeming, Executive Secretary, Michigan Water Resources Commission, entitled "Water Management Legislation in Michigan".

Mr. Oeming's discussion summarized provisions of two new Michigan water acts; Act No. 20, entitled "Surplus Waters Act of 1964" and Act No. 253 (1964), entitled "Local River Management Act".

12. A tour of the middle Grand River Basin was conducted in the afternoon of 19 May 1965, covering points of interest west of Lansing and downstream to Lyons-Muir, returning through the agricultural areas of the Basin along Stony Creek, and the Maple and Lookingglass Rivers. The recently completed P.L. 566 project on Morris Drain-Musket Creek was inspected.

1 Incl
List of Attendance

LIST OF ATTENDANCE
GRAND RIVER BASIN COORDINATING COMMITTEE
FOURTH MEETING - 18 & 19 MAY 1965
EAST LANSING, MICHIGAN

DEPARTMENT OF THE ARMY

*Edward C. Bruce, Chairman, Col., C of E, Dist. Engr., Detroit Dist.
Vernon G. Goelzer, Chief, Basin Plng. & Proj. Plng. Br., Detroit Dist.
Philip McCallister, Chief, Basin Planning Section, Detroit District
Charence H. Paquette Jr., Leader, Grand River Task Team, Basin Plng. Sec., Detroit District
Richard V. Meland, Basin Planning Branch, North Central Division
R. R. Werner, Major, C of E, Deputy Asst. for Comprehensive Plng., OCE, Washington, D.C.

DEPARTMENT OF AGRICULTURE

*Mr. A. J. Collins, State Conservationist, Soil Conservation Service
**Mr. E. E. Fenton, Asst. State Cons., Soil Conservation Service
Mr. C. L. Overstreet, Jr., Head, Grand River Survey Party, Soil Conservation Service
Mr. R. L. Kerr, Forester, Forest Service
Mr. M. L. Cotner, Leader, N. Basin Program, Economic Research Serv.

DEPARTMENT OF COMMERCE

**Mr. Harry Krashen, Plng. & Research Engr., Bureau of Public Roads
Mr. A. H. Eichmeier, State Climatologist, Weather Bureau

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

**Mr. C. R. Ownbey, Sanitary Engr., Water Supply & Pollution Control, Public Health Service
Mr. R. E. Johnson, Sanitary Engr., Project Engr., Public Health Serv.

DEPARTMENT OF INTERIOR

*Mr. H. C. Jordahl, Jr., Regional Coordinator
Mr. J. M. Morgan, Gen. Engineer, Sec. Office for Water Power
Mr. W. H. Nord, River Basin Studies, Sport Fisheries and Wildlife
Mr. A. Baldwin, Biologist, Sport Fisheries and Wildlife
Mr. M. C. Beaudry, Recreation Planner, Bureau of Outdoor Recreation
Mr. R. L. Pierce, Recreation Resource Planner, Bur. of Outdoor Rec.
Mr. R. K. Franz, Recreation Resource Planner, Bur. of Outdoor Rec.
Mr. C. Hollenbaugh, Recreation Resource Planner, Bur. of Outdoor Rec.
Mr. J. Fischer, Recreation Resource Planner, Bur. of Outdoor Recreation

Inclosure No. 1

MINUTES OF
GRAND RIVER BASIN COORDINATING COMMITTEE
FIFTH MEETING - 1-2 DECEMBER 1965
GRAND RAPIDS, MICHIGAN

1 1. Opening Remarks. The meeting was called to order on 1 December and the participants were welcomed by the Chairman, Colonel E. C. Bruce. A list of those attending is provided as Inclosure 1.

a. Mr. McCallister explained the new method for compiling the minutes of the meeting, by note taking, backed up by the tape recorder. The Corps will retain the tapes for reference. A full transcript of any portion of the meeting will be provided upon request to any participant.

b. Significant transmittals and events since the fourth meeting, in May, were summarized, as follows:

(1) Transmittals of various documents and data to Coordinating Committee members.

(a) Minutes of the fourth meeting.
(b) Reservoir maps with accompanying preliminary data on the sites.
(c) Change No. 1 to the Plan of Investigation.
(d) The Agriculture Report for the economic base study from the Economic Research Service.
(e) Miscellaneous errata on Battelle's economic base study report, including comments from each of the agencies.
(f) Listing of study descriptions by the various agencies including preliminary and final completion dates of each.
(g) Draft of PERT-Network Analysis System.
(h) Draft of portions of Appendix P - The Basin Plan Formulation Criteria.
(i) Quarterly Status Report ending 30 June 1965 and 30 September 1965.

(2) Significant Events

(a) Coordinated Budget submitted 1 June 1965.
(b) Plan of Investigation with Change No. 1 submitted to higher authority 16 July 1965.
(c) Fish and Wildlife and Recreation Subcommittee formed in July and held first meeting in Ann Arbor, Michigan, on 21-22 July 1965.

Minutes are not verbatim

(d) Basin Plan Formulation Subcommittee formed in September 1965 and held its first meeting in Detroit, Michigan, on 19-20 October 1965 and its second meeting in Detroit on 16-17 November 1965.

(e) Corps and Soil Conservation Service held its meeting in East Lansing on 21 October 1965 to discuss the PERT activities and dates. The Corps also held discussions that day with Geological Survey concerning its scheduled study contributions.

(f) Hydraulics and Hydrology Subcommittee held its second meeting at East Lansing on 9 November 1965.

2. Plan of Investigation. Mr. McCallister pointed out that the Coordinated Budget was for FY 1966, because the FY 1967 budget is still classified.

a. Change No. 1 - This change, distributed in July 1965, converted the appendices to the single-purpose plan concept. Also, some agencies have furnished authorization and/or justification statements for their part in the study, to be included in Paragraph 2. Department of the Army, Agriculture, and Health, Education and Welfare are now included.

b. Pending Change No. 2 - The Corps has some changes now and other changes will be included whenever requested. It is assumed that all agencies are reviewing the outlines of their single-purpose appendices and changes can be expected.

c. Progress on Drafts of Appendices by Mr. McCallister.

(1) Appendix C, Climate - The Corps has drafted this appendix and will shortly furnish it to the U. S. Weather Bureau at Lansing for review. Then, the draft will be furnished to the Hydraulics-Hydrology Subcommittee for review and comments prior to its presentation to the Coordinating Committee.

(2) Appendix O, The Economic Base Study - Final comments were furnished to Battelle Memorial Institute and their printed report is expected by 29 January 1966. The Corps will print and attach thereto reports by the Department of Agriculture, Federal Power Commission and Bureau of Mines. All reports will be bound in a single volume and distribution will be made during February 1966.

(3) Appendix P, Basin Plan Formulation Criteria - A subcommittee was formed to draft this appendix. To date, there has been general agreement on the wording of the first four sections, more or less following the draft outline to the Plan of Investigation. An advance draft of revised pages 1 through 23, dated 17 November 1965, was furnished to participants at the meeting.

d. Proposed Cover for Main Report and Appendices - A proposed report cover format was displayed for inspection. Discussion resulted in general acceptance of the cover format, but considerable changing of the identification.

3. PERT-Network Analysis System. The Corps of Engineers passed out two items to participants; the PERT-Network Diagram (November 1965 revision) and a computer printout, dated 30 November 1965. Activities shown on these two items are in agreement. The diagram is time-scaled and agrees with the scheduled and budgeted phasing of the study. The computer printout has two sections; the first six pages contain input data that was compiled by the Corps, and the second six-page section provides the Critical Path Schedule for the study, based on the furnished information. The completion date of 20 September 1970 for the final activity does not agree with the desired completion date for the study (30 June 1969). The input data and programming will be further studied prior to an official distribution. The PERT does show dependencies and should be helpful to most agencies. The agencies were requested to review the input data (the first section) and comment to the Corps on their activities and other activities that effect their contribution to the study.

4. Implementation of the Economic Base Study. Mr. McCallister stated that the economic base study draft report is being used by the various agencies to project water needs in the Basin for different uses. The Corps' 2 August 1965 letter listed assumptions on how each agency would implement the economic base study by type of study and by completion dates. Replies from all agencies have acknowledged these intended uses and confirmed the completion dates. Since that time, the Corps has devised a methodology to relate the economic projections to flood damage estimates and potential benefits. He read a statement on the proposed methodology to be used by the Corps. The Bureau of Sport Fisheries and Wildlife had also prepared a methodology for implementation of the economic base study.

5. Presentation of Mr. William G. Rowden, Assistant Executive Director, Tri-County Regional Planning Commission.

a. Colonel Bruce introduced Mr. Rowden and furnished his background.

b. Mr. Rowden discussed the organizational structure of the Commission, its history, and its delegated responsibilities and objectives. He described its past, ongoing, and planned studies, and in particular its Land Use-Natural Resources-Transportation Study now underway. He offered to cooperate with the Grand River Coordinating Committee and all agencies represented by providing assistance in their areas of concern for the Tri-County (Lansing) area.

Soil Conservation Service representatives passed out to participants a copy of "Composite of Inventory, Analysis and Summary Reports - Grand River Basin". It was pointed out that additional copies, if desired, can be obtained upon direct request to SCS. The report includes the SCS inventory of Basin problems, and data on upstream reservoirs, similar to the preliminary reservoir data furnished earlier by the Corps.

6. Dinner Speaker - Presentation of Mr. Loring F. Oeming, Executive Secretary, Michigan Water Resources Commission on status of water management activities in Michigan relating to Act Nos. 20 and 253 of 1964.

Mr. Oeming discussed the status of water management activities in Michigan as related to Public Acts Nos. 20 and 253 of 1964. To date, three requests have been acted upon and these concern the Tittabawassee Watershed (Act 20), the Huron River Watershed (Act 253), and the Grand River Watershed (Act 253). Other problem areas likely to use these statutes are the Raisin River basin and Kalamazoo River basin communities.

7. Presentation of Mr. Eugene W. Weber, Deputy Director of Civil Works for Policy, Office Chief of Engineers, Washington, D. C. on Water Resources Planning Act of 1965, Public Law 89-80.

a. Colonel Bruce introduced and welcomed Mr. Weber from the Office of Chief of Engineers, who discussed the provisions of the Water Resources Planning Act of 1965 and how he visualized the act will work. The Water Resources Council estimated that in the near future one Commission would be in an action status and two or three Commissions would be getting started. To date, two requests have been received, one from the New England States and the second from the Great Lakes States with requests from other areas expected.

8. Report of Subcommittees.

a. Economic Base Study Informal Advisory Board - Mr. McCallister reported that the Subcommittee had completed its work, with the economic base study essentially complete. The Board will now enter inactive status. Copies of the draft report have been distributed to local planning commissions within the Basin, as decided at the last Coordinating Committee meeting.

b. Hydraulics and Hydrology Subcommittee - Mr. Paquette reported that a second meeting of this group was held on 9 November 1965 at East Lansing. Discussion at this meeting primarily concerned drought flow criteria. The Public Health Service outlined several alternative techniques for determining storage requirements for low-flow augmentation.

A mutually acceptable technique is now required, to determine storage needs to meet PHS-determined flow requirements. It was suggested by Mr. McCallister that this technique be developed under the sponsorship of the Subcommittee. Also, the Subcommittee will be reviewing the tentative draft of Appendix C - Climate. Mr. Kehr mentioned that discussions were proceeding at agency levels between PHS and the Corps and felt it would be advisable to await the outcome of those discussions. Mr. McCallister responded that this procedure would constitute a loss of control on progress of the study.

Ensuing discussion resulted in consensus that a Task Group should be formed within the Hydraulics and Hydrology Subcommittee for developing a technique. Members would be designated from the following agencies: Geological Survey, Public Health Service, Soil Conservation Service, State of Michigan, and Corps of Engineers. A letter will be sent to all agencies concerning formation of the Task Group.

c. Basin Plan Formulation Subcommittee - Mr. Paquette reported that the Subcommittee was formally established on 7 September 1965 by a letter to all agencies requesting designation of membership. The first meeting was held in Detroit on 19-20 October and minutes have been distributed.

A second meeting was held in Detroit on 16-17 November 1965 for which minutes will be mailed out in December. An advance draft of Appendix P, the principal effort of this Subcommittee developed to date, was furnished participants for interim review and comments by 15 January 1966. These comments will be the basis for discussion at the scheduled third meeting, to be held in Detroit 25-26 January.

d. Fish and Wildlife and Recreation Subcommittee - Mr. Beaudry reported that the Subcommittee was formally established by 4 June 1965 letter to all agencies, requesting designation of membership. The first meeting was held in Ann Arbor on 21-22 July and minutes have been distributed. The purpose of the meeting was to establish criteria and methods for determining recreation demand, supply, and needs to meet the requirements for a single-purpose recreational development plan for the Basin.

The Subcommittee is co-chaired by representatives of the Bureau of Sport Fisheries and Wildlife and the Bureau of Outdoor Recreation. Both chairmen have presented study outlines and proposed methods for evaluating needs. Water quality control at potential reservoir sites is of particular concern to both agencies.

e. Consideration of Other Subcommittees - Mr. Fenton stated that the Field Advisory Committee of U.S.D.A. is giving further consideration to formation of an Agricultural Subcommittee. If it is decided that a Subcommittee is desirable, they would initiate the action.

Colonel Bruce noted that other comprehensive studies have Water Quality Control Subcommittees. It has been proposed to use Public Health Service's GLIRB Project Subcommittee deliberations and not form a Grand River Water Quality Control Subcommittee. However, activities and status reports on the GLIRB Project studies have not been furnished to date.

Mr. Kehr responded that the Water Quality Act of 1965 provides procedures for establishing quality standards for interstate waters and their tributaries. The states have the primary responsibility to set the standards. This Act will have a major influence on the GLIRB Project study procedures. The Public Health Service would be happy to furnish copies of their periodic reports, and any other available data on the GLIRB Project, to other agencies.

10. Other Business. Mr. Haynes passed along a suggestion by Mr. Jordahl that the outline format adopted for Type I framework study quarterly status reports be adopted for use by all agencies for their Grand River quarterly status reports. Mr. Paquette noted that the Corps status report now essentially follows this outline. Mr. Jordahl's suggestion was concurred in by all.

11. Scheduling and Funding. Fiscal Year 1967 Budget - Mr. McCallister reported that the budget had been approved by the Interdepartmental Staff Committee and was now being considered by the Bureau of the Budget. The document is still classified as "For Official Use Only" and will remain so until the President's Budget for FY 1967 is released.

12. Tour. A tour of the lower-middle Grand River Basin was conducted on the afternoon of 2 December 1965, covering points of interest in and around Grand Rapids and the lower reaches of the Rogue, Flat and Thornapple Rivers.

1 Incl
List of Attendance

Inclosure .

LIST OF ATTENDANCE
GRAND RIVER BASIN COORDINATING COMMITTEE
FIFTH MEETING - 1 & 2 DECEMBER 1965
GRAND RAPIDS, MICHIGAN

DEPARTMENT OF AGRICULTURE

**Mr. E. E. Fenton, Soil Conservation Service, E. Lansing, Michigan
Mr. V. M. Bathurst, Soil Conservation Service, E. Lansing, Michigan
Mr. H. A. Amsterburg, Soil Conservation Service, E. Lansing, Michigan

DEPARTMENT OF THE ARMY

*Colonel E. C. Bruce, Chairman, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. C. H. Paquette, Jr., Corps of Engineers, Detroit, Michigan
Mr. R. V. Meland, Corps of Engineers, Chicago, Illinois

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

*Mr. W. Q. Kehr, Public Health Service, Chicago, Illinois
Mr. S. G. Viktora, Public Health Service, Chicago, Illinois

DEPARTMENT OF THE INTERIOR

*Mr. H. C. Jordahl, Jr., Madison, Wisconsin
***Mr. W. H. Nord, Sport Fisheries & Wildlife, Minneapolis, Minnesota
Mr. E. A. Haynes, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. C. H. Harris, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. M. C. Beaudry, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. K. E. Vanlier, Geological Survey, Lansing, Michigan

FEDERAL POWER COMMISSION

*Mr. L. B. Young, Chicago, Illinois

STATE OF MICHIGAN

***Mr. L. F. Oeming, Water Resources Commission, Lansing, Michigan
Mr. D. W. Granger, Water Resources Commission, Lansing, Michigan

GUEST SPEAKERS

Mr. Eugene W. Weber, Deputy Director of Civil Works for Policy, Department of the Army, Corps of Engineers
Mr. William G. Rowden, Asst. Executive Director, Tri-County Regional Planning Commission

GUEST

Mr. Thomas E. Borton, Graduate Assistant, Tri-County Regional Planning Commission

*Member of Coordinating Committee
**Alternate Member of Coordinating Committee
***Representing the Coordinating Committee Member

GRAND RIVER BASIN COORDINATING COMMITTEE
SIXTH MEETING - 1-2 JUNE 1966
GRAND HAVEN, MICHIGAN

1. Opening Remarks

a. Welcome and Introduction. The meeting was called to order at about 1:00 P.M. on 1 June 1966 and the participants were welcomed by the Chairman, Colonel E. C. Bruce. Inclosure No. 1 is a list of those attending.

b. Comments on fifth meeting minutes. Mr. McCallister stated that on page 13, in paragraph 11b., the word "not" in the third line of the first sentence should be corrected to "now".

c. Summary of significant study events since last meeting. Significant events since the fifth meeting, in December 1965, were summarized, as follows:

(1) By letter dated 27 December 1965, Mr. Bathurst was designated Coordinating Committee member replacing Mr. Collins.

(2) By letter dated 6 January 1966 to Coordinating Committee members, the Corps initiated a suggested format for the report and Appendixes.

(3) By letter dated 11 January 1966, Mr. Granger was designated Coordinating Committee member replacing Mr. DeJonge.

(4) By letter dated 28 January 1966 to Coordinating Committee members, the minutes of the fifth meeting were transmitted, inclosing an address listing, copy of the "Green Book", Senate Document No. 97, and Supplement No. 1 to the Senate Document 97.

(5) By letter dated 4 February 1966 to Coordinating Committee members, the 31 December 1965 Quarterly Status Report was transmitted.

(6) By 4th Indorsement dated 7 February 1966, the Corps of Engineers received approval to utilize color printing in the report and study documents.

(7) By letter dated 21 February 1966, the Corps of Engineers accepted Battelle Memorial Institute's work on the economic base study and closed out the contract.

(8) By letter dated 17 March 1966 to Coordinating Committee members, the Hydrology Task Group was established as part of the Hydraulics and Hydrology Subcommittee.

Minutes are not verbatim

(9) During the period 15 to 24 March 1966, the completed Appendix O - Economic Base Study was distributed.

(10) By letter dated 15 April 1966 to Coordinating Committee members, a draft of an Information Booklet on the Economic Base Study (with a proposed distribution list) was transmitted.

(11) By letter dated 20 April 1966 to Coordinating Committee members, the 31 March 1966 Quarterly Status Report was transmitted.

(12) By a contract awarded 23 May 1966 to consultant Ralph J. Stephenson, arrangements were made to obtain instruction and advice on a network analysis planning method for the study.

(13) By letter dated 26 May 1966 to Chief of Engineers, a copy to Federal Coordinating Committee members, the Coordinated Budget package for FY 1968 was transmitted. Individual agency copies were passed out to all Federal Coordinating Committee members at the meeting.

d. Status of Grand River Watershed Council (Michigan Act 253). Mr. Granger reported that the Water Resources Commission had conducted a 20 April 1966 organizational meeting to establish a Grand River Watershed Council, under the provisions of Act 253 of 1964 (the Local River Water Management District Act). Eligibility for membership in the Council was determined as follows: (1) each municipal unit (city, village, or township) which uses the Grand River or tributaries for either water supply or waste disposal is entitled to one delegate for each 20 thousand persons or major fraction thereof; (2) if 15 percent or more of the land area of a county is within the Basin, the county is entitled to one delegate plus an additional delegate for each 20 thousand persons or major fraction thereof residing within townships located primarily within the Basin; and (3) in addition, the Council thereby constituted may, as a body, invite other governmental authorities to appoint delegates to the Council. One hundred one delegates were appointed to the Council, and nearly all of them attended the organizational meeting, where they elected temporary officers, and appointed a committee on constitution and bylaws and a committee on finance. A meeting of the officers and committee members is scheduled for 22 June 1966.

Mr. Granger added that the 11 counties of the Tittabawassee River basin have organized a commission, under the provisions of Act 20 of 1964 (the Surplus Waters Act). The commission will attempt to determine whether there is surplus water which could be impounded to augment the low flow of the Tittabawassee River. The Water Resources Commission must, upon request, determine optimum flows below any proposed reservoirs. Two reservoirs have thus far been proposed, one on the Middle Branch of the Tittabawassee River in Edwards Township in Ogemaw County and another on the Pine River in Richland Township in Montcalm County. The Water Resources Commission has announced an 18 October 1966 public hearing, to discuss optimum flow requirements below these reservoirs.

e. Status of Great Lakes Basin Commission (P. L. 89-80). Under the Federal Water Resources Planning Act of 1965 (Title III), States within a major river basin or watershed may create a commission charged with responsibilities for coordination of water resources development programs in that region. The Governor of Michigan had petitioned the Secretary of the Interior, requesting that a Great Lakes-St. Lawrence River Basin Commission be formed. The State of Michigan has been advised that an executive order creating the requested commission is forthcoming.

f. Planned Network Analysis Presentation. Colonel Bruce reported that the Corps of Engineers dissatisfaction with its PERT-Network Diagram, passed out at the last Coordinating Committee meeting, had led to the execution of a contract with Mr. Ralph J. Stephenson, a consulting engineer, for instruction and advice on network analysis for the Grand River study. Mr. Stephenson has been invited to participate as a guest speaker at the meeting.

2. Report of Participating Agencies. Past and current activities of all participating agencies were presented at this point.

3. Report of Subcommittees.

a. Economic Base Study Informal Advisory Board.

(1) Mr. McCallister noted that, with the completion and publication of the economic base study, the most important function of the Board has been accomplished. Since the last meeting of the Board in June 1965, its activities have been limited to submittal of formal comments on the economic base study report (in Autumn 1965) and review of the proposed economic base study Information Booklet (Spring 1966). The Board continues to function informally, through continuing communications among its members, but no further formal meetings have been held or are proposed. Conversion of the basic economic projections into water-use requirements is currently being carried out by individual agencies. Next, Mr. McCallister introduced discussions on the proposed Information Booklet on the Grand River basin economic base study.

Mr. T. C. Nuttle of the Corps of Engineers, Chairman of the Hydrology Task Group, has provided the following report on the activities of the Task Group:

The Hydrology Task Group was formed on 17 March 1966 when interested agencies were asked to designate participants. By 14 April, membership was confirmed by the five participating agencies: the Soil Conservation Service, the Federal Water Pollution Control Administration, the Geological Survey, the State of Michigan, and the Corps of Engineers. The first meeting was held 27 April in Detroit. The participants discussed three methods of determining reservoir storage requirements for

low-flow augmentation. These methods are: (1) the Stalls method, used by the Corps of Engineers; (2) the Modified Rainwater method, used by the Federal Water Pollution Control Administration; and (3) the Ripple or Mass Curve method, used by the Soil Conservation Service and the Geological Survey. (The State of Michigan has used all three methods, depending upon the situation.) The Federal Water Pollution Control Administration representative offered to furnish to the Corps of Engineers the streamflow requirements of the Grand River at Jackson and Lansing. The data has been received, and results will be computed using all three methods for comparison.

c. Fish and Wildlife and Recreation Advisory Subcommittee. Mr. M. C. Beaudry, formerly co-chairman of the Subcommittee, has been transferred from the Bureau of Outdoor Recreation to the Fish and Wildlife Service. He has been succeeded as co-chairman by Mr. R. L. Franz, of the Bureau of Outdoor Recreation. Also, Mr. Warren Nord, Chief of the River Basin Studies Branch, Bureau of Sport Fisheries and Wildlife, has replaced Mr. A. G. Baldwin as co-chairman of the Subcommittee.

d. Basin Plan Formulation Subcommittee. Mr. Paquette reported that the third meeting of the Subcommittee was held on 25 and 26 January 1966, the fourth meeting on 4 March 1966, and the fifth meeting on 26 April 1966. Attention has been focused on the drafting of Appendix P ("Basin Plan Formulation Criteria"). Of Appendix P's nine proposed sections, six have been drafted and four of the six have received the approval of the members of the Subcommittee. Recent meetings have been devoted to review of the draft of Section V on individual-agency criteria. Section VIII, on engineering criteria, is the joint responsibility of the Corps of Engineers and the Soil Conservation Service, and has been partially drafted. The three sections yet to be initiated are "Alternative Methods of Providing Required Water and Land Development", "Sequential Appraisal", and "Selection Techniques". Each of these sections requires contributions from all participating agencies. Therefore, there is still much work ahead.

4. Scheduling and Funding. The ISC-prepared FY 1967 budget estimate dated October 1965, distributed by a 14 January 1966 letter to Federal members of the Coordinating Committee, supersedes the budget estimate contained in the Plan of Survey. It appears that the funds indicated in that estimate will be available.

Mr. Goelzer requested that the agencies scheduled to receive transfer funds in FY 1967 submit estimates, by 15 June, of funds needed, by quarters. The agencies involved are the Forest Service and the Economic Research Service of the Department of Agriculture and the Geological Survey, the Bureau of Mines, the Bureau of Outdoor Recreation, and the Bureau of Sport Fisheries and Wildlife of the Department of the Interior.

5. Presentation by Mr. W. Q. Kehr from Federal Water Pollution Control Administration, subject, "The Federal Water Pollution Control Program". Colonel Bruce introduced Mr. Kehr.

Mr. Kehr reviewed the provisions and implications of Public Law 660 (the Federal Water Pollution Control Act) with particular reference to the comprehensive water pollution control program.

6. Plan of Investigation.

a. Comments on need for Change No. 2. Mr. Goelzer felt there is no immediate need to process a Change No. 2, since only minor changes are indicated at this time. After completion of the network analysis of the study, however, a major overhauling of the Plan of Investigation will be undertaken.

7. Introduction and Presentation of Mr. Ralph J. Stephenson, P. E., Consulting Engineer, "Grand River Study Network Analysis - Contributions Required from Participating Agencies". Colonel Bruce introduced Mr. Stephenson, who is a registered professional engineer, in private practice since 1962.

8. Other Business.

a. Appendix P - Problem area - Base year, price levels, and interest during construction. Mr. McCallister introduced this topic by stating that the Corps of Engineers has generally used existing prices for evaluation of costs and benefits, whereas the Department of Agriculture has used projected long-term prices. Due to the difficulties that might arise in evaluating costs and benefits of multipurpose structures, the Plan Formulation Subcommittee wishes to resolve this question. At its most recent meeting the Subcommittee deferred discussion of the issue until this Coordinating Committee meeting, anticipating a release from the Water Resources Council which might resolve it. Recently, the Interdepartmental Staff Committee of the Water Resources Council issued a document titled, "Interim Price Standards for Planning and Evaluating Water and Land Resources", but described their price standards as optional for going studies, thereby returning the problem to the Plan Formulation Subcommittee. Mr. McCallister wondered if the Department of Agriculture wished to comment on the Council document.

Mr. Fenton replied that the Department wishes to adopt the new price standards recommended in that document. Colonel Bruce advised that the issue should be referred back to the Plan Formulation Subcommittee for final determination.

Mr. Fenton questioned the Corps of Engineers' use of February 1960 prices in the Grand River basin study. He cited Senate Document No. 97, which states that "Estimates of initial project costs should be based on price relationships prevailing at the time of the analysis". Colonel Bruce replied that the choice of 1960 as a common base year was an attempt to approximate this requirement, and added that estimates of costs and benefits would later be updated. This question, and the question of interest during construction, were also referred to the Plan Formulation Subcommittee for suggested resolution.

Inclosure 1

LIST OF ATTENDANCE
GRAND RIVER BASIN COORDINATING COMMITTEE
SIXTH MEETING - 1-2 JUNE 1966
GRAND HAVEN, MICHIGAN

DEPARTMENT OF AGRICULTURE

*Mr. V. M. Bathurst, Soil Conservation Service, E. Lansing, Michigan
**Mr. E. E. Fenton, Soil Conservation Service, E. Lansing, Michigan
Mr. L. L. Oshel, Soil Conservation Service, E. Lansing, Michigan
Mr. R. L. Kerr, Forest Service, Indianapolis, Indiana
Mr. M. L. Cotner, Economic Research Service, E. Lansing, Michigan

DEPARTMENT OF THE ARMY

*Colonel E. C. Bruce, Chairman, Corps of Engineers, Detroit, Michigan
Mr. G. W. Reschke, Corps of Engineers, Detroit, Michigan
Mr. V. G. Goelzer, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. C. H. Paquette, Jr., Corps of Engineers, Detroit, Michigan
Mr. T. E. Odle, Corps of Engineers, Detroit, Michigan
Mr. R. V. Meland, Corps of Engineers, Chicago, Illinois

DEPARTMENT OF COMMERCE

**Mr. H. Krashen, Bureau of Public Roads, Lansing, Michigan
Mr. N. D. Strommen, Weather Bureau, E. Lansing, Michigan

DEPARTMENT OF THE INTERIOR

*Mr. H. C. Jordahl, Jr., Madison, Wisconsin
Mr. W. Q. Kehr, Federal Water Pollution Control Administration, Chicago, Illinois
Mr. S. G. Viktora, Federal Water Pollution Control Administration, Chicago, Illinois
Mr. C. H. Harris, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. R. K. Franz, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. A. D. Ash, Geological Survey, Lansing, Michigan
Mr. K. E. Vanlier, Geological Survey, Lansing, Michigan

FEDERAL POWER COMMISSION

*Mr. L. B. Young, Chicago, Illinois

STATE OF MICHIGAN

*Mr. D. W. Granger, Water Resources Commission, Lansing, Michigan

GUEST SPEAKER

Mr. R. J. Stephenson, P. E., Consulting Engineer

*Member of Coordinating Committee
**Alternate Member of Coordinating Committee

GRAND RIVER BASIN COORDINATING COMMITTEE
SEVENTH MEETING - 6-7 DECEMBER 1966
EAST LANSING, MICHIGAN

1. Opening Remarks

a. Welcome and Introduction: The meeting was called to order at 1:10 P.M. on 6 December 1966 and the participants were welcomed by the Chairman, Colonel E. C. Bruce followed by an introduction of all participants. A list of those attending is provided as Inclosure No. 1

b. Summary of significant study events and transmittals since the sixth meeting:

(1) Events:

(a) Mr. Stephenson conducted a Network Analysis Planning training course on 7-8 June 1966 attended by the various agencies active in the study.

(b) Various subcommittee meetings were held.

(c) Mr. Novick was appointed Coordinating Committee member, representing the Department of Health, Education and Welfare.

(d) The Bureau of Public Roads was transferred from the Department of Commerce into the newly formed Department of Transportation (Public Law 89-670 dated 15 Oct 66). Exact status of Department of Commerce representation is unknown at this date. Mr. Krashen stated that BPR transfer into the new Department was anticipated within ninety days. Mr. Krashen stated that he would contact Mr. S. E. Ridge to resolve representation on the Coordinating Committee with regard to both Department of Commerce and Department of Transportation. Mr. McCallister stated that a similar query would be directed through Department of the Army channels.

(e) A special informal briefing on the Network Analysis system was furnished to the Bureau of Sport Fisheries and Wildlife and to the Federal Water Pollution Control Administration as these agencies had both missed the training course conducted by Mr. Stephenson (paragraph (a) above).

(f) Two meetings, the Executive Committee and later the full Council, of the Michigan Grand River Watershed Council were attended by Colonel Bruce and Mr. Granger. At both meetings the comprehensive study was described to the participants by Colonel Bruce.

Minutes are not verbatim

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(2) Transmittals:

(a) Two quarterly status reports were transmitted.

(b) Draft No. 3 of Appendix C - Climate was transmitted and reviewed by the Hydraulics and Hydrology Subcommittee.

(c) The revised draft of the Economic Base Study Information Booklet was transmitted for review and comment.

(d) Issue No. 1 of the Functional Management Network Analysis Plan was transmitted for review and comment. Later comments were received on Issue No. 1 documents and the network plan was revised accordingly.

(e) Issue No. 2 of the Functional Management Network Analysis Plan dated 7 November 1966 was transmitted for use.

2. Reports on Study Progress (Utilizing the Network Analysis Functional Management Plan, Issue No. 2, dated 7 November 1966)

Copies of Issue No. 2 documents were distributed to participants. This consisted of the five drawings and separate computer printout of "Node", "Early Start Date", "Latest Start Date", "Latest Finish Date" and the particular Department sequence. Also furnished was a three-page paper titled "Four Steps in Monitoring and What They Indicate". It was pointed out that at this meeting and at future meetings of the Coordinating Committee the progress and status of the study would be reviewed utilizing the network analysis plan. Individual agency reports and subcommittee reports, not now identified in the network, would be reported upon by the responsible individual after the network monitoring session is completed.

A full-size set of drawings were displayed on the wall and as each appendix was monitored the task in progress was color coded on these. It was pointed out that normally all tasks since the last monitoring session are color coded; however, to save time only those tasks in progress were color coded at the meeting.

Using the furnished write-up on monitoring, color coding was explained as well as the use of each computer printout sequences listed and used in monitoring. Next, the Coordinating Committee in conjunction with Mr. Stephenson then monitored each appendix separately as of 6 December 1966 using the network drawings and referring to the "Node" sequence computer printout for start and finish dates.

After monitoring and reviewing the Network Analysis Functional Management Plan it was mentioned how well the monitoring session gave all a good picture of the current status of the study and how well it covered most of the business portion of the Coordinating Committee meeting. However, in order that any other information on hand would come forth the Chairman, Colonel Bruce, called for supplemental reports from the various subcommittees, departments and agencies.

a. Reports by Subcommittees

(1) Economic Base Study Informal Advisory Board. Mr. McCallister, its moderator, reported that the Information Booklet is now published and deemed to be tardy. It will be furnished to the Coordinating Committee and all others known to be interested in the study. Three thousand copies are being printed. The Michigan Grand River Watershed Council stated that it desired to make a mailing of its own to let the people in the Basin know of its interest in the study and also to get more people aware of the Council's existence. Therefore, it was agreed that the Corps would furnish the necessary copies to the Council and the Council would furnish its distribution list for information and for the record. It is also planned that it will be advertised in the Federal Catalog, a monthly summary of available Government publications. Those present were given an opportunity to revise the previously furnished distribution list and the number of copies to be furnished which earlier had been reviewed and commented upon by all. It was also stated that the Coordinating Committee and others would be furnished copies of the distribution list. With regard to other activities, none are presently planned. One future task will require review of the OBE report for possible updating of the Appendix O projections.

(2) Hydraulics and Hydrology Subcommittee. Mr. Paquette, its moderator, reported no meeting has been held since the last Coordinating Committee meeting. The subcommittee did review and comment upon the Corps draft of Appendix C - Climate. Also, within this subcommittee, the Hydrology Task Group had been formed earlier to develop a method for determining reservoir storage requirements for low flow augmentation. The Task Group has held three meetings and various methods were discussed and miscellaneous data developed. They have recommended that either the Ownbey-Rainwater or Stalls' method be used when estimating the storage as both methods produce similar results. Each of these methods are explained in the distributed minutes to those meetings.

(3) Fish and Wildlife and Recreation Advisory Subcommittee. Mr. Franz, its Co-chairman, reported that no meetings have been held since the last Coordinating Committee meeting. However, there may be a future meeting to review drafts of Appendixes J and K.

(4) Basin Plan Formulation Subcommittee. Mr. Paquette, its Moderator, reported that three meetings had been held since the last Coordinating Committee meeting. The major effort is directed toward Appendix P which is estimated to be 75 percent complete. Some prior problems on base year, interest during construction and the WRC - Interim Price Standards have been resolved and are discussed in published minutes to the meetings. The next meeting is scheduled for the 8th of December. It is anticipated that Appendix P will be completely drafted by 1 March 1967.

a. Reports by Departments and Agencies - All participating agencies reported on their activities.

b. Use of the Functional Management Plan in future status reports. Colonel Bruce commented that from Mr. Stephenson's various presentations and from his instruction classes that most of the participating agencies had been schooled in the content and know-how of Network Analysis Planning and in the use of the studies developed documents.

He continued that we now have a working network analysis plan and future meetings will devote a portion of the time to monitoring the studies progress. One item is required between meetings and that is a method on how to keep track and know where each of us is with regard to the network plan. With this in mind, the Corps suggested a monthly status report applicable to the network analysis plan. A short form letter report was suggested and blank copies were distributed at the meeting and discussed. It was then agreed that the form letter status report would be submitted monthly, to represent status as of the end of the month, and will be due by the 10th of the succeeding month. This procedure would be tried for two or more months and the results assessed. This report would be in addition to the quarterly status report which is mainly narrative. The Corps of Engineers will furnish blank copies of the form and an example to all participating agencies in the near future. It was further agreed that direct transmittal to the Corps was preferred. However, indirect transmittal through the Department would be optional with each Department.

c. Discussion on updating procedures, etc. Discussion was led by Ralph J. Stephenson who stated that updating is no more than a re-run of the network to adjust for tasks completed, for time lags,

and for changes in logic or in duration times. Normally it is not associated with a monitoring session as was done at this meeting. He then outlined the steps in updating, which are as follows:

(1) On the network diagram, locate all tasks in progress and color in the beginning node number circle. This is usually done in red but an orange color was used at the meeting. Determine the expected finish time of each task in progress.

(2) On the network diagram, enter a new task "Updating Time Restraint" or simply "UT/R" from the beginning node number one and assign an end node number, utilizing any completed or reserved task node number in that appendix.

(3) Add necessary dummy tasks from this UT/R task to the beginning node of the task or task in progress.

(4) Cross out all completed tasks using a reverse slash from that used in monitoring.

(5) The controller of the network, the Corps, will make a new computer input card of each UT/R task and each connecting dummy task to tie the network together and will also remove from the input deck all cards on the completed tasks, including their connecting dummies.

(6) A duration time is then assigned to each UT/R task to meet the updating date or to adjust to meet the expected finish date of the following task in progress. In a particular appendix where two or more tasks are in progress and not expected to be finished at the same time, the duration time of one or the other tasks in progress must be adjusted also.

(7) The program is run and an updated Issue of the Node Sequence computer printout is made. Afterwards a complete analysis of the network is required and further adjustments are usually required to meet the desired end completion date of the study.

(8) After adjustment, the program is run and re-issued which in this study will be Issue No. 3 documents.

d. Conclusion. Colonel Bruce then highlighted the milestones in the Corps contract with Mr. Stephenson. Initially, training classes were scheduled and attended by the various participating agencies. Mr. Stephenson's next effort was assistance in the development of a working management tool for the Grand River study which we now have in the Functional Management Network Analysis

Plan. Later, he worked with us after its preparation, to recommend and assist in ironing out our problems and participating in monitoring sessions and developing updating procedures. All these things, the Colonel pointed out, Mr. Stephenson has done exceptionally well. "I don't believe we could have found a more qualified consultant to help us. As Chairman of the Coordinating Committee, I thank him for his efforts."

3. Presentation by the Michigan Grand River Watershed Council, subject "Council Formation and Activities to Date". Mr. Granger introduced the Council representatives present at the meeting: Mr. Keyworth, Mr. Kennaugh , and Mr. Williams . Mr. Jerrold Keyworth, the Chairman of the Executive Committee, provided the following remarks: In 1964 we became aware of new legislation, Michigan Act 253, which permitted creation of a formed organization to represent groups in the Basin. At that time we attempted to organize an articulate and coherent group to get from the people an expression of their desires regarding the water needs of their communities.

When we organized I didn't know that there were Federal people laboring in our behalf, and frankly I believe that very few people in the Basin knew of your existence, or knew that a study of the water needs of the Basin was in progress. Since then I have found that our Basin is one of ten which is being studied intensively.

Alot of our time has been spent in organizing. We are in essence a study, advisory, and coordinating group working with the State of Michigan. We are composed of 59 governmental units from counties with 15 percent or more land area within the Basin. There are 21 cities and villages and 4 townships in the organization. From the beginning we have been dependent on voluntary help and have found good people, such as John Kennaugh, to help us. We now feel we are ready to proceed with work for the betterment of the people. Until now we have been merely "an idea with an office" group. The Basin's people are important and we need their moral, legal, and financial help. Since the Grand River study is underway, alot of what could have been our work has or is being done by the Federal Government. I anticipate that the Council will be partner in obtaining the results you recommend.

The Council, we feel, is the link with the people as intended in Act 253. It is our aim to eliminate duplication of efforts. The Council can and will do some of the work. Presently, we plan to strive for flood plain ordinances in the communities. There is other work we can do, prompted by needs revealed in the Grand River study reports. It is our purpose to do non-technical work where it is needed.

Mr. Keyworth then presented Mr. John Kennaugh, who became Executive Secretary of the Council after its formation under Act 253. Presently one of his major tasks is to sell the program and the Council to the people of the Basin. His presentation to the Coordinating Committee then outlined his approach for informing the people in the Basin.

Dinner Session -

4. Presentation by Mr. Hollis R. Williams, subject "Comprehensive River Basin Planning". Colonel Bruce welcomed Mr. Williams and then called on Mr. Bathurst to introduce him to the meeting's participants.

5. Scheduling and Funding. Participants were reminded that certain funding documents and budget data are tentative and marked "For Official Use Only" until after the President announces the Federal Budget, normally in late January or early February of each year. As such the current and future years' budget amounts should not be openly discussed or published.

a. FY-68 Budget. Mr. McCallister reported on the status of the FY-68 coordinated budget package which had been drafted and provided to Federal members at the last Coordinating Committee meeting. Since that time the Water Resources Council has reviewed and revised, slightly upward, the total amount in their 17 October 1966 transmittal to the Bureau of the Budget. This was mainly to adjust for the recent Federal employees pay increase. The Water Resources Council has also revised the budget to show Public Health Service (Department of Health, Education and Welfare) and Federal Water Pollution Control Administration (Department of the Interior) as separate funding groups.

b. FY-69 Budget. Mr. Fenton stated that a reference in the ISC-WRC "Guidelines for Framework Studies" dated 8 April 1966 (Part V, paragraph 5, Coordination of Budgets) suggests that a meeting be held sometime during the third quarter (1 January to 31 March) to coordinate and draft the budget. It was agreed that the Corps of Engineers would do the preliminary work, draft the necessary letter, call such a meeting after the President's budget is announced in 1967, to avoid the usual rush and last minute changes of past years' efforts in drafting the coordinated budget package. This would provide a working document to be on hand when the higher authority request is received with its normally tight submittal date.

c. FY-67 Budget. Discussion revealed that all agencies received the FY-67 funding as programmed. The Corps of Engineers announced that $60,000 on hand was over and above anticipated expenditures and was being declared available for revocation. The Federal agencies scheduled to receive future-year transfer funds from the Corps were notified that funds can be acvanced at this time.

d. Other Funding Matters. It was noted that the present issue of the Network Analysis Functional Management Plan, Issue No. 2, has a scheduled completion date into FY 1970 and the study has no FY-70 budget proposed. Mr. McCallister stated that as of now FY-1969 is the last funding year in the Grand River Study. It is anticipated that the network plan schedule will be compressed to show completion during FY 1969. Should the final report extend beyond that year, we assume the remaining work would be minor and feel that we would be allowed to utilize carry-over monies to complete the report.

6. Presentation by U. S. Department of Agriculture on the Upper Maple River Watershed (PL 566 Project). Mr. Fenton reviewed the history of the area's problems and needs. The watershed has severe problems: overland flooding with damage to roads and bridges and impaired drainage of agricultural lands. There is also an interest in recreational development, which has been expressed in various ways:

a. A Battelle Memorial Institute report of two or three years back, prepared for the Tri-County Planning Commission, recommended recreational improvement in this general area.

b. The Michigan Department of Conservation is planning a State Park in the area of structure number 110.

c. In the original request from the sponsoring district, the Maple River Inter-County Drainage Board requested that recreation be considered.

The problems in this area have been prevalent for sometime; if there had been an easy solution it would have been accomplished long ago. About 1948 the Corps of Engineers was doing some preliminary planning on the Grand River Basin and contacted SCS for assistance on studies of the major tributaries.

By 1959 SCS was completing the initial survey report on the Maple River, but before it was completed the Drainage Board engaged a private engineer to develop a plan of improvement. The Board accepted the prepared plan and decided to proceed without Federal assistance. They immediately started to acquire land rights, were

questioned and brought into the courts, and subsequently were stopped by an injunction. During this litigation, SCS was completing its field work in the survey, but from various contacts with the public and reaction received, a decision was made to stop all work in the watershed in order not to prejudice the court proceedings. The proposed improvement by the private firm consisted of straightening, widening, and deepening the channel upstream from the village of Maple Rapids. The basic objections to this plan were that it improved the upstream portion but dumped the improved runoff abruptly on the lower basin where nothing was proposed, and that it lacked provision for vegetation on the banks or for drainage of water behind the new embankments.

While the case was tied up in the Courts, the opposition informed the Drainage Board that if a Federally-assisted project, either through the Corps or SCS legislation, was attempted they would go along with either of the two Federal agencies recommendations and/or plans and would drop the Court action. The Drainage Board countered that they would consider this but would require that all units of government in the area who had objected in the prior procedure would have to furnish legal stipulations that they would not be a party to opposing litigation if the Board would proceed under a PL 566 or a Corps project. This was agreed to, and the Board received them and then made a decision to go ahead with a PL 566 project rather than a Corps project. SCS got the job because the Corps requires the local cooperation funds immediately whereas SCS allows for deferred payment. Soon afterward the Drainage Board applied for PL 566 assistance and jointly we conducted an extensive information and education program about the project. We then held a public hearing. Of the 200 people attending only four or five opposed the project. As a result, SCS then completed their preliminary investigation on the project.

Mr. Fenton then called on Mr. Oshel to outline the overall proposed project, including the detailed project features, costs, and benefits.

7. Other Business

a. Plan of Investigation. The Corps of Engineers is planning to issue Change No. 2. An opportunity was given to all to review the existing document and then provide comments to the Corps.

(1) As mentioned earlier, we propose to include Issue No. 2 of the Functional Management Network Analysis Plan as Attachment No. 4 to the Plan of Investigation.

(2) A draft of the "Report Format and Preparation Standards" was furnished to the participants. This draft incorporates comments from the various agencies made in response to an initial draft transmitted by the Corps of Engineers. A formal distribution will be made in the near future requesting additional comments. We intend to include this document as Attachment No. 6 to the Plan of Investigation. It was agreed that comments would be submitted to the Corps by 1 January 1967, and that the recommended standards would be used by agencies in preparing drafts of appendixes, to reduce editing and format for the final draft of the report.

1 Incl
1. List of Attendance

Inclosure 1

LIST OF ATTENDANCE
GRAND RIVER BASIN COORDINATING COMMITTEE
SEVENTH MEETING - 6-7 DECEMBER 1966
EAST LANSING, MICHIGAN

DEPARTMENT OF AGRICULTURE

*Mr. V. M. Bathurst, Soil Conservation Service, E. Lansing, Michigan
**Mr. E. E. Fenton, Soil Conservation Service, E. Lansing, Michigan
Mr. L. L. Oshel, Soil Conservation Service, E. Lansing, Michigan
Mr. J. E. Hostetler, Economic Research Service, E. Lansing, Michigan
Mr. F. Casanova, Forest Service, Upper Darby, Pennsylvania
Mr. F. L. Wiles, Forest Service, Morgantown, West Virginia
Mr. R. L. Kerr, Forest Service, Indianapolis, Indiana

DEPARTMENT OF THE ARMY

*Colonel E. C. Bruce, Chairman, Corps of Engineers, Detroit, Michigan
Mr. G. W. Reschke, Corps of Engineers, Detroit, Michigan (part time)
Mr. V. G. Goelzer, Corps of Engineers, Detroit, Michigan (part time)
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. C. H. Paquette, Jr., Corps of Engineers, Detroit, Michigan
Mr. E. V. Weiss, Corps of Engineers, Chicago, Illinois

DEPARTMENT OF COMMERCE

**Mr. H. Krashen, Bureau of Public Roads, Lansing, Michigan
Mr. N. D. Strommen, Weather Bureau, E. Lansing, Michigan

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

***Mr. H. Eklund, Public Health Service, Chicago, Illinois

DEPARTMENT OF THE INTERIOR

***Mr. R. K. Franz, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. F. J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. A. D. Ash, Geological Survey, Lansing, Michigan
Mr. K. E. Vanlier, Geological Survey, Lansing, Michigan
Mr. W. A. Grosh, Bureau of Mines, Minneapolis, Minnesota

FEDERAL POWER COMMISSION

*Mr. L. B. Young, Chicago, Illinois

STATE OF MICHIGAN

*Mr. D. W. Granger, Water Resources Commission, Lansing, Michigan
Mr. W. B. Williams, Mich. Grand River Watershed Council, Lansing, Mich.
Mr. J. H. Kennaugh, Mich. Grand River Watershed Council, Lansing, Mich.

GUEST SPEAKERS

Mr. H. R. Williams, Soil Conservation Service, USDA, Washington, D.C.
Mr. J. H. Keyworth, Mich. Grand River Watershed Council, Lansing, Mich.

NETWORK ANALYSIS CONSULTANT

Mr. R. J. Stephenson, P.E. Consulting Engineer, Detroit, Michigan

*Member of Coordinating Committee
**Alternate Member of Coordinating Committee
***Representing Coordinating Committee Member

GRAND RIVER BASIN COORDINATING COMMITTEE
EIGHTH MEETING - 23-24 MAY 1967
DETROIT, MICHIGAN

1. Opening remarks

a. Welcome and Introduction: The meeting was called to order at 2:00 PM on 23 May 1967 and the participants were welcomed by the Chairman, Colonel Edward C. Bruce. The list of participants is inclosure No. 1.

b. Comments on seventh meeting minutes. Colonel Bruce stated that some grammatical and editorial changes must be made in the seventh meeting minutes. There were no comments from others. The revised pages will be distributed after the changes are made.

c. Summary of study events since last meeting.

(1) Significant events. Two significant events were mentioned: The Great Lakes Basin Commission was established with Mr. Raymond F. Clevenger, who was present at the meeting, named as its Chairman. The second noteworthy event was Mr. Harry Krashen's temporary dual appointment as Coordinating Committee alternate member representing both the Department of Transportation and the Department of Commerce.

(2) Transmittals. Twelve hundred copies of the economic base study information booklet have been distributed by the Michigan Grand River Watershed Council to persons in the Basin. Two status reports were compiled and issued to Committee members.

2. Report on Study Progress.

a. Monitoring the network diagram by Appendix (Utilizing the Functional Management Network Analysis Plan). Progress made in drafting Appendixes A through Q was discussed in detail and is summarized as follows:

Appendix A. "History": Task 1-517 (a time restraint) is 5% completed. Work on Appendix A is on time.

Appendix B. "Basin Description": Task 243-244 (preparation of the first draft of Appendix B by the Corps' Detroit District using the contributions from others) is 60% completed. Work on Appendix B is 21 weeks behind schedule.

Appendix C. "Climate": Task 278-280 (review and comments upon the fourth draft of Appendix C by the Corps' North Central Division and the Corps' Chief of Engineers) is 5% completed. Task 279-281 (review of the fourth draft of Appendix C by all agencies) is 5% completed. Work on Appendix C is on time. Remarks: The draft has also been distributed to the members of the Hydraulics and Hydrology Subcommittee.

Minutes are not verbatim

Appendix D. "Surface Water Hydraulics/Hydrology and Fluvial Sediment": Task 311-312 (preparation of the first draft of Appendix D by the Corps' Detroit District) is 50% completed. Work on Appendix D is 21 weeks behind schedule. Remarks: The draft should be completed by 30 June 1967. Five technical papers have been prepared; the first four papers have been already approved by the U. S. Army Engineer Division, North Central, and the fifth will soon undergo Division review. Paper #1 has already been distributed to the Hydraulics and Hydrology Subcommittee; Papers #2, 3, and 4 will be distributed to them soon; and Paper #5 will be distributed after Division approval.

Appendix E, "Ground Water and Geology": Task 353-355 (review of the first draft of Appendix E by the Department of the Interior and the Washington office of the Geological Survey) is 50% completed. Task 354-356 (review of the first draft of Appendix E by the Hydraulics and Hydrology Subcommittee) is 50% completed. Work on Appendix E is 10 weeks behind schedule. Remarks: Mr. Hopkins said that the Public Health Service, not being represented on the Hydraulics and Hydrology Subcommittee, would also like to review the report, and Mr. Jordahl agreed to furnish them the draft.

Appendix F. "Mineral Resources": Task 381-382 (preparation of the first draft of Appendix F by the Bureau of Mines and the Michigan Geological Survey) is 70% completed. Work on Appendix F is 11 weeks behind schedule. Remarks: Colonel Bruce requested submission of this draft by the end of June.

Appendix G. "Water Use and Stream Quality": Task 215-217 (review of the first draft of the single-purpose plan by the Department of the Interior and the Washington office of the Federal Water Pollution Control Administration) is 100% completed. Task 216-218 (review of the draft of the single purpose plan by all agencies) has not started. Work on Appendix G is 20 weeks behind time. Remarks: Mr. Ownbey stated that distribution of the single-purpose plan draft has been delayed, due to differences in philosophy between the Federal Water Pollution Control Administration and the State of Michigan. However, Mr. Granger of the State of Michigan consented to distribution of the draft, provided that the comment letter from the State of Michigan, identifying unresolved issues, accompany its distribution. A note in the report would stress the preliminary nature of the draft.

Appendix H. "Flood Control": Task 43-44 (review of the first draft by the Corps' Detroit District, the Corps' North Central Division, the Soil Conservation Service, the Department of Agriculture, and the State of Michigan) is 80% completed. Work on Appendix H is 22 weeks behind schedule. Remarks: The draft was distributed, but the Soil Conservation Service's section and two Corps sections were omitted.

Appendix I. "Navigation": Task 87-88 (preparation of the first draft of the navigation study by the Corps' Detroit District) is 100% completed.

Work on Appendix I is 20 weeks behind schedule.

Appendix J, "Recreation": Task 151-152 (development of the first draft of the single-purpose recreation plan by the Bureau of Outdoor Recreation and the National Park Service) is 95% completed. Work on Appendix J is 28 weeks behind schedule. Remarks: The first draft of the recreation appendix will be ready for printing within a few days; it has not been reviewed and approved by the Recreation and Fish and Wildlife Advisory Subcommittee as was originally planned.

Appendix K, "Fish and Wildlife": Task 126-128 (review of the first draft of the single-purpose plan by the Department of the Interior and the Washington office of the Fish and Wildlife Service) is 100% completed. Task 127-129 (discussion of the projects recommended in the first draft by the Fish and Wildlife Service and the Michigan Department of Conservation) is 80% completed. Work on Appendix K is 21 weeks behind schedule.

Appendix L, "Power": Task 7-9 (review of the first draft of the single-purpose plan by the Washington office of the Federal Power Commission) is 10% completed. Task 8-10 (review of the first draft of Appendix L by all agencies) is 10% completed. Work on Appendix L is 17 weeks behind schedule. Remarks: The first draft of Appendix L was distributed on 17 May; comments should be returned before the end of June. Mr. Young stated that load forecasts used in the draft are undergoing revision at the National level, and that the Appendix would be revised accordingly.

Appendix M, "Agriculture": Task 182-184 (review of the first draft of the single-purpose plan by the State of Michigan and the Soil Conservation Committee) is 5% completed. Task 183-185 (review of the first draft of the single-purpose plan by all agencies) is 5% completed. Work on Appendix M is 17 weeks behind schedule. Remarks: Comments on the first draft should be submitted before the end of June.

Appendix N, "Water Laws": Task 413-414 (preparation of the first draft of Appendix N by the Corps' Detroit District and Michigan's Office of Attorney General) is 50% completed. Work on Appendix N is 19 weeks behind schedule. Remarks: "Michigan Laws relating to Water", a publication of the State of Michigan Joint Committee on Water Resources Planning, has been submitted to the Coordinating Committee for consideration as part of Appendix N. Mr. Granger added that the Attorney General's summary of Michigan's water laws, to be included as an attachment to Appendix N, is presently undergoing revision.

Appendix O, "Economic Base Study": Task 523-524 (updating of Appendix O by all agencies) is 10% completed. Work on Appendix O is on time.

Appendix P, "Basin Plan Formulation Criteria": Task 440-441 (preparation of the first draft of Appendix P by the Basin Plan Formulation Subcommittee) is 90% completed. Work on Appendix P is 27 weeks behind schedule. Remarks: The first draft of Appendix P was distributed to participants at the meeting.

Appendix Q, "Basin Plan of Development": Task 1-462 (a time restraint) is incomplete. Work on Appendix Q is 17 weeks behind schedule.

3. Presentation by Mr. Carl Argiroff, Assistant Chief for Flood Plain Management Services, U. S. Army Engineer District, Detroit: "Unified National Program for Reducing Flood Losses"

4. Introduction of and Presentation by Mr. George E. Tomlinson, Deputy Chief Bureau of Power, Federal Power Commission, Washington, D.C.: "FPC's Role in River Basin Planning". Mr. Leonard Young introduced the speaker: Mr. Tomlinson is the Deputy Chief of the Bureau of Power, Federal Power Commission.

5. Status of Funding

a. FY 1968 Coordinated Budget. The status of the FY 1968 coordinated budget is unchanged as reported at the last Coordinating Committee meeting.

b. FY 1969 Coordinated Budget. The budget documents were compiled and have been distributed to all Federal agencies. In response to an invitation for comments, it was pointed out that the Public Health Service has not received transfer funds from either the Federal Water Pollution Control Administration or the Corps of Engineers; hence, its' work must necessarily be limited. It was also pointed out that the Bureau of Outdoor Recreation can profitably use additional transfer money this year.

c. Other Funding Matters. It has been ascertained that comprehensive planning money cannot be used to underwrite flood plain information studies.

6. Presentation by Mr. John H. Kennaugh, Executive Secretary, Michigan Grand River Watershed Council, Lansing, Michigan: "Activities of the Council". The Michigan Grand River Watershed Council was officially organized in June 1966 in response to an Order of Determination by the Michigan Water Resources Commission, adopted 28 October 1965 pursuant to the provisions of Act 253 of the Public Acts 1964. Later in June 1966, officers were elected, by-laws were adopted, and an annual budget was approved. The Executive Committee officers then developed the operational structure of the Council, appointed an executive secretary, and developed a program for the benefit of the 59 governmental units located in the Grand River Basin. Of the fifty-nine governmental units eligible to participate, fifty-one units have designated eighty representatives on the Council.

The Council has the task of representing the interests of local governments, both before the Michigan Water Resources Commission and, by the authorization of the Governor of the State of Michigan, before this Coordinating Committee. The Council has, in particular, an active information mission to keep residents aware of State and Federal programs.

including this study, which may affect their interests. A regularly published and widely distributed newsletter has been supplemented, in the past year, by five public informational meetings in Grand Haven, Ionia, Lansing, Jackson, and Wyoming. The meetings were held jointly with meetings of conservation classes in local schools, and received good press coverage. The Council has also sponsored twenty-four other presentations before civic groups, attended by more than 800 people.

At recent meetings, the Council has taken several actions to broaden its popular base and improve its efficiency: (1) representatives of soil conservation committees have been admitted to the Council as non-voting members; (2) four committees have been set up: Administrative Control, Financial Control, Quality Control, and Quantity Control. Each Council member has been assigned to one of the committees; (3) voluntary contributions from participating communities have been raised to 4.4 cents per capita.

Recent and anticipated activities of the Council include: (1) distribution of 1200 copies of the Grand River Basin Economic Base Study information booklet; (2) sponsorship of a feasibility study of a proposed western Michigan aqueduct to bring Lake Michigan water inland as far as Lansing for water supply; (3) recommendations regarding priority sectors for flood plain information studies in the basin; and (4) advice to the Michigan Water Resources Commission regarding establishment of water quality standards in the basin.

Mr. Kennaugh added that once this study is completed, the Council's task-implementation will just begin. Meanwhile, the Council is introducing basin residents to the idea of comprehensive river basin planning.

7. Presentation by Professor Lyle E. Craine, Chairman, Department of Conservation, School of Natural Resources, University of Michigan, Ann Arbor, Michigan: "Observations on River Basin Organizations". Mr. Philip McCallister introduced the speaker.

8. Other Business.

The recent State publication, Michigan Laws Relating to Water, will be incorporated into Appendix N, "Water Laws", as part of the States' contribution to the appendix.

Inclosure 1

LIST OF PARTICIPANTS
GRAND RIVER BASIN COORDINATING COMMITTEE
EIGHTH MEETING - 23-24 MAY 1967
DETROIT, MICHIGAN

DEPARTMENT OF AGRICULTURE

*Mr. V. M. Bathurst, Soil Conservation Service, E. Lansing, Michigan
**Mr. R. S. Fellows, Soil Conservation Service, E. Lansing, Michigan
Mr. L. L. Oshel, Soil Conservation Service, E. Lansing, Michigan
Dr. R. W. Strohbehn, Economic Research Service, E. Lansing, Mich.
Mr. J. E. Hostetler, Economic Research Service, E. Lansing, Mich.
Mr. R. L. Kerr, Forest Service, E. Lansing, Michigan

DEPARTMENT OF THE ARMY

* Colonel E. C. Bruce, Chairman, Corps of Engineers, Detroit, Michigan
Mr. V. G. Goelzer, Corps of Engineers, Detroit, Michigan ****
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. C. H. Paquette, Jr., Corps of Engineers, Detroit, Michigan
Mr. T. E. Odle, Corps of Engineers, Detroit, Michigan
Mr. E. V. Weiss, Corps of Engineers, Chicago, Illinois

DEPARTMENT OF COMMERCE

**Mr. H. Krashen, Bureau of Public Roads, Lansing, Michigan
Mr. N. D. Strommen, Weather Bureau, Lansing, Michigan

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

***Mr. W. G. Hopkins, Public Health Service, Chicago, Illinois

DEPARTMENT OF THE INTERIOR

*Mr. H. C. Jordahl, Jr., Office of the Secretary, Madison, Wisc.
Mr. C. F. Nelson, Jr., Bureau of Outdoor Recreation, Ann Arbor, Mich.
Mr. F. J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Mich.
Mr. D. F. Klyce, Bureau of Mines, Minneapolis, Minn.
Mr. W. H. Meyer, Bureau of Sport Fisheries & Wildlife, Lebanon, Ohio
Mr. C. R. Ownbey, Federal Water Poll. Control Admin., Chicago, Ill.

FEDERAL POWER COMMISSION

*Mr. L. B. Young, Bureau of Power, Chicago, Ill.

STATE OF MICHIGAN

*Mr. D. W. Granger, Water Resources Commission, Lansing, Michigan
Mr. W. B. Williams, Mich. Grand River Watershed Council, Grand Rapids, Mich.
Mr. J. H. Kennaugh, Mich. Grand River Watershed Council, Lansing, Michigan

GUEST SPEAKERS

Mr. C. Argiroff, Corps of Engineers, Detroit, Michigan ****
Mr. G. E. Tomlinson, Federal Power Commission, Washington, D.C.
Dr. L. E. Craine, Univ. of Michigan, Ann Arbor, Michigan ****

NETWORK ANALYSIS CONSULTANT

Mr. R. J. Stephenson, P.E. Consulting Engineer, Detroit, Michigan ****

GREAT LAKES BASIN COMMISSION

Mr. R. F. Clevenger, Chairman, Washington, D. C. ****

WATER RESOURCES COUNCIL

Mr. M. V. Hughes, Jr., Staff Member, Washington, D. C.

*Member of Coordinating Committee
**Alternate Member of Coordinating Committee
***Representing Coordinating Committee Member
****Attended only part of the meeting

GRAND RIVER BASIN COORDINATING COMMITTEE
NINTH MEETING - 29-30 NOVEMBER 1967
EAST LANSING, MICHIGAN

1. Opening Remarks

a. Welcome and Introduction: The meeting was called to order at 1:00 P.M. on 29 November 1967 and the participants were welcomed by the Chairman, Colonel James T. White, Jr. The list of meeting participants is Inclosure No. 1.

b. Comments on eighth meeting minutes: Colonel White stated that two known changes must be made in the eighth meeting minutes. Mr. Bathurst noted that on page 3, paragraph 4, Appendix M, Agriculture, the first sentence should read: "Appendix M, "Agriculture": Task 182-184 (review of the first draft of the single-purpose plan by Federal and State agencies) is 5% completed." There were no other comments. The revised pages 1, 3 and 5 will be distributed after the changes are made.

c. Summary of study events and transmittals since the last meeting:

(1) Significant events: Three changes occurred in the Coordinating Committee membership: Colonel James T. White, Jr. has replaced Colonel Edward C. Bruce as Chairman and Department of the Army member; Mr. Charles H. Stoddard has replaced Mr. Harold C. Jordahl, Jr. as Department of the Interior member and Mr. Donald W. Marshall has replaced Mr. Robert E. Novick as Department of Health, Education, and Welfare member.

(2) Transmittals: Study distribution has been made of drafts of the last three single purpose plans.

(a) Appendix G - Water Use and Stream Quality, by Federal Water Pollution Control Administration.

(b) Appendix I - Navigation, by Corps of Engineers.

(c) Appendix J - Recreation, by Bureau of Outdoor Recreation.

Also study distribution has been made of drafts of five supporting appendixes.

(a) Appendix D - Surface Water Hydrology and Hydraulics, and Fluvial Sediment, by Corps of Engineers and Soil Conservation Service.

(b) Appendix E - Ground Water and Geology, by Geological Survey.

(c) Appendix F - Mineral Resources, by Bureau of Mines.

Minutes are not verbatim

(d) Appendix L - Power, (second draft) by the Federal Power Commission.

(e) Appendix F - Basin Plan Formulation Criteria, by the Basin Plan Formulation Subcommittee.

Two composite quarterly status reports were compiled and issued to Coordinating Committee members along with miscellaneous correspondence and papers.

2. Report on Study Progress:

a. Monitoring the network analysis diagram by Appendix (Utilizing the Functional Management Network Analysis Plan, Issue No. 2, dated 7 November 1966): Colonel White reminded the Coordinating Committee that it was their duty to let it be known when their work was being held up by delays in receipt of any appendix or in work efforts of others. The Corps of Engineers furnished a computer printout listing titled "Estimated Status as of 1 November 1967" to participants. Progress work, efforts and status in drafting Appendixes A through Q was discussed in detail and is summarized as follows:

Appendix A, "History": Task 1-517 (a time restraint) is 5% completed. Work on Appendix A is on time.

Appendix B, "Basin Description": Task 243-244 (prepare the first draft of Appendix B by the Corps of Engineers, Detroit District using the contributions from others), is 80% completed. Work on Appendix B is 42 weeks behind schedule.

Appendix C, "Climate": Task 292-293 (prepare the fifth draft of Appendix C by Corps of Engineers, Detroit District) is 5% completed. Work on Appendix C is on time.

Appendix D, "Surface Water Hydraulics and Hydrology and Fluvial Sediment": Task 313-315 (distribute, review, and approve the first draft of the appendix by higher headquarters of Corps of Corps of Engineers and Dept. of Agriculture Soil Conservation Service) and Task 314-316 (distribute, review and approve the first draft of the appendix by the Hydraulics and Hydrology Subcommittee) are 25% completed. The appendix is 36 weeks behind schedule. Mr. Paquette noted that while the appendix is behind schedule, the necessary data contained in the appendix is available to the Basin Plan Formulation Subcommittee and others who need it.

Appendix E, "Ground Water and Geology": Task 363-364 (prepare the third draft of Appendix E by Geological Survey) is 90% completed. Work on Appendix E is on schedule.

Appendix F, "Mineral Resources": Task 383-385 (review of the first draft of Appendix F by the Department of the Interior and higher headquarters of the Bureau of Mines) and Task 384-386 (review of the first

draft of Appendix F by all study participants) are 10% completed. Work on Appendix F is on time.

Appendix G, "Water Use and Stream Quality": Task 219-220 (prepare single purpose plan, the second draft of Appendix G, by the Federal Water Pollution Control Administration) has not been started. The work on Appendix G is on schedule. Remarks: Mr. Franz asked if the appendix would contain water quality information on inland lakes within the Basin. Mr. McCallister stated it was not included in the appendix outline contained in Plan of Investigation or contemplated by the Federal Water Pollution Control Administration. Colonel White asked if the omission in the study was intentional or an oversight. Mr. Granger replied that he believed it was an oversight and that we should include the lake quality data in the study report. He added that the State of Michigan has been collecting this type of information and it would be a matter of compiling the data, with reference to the Basin, and this could be accomplished in about 60 days. It was agreed that this matter would be pursued through correspondence between the involved agencies.

Appendix H, "Flood Control": Task 45-46 (prepare the second draft of Appendix H, by the Corps of Engineers, Detroit District and the Soil Conservation Service) is 60% completed. Work on the appendix is 45 weeks behind schedule. Remarks: The first draft was distributed with one Soil Conservation Service section and two Corps of Engineers sections omitted. It was noted that while the appendix is not on schedule the information is available to all who require it and is not effecting the study schedule.

Appendix I, "Navigation": Task 95-96 (prepare the third draft of Appendix I, by Corps of Engineers, Detroit District) is 10% completed. The work on Appendix I is on schedule.

Appendix J, "Recreation": Task 157-158 (prepare the second draft of Appendix J, by the Bureau of Outdoor Recreation) is 30% completed. The work on Appendix J is 45 weeks behind schedule. Mr. Paquette, as moderator of Basin Plan Formulation Subcommittee stated that he believed the subcommittee had been furnished enough data on recreation to proceed with formulating the preliminary Basin plan. Remarks: A change in logic has been made. National Park Service will contribute their study efforts to Appendix B rather than to Appendix J as they have indicated that their work will be more of a descriptive nature rather than recreation oriented data.

Appendix K, "Fish and Wildlife": Task 130-131 (prepare the second draft of Appendix K, by the Bureau of Sport Fisheries and Wildlife) is 98% completed. According to the logic of the network plan the work is 45 weeks behind schedule. Mr. Nord requested that they prefer to refer to the current draft efforts as the third draft, Task 144-145, and as such they are on time. The Coordinating Committee agreed to Mr. Nord's request.

Appendix L, "Power": Task 13-14 (distribute, review and approve the second draft of Appendix L, by all study participants) is 10% completed. This task is on time and has 77 weeks of float time remaining. Mr. Young stated he believes the current draft of their appendix is complete and suitable to serve as the final study document. Mr. Granger asked what affect the newly proposed Consumers Power Company pump-storage plant at Ludington would have on the Basin. Mr. Young replied that the appendix calls for power transmission into the Basin and the location of power plants outside of the Basin will affect only the location of transmission lines within the Basin and not the basic power needs of Basin as given in the report.

Appendix M, "Agriculture": Task 200-201 (prepare the third draft of Appendix M, by Soil Conservation Service) is 10% completed. This task has 82 weeks of float time remaining. Mr. Bathurst commented that they have revised the network logic in the scheduled second draft (Task 186-187) and that they now plan to resume work on Task 200-201 in March 1968.

Appendix N, "Water Laws": Task 421-422 (prepare the second draft of Appendix, by Corps of Engineers, Detroit District and State of Michigan, Office of the Attorney General) is 50% completed. Work on the appendix is 33 weeks behind schedule. Mr. Granger stated that the Attorney General's Office will provide a revised draft of "Summary of Constitutional, Statutory and Common Law Rights in Water" in approximately 15 days and would forward the revised draft to the Corps of Engineers as soon as possible for the Appendix draft.

Appendix O, "Economic Base Study": Task 523-524 (updating of Appendix O by all agencies) is 10% completed. Work on Appendix O is on time.

Appendix P, "Basin Plan Formulation Criteria": Task 448-449 (distribute review and approve the second draft of Appendix P by all participating agencies) is 60% completed. This task has 66 weeks of float time to complete. It is anticipated that the next draft will be published in April 1968.

Appendix Q, "Basin Plan of Development": Task 473-474 (develop the preliminary multi-purpose plan by subarea and estimate scope of the total Basin plan by the Corps, Detroit District, Soil Conservation Service and the Basin Plan Formulation Subcommittee) is 80% completed. Task 469-471 (establish single purpose projects not amenable to multi-purpose projects by the Basin Plan Formulation Subcommittee) is 80% completed. Both of these tasks are 20 weeks behind schedule. Even though the logic of the network calls for completion of task 473-474 before starting subsequent tasks, work has been initiated on tasks 475-479, 476-480, 477-481 and 478-482. These four tasks are detail investigations of selected multi-purpose sites.

Main Report: Task 1-534 (a time restraint) is incomplete. Work on the main report has not started and the work is on schedule.

b. Reports by Subcommittees:

(1) Economic Base Study Informal Advisory Board: Mr. McCallister, its moderator, reported with regard to possible revision of the economic base study: The Office of Business Economics, which develops the framework projections to be followed in river basin studies, is currently preparing a new set of projections. They will be available by next summer.

The framework national projections of the Office of Business Economics are based upon projections of national population made by the Bureau of the Census. Hence, the direction and magnitude of change in the new OBE projections is indicated by the direction and magnitude of change in the revised Census Bureau projections. Indications are that the direction will be downward from the data used in our study, and that the magnitude with regard to the Basin study will be as follows: no change for 1980; 5% downward for year 2000; and 15% downward for year 2020.

The regional OBE projections will be published only with regard to large areas. The smallest area that OBE might project would be the Lake Michigan watershed, which would include Chicago, Milwaukee, and so forth. The size of this area would make comparison with the Grand River basin projections difficult.

After receipt of the new OBE projections, the Informal Advisory Board will consult to discuss the question whether the indicated magnitude of change makes revision desirable, and to discuss the mechanics of revision, if judged necessary.

(2) Hydraulics and Hydrology Subcommittee: Mr. Paquette, its moderator, reported that one meeting was held 12 July 1967. At that meeting the subcommittee reviewed and discussed drafts of the following study documents:

Appendix E - Geology and Ground Water - February 1967.

Appendix C - Climate, March 1967.

Appendix D - Interim Technical Paper No. 1 (Streamflow and Reservoir Routing)

Appendix D - Interim Technical Paper No. 2 (Discharges for Ungaged Areas within the Grand River Basin)

Appendix D - Interim Technical Paper No. 3 (Estimating Evapotranspiration Losses within the Grand River Basin)

Appendix D - Interim Technical Paper No. 4 (Regulation of a Reservoir System)

(3) Fish and Wildlife and Recreation Advisory Subcommittee: Mr. Franz, its Co-Chairman, reported that no meetings have been held since the last Coordinating Committee meeting. However, in the future, there may be a meeting to review the latest drafts of Appendixes J and K.

(4) Basin Plan Formulation Subcommittee: Mr. Paquette, the moderator, summarized activities of the latest six subcommittee meetings:

c. Reports by Departments and Agencies: All participating departments and agencies reported on-going work at this point.

3. Presentation by Mr. Raymond F. Clevenger, Chairman, Great Lakes Basin Commission, Ann Arbor, Michigan: "A Report on the Great Lakes Basin Commission". Colonel White introduced Mr. Clevenger as being a graduate lawyer who practiced law mainly in Sault Ste. Marie, Michigan, and later on held various appointed and elected positions in that area. He had been elected to the 89th Congress to represent the 11th Michigan Congressional District. He was appointed by President Johnson in April 1967 to his present position as Chairman, Great Lakes Basin Commission.

4. Presentation by Mr. Mark V. Hughes, Jr., Staff Specialist, Water Resources Council, Washington, D. C.: "Organizing for River Basin Planning". Colonel White introduced Mr. Hughes as being a graduate economist who later turned civil engineer. He had various assignments in his professional career with the Federal Government starting in 1949. His latest experience and responsibilities have been in comprehensive river basin planning. He was appointed to his present position in June 1966 continuing his work in interagency coordination.

5. Presentation by Mr. John H. Kennaugh, Executive Secretary, Michigan Grand River Watershed Council, Lansing, Michigan: "Activities of the Council". Mr. Kennaugh reviewed briefly the history and the purpose of his organization. (See the minutes of 7th meeting for a more detailed report). He then outlined the Council's current activities and concerns.

6. Status of Funding

a. FY 1968 Coordinated Budget. The status of the FY 1968 coordinated budget is unchanged from that as was reported at the last Coordinating Committee meeting. Most agencies are experiencing late receipt of full funding allotments pending release by Congress. It is felt this is a temporary situation.

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b. FY 1969 Coordinated Budget. The Coordinated Budget Package was assembled and transmitted to higher authority and Federal members of the Coordinating Committee in April 1967. We anticipate receiving the Water Resources Council's revised transmittal to the Bureau of the Budget during December. It was again pointed out that this is the final request for study funds and that it was hoped that completion money for all agencies was adequate to get the job done.

c. Other Funding Matters. The Coordinated Budget Package for 1968 provides for transfer of $35,000 to various Department of the Interior study participants. To date the Corps of Engineers has transferred about one half of the total amount to them. It is anticipated that the remaining transfer money will be made as scheduled. It was also noted that the FY 1968 transfers represent the last significant transfers from the Corps of Engineers to other agencies as the scheduled FY 1969 transfers are only token amounts.

7. Presentation of Movie "Twentieth Century River". A 29 minute color movie was shown explaining how the Potomac River Basin was studied, principally by the Corps of Engineers, for comprehensive development and conservation of its water and land resources. The film illustrated the complexity of social, economic and political interests in a river basin. It was prepared to serve as a background for in-person discussions by Corps of Engineers representatives at public gatherings and had been developed in connection with the Potomac River Basin Study, a study very similar to the Grand River basin comprehensive planning study. Discussion after its showing centered on the question "Should we develop such a film?" General consensus was that making of a special movie about the Grand River study was a good idea but that neither funds nor manpower was available to do the job as a part of the study effort.

8. Other Business

a. Water Resources Council's Guidelines. The 17 May 1967 Water Resources Council's Guidelines for Submission and Review of Coordinated Comprehensive (Type 2) River Basin Reports was discussed by the Committee in general terms. It was agreed that the most expedient means to deal with this general document was for the Corps of Engineers to prepare a draft to replace Section 15 of the Plan of Investigation and then obtain the Coordinating Committee's views. Section 15 specifies the reporting procedures for the report.

b. Environmental Quality Advisory Board. The Corps of Engineers proposed the formation of a board of leading authorities to advise the Coordinating Committee on the environmental aspects of the draft of the recommended Basin plan. After preliminary discussions it was agreed that the Coordinating Committee would take the proposal under advisement and they would then send their comments on the proposal to the Chairman by 15 December 1967. Incidental to the Board would be formed a group tentatively called "Agency Associates". This to be composed of representatives of the various participating agencies who would nominate Board members and draft the terms of reference which would contain the guidelines and constraints of the Board and state their function in the study.

c. Summary of each Appendix. A suggestion was made for preparation of a summary document for each appendix. The proposed summary, about 20 pages, would be prepared for each draft by the agency drafting the appendix. This would be a separate document, an expansion of the short summary found within the parent text usually found just after the Table of Contents. Discussion resulted in no decision but rather that all agencies responsible for the drafts of appendixes would review the proposal and submit their ideas to the Corps of Engineers through their Coordinating Committee member.

d. Mr. McCallister furnished information on other Corps of Engineers studies in the Basin:

(1) A new commercial navigation study will start in FY 1968 titled "Grand Haven Harbor, Michigan". This study of a deep draft harbor and stream from the mouth of the Grand River upstream to Bass River was requested by local Congressmen.

(2) Estimated completion date for four Basin Flood Plain Information Reports were furnished:

(a) Grand River, Grand Ledge to Dimondale - May 1968

(b) Red Cedar River, MSU Dam to Williamston - July 1968

(c) Upper Grand River, Dimondale to Jackson County - October 1968

(d) Lookingglass River, Ionia County line to Shiawassee line - March 1969

LIST OF PARTICIPANTS
GRAND RIVER BASIN COORDINATING COMMITTEE
NINTH MEETING, 29-30 NOVEMBER 1967
EAST LANSING, MICHIGAN

DEPARTMENT OF AGRICULTURE

*Mr. V. M. Bathurst, Soil Conservation Service, East Lansing, Michigan
**Mr. R. S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. L. L. Oshel, Soil Conservation Service, East Lansing, Michigan
Mr. J. E. Hostetler, Economic Research Service, East Lansing, Michigan
Mr. R. L. Kerr, Forest Service, Lansing, Michigan
Mr. S. I. Becker, Forest Service, Lansing, Michigan

DEPARTMENT OF THE ARMY

*Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Mich.
Mr. V. G. Goelzer, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. C. H. Paquette, Corps of Engineers, Detroit, Michigan
Mr. E. V. Weiss, Corps of Engineers, Chicago, Illinois

DEPARTMENT OF COMMERCE

**Mr. H. Krashen, Bureau of Public Roads, Lansing, Michigan
Mr. N. D. Strommen, ESSA - Weather Bureau, East Lansing, Michigan

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

*Mr. D. W. Marshall, Public Health Service, Chicago, Illinois

DEPARTMENT OF THE INTERIOR

***Mr. R. K. Franz, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. F. J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. W. A. Grosh, Bureau of Mines, Minneapolis, Minnesota
Mr. W. H. Nord, Bureau of Sports Fisheries and Wildlife, Minneapolis, Minn.
Mr. R. E. Cleary, Bureau of Sports Fisheries & Wildlife, Lebanon, Ohio
Mr. H. D. Hirt, Federal Water Pollution Control Admin, Chicago, Ill.
Mr. A. D. Ash, Geological Survey, Lansing, Michigan

FEDERAL POWER COMMISSION

*Mr. L. B. Young, Bureau of Power, Chicago, Illinois
Mr. D. L. Simon, Bureau of Power, Chicago, Illinois

STATE OF MICHIGAN

*Mr. D. W. Granger, Water Resources Commission, Lansing, Michigan
Mr. C. E. Thornton, Mich. Grand R. Watershed Council, Lansing, Mich.
Mr. J. H. Kennaugh, Mich. Grand R. Watershed Council, Lansing, Mich.
Mr. J. H. Keyworth, Mich. Grand R. Watershed Council, Lansing, Mich.

GREAT LAKES BASIN COMMISSION

Mr. R. F. Clevenger, Ann Arbor, Mich. (Guest Speaker)
Mr. L. T. Crook, Ann Arbor, Mich.

WATER RESOURCES COUNCIL

Mr. M. V. Hughes, Jr., Washington, D. C. (Guest Speaker)

*Member of Coordinating Committee
**Alternate Member of Coordinating Committee
***Representing Coordinating Committee Member

GRAND RIVER BASIN COORDINATING COMMITTEE
TENTH MEETING - 21-22 MAY 1968
GRAND RAPIDS, MICHIGAN

1. Opening Remarks:

a. Welcome and Introduction: The meeting was called to order at 1:00 P.M. on 21 May 1968; the participants were welcomed by the Chairman, Colonel James T. White, Jr. The list of meeting participants is Inclosure No. 1.

b. Summary of study events and transmittals since the last meeting.

(1) Study distribution was made of two Appendices.

(a) Appendix N - Water Laws, by the Corps of Engineers.

(b) Appendix K - Fish and Wildlife, by the Bureau of Sport Fisheries and Wildlife.

(2) Distribution was made of two composite quarterly status reports.

(3) Seven subcommittee meetings were held; five by the Basin Plan Formulation Subcommittee and two by the Agency Associates Group.

(4) Miscellaneous transmittals were made to the Coordinating Committee.

(a) 29 December 1967 - Latest study Address List and revised pages to minutes of 8th meeting were distributed.

(b) 29 February 1968 - Consensus of the Coordinating Committee on the proposal "Environmental Quality Advisory Board" was distributed.

(c) 11 March 1968 - Consensus of the Coordinating Committee on the proposal "Summaries of Appendixes" was distributed.

(d) 13 March 1968 - Minutes of the 9th Coordinating Committee meeting were distributed.

(e) 2 May 1968 - A press release was made to Basin's news media concerning soil investigations underway in the Basin. This release was made in the name of the Coordinating Committee through the Corps of Engineers. A copy was provided to participants.

Minutes are not verbatim

(5) The Department of Health, Education, and Welfare indicated the desire to contribute an input to the study on "Health Aspects of the Basin Plan." A decision was made by the Chairman to include its contribution as a supplement to Appendix G - Water Use and Stream Quality. However, Later the agency preparing Appendix G noted it had not necessarily agreed to include this contribution. The matter will be resolved.

c. Comments on ninth meeting minutes: Colonel White noted that on page 7, middle of the page, the correct reference is "Public Law 89-72" rather than "80-72". This should be a pen or pencil change. There were no other comments on the minutes.

d. Other: A redraft of Section 15 of the Plan of Investigation was handed out to the particpants for their review. It covered the proposed procedure for report submission to higher authority. This was discussed later during the meeting.

2. Report on Study progress

a. Monitoring the network analysis diagram by appendix (utilizing the Functional Management Network Analysis Plan, Issue No. 2, dated 7 November 1966): Colonel White reminded the Coordinating Committee members and others to send the monthly network analysis reports to the Corps office and to relate these reports directly to status with regard to the Network Analysis Plan. A computer printout listing titled "Estimated Status as of 1 May 1968" was furnished to participants. The progress, work efforts and status in drafting Appendix A through Q was discussed in detail and summarized as follows:

Appendix A, "History": Task 1-577 (a time restraint) has not reached the late start date and is 5% completed. Work on Appendix A is on time.

Appendix B, "Basin and Description": Task 243-244 (prepare the first draft of Appendix B by the Corps of Engineers, Detroit District using the contributions from others) is 90% completed. Work on Appendix B is 66 weeks behind schedule. Mr. Paquette noted that, while the appendix is behind schedule, the Appendix will be on time once the first draft is published and distributed.

Appendix C, "Climate": Task 292-293 (prepare the fifth draft of Appendix C by Corps of Engineers, Detroit District) is 10% completed. Mr. Paquette noted that Mr. Strommen has suggested adding more data on hail and data on probability of temperature and precipitation to Appendix C. These data will be added when the next draft is finalized. Work on Appendix C is practically done.

Appendix D, "Surface Water Hydraulics and Hydrology and Fluvial Sediment": Mr. Paquette noted a change in logic. Task 317-318 (distribute, review, and approve the second draft of the appendix by higher headquarters of

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Corps of Engineers and Department of Agriculture, Soil Conservation Service) was bypassed and work shifted to Task 323-324 (distribute, review, and approve the third draft of the appendix by higher headquarters of Corps of Engineers and Department of Agriculture, Soil Conservation Service). Task 323-324 is 10% completed. Work on Appendix D is on time.

Appendix E, "Geology and Groundwater": Task 363-364 (prepare the third draft of Appendix E by Geological Survey) is 50% completed. Work on Appendix E is on time. The third draft is currently being reviewed by the U.S.G.S. St. Louis office. Upon approval, the draft will next be sent to the U.S.G.S. Washington, D.C. office for final interoffice review. Mr. Vanlier questioned the water quality parameters presented in Appendix G. If used, they would affect the wording and conclusions on use of groundwater as stated in Appendix E. Mr. Hirt replied that Appendix G water quality parameters will be changed to Michigan intra-state standards when those standards are established. State water quality standards have been drafted and are available, but have not been fully adopted. Appendix E, Mr. Vanlier commented, was based on Public Health Service standards, not the Federal Water Pollution Control Administration standards. Colonel White requested the Federal Pollution Control Administration, Geological Survey, and the Michigan Water Resources Commission to work together and resolve the conflict. Colonel White requested members of the Coordinating Committee to work together to resolve problems existing between their Departments and agencies whenever similar situations arose.

Appendix F, "Mineral Resources": Task 387-388 (prepare the second draft of Appendix F by the Bureau of Mines and the Michigan Department of Conservation) is 100% completed. This draft will be distributed about 1 July 1968. Work on Appendix F is on time.

Appendix G, "Water Use and Stream Quality": Task 219-220 (prepares single purpose plan draft No.2 of Appendix G by Federal Water Pollution Control Administration and Michigan Water Resources Commission) is 30% completed. Mr. Hirt advised that the first draft was revised to include comments from participating agencies and was sent about 1 May 1968 to the Michigan Water Resources Commission for its comments, additions or corrections. It is assumed that the State changes will be substantial since, interstate water quality standards have been set and intra-state water quality standards will soon be set. The appendix will no doubt reflect decisions made at the recent four-state pollution conference. A State public hearing is set for 28 August 1968 on the intra-state standards.

It was pointed out that the water quality standards presented in Appendix G must be firmed up immediately as other appendixes are affected as well as Basin water quality benefits and their evaluations being used in basin plan formulation studies for Appendix Q. Plan formulation studies to date have utilized the first draft of Appendix G and benefits presented therein as well as data furnished at Basin Plan Formulation Subcommittee meetings.

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Appendix H, "Flood Control": Task 45-46 (prepare the second draft of Appendix H, by the Corps of Engineers, Detroit District and the Soil Conservation Service) is 80% completed. Work on Appendix H is 69 weeks behind schedule. Mr. Paquette noted that the second draft is in office review. He also noted that a Corps of Engineers section on flood plain information studies and a Soil Conservation section on rural flood control studies will also be added before the second draft is distributed. It was also noted that while work on Appendix H is behind schedule, time will be made up once the second draft is published.

Appendix I, "Navigation": Task 95-96 (prepare the third draft of Appendix I, by Corps of Engineers, Detroit District) is 10% completed. The work on Appendix I is on schedule. Remarks: Mr. McCallister stated that the State had been requested to resolve a disagreement among state agencies concerning the proposal of the Michigan Waterways Commission for channel deepening upstream from Grand Rapids.

Appendix J, "Recreation": Task 157-158 (prepare the second draft of Appendix J, by the Bureau of Outdoor Recreation) is 90% completed. The work on Appendix J is 69 weeks behind schedule. The second draft is in office review and will soon be distributed for inter-agency review.

Appendix K, "Fish and Wildlife": Task 132-133 (distribute, review and approve the second draft of Appendix K, by all study participants) is 50% completed. The work on Appendix K is on time.

Appendix L, "Power": Task 29-30 (prepare the third draft of Appendix L, by the Federal Power Commission) is 10% complete. The work on Appendix L is on time.

Appendix M, "Agriculture": Task 200-201 (prepare the third draft of the single-purpose plan, by the Soil Conservation Service) is 10% completed. The work on Appendix M is on time. It was anticipated that the third draft will be published in December 1968.

Appendix N, "Water Laws": Task 423-425 (distribute, review and approve the second draft of Appendix N to Headquarters, North Central Division and Office, Chief of Engineers) is 90% completed. Concurrent Task 424-426 (distribute, review and approve the second draft of Appendix N, by all study participants) is 80% completed. The work on Appendix N is on time.

Appendix O, "Economic Base Study": Task 523-524 (updating of Appendix O, by all study participants) is 10% completed. The work on Appendix O is on time.

Appendix P, "Basin Plan Formulation Criteria": Task 448-449 (distribute, review, and approve the second draft of Appendix P, by all study participants) is 75% completed. The work on Appendix P is on time. Colonel White asked for review comments including negative comments on Appendix P from all agencies.

Appendix Q, "Basin Plan of Development": Task 469-471 (establish single purpose plan projects not amendable to multi-purpose plans, by the Basin Plan Formulation Subcommittee) is 80% completed. The work on Appendix Q is behind schedule. Mr. McCallister pointed out that work on Appendix Q is falling behind as task 475-479, task 476-480, task 477-481, and task 478-482 are well past their late finish date of 3 December 1967 and each are only 25% completed. Colonel White stated that personnel shortages and the late appropriations of FY 1968 money in all agencies has caused delays in the completion of these important study tasks.

Main Report: Task 1-534 (a time restraint) is incomplete. Work on the main report has not started, and the work is on schedule.

b. Reports from Subcommittees:

(1) Economic Base Study Informal Advisory Board: Mr. McCallister, its moderator, reported that Appendix O is complete, but economic projections will be revised as necessary. His office has just received "Economic Activities in Agriculture, Forest and Related Sectors of U. S. and Water Resource Regions 1980-2020", and is awaiting receipt of other revised national economic projections. After receipt of the OBE projections, the Informal Advisory Board will consult to discuss whether or not the indicated magnitude of change makes revision desirable, and to discuss the mechanics of revision, if judged necessary. As of now, no meetings are planned. Colonel White suggested that there should be a brief statement within Appendix O, describing the overall function of the economic base study and its relevance to the Grand River study. It was agreed that evaluation of economic data with regard to specific applications should be left to the appendix dealing with that application.

(2) Hydraulics and Hydrology Subcommittee: Mr. Paquette, its moderator, reported that there have been three meetings to date to review Appendices C (Climate), D (Surface Water Hydraulics and Hydrology and Fluvial Sediment) and E (Geology and Ground Water). There are no meetings planned. However, subsequent meetings may be scheduled after the above three appendix drafts are re-published.

The Hydrology Task Group has held three meetings to resolve differences in determining storage requirements for low-flow augmentation. The task group has completed its assigned mission.

(3) Fish and Wildlife and Recreation Advisory Subcommittee: Mr. Baker, a subcommittee member, stated that there had been no recent meetings. Mr. Paquette then reported that one meeting had been held before Mr. Baker joined the subcommittee.

Mr. Paquette recalled that two agencies of the Department of the Interior: the Bureau of Sport Fisheries and Wildlife and the Bureau of Outdoor Recreation, formed the subcommittee to review their individual appendices. One meeting was held to decide how to draft each appendice. Review of these drafts has been accomplished by Coordinating Committee members.

Colonel White suggested that the subcommittee be dissolved since its purpose has been fulfilled.

(4) Basin Plan Formulation Subcommittee: Mr. Paquette, its moderator, reported that there have been 25 subcommittee meetings to date. There have been five meetings since the last Coordinating Committee.

The status of Appendices P and Q is as follows: Appendix P - Plan Formulation Criteria, one section of the Appendix remains to be re-written before the draft is re-published and distributed for final review.

Appendix Q - "Plan of Development" Development of a Basin Plan was initiated about a year ago. The steps completed in its development are as follows:

(a) Review of needs and proposals presented in the single-purpose plan appendices;
(b) Division of Basin into six subareas to facilitate study;
(c) Screening of sites and separation into two groups:

1 Sites proposed by more than one agency or for more than one purpose,
2 Sites proposed by a single agency for one purpose only.

(d) Review of preliminary cost data for the multi-purpose sites.

The Corps inventoried data for 79 sites, and SCS inventoried 85 sites. Cost data for the Michigan Department of Conservation sites selected by some agencies is not available and will have to be estimated.

(e) Further screening of multi-purpose sites to 25. These sites were reviewed to determine:

1 B/C ratios
2 Interest indicated by the proposing agency: some sites were presented in single-purpose plans, but seemed to have less urgency later when discussed by the Basin Plan Formulation Subcommittee members.

(f) Further screening of proposed multi-purpose sites from 25 for detailed investigations of six sites in the upper basin designed to serve projected 1985 needs.

The steps or procedure needed for completion of Appendix Q are as follows:

1 Planning of projects downstream of Lansing (Lower Grand River basin) for projected 1985 needs
2 Planning of all Grand River projects for projected 1985-2020 needs
3 Writing of the draft of the Appendix

The preparation of Appendix Q is at least 26 weeks behind schedule. To get back on schedule Colonel White remarked that one way would be for two or three people from each agency to meet for one or two months in an effort to catch up, but that this would be impossible because of the known shortage of personnel in the agencies.

It would also be profitable to have several week long meetings, held in a relatively isolated location, and attended by people sufficiently interested and free from other committments to allow efficient and uninterrupted work. This was agreed to by all Coordinating Committee members. Selected dates for three one-week meetings were set for 10-14 June 1968, 8-12 July 1968, and 12-16 August 1968. Mr. Paquette gave the names of designated members, alternate members and recent participants of the Basin Plan Formulation Subcommittee to inform participants of those expected to attend the scheduled meetings.

c. Reports by Departments: The activities of participating departments were presented at this point.

3. Presentation by Mr. Ralph F. Kresge, Assistant to Associate Director, Weather Bureau (Hydrology), Environmental Science Services Administration, Washington, D. C. "A Report on the Environmental Science Services Administration and its Organization". Mr. Harry Krashen introduced Mr. Ralph F. Kresge.

4. Introduction of and Presentation by Mr. Glenn C. Gregg, Deputy Director for Recreation, Michigan Department of Conservation, Lansing, Michigan: "Conservation of our Natural Resources". Arrangements for Mr. Gregg's participation were made by Mr. Dale Granger and in his absence, Mr. Verne Bathurst introduced the speaker.

5. Status of Funding: FY 1969 Coordinated Budget: Preparation of the FY 1969 Coordinated Budget Package was initiated early in 1967, assembled and transmitted to higher authority and to Federal members of the Coordinating Committee on 13 April 1967. The Water Resources Council revised the overall estimate dated September 1967. This was distributed to all Coordinating Committee members in a 28 February 1968 letter and the State of Michigan was furnished the complete package at this time.

In a revised March 1968 estimate, the Water Resources Council dropped the total study estimate to $1,894,000. A copy of its estimate was furnished to all study participants in a 11 April 1968 letter.

a. The Department of Health, Education, and Welfare reported that it has not been funded for water resources work.

b. The Corps of Engineers declared that $40,000 surplus funds was revoked as these could not be utilized this year, as a result of being behind schedule in their plan formulation studies. The Corps anticipates this money will be returned with the programmed FY 1969 funds. The Coordinated Budget Package for FY 1968 called for transfer of $35,000 from the Corps to some of the Department of the Interior study participants.

All of this total has been transferred to these agencies. These transfers represent the last significant transfers to study participants. The Coordinated Budget Package for FY 1969 calls for only token amounts of monies to be transferred during the last budgeted fiscal year of the study.

6. Presentation by Mr. John H. Kennaugh, Executive Secretary, Michigan Grand River Watershed Council, Lansing, Michigan: "Activities of the Council". Mr. Kennaugh announced that Mr. Collins Thornton, the official representative of the Michigan Grand River Watershed Council to the Coordinating Committee, was elected vice chairman of the Council at the second annual meeting. He then outlined the Council's current activities and concerns.

7. Other Business

a. Composite Summary: Colonel White reported that Committee members have discussed the question of whether there should be a separate composite summary for all of the appendices. The general consensus was that there should not be a separate summary; individual summaries in each appendix would be sufficient. It was decided that further consideration of this matter be deferred.

b. Water Resource Council's Guidelines: A re-draft for a study document was provided to participants and discussed. Colonel White reported that the 17 May 1967 Water Resources Council's Guidelines for Submission and Review of Coordinated Comprehensive (Type 2) River Basin Reports necessitated a change in Section 15 of the Plan of Investigation; since this specifies reporting procedures for the study report. 15 June 1968 was designated as the closing date for comments on the furnished re-draft.

c. Environmental Quality Advisory Board: Mr. Gregory reported that the Agency Associates Group composed of representatives of the various participating agencies has met twice since its formation. The Agency Associates Group will nominate Board members to the Coordinating Committee. A draft was prepared by the Group containing terms of reference, the guidelines and constraints of the Board and the Boards function in the study. The discussion that followed raised the question whether the public's reaction as to economic acceptability of a project should be studied by the board. There were two arguments:

(1) The public's knowledge of economic matters is sufficiently incomplete to invalidate many of its conclusions;

(2) Economic matters are best left to the Corps of Engineers, who have already made economic studies of proposed projects and can better evaluate economic consequences.

It was mentioned that the study by the Board members should focus not so much on opinion, but on recommendations for improvement. It was also suggested that an agency expert be appointed to help Board members with wording of statements and with their approach to the Basin Plan. Decisions on all of these matters were deferred until a later time; however, it was suggested that Board members be nominated for selection at the next Coordinating Committee meeting.

d. Other: Colonel White suggested that there should be integrated in the Basin plan or into the main report, a recommendation or some provision for a periodic updating and review of the completed study, so that the recommended plan will remain viable and relevant through 2020. This was concurred in by the Coordinating Committee members present.

Inclosure 1

LIST OF PARTICIPANTS
GRAND RIVER BASIN COORDINATING COMMITTEE
TENTH MEETING, 21-22 MAY 1968
GRAND RAPIDS, MICHIGAN

DEPARTMENT OF AGRICULTURE

*Mr. V. M. Bathurst, Soil Conservation Service, East Lansing, Michigan
**Mr. R. S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. L. L. Oshel, Soil Conservation Service, East Lansing, Michigan
Dr. R. W. Strohbehn, Economic Research Service, E. Lansing, Michigan
Mr. J. E. Hostetler, Economic Research Service, E. Lansing, Michigan
Mr. R. L. Kerr, Forest Service, Lansing, Michigan
Mr. S. I. Becker, Forest Service, Lansing, Michigan

DEPARTMENT OF THE ARMY

*Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Michigan
Captain E. A. Welsh, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. C. H. Paquette, Jr., Corps of Engineers, Detroit, Michigan
Mr. E. V. Weiss, Corps of Engineers, Chicago, Illinois

DEPARTMENT OF COMMERCE

**Mr. H. Krashen, Bureau of Public Roads, (Dept. of Trans.), Lansing, Mich.
Mr. N. D. Strommen, ESSA-Weather Bureau, East Lansing, Michigan
Mr. R. F. Kresge, ESSA-Weather Bureau, Silver Spring, Maryland (Guest Speaker)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

*Mr. D. W. Marshall, Public Health Service, Chicago, Illinois

DEPARTMENT OF THE INTERIOR

***Mr. F. J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. K. E. Vanlier, Geological Survey, Lansing, Michigan
Mr. H. D. Hirt, Federal Water Pollution Control Admin., Chicago, Ill.

FEDERAL POWER COMMISSION

*Mr. L. B. Young, Bureau of Power, Chicago, Illinois

STATE OF MICHIGAN

***Mr. J. H. Kennaugh, Mich. Grand River Watershed Council, Lansing, Mich.
Mr. C. E. Thornton, Mich. Grand River Watershed Council, Lansing, Mich.
Mr. G. C. Gregg, Mich. Department of Conservation, Lansing, Mich. (Guest Speaker)
Mr. W. H. Colburn, Mich. Department of Conservation, Lansing, Mich.

*Member of Coordinating Committee
**Alternate Member of Coordinating Committee
***Represented Coordinating Committee Member

GRAND RIVER BASIN COORDINATING COMMITTEE
ELEVENTH MEETING - 3-4 DECEMBER 1968
GRAND RAPIDS, MICHIGAN

1. Opening Remarks.

a. Welcome - Colonel James T. White, Jr., Chairman. The meeting was called to order at 1:00 P.M. on 3 December 1968. The participants were welcomed by the Chairman, Colonel James T. White, Jr. The list of meeting participants is Inclosure No. 1.

b. Comments on tenth meeting minutes. There were no comments on the tenth meeting minutes.

c. Summary of study activities and events since last meeting. The Coordinating Committee membership has remained unchanged since September 1967 when Mr. Jordahl left and Mr. Stoddard replaced him on the Committee. This is the longest interval of time without change in the history of the study.

With Regard to Recent Study Activities:

(1) The latest draft of Appendix F-Mineral Resources, by the Bureau of Mines, was distributed for review and comment.

(2) Two composite quarterly status reports were mailed, one as of 30 June 1968, and the other as of 30 September 1968.

(3) Five Basin Plan Formulation Subcommittee meetings were held.

(4) Some miscellaneous letters were transmitted to Coordinating Committee members:

(a) Three letters gave noteice of each week-long Basin Plan Formulation Subcommittee meeting.

(b) A 25 November letter gave notice of this meeting, and inclosed a portion of the draft of Appendix Q for review.

(5) Corps of Engineers personnel accepted several speaking engagements to explain the study:

Minutes are not verbatim

(a) At East Lansing, to Michigan State University professors and students.

(b) At Lansing, to Michigan Natural Resources Department personnel.

(c) At Chicago, to discuss the current basin plan formulation procedures with personnel of the office of the Chief of Engineers and the North Central Division.

(d) At Lansing, in cooperation with Mr. John Kennaugh of the Michigan Grand River Watershed Council, to local municipal planners of the Basin.

(e) At Grand Rapids, to members of the American Society of Civil Engineers and Professional Engineers.

(6) On 23 July, the contract for aerial photography and mapping in the Basin with the Abrams Aerial Survey Corporation was completed and accepted.

(7) On 28 August, the Michigan Water Resources Commission sponsored a public meeting at Kalamazoo to discuss intrastate water quality standards for Southwestern Michigan (a region which includes the Grand River Basin).

2. Availability of Water Quality Benefits.

At the tenth meeting of the Coordinating Committee, on 21-22 May 1968, the subject of availability of water quality benefits for the Basin Plan was aired. The Chairman was authorized to send a letter to the Department of the Interior, requesting requirements for water quality storage be established as well as the benefits available in the Basin by time period for meeting these water quality standards. Accordingly, on 13 June, the Chairman sent a letter to Mr. Stoddard of the Department of the Interior, requesting clarification of the Department of the Interior's position. On 14 October Mr. Stoddard replied that benefits would be assigned for flow augmentation storage for water quality. It was his understanding that the storage could be reallocated to other purposes when alternative means of maintaining water quality are implemented.

Mr. Philip McCallister, of the Corps of Engineers, summarized the current position of the Department of the Interior, as it had been communicated to him: Since the study was initiated, the Federal Water Resources Council has undertaken an extensive review of the analysis of water quality control benefits, with the philosophy being established that there is no such thing as a water quality control benefit per se, but that the benefits are actually attributable to other uses, such as recreation, fish and wildlife, and so forth. With that in mind, Secretary Udahl has directed that water quality benefits resulting from water resources projects be evaluated to the maximum extent possible in terms of a direct appraisal of the value of the water uses protected or

enhanced. This policy will require that the beneficiaries of the improved water quality be identified and the value of the enhancement be determined. The beneficiaries will include, but are not limited to, recreational users, fishermen, boaters, municipal and industrial water users, and the public in general through reduction of nuisances and through increased economic activity. He further recommended in his letter to the Water Resources Council and the Bureau of the Budget that the costs of water quality management storage should be reimbursable on a basis comparable with local participation under other programs. Fifty percent of the benefits accruing to recreational and sports fishery uses through water quality control should be borne by local interests. Second, he has directed the Federal Water Pollution Control Administration to give more explicit consideration to possible alternatives to flow regulation. This might permit meeting the water quality objectives with lesser amounts of storage for that purpose in project design. It would require that the project be periodically reviewed to determine whether storage originally provided for stream flow regulation could be reallocated to other uses in future years when advanced waste treatment technology becomes more economical to apply and facilities are provided. Some difficulties in water resource project planning will arise during the interim period of changing and emerging policy. This new look at stream flow regulation and its contribution to water quality control is needed to make stream flow regulation a more effective tool in overall water resources development. Over the long run, this re-evaluation of policy on stream flow regulation benefits by the Water Resources Council will make a significant contribution to the optimum development and use of our water resources. Further research and development can be expected to result in some further reduction in costs of advanced waste treatment and to give greater assurance of plant reliability. In some cases, it may be found possible, through use of a higher level of waste treatment, to maintain water quality at lower cost than is now indicated in our study's Appendix G. Appropriate modification of specific project features and area interests would need to be considered in any such changes. In those cases where flow augmentation cannot maintain the water quality goal of five milligrams per liter of dissolved oxygen in streams designated for fishery use, some type of advanced waste treatment must be utilized in conjunction with the flow augmentation, and alternative costs will need to be adjusted.

Mr. McCallister concluded his discussion of the position of the Department of the Interior: Changes in waste treatment technology occuring before authorization, and the adoption of the new Department of the Interior policy for all Federal and Federally-assisted projects, will result in and require re-analysis of the conclusions of Appendix G pertaining to the costs and benefits relating to flow augmentation. The benefits determined by the Federal Water Pollution Control Administration using the most likely alternative method will be utilized in the plan formulation process until the re-analysis is made.

3. Report on Study Progress

The Chairman reported upon the overall status of study progress: Since the seventh Coordinating Committee meeting in December 1966, the Committee has utilized a network analysis plan to check upon the study's progress. However, in this the last funded year of the study, the network analysis plan has become outdated. Therefore, this report and future reports upon

the progress of the study will indicate, individually, the status of each appendix and the time and work required to complete it. Only three appendices are known to be complete: Appendix O "Economic Base Study"; Appendix K "Fish and Wildlife"; and Appendix L "Power". Even these three appendices must be formally reviewed by all agencies, as evidenced by formal letters of comment to whatever agency has primary responsibility for the appendix draft. In the future each appendix transmitted to the Corps of Engineers for publication should be accompanied by a transmittal letter stating its degree of completion.

Mr. Paquette then monitored all reports upon the status of the individual appendices.

Appendix A "History of the Investigation": A draft of this appendix has been written and is ready for publication and distribution. However, this appendix cannot be completed until the study has been completed. The draft in its current form, compiled primarily from status reports of study progress, will be distributed for review and comment in early 1969. It is estimated that two more man-months of direct effort, and two man-months for publication, distribution, and review, will be required to finish it.

Appendix B "Basin Description": The final draft is being typed and will be published in early 1969.

Appendix C "Climate": The final draft is undergoing in-house review prior to final typing. Two man-months of direct effort, and one man-month for publication, distribution, and review, are required to finish this appendix.

Appendix D "Surface Water Hydraulics, Hydrology, and Fluvial Sediment": The final draft is undergoing in-house review and has been partially typed. Two man-months of direct effort, and one man-month for publication, distritution, and review, are required to finish this appendix.

Appendix E "Geology and Ground Water": The United States Geological Survey has primary responsibility for this appendix. Their first draft has been published and distributed; and the final draft, having been approved by the Washington office of the Geological Survey, needs only to be re-typed before being submitted to the Corps of Engineers for publication. It should be published in early 1969. The Corps of Engineers expects to devote one man-month to publication, distribution, and review of this appendix.

Appendix F "Mineral Resources": The Bureau of Mines has primary responsibility for this appendix. The final draft has been distributed and reviewed, and will soon be ready for final publication. The Corps of Engineers expects to devote one man-month to publication, distribution, and review of this appendix.

Appendix G "Water Use and Stream Quality": The Federal Water Pollution Control Administration has primary responsibility for this appendix. The

second draft is now being written, in consulation with the State of Michigan. It should be ready for general distribution and comment early in 1969. Mr. Hirt estimated that his agency would need to devote only one more man-month of work to the appendix, assuming that extensive changes were not required by the subsequent review. The Corps of Engineers expects to devote one man-month to publication and review of this appendix.

Appendix H "Flood Control": The latest draft requred only minor in-house review and final typing. Two man-months of direct effort, and one man-month for publication, distribution, and review, will be required to complete this appendix.

Appendix I "Navigation": The final draft has not yet been written. Two months of direct effort, and one half month for publication, distribution, and review, will be required.

Appendix J "Recreation": The Bureau of Outdoor Recreation has primary responsibility for this appendix. The second draft is ready to be printed. It has passed through in-house review, and should be ready for publication early in 1969. The Corps of Engineers expects to devote one man-month to publication and review of this appendix.

Appendix K "Fish and Wildlife": The Bureau of Sport Fisheries and Wildlife has primary responsibility for this appendix. The latest draft was submitted to the Corps of Engineers, and published and distributed in April 1968. The final draft, which differs in only minor respects from the April 1968 draft, will be published in early 1969. The Corps of Engineers expects to devote one man-month to publication of this appendix.

Appendix L "Power": The Federal Power Commission has primary responsibility for this appendix. The final draft is ready for publication. The Corps of Engineers expects to devote one half man-month to publication of this appendix.

Appendix M "Agriculture": The Department of Agriculture has primary responsibility for this appendix. The final draft is scheduled for completion by March 1969. The Corps of Engineers expects to devote one man-month to publication of this appendix. Mr.

Appendix N "Water Laws": The final draft is ready for publication. One and a half man-months of work will be required for publication, distribution, and

Appendix O "Economic Base Study": The final report has already been published as Volume X of the Comprehensive Study. One half man-month of work will be required for further review.

Appendix P "Basin Plan Formulation Criteria": The final draft requires minor review and final typing. One half man-month will be needed for publication and distribution.

The Main Report (or The Summary Report): This report has not yet been started. The Corps will expend six man-months to do its portion of the work, assuming contribution from other agencies, and will require two man-months to publish and distribute the report.

Appendix Q "The Basin Plan": The Chairman stressed the importance of proposing the best plan for development of the basin's water resources, in possible contrast to the best plan that can be implemented given existing laws and institutional arrangements. Mr. Paquette stated that Sections I and II of the appendix had been distributed, and that comments were being sought from all agencies.

4. Presentations by Department of the Interior Agencies, General Topic: "Findings in Specific Studies of The Grand River Basin". The Department of the Interior had been requested to conduct special studies of the proposed reservoir sites. Two agencies-the United States Geological Survey and the National Park Service - made presentations of their special studies before the Coordinating Committee. The Bureau of Mines, although not represented at the meeting, had already submitted its studies of the reservoir sites to the Corps of Engineers,

Presentation by Mr. Kenneth E. Vanlier, Hydrologist, United States Geological Survey, Lansing, Michigan: "Findings in Specific Geological Survey Studies in the Grand River Basin". Mr. Francis Baker, of the Bureau of Outdoor Recreation, introduced Mr. Vanlier,

Presentation by Dr. Charles E. Cleland, Department of Anthropology, Michigan State University, East Lansing, Michigan: "A Report on the Natural, Archaelogic, and Historic Resources of the Proposed Reservoir Sites". Mr. Baker introduced Dr. Cleland,

Dr. Cleland was accompanied at the meeting by Dr. Maxwell, chairman of the Department of Archeology, Michigan State University, who also participated in the reported study for the National Park Service.

5. Presentation by Mr. Loren L. Oshel, Leader, River Basin and Watershed Planning Party, Soil Conservation Service, East Lansing, Michigan: "Public Law 566 Watershed Development by 1985 in the Grand River Basin". Mr. Verne Bathurst, of the Department of Agriculture, introduced Mr. Oshel.

6. Report by Mr. John Kennaugh, Executive Secretary, Michigan Grand River Watershed Council. Mr. Kennaugh's statement concerns the need to present the Plan and study to the public.

In response to Mr. Kennaugh's proposal, the Coordinating Committee created a Public Information Subcommittee. The members of the Subcommittee are: Mr. John Kennaugh, of the Michigan Grand River Watershed Council; Mr. Dale Granger, of the State of Michigan; Mr. Robert Fellows, of the Department of Agriculture; Mr. Robert Gregory of the Department of the Army; and an undesignated member from the Department of the Interior. Approval of the Michigan Grand River Watershed Council's public information program, and consequent recommendations to the Coordinating Committee and participating agencies for expenditure of study funds to support it, was granted by the Subcommittee. Mr. Granger was appointed chairman of the new Subcommittee.

7. Status of Funding to Complete Report

a. The last funding year in the Coordinated Budget is this year, Fiscal Year 1969.

b. The coordinated budget package was forwarded to the Water Resources Council by letter dated 13 April 1967. In an overall revised estimate, the Water Resources Council dropped slightly the total study estimate to $1,894,000. All study participants were furnished copies of pertinent data.

c. The fiscal year 1969 coordinated budget package calls for the Department of the Army to transfer $5,000 to some of the Department of the Interior participants ($1,000 to the Bureau of Sports Fisheries and Wildlife; $1,000 to the Bureau of Outdoor Recreation; $2,000 to the Bureau of Mines; and $1,000 to the Geological Survey), which transfers have been made.

d. Also, there are minor amounts of prior year transfer moneys not yet spent which can be utilized by the holding agencies.

e. As of now, this completes all justified transfers from the Department of the Army.

8. Other Business

a. Report by Agency Associates Group, and proposal on use of environmental quality consultants. A change in the second paragraph, entitled "Purpose", of the Mission Statement for Environmental Quality Consultants was approved by the Coordinating Committee. The corrected statement is: "The critique will be based on environmental quality aspects of the Basin Plan".

Three environmental quality consultants were selected by the Coordinating Committee to be contacted.

(1) Dr. Lyle Craine. Bachelor's degree from Oberlin College; master's degree in geography from the University of Wisconsin; master's degree in public administration from Syracuse University; and a doctor's degree in conservation from the University of Michigan. Professor within, and formerly Chairman of, the Department of Conservation within the School of Natural Resources of the University of Michigan. Formerly served with the Bureau of the Budget, the War Production Board (as Director of Organization Planning), the Bureau of the Budget again (as Director of Research on Postwar Natural Resources Organization), the field staff of the Institure of Public Administration in New York City, and the Program Planning Office of the Department of the Interior (as Acting Director). He contributed to the drafting of legislation authorizing watershed councils in the State of Michigan, and, in that connection, has been associated with the Huron River Intergovernmental Committee and the Huron River Watershed Council.

(2) Mr. Robert Hotaling. Bachelor's degree in landscape engineering and recreational management from Syracuse University; and a master's degree in urban planning from Michigan State University. His major areas of study have been landscape engineering, recreational management, forest conservation, architecture, civil engineering, horticulture, landscape design, and urban planning. He is currently Professor of Urban Planning at Michigan State University, and Chairman of the Planning Commission of Meridian Township.

(3) Mrs. Marie Shepard. Bachelor's degree from Central Michigan University, and a master's degree in resource development from Michigan State University. She has been active in soil and water conservation work since 1949. She has served as secretary-treasurer, since 1953 (the first woman Soil Conservation District Chairman in Michigan); has served as treasurer of the State Association of Soil Conservation Districts, Incorporated; and was recently re-appointed by the Michigan Secretary of Agriculture to the Soil and Water Conservation Board, where she has served since 1956. She is currently a teacher in the Swartz Creek school system.

In the event that any of the above persons declined to serve, the Agency Associates Group was authorized to designate a replacement. The Chairman of the Coordinating Committee reserved the right to set the number of man-days of work per person, in accordance with budget limitations.

Inclosure 1

LIST OF PARTICIPANTS
GRAND RIVER BASIN COORDINATING COMMITTEE
ELEVENTH MEETING, 3-4 DECEMBER 1968
GRAND RAPIDS, MICHIGAN

DEPARTMENT OF AGRICULTURE

*Mr. V. M. Bathurst, Soil Conservation Service, East Lansing, Michigan
**Mr. R. S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. L. L. Oshel, Soil Conservation Service, East Lansing, Michigan
Mr. J. E. Hostetler, Economic Research Service, East Lansing, Michigan
Mr. S. I. Becker, Forest Service, Lansing, Michigan

DEPARTMENT OF THE ARMY

* Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. C. H. Paquette, Corps of Engineers, Detroit, Michigan
Mr. T. E. Odle, Corps of Engineers, Detroit, Michigan

DEPARTMENT OF COMMERCE

**Mr. H. Krashen, Bureau of Public Roads, Lansing, Michigan
Mr. N. D. Strommen, ESSA - Weather Bureau, East Lansing, Michigan

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

*Mr. D. W. Marshall, Public Health Service, Chicago, Illinois

DEPARTMENT OF THE INTERIOR

***Mr. F. J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. W. H. Meyer, Bureau of Sport Fisheries and Wildlife, Minneapolis, Minn.
Mr. H. D. Hirt, Federal Water Pollution Control Admin., Chicago, Illinois
Mr. K. E. Vanlier, Geological Survey, Lansing, Michigan

FEDERAL POWER COMMISSION

**Mr. O. E. Haukedahl, Bureau of Power, Chicago, Illinois

STATE OF MICHIGAN

*Mr. D. W. Granger, Water Resources Commission, Lansing, Michigan
Mr. F. W. Bouma, Mich. Grand R. Watershed Council, Lansing, Michigan
Mr. C. E. Thornton, Mich. Grand R. Watershed Council, Lansing, Michigan
Mr. J. H. Kennaugh, Mich. Grand R. Watershed Council, Lansing, Michigan

GREAT LAKES BASIN COMMISSION

Mr. L. T. Crook, Ann Arbor, Michigan

GUEST SPEAKERS

Dr. M. S. Maxwell, Michigan State University, East Lansing, Michigan
Dr. C. E. Cleland, Michigan State University, East Lansing, Michigan

*Member of Coordinating Committee
**Alternate Member of Coordinating Committee
***Representing Coordinating Committee Member

GRAND RIVER BASIN COORDINATING COMMITTEE
TWELFTH MEETING - 6-7 MAY 1969

1. Colonel James T. White, Jr., Chairman of the Grand River Basin Coordinating Committee, welcomed and introduced members of the Coordinating Committee and other representatives of the participating agencies. An attendance roster is Inclosure No. 1.

2. The general theme of the meeting was Appendix Q. Mr. Gregory, who was appointed Moderator by the Plan Formulation Subcommittee, introduced the subject. Draft copies of "Appendix Q" were distributed to committee members.

3. The following statements were made by the various agencies:

a. Federal Water Pollution Control Administration - Mr. Viktora advised that FWPCA is continuing review of the needs of the basin with respect to water quality.

b. Fish and Wildlife - Mr. Meyers stated that they have been coordinating their efforts with the State of Michigan's Department of Natural Resources. They will continue review of their appendix.

c. Bureau of Recreation - Mr. Baker reviewed their effort, specifically pointing out Jackson's and Lansing's water and land needs. About 7 percent of total land area should be placed under water by the year 2020 to meet recreational needs; this requirement seems impossible to meet. Review of the appendices will continue.

d. Flood Control and Navigation - Mr. Gregory provided information on reservoir sites and pertinent problems on flood control.

e. Federal Power Commission - There was discussion about steam power plant installations on the Grand River, at Lansing. A meeting between FPC and the State is being planned within thirty days on this subject. FPC will continue coordination with the State and report to the Plan Formulation Subcommittee on power needs of the area.

f. Soil Conservation Service - Mr. Oshel reviewed water and land uses, with respect to industrial, domestic and irrigation requirements. As land use changes take place, more agricultural land goes into urban use. The SCS land treatment program should be expanded, including forest lands and tree planting. Some of the needs are listed below:

Minutes are not verbatim

(1) Upstream land treatment - 566 law program.

(2) Effective land treatment above each reservoir - keep damaging sediments out of reservoirs.

(3) Overall acceleration of land treatment program.

g. Discussion:

Mr. McCallister stated that we came up with the best plan through compromise; this process is important--having two or three plans generates problems and creates stalemates.

Mr. Wampler: We feel we should state our plan as being the best plan to satisfy the needs set for 1985.

Mr. Gregory advised that the best plan is the "best mix"; it meets needs through compromise. A planning process is a series of compromises.

Question from the floor: Will plan alternatives be available to the people?

Answer by Mr. Gregory: We do not plan publishing the deliberation (alternatives).

Question from the floor: Was cost a factor in determining the plan?

Answer by Mr. McCallister: If we haven't properly interpreted, there will be a problem.

Mr. Wampler: With reference to the Wabash River Study, the Wabash Valley Chapter with a membership of 9,000 testified their needs. To this day, they are the most progressive organization in the country.

4. Public Information Program. Mr. John Kennaugh of the Grand River Watershed Council made an after-dinner presentation to Coordinating Committee members, of his Public Information Program. The program was well received.

5. Coordinating Committee's Activity - Schedule for Completion of the Study.

a. Appendix Q Completion Schedule:

1 October - Comments due from agencies
31 October - Revised and completed draft due from Plan Formulation Subcommittee

15 November - Ready for printing - "To Press"
1 December - Mailing to agency members for final review.

b. Coordinating Committee Members' Comments:

From the floor: For public hearings, describe the process and considerations which lead up to the final plan.

From the floor: Coordinating Committee should give instructions on what should be said at Public Hearings.

From the floor: Regarding Flood Plain Regulations, John Kennaugh has prepared a document for local government use when the program is ready for final submission.

From the floor: It was suggested that when the final draft of the plan is available, copies should be sent to the State asking whether there are conflicts with any thoughts or plans they may have.

From the floor: Mr. Bathurst suggested the plan be submitted to State governmental agencies through Dale Granger.

From the floor: Consultants should report to the Coordinating Committee and to the Plan Formulation Subcommittee.

Instructions for the Plan Formulation Subcommittee. Institutional and legislative changes are necessary. There is a need for change of local zoning laws to accommodate flood plain requirements, but not regulations on how to construct the projects.

From the floor: Regarding plan formulation interest rate, a statement was made about heavy cost for the year 2020--economic justification for projected loss in future dollar value.

6. Recreational Navigation:

From the floor: Recreational navigation has been proposed on the Grand River from the mouth to the City of Grand Rapids. Objections to cruiser channels have been cited by Fish and Wildlife; however, at the present time there seems to be no objection to larger craft.

From the floor (FWPCA). Samplings have been taken of water on all harbors around Chicago, Illinois. The lower Grand River has not been considered at this time.

1 Incl
List of Participants

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Twelfth Meeting - 6-7 May 1969

Department of Agriculture

Mr. S. I. Becker, Forest Service, Lansing, Michigan
Mr. R. S. Fellows, Soil Conservation Service, East Lansing, Mich.
Mr. L. L. Oshel, Soil Conservation Service, East Lansing, Michigan
Mr. H. M. Amsterberg, Soil Conservation Service, East Lansing, Mich.
Mr. R. L. Kerr, Forest Service, East Lansing, Michigan
Mr. U. M. Bathurst, Soil Conservation Service, East Lansing, Michigan
Mr. L. A. Christensen, Economic Research Service, East Lansing, Mich.

Department of the Army

Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Mich.
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas E. Odle, Corps of Engineers, Detroit, Michigan
Mr. V. G. Goelzer, Corps of Engineers, Detroit, Michigan
Mr. F. K. Seydler, Corps of Engineers, Detroit, Michigan
Mr. G. S. Lykowski, Corps of Engineers, Chicago, Illinois
Mr. C. Brown, Corps of Engineers, Chicago, Illinois

Department of Commerce

Mr. N. D. Strommen, ESSA-Weather Bureau, East Lansing, Michigan

Department of the Interior

Mr. F. Wampler, Regional Coordinator, Cincinnati, Ohio
Mr. Francis J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Mich.
Mr. Stanley G. Victora, Federal Water Quality Administration, Chicago, Illinois
Mr. W. H. Meyer, Bureau of Sports, Fisheries and Wildlife, Minneapolis, Minnesota
Mr. R. H. Meyer, Bureau of Outdoor Recreation, Ann Arbor, Michigan

Federal Power Commission

Mr. O. E. Haukedahl, Bureau of Power, Chicago, Illinois

State of Michigan

Mr. Dale Granger, State of Michigan, Lansing, Michigan
Mr. J. Keyworth, Michigan Grand River Watershed Council (Past Chairman)
Mr. John H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan
Mr. Kenneth E. Christensen, Michigan Department of Natural Resources, Lansing, Michigan

Great Lakes Basin Commission

Mr. L. T. Crook, Great Lakes Basin Commission, Ann Arbor, Michigan

Inclosure No. 1

THIRTEENTH MEETING OF THE GRAND RIVER BASIN
COMPREHENSIVE PLANNING STUDY
COORDINATING COMMITTEE

1. The thirteenth meeting of the Grand River Basin Comprehensive Planning Study Coordinating Committee was held in Romulus, Michigan, on 1 August 1969. Colonel James T. White, Jr., Chairman of the Coordinating Committee, welcomed the participants. A list of the participants is Inclosure 1.

2. Colonel White then summarized the study activities and events since the last meeting:

a. Three meetings of the Basin Plan Formulation Subcommittee were held on 20 May 1969, 11 June 1969, and 25 July 1969. Work was continued on the preparation of Appendix Q - Basin Plan of Development.

b. Mr. John Kennaugh is continuing the initial phase of the Public Information Program. Mr. Kennaugh will make an oral presentation later in the day.

c. Selections and contacts were made with three members of the Environmental Quality Board. Environmental Quality Consultants have been selected. They are:

Mrs. Marie Shepard
Mr. Robert Hotaling

Mr. Hotaling, due to a previous commitment, did not attend the meeting. Mrs. Shepard made a presentation on Environmental Quality.

d. Detailed design and related cost data work, for the two major reservoir complexes proposed in the Basin Plan, is being done by the Corps' Design Branch. The first cost estimate was scheduled for 31 July 1969. The report is due 31 October 1969. Results of the engineering studies will be included in Appendix Q.

e. Studies have been completed on the development of a computerized simulation model for the two major reservoir complexes proposed for the Basin Plan.

f. Participating agencies have continued to redraft their appendices and to participate in plan formulation efforts.

3. Colonel White then reviewed the status of the appendices to the main report:

Minutes are not verbatim

A - History. The last draft is being proofread.

B - Description. The final form is being typed.

C - Climate. It is being printed.

D - Hydrology. The last draft is being proofread.

E - Ground Water and Geology. It is being printed.

F - Mineral Resources. It is being edited by the Bureau of Mines.

G - Water Use and Stream Quality. The final draft has been received from the Federal Water Pollution Control Administration.

H - Flood Control. The final form is being typed.

I - Navigation. The final draft is being proofread.

J - Recreation. The draft is undergoing further review.

K - Fish and Wildlife. It is being printed.

L - Power. It is being printed.

M - Agriculture. It will be printed by the Department of Agriculture.

N - Water Laws. The final report awaits State of Michigan submission of 1968 supplement.

O - Economic Development. It has been printed.

P - Basin Plan Formulation Criteria. The final draft is being typed.

Q - Plan of Development. Preparation of the first draft is 50 percent completed.

The main report has not yet been started.

4. Colonel White proposed that members of the staff of the Water Resources Council be invited to participate in the next Coordinating Committee meeting. The Coordinating Committee concurred. Mr. Leonard Crook, of the Great Lakes Basin Commission, stated that the Water Resources Council would probably rely on the Basin Commission for much of its review.

5. Mrs. Marie Shepard, Environmental Quality consultant, then addressed the Committee on the subject of the environmental quality aspects of the Basin Plan. Mrs. Shepard's comments were directed toward a number of appendices, not just Appendix Q. A detailed text of Mrs. Shepard's presentation is available at the Corps' District Office in Detroit, Michigan.

6. After Mrs. Shepards' presentation, discussion was encouraged on the general subject of environmental quality.

7. Mr. McCallister asked Mr. Lapointe, of the Fish and Wildlife Service, if a special study would be conducted on the estuary of the Grand River at Lake Michigan. Mr. Lapointe said that no study of the estuary would be made in connection with the Grand River Study, but that the estuary would be discussed in a report due in 1970 on the estuaries of the Great Lakes.

Mr. McCallister stated that the Plan would probably include recommendations both for commercial navigation from Bass Island to the mouth of the Grand River and for recreational navigation from Grand Rapids to the mouth of the Grand River.

The Water Resources Council has requested a classification of rivers according to whether or not they should be studied with a view to incorporating them into the Wild Rivers System. It was generally felt that the Grand River would not appropriately fall under this program.

The Chairman of the Coordinating Committee recently sent a letter to Committee members asking them to make recommendations regarding the proper handling of "alternative plans" by the main report. Committee members at the meeting asked the Chairman to relay the recommendations back to the Committee for further consideration.

8. Mr. Kennaugh distributed a draft copy of a letter addressed to him from the West Michigan Environmental Action Council.

Discussion then turned to the question of how much detailed coordination should be sought with responsible citizen groups such as the League of Women Voters, the Michigan United Conservation Clubs, and the West Michigan Environmental Action Council. A meeting will be held with the Environmental Action Council as soon as possible.

9. Mr. Kennaugh then distributed copies of a "Progress Report on the Public Information Program for the Preliminary Plan of the Grand River Basin Comprehensive Water Resources Planning Study", and summarized the contents of the report. The report documents the work of the Michigan Grand River Watershed Council in bringing the Plan to the attention of the public.

1 Incl
List of Participants

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Thirteenth Meeting, 1 August 1969
Romulus, Michigan

Department of Agriculture

** Mr. Arthur H. Cratty, Soil Conservation Service, East Lansing, Michigan
Mr. Robert S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. Loren Oshel, Soil Conservation Service, East Lansing, Michigan
Mr. H. A. Amsterburg, Soil Conservation Service, East Lansing, Michigan
Mr. Roger Strohbehn, Economic Research Service, East Lansing, Michigan
Mr. Richard Kerr, Forest Service, Lansing, Michigan
Mr. Samuel Becker, Forest Service, Lansing, Michigan

Department of the Army

** Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas E. Odle, Corps of Engineers, Detroit, Michigan
Mr. Frank Seydler, Corps of Engineers, Detroit, Michigan
Lieutenant Gary G. Ruttan, Corps of Engineers, Detroit, Michigan
Mr. H. Gordon Hanson, Corps of Engineers, Chicago, Illinois

Department of Commerce

* Mr. Norton D. Strommen, Weather Bureau, Lansing, Michigan

Department of Health, Education, and Welfare

** Mr. Donald W. Marshall, Public Health Service, Chicago, Illinois

Department of the Interior

** Mr. Fred Wampler, Department of the Interior, Cincinnati, Ohio
Mr. Francis J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Donald F. Lapointe, Bureau of Sport Fisheries and Wildlife, Minneapolis, Minn.

Department of Transportation

* Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Inclosure 1

Federal Power Commission

** Mr. Lenard B. Young, Bureau of Power, Chicago, Illinois

State of Michigan

* Mr. John H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan

Mr. Eckhart Dersch, Michigan Department of Agriculture, Lansing, Michigan

Mr. John D. Cruise, Michigan Department of State Highways, Lansing, Michigan

Great Lakes Basin Commission

** Mr. L. T. Crook, Ann Arbor, Michigan

Mr. E. A. Jarecki, Ann Arbor, Michigan

Environmental Quality Consultant

Mrs. Marie Shepard, Flint, Michigan

** Coordinating Committee member.

* Represents agency in place of Coordinating Committee member.

FOURTEENTH MEETING OF THE GRAND RIVER BASIN
COMPREHENSIVE PLANNING STUDY
COORDINATING COMMITTEE

1. Opening Remarks

a. The fourteenth meeting of the Grand River Basin Comprehensive Planning Study Coordinating Committee was held at the Pick Fort Shelby Hotel in Detroit, Michigan, on 17 and 18 September 1969. Colonel James T. White, Jr., Chairman of the Coordinating Committee, welcomed the participants. A list of the participants in Inclosure No. 1.

b. Summary of activities and events since the thirteenth meeting:

(1) Since the 1 August Coordinating Committee meeting, the Plan Formulation Subcommittee held one meeting on 4 September 1969. Work was continued on the preparation of Appendix Q - "Basin Plan of Development".

(2) Mr. John Kennaugh is working with terminal phases of the Public Information Program. Mr. Kennaugh will provide comments during the discussion later in the program.

(3) Mrs. Marie Shepard and Mr. Robert Hotaling, environmental consultants, have and are making contributions to the study. Mrs. Marie Shepard made a presentation at the 1 August 1969 Coordinating Committee meeting. Mr. Robert Hotaling will make his presentation on Environmental Quality, today.

(4) Studies have been completed on the development of a computerized simulation model for the two major reservoir complexes proposed for the basin plan.

2. Colonel White then reviewed the status of the appendices:

A - History. Final form being typed.

B - Description. Final form being typed.

C - Climate. Released to printing.

D - Hydrology. Being reviewed for printing. There will be no further distribution.

E - Ground Water and Geology. Printed.

Minutes are not verbatim

F - Mineral Resources. Being edited by the Bureau of Mines.

G - Water Use and Stream Quality. The final draft is being prepared for issuance to the Corps.

H - Flood Control. Released to printing.

I - Navigation. Final editing.

J - Recreation. Final draft being reviewed.

K - Fish and Wildlife. Printed.

L - Power. Printed.

M - Agriculture. Final draft undergoing review by Department of Agriculture.

N - Water Laws. Final editing.

O - Economic Development. Printed.

P - Basin Plan Formulation. Final form being typed.

Q - Plan of Development. Draft to be presented at this meeting.

The main report has not yet been started.

Comments on the Status of the Appendices were presented by the representatives of the agencies present.

3. Presentation by Professor Robert B. Hotaling, Consultant Environmental Quality.

4. Environmental Quality Discussion.

Question: Colonel White asked Mr. Hotaling what he felt were the adverse environmental impacts to the Basin as the result of the program envisioned in the plan.

Response by Mr. Hotaling: The counties where you have structural improvement planned are not well organized or effective in maintaining antipollution standards. There will be disorderly land development which would enhance the pollution problem because of the rather primitive kinds of waste disposal systems for urban concentrations that would occur around these impoundments that would pollute them in a very short order.

Discussion:

Colonel White stated that the plan is based on the assumption that all the water quality standards will be reached.

Mr. Hotaling stated that we (the State) do not have the enforcement to reach those standards. This committee has got to go beyond that assumption because of the limitations of budgets, personnel, political implications have not, in these counties, precipitated the urban

standards of waste disposal around water. There are no public sewer systems, there are no waste treatment plants, there is no State policy on locating them, or is there any local policy on how they are going to come about either. Mr. Hotaling suggested that the Committee make specific recommendations as to how the water quality will be maintained and not just assume that water quality standards, having been set, will be maintained.

Mr. Rouse, Chairman of the Great Lakes Basin Commission, agreed wholeheartedly with Mr. Hotaling and stated that local planning boards do not have the experience or know-how to follow through, unguided, on a plan such as this.

Colonel White charged the State representative to find out what the State's position would be on changing the program to include this subject.

Mr. Hotaling stated that if you cannot control the consequences of this development and potential pollution, then in your acquisition program there ought to be a responsibility to prevent the development from getting close enough to the water to cause pollution. There are nonstructural ways of accomplishing this also.

Colonel White stated that it has been the consensus of the Committee in the past that we would not be restricted to existing legislation, but make recommendations as we see fit.

Question - Response:

Mr. Young asked Mr. Hotaling what additions he recommends to enhance the plan.

Mr. Hotaling stated the plan is missing local involvement and participation. You need land use planning (local participation) which should precede, by a considerable degree, water resource planning, then, the integration of the two.

Standards need to be set relative to land use planning to protect the water quality.

More emphasis should be placed on urban input which in his opinion should be overemphasized.

The public lacks an appreciation of the kind of things we are talking about, and these things are absolutely necessary to accomplish what you are trying to accomplish with this plan. Other inputs are needed, i.e., social controls and public regulations to give assurances that at least the minimum requirements of the standards are met.

Mr. Gregory asked how far out from impondment one must regulate to get a reasonable degree of control.

Mr. Hotaling stated that it depended upon the type of development that was planned for the impondment; however, the accesses to the reservoirs must be regulated also.

Colonel White addressed the Committee, saying, what is facing the Committee is how deeply should we get into determining the way of preventing adverse reactions brought on by our plan or adverse reactions that could affect our plan.

Mr. Hotaling recommended that the Committee build into the plan, the things that will encourage the present urban development to continue without disordering that any more than it is, or the reverse of that, having the residual of that urban development and the growth of it, or the relocation of it, adversely affect what you do in environmental water quality or misuse of it. You cannot divorce those two.

Mr. Wampler requested Mr. Hotaling to furnish a draft of legislative changes for zoning, i.e., changes in the Michigan Law to enable zoning to put in a more effective way for our use. This area will be developed further by the Plan Formulation Subcommittee.

Colonel White stated that the State has to develop recommended changes in State regulations and laws to implement and protect this plan. The Coordinating Committee should ask the State to develop those laws which are necessary or desirable to insure the implementation of the plan, and state their recommendations as to which ones should be implemented.

Colonel White asked each member of the Coordinating Committee, when they review Appendix Q, to come up with their suggestions on what legislative and institutional changes are required to best implement this plan as it relates to their agency.

5. Public Hearings. Mr. John Kennaugh stated that the tentative plan was to have three days for public hearings, beginning on 12, 13 and 14 November, with one day set aside for each of the metropolitan areas in the Basin, i.e., Jackson, Lansing, and Grand Rapids. It was decided to have two meetings each day, one in the afternoon and one in the evening. Mr. Kennaugh recommended that the hearings be part of the public information program and an informational session be conducted at the beginning of each meeting by presenting: (1) the planning process, (2) the organizational structure of the planning program, and (3) an overview of the plan. The remainder of the meeting would be devoted to comments and discussion from the floor.

It was decided that Colonel White will preside over the hearings and the Coordinating Committee members will be in attendance. Mr. John Kennaugh will give the public information briefing at the beginning of the hearings.

6. Appendix Q - The Basin Plan of Development.

a. Mr. Robert Gregory conducted the discussion of Appendix Q - "The Basin Plan of Development".

Mr. Gregory stated that there are no major changes in the way the Plan Formulation Subcommittee approached the early action plan, and the long-term plan is concentrated primarily on nonstructural programs with the continuation of on-going programs emphasizing valley preserves.

Mr. Gregory stated that the Plan Formulation Subcommittee decided to use the new nomenclature as set down by the WRC in Section I and Section IV. Section I will explain the terminology and philosophy of conducting the study and then the new terminology will be used in Section IV.

Mr. Gregory then explained the table of contents and the report format.

Mr. Fellows recommended changing "Land Stabilization" to "Land Treatment" in Item 8 of Section II. It was agreed to do so.

Mr. Gregory addressed himself to explaining Section III of Appendix Q, a very detailed outline of the early action program, for the benefit of Mr. Mark Hughes, Jr., a staff specialist for the Water Resources Council.

b. Mr. Maddox expressed his opinion that Section II was not necessary. It was clarified that Section II included the needs up to and including 2020 and Section III dealt only with those needs up to 1985. When needs are projected beyond the early action program, it becomes impossible to validly stick to the subareas for defining needs. Thus, the need for Section II.

Mr. Young stated that he did not see any mention made of the need for municipal and industrial (M and I) water in Section III.

Mr. Gregory stated that the Subcommittee will take it under consideration; however, M and I water turned out to be a rather insignificant part of any recommendation they have. It will probably be covered on a functional basis in Section II under water supply. On a short-term program, the on-going or existing programs would be sufficient in this area.

Mr. Crook asked how much is there in the post-1985 program in respect to structural development.

Mr. Gregory stated that there was no major multipurpose structure in the post-1985 planning process.

A question was raised over the use of the word "need". It was decided to define "needs" more carefully. The decision was reached to use the term needs to mean those residual needs beyond those that existing and on-going programs will not satisfy and should be defined in the introduction to the section on needs.

Discussion followed on water supply systems.

It was brought out that the short-term water supply would be met by on-going programs. The long-term water supply needs would be met by a regional water supply system. Colonel White stated that this long-term need should be worked out between the State and the Water Resources Council and local officials and stated somewhere in the report.

Colonel White stated that the Committee is going to have to develop a statement regarding short and long-term water supply needs and how they will be met. Further, it will be necessary to get consideration from the State and local people that the statement is accurate and will, indeed, be carried out.

It was clarified that the discussion by subareas (Section III) will discuss only those needs that are being met by the plan. All other needs will be handled in a discussion preceding the section.

Mr. Wampler asked where the Subcommittee dealt with recreation in Section III. Mr. Gregory stated that it was handled under multipurpose reservoirs. The small watershed developments do not lend themselves to recreation development.

Mr. Gregory asked for feedback on the way the Subcommittee treated water quality. Water quality was developed with total cognizance of on-going programs. The Subcommittee came up with only two areas where there was a pressing need that could not be handled by on-going programs.

Mr. John Kennaugh presented the Subcommittee approach to explaining and dealing with on-going programs of Water Quality Programs in the Grand River Basin.

All discussion was of a clarification nature.

Mr. Mark Hughes stated that he did not feel alternatives were properly handled in Appendix A.

Mr. Gregory stated that alternatives, from a technical and philosophical viewpoint would be incorporated in the next draft of Appendix Q.

Mr. Mark Hughes asked about future flood damages and Mr. Gregory explained the Subcommittee's philosophies regarding the matter.

Mr. Mark Hughes asked what the single-purpose plan for recreation provided and Mr. Francis Baker explained it to him.

Mr. Hughes questioned the Committee's treatment of the on-going programs in the report. Discussion followed and it was decided to be emphatic about the fact that State and local on-going programs are a part of the plan, that our plan supplements the on-going programs. This will be written up in the main report.

Mr. Mark Hughes recommended that the Committee concentrate its writing efforts, not so much on volume and backgrounds but rather emphasize analysis and the plan itself.

Colonel White asked the Committee members how alternatives should be presented.

Mr. Hughes recommended that alternatives be presented, not on an individual site-by-site basis, but rather on a basin-wide functional area basis.

Colonel White proposed that the Coordinating Committee recommend to the Plan Formulation Subcommittee that they treat alternatives to meet the water related needs of the Basin on a functional area basis, i.e., navigation, recreation, etc., for the Basin as a whole. At the same time, the alternatives should be reasonably acceptable from an engineering, economic, and social standpoint.

Mr. Gregory asked the Coordinating Committee what priorities the Plan Formulation Subcommittee should set on the early action plan and how much detail should the Subcommittee consider. If implementation has to be done by on-going programs, can it be specified that the early action program has to be accomplished one specific way.

Colonel White stated that the Coordinating Committee had charged the Subcommittee to disregard (to a degree) the on-going programs in setting priorities. The priorities should be set to meet the realistic needs.

Mr. Gregory stated that the Subcommittee subdivided the fifteen early action programs into three periods of five years each and then each of the structural programs was put into one of the three time frames. Mr. Gregory asked if this meets the request of the Coordinating Committee.

The consensus of the Committee was to include line items, i.e., recommendations for additional data collection, stream monitoring, research programs, meteorological programs, etc., as well as construction projects in the list of priorities. The consensus was to incorporate this in the main report.

Mr. Gregory brought up the topic of the State's role in water quality. Mr. Gary Guenther, sanitary engineer for the Michigan Water Resources Commission, was in attendance to answer any questions the Committee members might have.

Mr. Gregory informed Mr. Guenther of the Committee's assumption that water quality standards would be reached and maintained throughout the life of the program.

Colonel White asked for assurance from the State that the water quality standards would be met and that the State upgrade and enforce the standards (where and when necessary) to be compatible with the plan in its entirety.

Mr. Guenther stated that he thought the assumption was a valid one. As far as the standards program and the setting of water quality standards is concerned, Mr. Guenther stated that he felt this area had to be left, pretty much, up to the State.

Mr. Gregory asked for an explicit statement from the State regarding their views on water quality at the Jackson Complex.

Dialog between Colonel White and Mr. Guenther concluded that the State agreed with every element of the plan as developed by the Subcommittee.

The question was asked if there were any tangible values associated with water quality in the report.

Mr. Gregory clarified the Subcommittee's philosophy on this matter. He stated that since the standards set the minimum acceptable level that the State will accept, then monitary benfits are equal to the cost of the least expensive alternative to meet this water quality standard.

Mr. Gregory summed up the Coordinating Committee's charges to the Plan Formulation Subcommittee as follows:

(1) The Committee was in agreement with the Subcommittee on the use of the new nomenclature in Sections I and IV of Appendix Q.

(2) The Subcommittee will incorporate a discussion of alternatives by function, basin-wide, at the most appropriate spot in the report.

(3) The Subcommittee will address the priorities in the early action plan at the most appropriate spot in the report.

(4) The Subcommittee will include recommendations for research and related type activities that would be vital to the implementation of the plan.

(5) The Subcommittee will wait until after the public hearings before starting the preparation of the main report.

Mr. Robert Fellows recommended that the Committee review the schedule for public meeting and the preparation and printing of Appendix Q in light of what has transpired during this 2-day session.

Colonel White stated that feedback is needed from the Committee members on what has been said at this meeting, and the point that the Subcommittee has been charged with, and a review by the agencies of Appendix Q.

Mr. Mark Hughes addressed the Committee regarding Appendix Q.

(1) The Water Resources Commission's Planning Group should meet informally with the Plan Formulation Subcommittee to discuss Appendix Q further.

(2) The same shortcomings pointed up in a recent WRC memo appears in this report also.

(a) Early action program is overemphasized.

(b) Presentation of alternatives need work.

(c) No mention of consideration of estuaries.

(d) Covering environmental or aesthetic considerations.

(e) Nonstructural program as presented gave the impression of window dressing and not substantial enough.

(f) Need to relate the needs to the proposals and showing those in a tabulation or a discussion.

Mr. Hughes concluded by asking: "What would be the effect of stretching the early action over the longer period of time?"

The State participants and Coordinating Committee members, when they sign off on the main report, will be granting at their level of operation, full approval for the plan. If there is something they do not agree with, they should say so at that time.

7. The Main Report. It was decided to have the Plan Formulation Subcommittee develop a new recommended outline.

8. Release Procedure for Appendices. It was decided that appendices will be retained and issued as part of the total report, except for those agencies which the Committee desires input from.

1 Incl
List of participants

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Fourteenth Meeting, 17-18 September 1969

Detroit, Michigan

Department of Agriculture

Mr. Robert S. Fellows, Soil Conservation Service, East Lansing, Michigan

Mr. H. A. Amsterburg, Soil Conservation Service, East Lansing, Michigan

Mr. Richard Kerr, Forest Service, Lansing, Michigan

Mr. J. E. Hostetler, Economic Research Service, Lansing, Michigan

Department of the Army

** Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Michigan

Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan

Mr. Frank Seydler, Corps of Engineers, Detroit, Michigan

1LT. Gary G. Ruttan, Corps of Engineers, Detroit, Michigan

Mr. R. Buddecke, Corps of Engineers, Chicago, Illinois

Mr. C. G. Merriman, Corps of Engineers, Detroit, Michigan

Department of Commerce

* Mr. Norton D. Strommen, Weather Bureau, Lansing, Michigan

Department of Health, Education, and Welfare

Mr. Donald Maddox, Public Health Service, Chicago, Illinois

** Coordinating Committee member.
* Represents agency in place of Coordinating Committee member.

Inclosure 1

Department of the Interior

** Mr. Fred Wampler, Department of the Interior, Cincinnati, Ohio

Mr. S. G. Viktora, Federal Water Pollution Control Administration, Chicago, Illinois

Mr. Francis J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan

Mr. S. A. Dole, Jr., Bureau of Sport Fisheries and Wildlife, Lebanon, Ohio

Department of Transportation

* Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Federal Power Commission

** Mr. Lenard B. Young, Bureau of Power, Chicago, Illinois

State of Michigan

* Mr. John H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan

Mr. Kenneth Christensen, Michigan Department of Natural Resources, Lansing, Michigan

Mr. F. J. Wicks, Michigan Department of Natural Resources, Lansing, Michigan

Mr. Gary Guenther, Michigan Department of Natural Resources, Lansing, Michigan

Great Lakes Basin Commission

** Mr. F. O. Rouse, Ann Arbor, Michigan

Mr. L. T. Crook, Ann Arbor, Michigan

Mr. E. A. Jarecki, Ann Arbor, Michigan

Environmental Quality Consultant

Mrs. Marie Shepard, Flint, Michigan

Mr. Robert Hotaling, Okemos, Michigan

Water Resources Council

Mr. Mark V. Hughes, Jr., Water Resources Council, Washington, D. C.

** Coordinating Committee member.
* Represents agency in place of Coordinating Committee member.

GRAND RIVER BASIN COORDINATING COMMITTEE
FIFTEENTH MEETING - 25 MARCH 1970

1. Opening Remarks

a. The fifteenth meeting of the Grand River Basin Comprehensive Coordinating Committee was held at the Holiday Inn, I-94 Highway, Romulus, Michigan. Colonel James T. White, Jr., Chairman of the Coordinating Committee, welcomed the participants. A list of the participants is Inclosure No. 1.

b. Colonel White requested comments on the minutes of the fourteenth meeting. No corrections were offered.

c. Colonel White summarized general study activities since the last meeting as follows:

(1) Public Information Meetings were held on Wednesday and Thursday, 11 and 12 March 1970, respectively, at Wyoming City Hall Council Chambers, Wyoming, Michigan.

(2) A Basin Plan Formulation Subcommittee meeting was held on 12 March 1970. The subcommittee members were alerted to the request that Coordinating Committee members furnished written statements for distribution at the fifteenth Coordinating Committee meeting, regarding the role which they expect their agency or unit of government to play in the implementation of the basin plan of development.

(3) Mr. Burton Atwood is Regional Coordinator, Upper Mississippi - Western Great Lakes, Department of the Interior; he replaced Mr. Fred Wampler.

(4) Mr. Arthur Cratty is State Conservationist; he replaced Mr. Verne M. Bathurst.

2. Public Hearings. Colonel White introduced this subject for discussion and agreement on procedure. It was agreed that Mr. Dale Granger will open the meetings; Colonel White will chair the hearings and present implementation, authorization and process; Mr. John Kennaugh will present the plan; statements will then be made from Federal, State, and local governments. Visual aids will be used for showing governmental procedures employed in the process of planning. In finalization of presentation, the plan will be summarized. When oral statements from the public are heard, it was agreed there should not be debate or arguments; questions and statements from the flood will be received.

Minutes are not verbatim

Five thousand copies of the Grand River Basin (Suggested Development Plan) will be printed for general distribution at the public hearings.

An announcement will be made at the end of each meeting that State procedure allows 30 days lapse time, after the hearing, for the public to submit objections and viewpoints on the plan.

Mr. John Kennaugh will make personal contacts with the Tri-County Planning Commission and other government entities, informing them of the plan and public hearings.

For the record of public hearings, it was consensus of the committee that a reporting service be procured for the six meetings.

An effort will be made to arrange and set dates for Congressional briefings; after discussion of the subject, it was decided the Chairman and staff would follow-up on the matter.

3. Status of Appendices. Mr. Gregory reviewed status of the appendices.

A - History	Final form being typed.
B - Description	Printed.
C - Climate	Printed.
D - Hydrology	Final form being typed.
E - Ground Water and Geology	Printed.
F - Mineral Resources	Printed.
G - Water Use and Stream Quality	The final draft is being prepared for issuance to the Corps.
H - Flood Control	Printed.
I - Navigation	Released to printing.
J - Recreation	BOR has finalized the text; they are preparing the final draft.
K - Fish and Wildlife	Printed.
L - Power	Printed.
M - Agriculture	Typed and ready for printing.
N - Water Laws	Released to printing.
O - Economic Development	Printed.
P - Basin Plan Formulation	Final form being typed.
Q - Plan of Development	First draft has been circulated for review.

Comments related to appendices. We will reprint (600 copies) of Appendix O, with a new forward.

Appendices will be bound into eleven-volumes as follows:

Volume I	The Main Report
Volume II	History (A) & Basin Description (B)
Volume III	Climate (C) & Hydrology (D)
Volume IV	Ground Water and Geology (E) & Mineral Resources (F)
Volume V	Water Use and Stream Quality (G)
Volume VI	Flood Control (H) and Navigation (I)
Volume VII	Recreation (J), Fish and Wildlife (K) & Power (L)
Volume VIII	Agriculture (M)
Volume IX	Water Laws (N)
Volume X	Economic Development (O)
Volume XI	Basin Plan Formulation (P) & Plan of Development (Q)

5. Comments on Appendix Q. Written comments from Coordinating Committee members on the first draft of Appendix Q were received from:

a. Great Lakes Basin Commission

b. Department of the Interior

(1) National Park Service

(2) Bureau of Outdoor Recreation

(3) Bureau of Sport Fisheries and Wildlife

(4) Bureau of Mines

(5) Geological Survey

c. Federal Power Commission

d. Department of Transportation

e. Department of Commerce (Weather Bureau)

f. Michigan Department of Health

g. Michigan Department of Agriculture

h. U. S. Department of Agriculture will provide comments before 1 April 1970.

It was agreed that Mr. Thomas E. Odle, Editor, would incorporate all feasible comments into Appendix Q; where there is question about subject material, the matter will be taken to the Plan Formulation Subcommittee for opinion.

Flood warning systems are not referenced in Appendix Q; Mr. Granger asked for review of the matter and suggested consideration be given to including the subject in the next draft of Appendix Q; State and Weather Bureau will review the draft.

Mr. Jerecki asked about procedure before final review of the draft of Appendix Q. Mr. Odle stated that xerox copies will first be sent to the Plan Formulation Subcommittee, with changes marked as follows:

D - Delete

R - Revised

A - Addition

A suggestion was made for Section III, page 1, to insert Federal Power Commission, Great Lakes Basin Commission, State of Michigan, and Grand River Watershed Council.

6. Outline of Main Report - Comments and Discussion. At 1 p.m. (after lunch), the meeting was chaired by Mr. Dale Granger, who substituted the rest of the day for Colonel James T. White, Jr., Chairman.

The proposed outline of the first 10 sections of the Summary Report were reviewed; assignments and date (6 April 1970) of submittal were acceptable to all parties.

Mr. Fellows stated that Item F, Section IV, should be "Water Resources".

Mr. Gregory stated that the Main Report should contain about 100 pages. There was a proposal that style should be developed by the Plan Formulation Subcommittee.

Mr. John Kennaugh suggested a Summary Report; this should be a clear short (10-20 pages) public information report for handout; this should be in addition to the Main Report. The suggestion will be followed up by Mr. Kennaugh through members of the Plan Formulation Subcommittee.

7. Implementation of Basin Plan. Members were provided, by letter, proposed outline for Sections XI (Implementation), XII (Conclusions), and XIII (Recommendations) of the Main Report and written statements on the role they expect to play in the implementation of the Basin Plan of Development were presented.

After discussion, the consensus of the committee was that the Implementation Section (XI) should be organized "project-by-project," "program-by-program". Grouping when possible should be like PL 566; no grouping specifically by agency, although there will be some grouping tendency.

Mr. McCallister pointed out desirability of being candid by providing information whether Federal authorities are available to build a project.

Mr. McCallister stated that "valley preserves" are a very important part of the plan.

Mr. Granger stated that the committee has not heard from the property owners, yet.

Mr. Baker favors the "fee simple" approach to acquiring property.

Mr. Atwood stated that Federal Water Pollution Control Administration (FWPCA) is guided by the Lake Michigan Enforcement Program; grants assistance will be available. U. S. Geological Survey, Bureau of Outdoor Recreation, FWPCA, and Fish and Wildlife will submit statements through Mr. Atwood.

Mr. Krashen stated that the Department of Transportation will implement the development of highway structures; access roads will be provided by Public Roads.

A statement was made that the State of Michigan has no zoning responsiblity at the present time; the responsibility is all local government. A bill now in the State Lesiglature calls for zoning of "wildlife preserves" and "erosion and control areas" on shorelines of the Great Lakes.

Mr. Granger stated that local citizens should push a congressman to get a local flood control project started; the Corps will then proceed on congressional request, for an authorization study.

8. Announcement. It was agreed that the date and place of the next Coordinating Committee meeting will be decided by members during the public hearings scheduled 7, 8 and 9 April 1970.

1 Incl
List of Participants

LIST OF ATTENDANCE
GRAND RIVER BASIN COORDINATING COMMITTEE
FIFTEENTH MEETING - 25 MARCH 1970

DEPARTMENT OF AGRICULTURE

**Mr. A. Cratty, Soil Conservation Service, East Lansing, Michigan
Mr. Robert Fellows, Soil Conservation Service, East Lansing, Mich.
Mr. H. A. Amsterberg, Soil Conservation Service, East Lansing, Mich.
Mr. J. E. Hostetler, Economic Research Service, Lansing, Michigan
Mr. Richard Kerr, Forest Service, Lansing, Michigan
Mr. R. Lindahl, Forest Service, Lansing, Michigan

DEPARTMENT OF THE ARMY

**Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Mich.
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. T. E. Odle, Corps of Engineers, Detroit, Michigan
Mr. F. K. Seydler, Corps of Engineers, Detroit, Michigan
Mr. Louis D'Alba, Corps of Engineers, Chicago, Illinois

DEPARTMENT OF COMMERCE

*Mr. Robert Snider, Essa Weather Bureau, Detroit, Michigan

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

*Mr. F. D. Maddox, Public Health Service, Chicago, Illinois

DEPARTMENT OF THE INTERIOR

**Mr. Burton Atwood, Department of the Interior, Des Plaines, Illinois
Mr. F. J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan

DEPARTMENT OF TRANSPORTATION

*Mr. Harry Krashen, Department of Transportation, Lansing, Michigan

FEDERAL POWER COMMISSION

*Mr. Orel E. Haukedahl, Federal Power Commission, Chicago, Illinois

STATE OF MICHIGAN

Mr. John H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan
**Mr. Dale W. Granger, Michigan Department of Natural Resources, Lansing, Michigan
Mr. Kenneth E. Cristensen, Michigan Department of Natural Resources, Lansing, Michigan

GREAT LAKES BASIN COMMISSION

**Mr. Leonard Crook, Ann Arbor, Michigan
Mr. E. A. Jarecki, Ann Arbor, Michigan

**Coordinating Committee Member
*Represents agency in place of Coordinating Committee Member

Inclosure No. 1

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
SIXTEENTH MEETING - 8 MAY 1970

East Lansing, Michigan

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 9:30 A.M. on 8 May 1970 and the participants were welcomed by the Chairman, Colonel James T. White, Jr. The list of meeting participants is Inclosure No. 1.

b. Status of minutes of fifteenth meeting. No comments were presented regarding the minutes of the fifteenth meeting.

c. Summary of activities and events since the fifteenth meeting. A series of public hearings was conducted on 7, 8, and 9 April 1970 at Grandville, Lansing, and Jackson, Michigan, respectively. Two hearings were conducted at each location.

2. DISCUSSION OF PUBLIC HEARINGS

Colonel White discussed the six public hearings and the difficulty encountered in getting information across to the public. He concluded that the plan is technically sound but not necessarily publicly acceptable and that public opinion may not have been adequately reflected by the testimony at the public hearings. He then asked each representative present to express his reaction to the hearings and to advise the Coordinating Committee on action to be taken.

Mr. Dale Granger suggested that before getting the reaction of the committee, Mr. John Kennaugh should relate to the Coordinating Committee the public contacts he has had since the hearings.

Mr. Kennaugh stated that he has attended two meetings since the hearings. The first meeting, held at Middleville, lasted 2-1/2 hours. There were over 500 people present, and the tone of the meeting reflected strong opposition to the Labarge Reservoir (Site No. 22). The people did not seem to realize that the suggested plan is a regional plan and not a local plan of development. He went on to say that he tried to relate to the people that this is not a hard-and-fast plan, but a guideline. The people think the plan is final and that they have not been consulted. The second public contact was a one-hour television broadcast in Jackson. There are meetings scheduled in the near future for Williamston and Jackson.

Minutes are not verbatim.

Discussion followed regarding the wording of the plan, and the concensus was that if the study were to be redone the committee would be more specific in its wording to relate to the public exactly what the plan is intended to be and how it would affect the general public.

Mr. Granger requested that the authority from Washington, D.C., to conduct the study be read to the committee. More specifically, he asked what the responsibilities of the Coordinating Committee are. Discussion followed and the topic was tabled until later in the meeting.

Each member present then commented on his reaction to the public hearings. A digested concensus of opinion is as follows:

1. The members were generally disappointed with the public's reaction.

2. Those who attended were those who had a personal concern; mainly, loss of land.

3. The members were disappointed that local officials did not come forward with statements of support. It was felt that the reason for this was the concern over the anticipated increased tax base.

4. Pollution was a concern.

5. Opposition was to the structures. (Rural people do not want "city people" to infiltrate their area.)

6. Water levels were also a concern.

7. The methods of financing were of concern.

8. After discussion everyone present agreed that the hearings were basically similar to most public hearings.

9. It was suggested that the committee recommend more Federal Water Quality Administration grant funds for waste treatment.

10. Mr. Granger conveyed the reaction of the legislators: The legislators are under pressure (opposition) from their constituents and are worried that the public has been neglected. They are of the opinion that the Coordinating Committee has concealed information and has failed to answer the public's questions.

11. Mr. Kennaugh suggested that the committee set up a legislative breakfast meeting to inform the legislators of the full picture.

12. It was suggested that we get further guidance and assistance from the Water Resources Council.

13. Mr. Granger stated that he felt that the committee needs further guidance before it can make any final approval of the plan with respect to how we should determine and evaluate the needs and the dollars for recreational benefits. He suggested re-examination of the recreation benefits.

Colonel White stated that we would have to re-investigate all the benefits then.

Mr. Granger stated: Let us re-examine all the benefits. For example, we haven't considered the City of Jackson's plan for spraying effluent, but recreation is the main issue--it is critical; the whole plan stands or falls on recreation.

Mr. McCallister stated that there is a Recreation Benefit Act, which says we must include recreation in projects. The ultimate decision on recreation is up to the Secretary of the Interior.

14. Colonel White charged Mr. Granger with setting up the legislative breakfast as soon as possible.

Colonel White summarized the reaction to the public hearings by saying that there was a feeling of frustration that reflects on the public more than on us. It is a feeling of frustration that you receive from any public hearing, no matter how publicized. This leads us to several alternatives: (1) proceed with processing of the plan as we had planned; (2) conduct a phase 2 public acceptability plan which would require another six months; or (3) delay processing of the plan for a period of one or two years. In any case, we should proceed with the public information program. Discussion of the recommended alternatives followed, and it was the opinion of the committee that we should accept plan no. 2 in hope that a balanced response from the public can be obtained.

Mr. McCallister read a statement concerning the mission of the Coordinating Committee contained in a letter dated 4 December 1962 from Cyrus Vance, Secretary of the Army, to the Departments of Agriculture and Interior and to other Federal departments. He also read a letter dated 12 December 1963 to Mr. Gorden, Director of the Bureau of the Budget, signed by the Secretaries of Agriculture, Health, Education and Welfare, the Army, and of the Interior.

Colonel White stated that the guidelines on the study are not very clear.

Mr. Kennaugh reported on legislative contacts. The date for the legislative breakfast was set for 12 May 1970 at the Lansing Y.W.C.A. The meeting would convene at 8:00 A.M. and would continue two hours, but the committee would be available to answer further questions.

Colonel White asked the Coordinating Committee what action they felt should be taken, based on the reaction received at the public hearings. What do we want to do to fill the gap of public awareness of the plan and how does it affect the responses we have received. Colonel White repeated the alternatives cited earlier. Discussion followed and it was decided to proceed and to fill the gaps as fast as we can. It was decided to put out an expanded interim information bulletin to reach the general public and the elected officials. The information booklet should outline the plan and should pay special attention to methods of implementation so that the status of the plan can be related to each structural or non-structural element of the plan that the reader wishes to know. This will go to everyone on the mailing list.

Colonel White asked the Plan Formulation Subcommittee for guidance on re-evaluating the plan and possible modifications of the plan.

A lengthy discussion ensued regarding public involvement. Have we or have we not had public involvement? Discussion clarified the term "public involvement".

Mr. McCallister read a statement prepared by a staff member of the Water Resources Council. The statement further clarified the charges to the Committee regarding a Type II study. this represents the latest thinking regarding the subject as of November 1969.

Discussion ensued regarding authorization and funding of Federal projects. It was pointed out that the Corps would not start an authorization document unless it were requested by the State of Michigan.

Colonel White communicated to the Coordinating Committee Mr. Charles E. Chamberlan's request to keep the record open for comments for a longer period than the original thirty days. The committee concurred to keep the record open an additional thirty days with the deadline for submittal of comments set for 10 June 1970. It was further decided to use the referral system to answer some of the letters coming in to the Corps office.

Discussion followed regarding Appendix Q--the cover and the errors contained therein. It was recommended to remove the Corps of Engineers' name from the cover of the appendices. There was objection to the word "development" in the title of Appendix Q, and it was recommended to prefix the title of Appendix Q with the word "Suggested".

Colonel White charged the Plan Formulation Subcommittee to reanalyze those portions of the plan that came under attack at the public hearings and to make recommendations to the Coordinating Committee as to whether any modifications should be made. The areas to be reanalyzed are: Rockford Site, Site 148, Site 149, Jackson Complex, and Red Cedar Complex.

It was decided that the Corps would prepare the first draft of the information booklet.

The next meeting of the Coordinating Committee was set for 2 June 1970 to review the report of the Plan Formulation Subcommittee. The meeting will be held in the Manley Miles Building in East Lansing.

Colonel White restated the committee's charge to the Plan Formulation Subcommittee.

Discussion followed regarding a television broadcast in Jackson, Michigan. Mr. John Kennaugh volunteered to appear on the program but would not be representing the Coordinating Committee.

Mr. Kennaugh presented letters for the record to the Corps.

The six volumes of the transcript were passed out to committee members with the request to make digests of the volumes.

The point was emphasized throughout the discussion that the plan which the Coordinating Committee will present to higher authorities is not an authorizing document.

At different points in the meeting several members noted the tremendous job Mr. John Kennaugh has done on the public information program and sympathized with the many awkward situations he had been placed in.

Minutes compiled by:

Gary D. Ruttan

Lieutenant Gary Ruttan
Detroit District
Corps of Engineers

Inclosure No. 1

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Sixteenth Meeting - 8 May 1970
East Lansing, Michigan

Department of Agriculture

Mr. R. S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. J. E. Hostetler, Economic Research Service, East Lansing, Michigan
Mr. E. A. Terpstra, Soil Conservation Service, East Lansing, Michigan
Mr. R. L. Kerr, Forest Service, East Lansing, Michigan

Department of the Army

Colonel J. T. White, Jr., Chairman, Corps of Engineers, Detroit, Mich.
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas E. Odle, Corps of Engineers, Detroit, Michigan
Mr. Louis D'Alba, Corps of Engineers, Chicago, Illinois
Lt. Gary G. Ruttan, Corps of Engineers, Detroit, Michigan

Department of Commerce

Mr. Robert Bobb, Weather Bureau, Lansing, Michigan

Department of the Interior

Mr. B. Atwood, Department of the Interior, DesPlaines, Illinois
Mr. Francis J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Stanley G. Victora, Federal Water Quality Administration, Chicago, Illinois

Department of Transportation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Federal Power Commission

Mr. Lenard B. Young, Bureau of Power, Chicago, Illinois

LIST OF PARTICIPANTS (Cont'd)

State of Michigan

Mr. Dale Granger, State of Michigan, Lansing, Michigan
Mr. James Wicks, State of Michigan, Lansing, Michigan
Mr. John H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan
Mr. Kenneth E. Christensen, Michigan Department of Natural Resources, Lansing, Michigan

Great Lakes Basin Commission

Mr. E. A. Jarecki, Great Lakes Basin Commission, Ann Arbor, Michigan

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
SEVENTEENTH MEETING - 18 DECEMBER 1970

Lansing, Michigan

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 9:30 a.m. on 18 December 1970 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the minutes of the sixteenth meeting. No comments were presented regarding the minutes of the sixteenth meeting.

c. Summary of Activities and Events Since the Sixteenth Meeting. Plan Formulation Subcommittee meetings were held in May, August, September, October, and November. Work continued on the preparation of Appendix Q (Basin Plan of Development) and the Main Report.

A special Michigan State Legislative Committee, chaired by State Representative Jelt Sietsema, held hearings in Lansing on 7 December 1970 and in Grand Rapids on 15 December 1970 regarding the Basin Study. Two hearings were held at each location.

2. STATUS OF APPENDICES

Mr. Gregory reviewed the status of the appendices:

Volume	Appendix	Title	Status
I		Main Report	In draft form
II	A	History	Final form being typed.
	B	Description	Printed
III	C	Climate	Printed
	D	Hydrology	Final form being typed
IV	E	Ground Water and Geology	Printed
	F	Mineral Resources	Printed
V	G	Water Use and Stream Quality	Printed
		Health Guidelines	Printed
VI	H	Flood Control	Printed
	I	Navigation	Printed
VII	J	Recreation	Printed
	K	Fish and Wildlife	Printed
	L	Power	Printed

Minutes are not verbatim

Volume	Appendix	Title	Status
VIII	M	Agriculture	Printed
IX	N	Water Laws	Printed
X	O	Economic Development	Printed
XI	P	Basin Plan Formulation	Printed
	Q	Plan of Development	Final form being typed

3. CHANGING OF SUBCOMMITTEE'S NAME

Mr. Gregory suggested that the name of the Plan Formulation Subcommittee be changed to the Reports Preparation Subcommittee.

Mr. Dale Granger supported the suggestion, while indicating that the Subcommittee currently has a much smaller staff and no longer performs a plan formulation function.

The Coordinating Committee agreed to change the name of the Subcommittee from Plan Formulation Subcommittee to Reports Preparation Subcommittee.

Mr. Philip McCallister suggested that because the Corps has recently experienced considerable criticism regarding the Study, the Coordinating Committee may wish to have a representative of another agency chair the Subcommittee rather than a representative of the Corps.

A discussion ensued; however, it was decided that Mr. Tom Odle of the Corps would be the chairman of the Reports Preparation Subcommittee.

4. MICHIGAN STATE LEGISLATIVE COMMITTEE HEARINGS

Colonel Snoke briefly discussed the impact of the aforementioned Michigan State Legislative hearings, chaired by State Representative Jelt Sietsema. Colonel Snoke noted that State Representative Warner suggested that the Legislative Committee retain three environmental consultants to study the Basin Plan.

Colonel Snoke indicated that there were several recommendations made at the hearings that could affect the reservoir impoundments, valley preserves and other aspects of the suggested Basin Plan.

It was suggested that the Coordinating Committee obtain transcripts of the State Legislative Committee hearings. Mr. Granger noted that transcripts of the hearings may not be available.

Mr. McCallister asked Mr. Kennaugh if he thought that the State Legislative Committee might want the Coordinating Committee to delay submitting the Report to higher authority. Mr. Kennaugh indicated the affirmative.

A long discussion followed regarding whether submission of the Report should be delayed if so requested by the State Legislative Committee. Colonel Snoke asked each Coordinating Committee member his opinion regarding the question. Each member indicated that the Report should be submitted as currently planned and that all agencies should review the Report and offer their comments and suggestions during its 45-day review period.

Mr. Granger suggested that a complete set of appendices, constituting the entire report, be furnished the State Legislature. It was a consensus that when the Report is submitted for the 45-day review, a copy of the entire report be furnished the State Legislative Committee.

5. CITING OF OPTIMUM RESERVOIR SITES IN THE REPORT

Mr. Granger proposed that the identification of the most favorable reservoir sites that provide for only recreation and fish and wildlife benefits be deleted from Appendix Q and the Main Report. He stated that all reservoir sites inventoried should be presented and that no particular group or number should be singled out as being the most favorable; development of any of the sites would be the responsibility of the local people. A lengthy discussion followed regarding his proposal.

Mr. Roman Koenings indicated that if Mr. Granger's proposal was incorporated into the Report, the Water Resources Council would not endorse it.

Mr. McCallister indicated that the Coordinating Committee, in connection with conducting investigations for the Study, is charged with the responsibility of providing an optimum plan. He also cited Appendix P, which states that the Committee is to include an optimum plan in the Report.

Mr. Jarecki indicated that a report that did not include an optimum plan would probably be unsatisfactory to the Great Lakes Basin Commission.

Colonel Snoke asked each Coordinating Committee member and also Mr. John Kennaugh his opinion concerning the proposal. Each indicated that the most favorable reservoir sites which would be used to satisfy only recreation and fish and wildlife needs should be included in the Report.

6. WATER QUALITY

It was agreed that a recommendation will be included in the Main Report that no structural or nonstructural phase of the plan will be developed until water quality conditions in the basin are satisfactory to the State of Michigan.

Mr. Granger, in a reference to the city of Muskegon's plan to incorporate "spray irrigation" in its sewage treatment program, stated that the State of Michigan does not accept dilution (low flow augmentation) as a substitute for pollution abatement.

Mr. C. R. Ownbey, at the suggestion of Colonel Snoke and Mr. Granger, conferred with Mr. Bill Turner of the Michigan Water Resources Commission throughout the meeting in an effort to resolve differences between FWQA and the State concerning water quality data which FWQA had submitted for inclusion in the Report. Mr. Ownbey reported to the Committee that he had furnished Mr. Turner a xerox copy of the data with revisions incorporated in it. He indicated that there were still a few items that the two had not fully agreed on.

7. Authorization of Study

Mr. Granger stated that Grand River basin investigations conducted in the early 1930's in accordance with provisions of House Document No. 308, 69th Congress, 1st Session should not be regarded as the origin for the current Study's authorization and should not be mentioned as such in the forthcoming Main Report.

Mr. McCallister briefly discussed the history of the Study's authorization.

Mr. Tom Odle gave Colonel Snoke a draft of an authorization statement that excluded any mentioning of the "308" report. Colonel Snoke read the draft and suggested that a paragraph relating to the ad hoc Water Resources Council's role in the authorization be added.

8. Environmental Impact Statement

The question as to what extent Public Law 91-190, the National Environmental Policy Act, applies to the Main Report was discussed.

It was brought out that a detailed 5-point environmental impact statement is required for a specific project report but not necessarily for a Type II study report.

Mr. Jarecki indicated that the Water Resources Council was redefining the Type II study to more clearly state the extent to which Public Law 91-190 applies.

It was decided that a general environmental impact statement will be included in the Main Report rather than a detailed 5-point statement for every possible project that might result from the comprehensive study.

It was agreed that background information concerning the study will be furnished to the three environmental consultants to be retained by the State Legislative Committee.

9. Future Meeting

The next Coordinating Committee meeting will be held on 15 January 1971 in the Stevens T. Mason Building, Lansing, Michigan. Colonel Snoke indicated that meetings would be held more frequently in order to complete the report.

Minutes prepared by

ELIHU JACKSON
Civil Engineer
U. S. Army Corps of Engineers

1 Incl.
As stated

Inclosure No. 1

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Seventeenth Meeting - 18 December 1970
Lansing, Michigan

Department of Agriculture

Mr. Arthur A. Cratty, Soil Conservation Service, East Lansing, Michigan
Mr. Robert S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. R. L. Kerr, Forest Service, East Lansing, Michigan

Department of the Army

Colonel Myron D. Snoke, Chairman, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas E. Odle, Corps of Engineers, Detroit, Michigan
Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of Commerce

Mr. Robert Babb, Weather Bureau, Lansing, Michigan

Department of Health, Education, and Welfare

Mr. Donald Marshall, U. S. Public Health Service, Chicago, Illinois

Department of the Interior

Mr. B. Atwood, Department of the Interior, DesPlaines, Illinois
Mr. Francis J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Roman H. Koenings, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Robert Knutilla, U. S. Geological Survey, Lansing, Michigan

Department of Transportation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Environmental Protection Agency

Mr. Donald Maddox, Water Hygiene Office, Chicago, Illinois
Mr. Charles R. Ownbey, Water Quality Office, Chicago, Illinois

State of Michigan

Mr. Dale Granger, State of Michigan, Lansing, Michigan
Mr. John H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan
Mr. Collins E. Thornton, Michigan Grand River Watershed Council, Lansing, Michigan

State of Michigan (Cont'd)

Mr. Kenneth E. Christensen, Michigan Department of Natural Resources, Lansing, Michigan
Mr. James Dooley, Michigan Department of Natural Resources, Lansing, Michigan

Great Lakes Basin Commission

Mr. E. A. Jarecki, Great Lakes Basin Commission, Ann Arbor, Michigan

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
EIGHTEENTH MEETING - 15 JANUARY 1971
LANSING, MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 9:30 a.m. on 15 January 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the minutes of the seventeenth meeting. The minutes of the seventeenth meeting had not yet been furnished to Coordinating Committee members and alternates.

c. Summary of activities and events since the seventeenth meeting. Mr. Donald Marshall indicated that although several Federal Water Quality Administration and Public Health Service employees, including himself, are scheduled to be transferred, he plans to continue to represent the Department of Health, Education, and Welfare on the Coordinating Committee until instructed to do otherwise.

Mr. McCallister stated that present members on the Committee will probably be allowed to continue to serve until the study is completed.

Mr. Granger stated that the 7 October 1970 pre-taped televised program concerning the Grand River Basin Study was recently shown. Mr. Granger noted that some individuals he had discussed the program with thought that the current basin plan of development was in the interest of those Federal agencies who are associated with the Study.

Mr. John Kennaugh noted that a large portion of the program pertaining to the history of the Study was not shown.

Colonel Snoke and Mr. Granger indicated that they had had interviews with two Michigan State University students employed with the University's campus newspaper, the State News. The students were preparing articles on the Grand River Basin Study. Colonel Snoke stated that he had informed the students that all data pertaining to the study were available for their review. He noted that they were interested in obtaining flood control and reservoir impoundment data. Colonel Snoke advised them that the Grand River Basin Study was not connected with the Trans-Michigan Waterway Study. Mr. Granger stated that the students had received letters from a Shiawassee County group opposing the Basin Plan.

Messrs. Granger and Christensen indicated that they had discussed the Grand River Basin plan with a Shiawassee County citizen who wanted information on ground water. She also wanted to know if the Grand River Basin Study was associated with the Trans-Michigan Waterway Study.

Mr. McCallister stated that she had contacted him about the Study and indicated that she was trying to gain knowledge of the Study independently rather than through those who strongly oppose the plan.

Mr. Krashen stated that Mr. Babb had reviewed Appendix Q and has some comments he will make regarding the climatology data included in the report.

2. DISCUSSION

Mr. Granger distributed an Eaton Rapids proposal that pertains to the basin plan. The proposal was submitted to him by State Representative Dale Warner of the Eaton Rapids area. Representative Warner indicated that other groups concerned about the basin plan of development were taking similar actions.

Mr. Granger asked the Coordinating Committee to reconsider his proposal to delete from the report all single-purpose recreation and fish and wildlife reservoirs. He made the following observations:

a. In Appendix Q, the water resources needs of the basin have not been clearly identified. Water quality is the only critical water resources need in the basin.

b. From a sociological and political viewpoint, the plan in Appendix Q is totally unacceptable to the people of the basin.

c. Appendix Q and the Main Report should state that the water quality standards of the State of Michigan, approved by the Federal Government, constitute the law, and shall be enforced. The reports should state that the suggested plan is based on the assumption that the State's water quality standards will be enforced.

Colonel Snoke indicated that the suggested plan the Coordinating Committee submits to higher authority should be acceptable to participating Federal, State, and local agencies. Mr. Crook agreed with Colonel Snoke.

Mr. Granger stated that in 1962 the concept of comprehensive water resources planning in the United States changed from strictly a professional view to one of complete coordinated local participation of citizen's effort and input. He indicated that Appendix Q does not sufficiently and clearly reflect the local people's views and inputs.

Mr. Crook stated that the recommendations in the Main Report should reflect the views of the Coordinating Committee. These recommendations might not be fully compatible with the plan presented in Appendix Q.

Colonel Snoke indicated that he prefers to have the recommendations in the Main Report compatible with the plan in Appendix Q, as Mr. Granger has suggested.

Mr. Granger asked the Coordinating Committee to consider alternative plans for Appendix Q. The alternative plans he described are as follows:

a. Plan A will be essentially the same as the current plan contained in Appendix Q. An effort would be made to satisfy as many of the water resources needs of the basin as possible. Plan A would include all reservoirs for recreation and fish and wildlife needs that are a part of the current plan.

b. Plan B would provide for 50 percent of the recreation and fish and wildlife needs. Plan B would provide for all of the water quality needs of the basin.

c. Plan C would include no reservoirs that would be used for recreation and fish and wildlife purposes only. It would provide for water quality, flood control, and some recreation needs. Some flood control and recreation needs would be satisfied by instituting valley preserves. When the water quality of streams in the basin is brought up to the State's standards, many fish and wildlife and water oriented recreation needs could be satisfied.

Colonel Snoke noted that there are few if any funds remaining to sufficiently revise Appendix Q as has been suggested.

Mr. Crook was asked about the chances of a Type II study like the Grand receiving additional funds. He indicated that there have been a few studies that received additional funding but only in very limited amounts.

It was brought out that the alternative plans should include additional measures to satisfy recreational needs in the basin if impoundments for recreational and fish and wildlife needs are to be deleted from the current plan.

Mr. Fellows indicated that whatever type of plan we submit, it should be acceptable to the people of the basin.

Colonel Snoke expressed some concern about a plan that did not include reservoirs for recreation and fish and wildlife needs being acceptable to the Great Lakes Basin Commission and subsequently to the Water Resources Council.

Mr. Crook indicated that the inclusion of water oriented recreational impoundments was desirable but that the plan should be acceptable to the local people.

Mr. Odle stated that we should analyse the "valley preserves" more closely and determine there benefit/cost ratios.

Mr. McCallister suggested that we leave Appendix Q essentially as it is and let the Main Report reflect the suggested revisions.

Colonel Snoke stated that Appendix Q and the Main Report should be compatible.

Mr. John Kennaugh noted that Appendix Q is a technical report and its contents should not be altered because of opposition coming from the local people. However, it was a consensus that Appendix Q and the Main Report be compatible.

Mr. Gazely indicated that he felt Appendix Q should be revised so that it is acceptable to the local people.

Mr. Granger asked the Coordinating Committee to determine the extent to which Appendix Q should be revised.

Mr. Baker stated that alternative plans should include more valley preserves to compensate for the loss of the recreational impoundments. He expressed concern about water quality and flood control needs being met if the multiple-purpose reservoirs are deleted from the plan.

Mr. Gazely asked if the plan must provide for all of the water resources needs of the basin.

Mr. Dooley stated that at point sources, using the "spray irrigation system" in the treatment of sewage, as much as 99 percent BOD removal is obtainable. Consequently, low flow augmentation may not be necessary in improving the water quality of streams in the basin to meet the standards of the State of Michigan.

Colonel Snoke suggested that the Plan Formulation Subcommittee make an estimate of time and cost required to revise Appendix Q and disclose its findings at the next Coordinating Committee meeting.

It was a consensus that the Plan Formulation Subcommittee provide the Coordinating Committee with a time and cost estimate for revising Appendix Q.

3. NOTICE

Next Coordinating Committee meeting is scheduled for 12 February 1971 at 10:00 a.m., 8th Floor, Conference Room, Stevens T. Mason Building, Lansing, Michigan.

Meeting adjourned.

Minutes prepared by

ELIHU JACKSON
Civil Engineer
U. S. Army Corps of Engineers

3 Inclosures
As stated

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Eighteenth Meeting - 15 January 1971
Lansing, Michigan

Department of Agriculture

Mr. R. S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. R. L. Kerr, Forest Service, East Lansing, Michigan

Department of the Army

Colonel M. D. Snoke, Chairman, Corps of Engineers, Detroit, Michigan
Mr. P. McCallister, Corps of Engineers, Detroit, Michigan
Mr. R. L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. T. E. Odle, Corps of Engineers, Detroit, Michigan
Mr. E. Jackson, Corps of Engineers, Detroit, Michigan

Department of Commerce

Mr. R. Babb, Weather Bureau, Lansing, Michigan

Department of Health, Education, and Welfare

Mr. D. W. Marshall, Public Health Service, Chicago, Illinois

Department of the Interior

Mr. F. J. Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. R. Knutilla, U. S. Geological Survey, Lansing, Michigan

Department of Transportation

Mr. H. Krashen, Bureau of Public Roads, Lansing, Michigan

Federal Power Commission

Mr. O. E. Haukedahl, Bureau of Power, Chicago, Illinois

State of Michigan

Mr. D. W. Granger, State of Michigan, Lansing, Michigan
Mr. A. G. Gazely, Michigan Department of Natural Resources, Lansing, Michigan
Mr. J. Dooley, Michigan Department of Natural Resources, Lansing, Michigan
Mr. K. E. Christensen, Michigan Department of Natural Resources, Lansing, Michigan
Mr. J. H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan
Mr. C. E. Thornton, Michigan Grand River Watershed Council, Lansing, Michigan

Great Lakes Basin Commission

Mr. L. Crook, Great Lakes Basin Commission, Ann Arbor, Michigan

Inclosure No. 1

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
NINETEENTH MEETING - 12 FEBRUARY 1971
LANSING, MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 10:00 a.m. on 12 February 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the minutes of the eighteenth meeting. Colonel Snoke asked the Coordinating Committee members and alternates to review the minutes of the seventeenth and eighteenth meetings and submit their comments.

c. Summary of activities and events since the eighteenth meeting.

Mr. Granger noted that he had recently attended a "State Participation in Water Resources" Planning Conference held in Cincinnati, Ohio. He stated that, during the conference, it was brought out that more guidelines should be developed to get a greater degree of local participation in Type I and Type II Studies. He stated that a set of recommendations were adopted at the conference; and that he will furnish the Coordinating Committee members with copies.

Mr. Jarecki also attended the conference and noted that the Water Resources Council appeared to be unable to provide additional funds for Type II Studies. He suggested that the Coordinating Committee invite Mr. Stuart Pyle, Assistant Director of Federal-State Programs, Water Resources Council, to the next Coordinating Committee meeting in order that he may become more abreast of the Study and provide guidance for the Coordinating Committee and Plan Formulation Subcommittee.

Messrs. Cratty and Fellows discussed the status of several watershed programs in the basin. They noted the following:

1. The West Maple River Watershed plan has been submitted to the Soil Conservation Service Office in Washington, D. C.

2. The East Maple River Watershed plan has been approved.

3. A meeting was held concerning the Bear Creek reservoir plan. Opposition was expressed, mainly because of its recreational aspects.

Minutes are not verbatim

4. An application for the Upper Rogue River Watershed has been received.

Mr. Atwood expressed his concern about the Coordinating Committee's plans, as expressed at its last meeting, to delete the recreational reservoir sites from the plan in Appendix Q. Colonel Snoke noted that the Plan Formulation Subcommittee recommendations, which would be presented to the Coordinating Committee later in the meeting, include a consideration of the recreational needs of the basin.

Colonel Snoke stated that he was going to appear before the Great Lakes Basin Commission on Tuesday, 16 February 1971. He said that he planned to discuss Study activities since the public hearings. He indicated he was planning to discuss the monetary needs of the Study.

2. RECOMMENDATIONS

Colonel Snoke stated that during the last Coordinating Committee meeting, the Plan Formulation Subcommittee was asked to determine time and costs required to provide alternative plans for Appendix Q. He asked Mr. Odle to present the recommendations the Subcommittee prepared.

Mr. Odle discussed the recommendations, the schedule, and the time and cost estimate.

The recommendations, which were endorsed by Coordinating Committee members, propose an Addendum to Appendix Q. The latest draft of Appendix Q will remain unchanged.

3. PARTICIPATION OF AGENCIES

The importance of having the Water Quality Office (WQO) and other agencies participate in the preparation of the addendum was discussed.

Mr. Ownbey noted that another water quality planning effort concerning the Basin is scheduled to start. The planning will be accomplished by the State. The plan that will result from this effort, when certified by the State of Michigan, will become the official water quality plan for the Grand River basin. He stated that the plan is scheduled to be completed in 1973. He noted that perhaps a reference to this new effort should be included in the addendum.

Mr. Granger stated that WQO should be largely responsible for the water quality part of the addendum. Mr. Ownbey differed with Mr. Granger and stated that perhaps the State should prepare the water quality part and WQO would review it.

A discussion of this issue ensued. Colonel Snoke stated that Mr. Mayo of the Water Quality Office should be contacted in regard to getting sufficient cooperation from the WQO staff in preparing the water quality portion of the addendum.

Mr. Cratty said that the Department of Agriculture would place a high priority on the preparation of the addendum.

Mr. Atwood stated that he would try to get sufficient cooperation from the Bureau of Outdoor Recreation and the Bureau of Sport Fisheries in this matter.

Mr. Kennaugh and Mr. Jarecki agreed that they would furnish their support.

Mr. Granger indicated that he expected full cooperation on the part of the State.

4. FUNDS

Each member of the Coordinating Committee representing a Federal agency indicated that obtaining funds to prepare his portion of the addendum would be a problem.

Mr. Ownbey stated that the Water Quality Office probably would not have a funding problem if they participated, but had no funds to transfer to other agencies

Mr. Granger indicated that the State could participate without a funding problem.

Since all Federal agencies represented by the Coordinating Committee lack the required funds, Colonel Snoke asked Committee members if the Great Lakes Basin Commission should be asked to furnish the required funds ($30,000).

It was a consensus that the Coordinating Committee ask the Commission for the funds. Colonel Snoke stated that a letter to this effect would be prepared shortly and sent to Mr. Rouse of the Commission.

5. ENVIRONMENTAL IMPACT STATEMENT

Colonel Snoke stated that all agencies should assist in the preparation of the environmental impact statement to be included in the Report.

Mr. McCallister noted that the statement should be objective and that it would undergo considerable scrutiny. Consequently, it probably should be prepared by personnel not affiliated with the Study.

A discussion followed concerning this matter. However, it appeared that those in attendance were in support of Mr. McCallister's views.

Mr. Granger stated that he would ask the Michigan Department of Natural Resources to furnish personnel not affiliated with the Study to assist in the preparation of the statement.

Colonel Snoke proposed that the preparation of the environmental impact statement be assigned to the Plan Formulation Subcommittee with augmentation coming from personnel of the various agencies including the State.

It was a consensus that the Plan Formulation Subcommittee be responsible for the statement.

6. PUBLIC CONTACT

Colonel Snoke noted that Mr. Kennaugh had suggested to him that the public be informed of the Coordinating Committee's decision to provide an addendum to Appendix Q. A discussion ensued as to how the public should be informed.

Mr. Granger said that a personal letter to key persons in the basin, informing them of the planned addendum, would probably be sufficient. The letter would not include an invitation for comments. He suggested that the letters be sent out shortly after the Committee knows whether it will be able to obtain the required funds.

Mr. Jarecki suggested that a draft of the letter be prepared and that its contents be discussed at the next Coordinating Committee meeting which is scheduled for 30 March 1971. He stated that by then the Plan Formulation Subcommittee should have a better idea as to what the addendum to Appendix Q will contain.

It was a consensus that a draft of the letter be prepared and that its contents be considered at the next Coordinating Committee meeting.

The Coordinating Committee agreed that a set of appendices, minus Appendix Q, should be lent to a University of Michigan group.

The next Coordinating Committee meeting will be held at 10:00 a.m. on 30 March 1971 at the Stevens T. Mason Building, Lansing, Michigan

Meeting adjourned

Minutes prepared by

ELIHU JACKSON
Civil Engineer
U. S. Army Corps of Engineers

3 Inclosures
As stated

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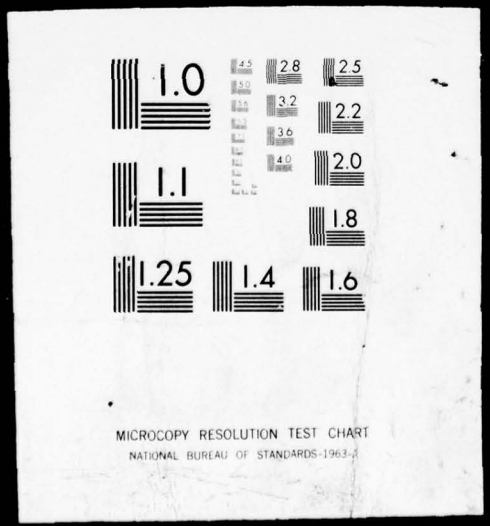

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Nineteenth Meeting - 12 February 1971
Lansing, Michigan

Department of Agriculture

Mr. Arthur A. Cratty, Department of Agriculture, East Lansing, Michigan
Mr. Robert S. Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. Richard L. Kerr, Forest Service, East Lansing, Michigan

Department of the Army

Colonel Myron D. Snoke, Chairman, Corps of Engineers, Detroit, Michigan
Mr. Philip McCallister, Corps of Engineers, Detroit, Michigan
Mr. Robert L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas E. Odle, Corps of Engineers, Detroit, Michigan
Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of the Interior

Mr. Burton H. Atwood, Department of the Interior, Des Plains, Illinois

Environmental Protection Agency

Mr. Charles R. Ownbey, Water Quality Office, Chicago, Illinois

Federal Power Commission

Mr. Lenard B. Young, Bureau of Power, Chicago, Illinois

State of Michigan

Mr. Dale W. Granger, State of Michigan, Lansing, Michigan
Mr. Kenneth E. Christensen, Michigan Department of Natural Resources, Lansing, Michigan
Mr. James Dooley, Michigan Department of Natural Resources, Lansing, Michigan
Mr. John H. Kennaugh, Michigan Grand River Watershed Council, Lansing, Michigan

Great Lakes Basin Commission

Mr. Eugene A. Jarecki, Great Lakes Basin Commission, Ann Arbor, Michigan

Inclosure No. 1

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
TWENTIETH MEETING - 30 MARCH 1971
LANSING, MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 10:00 a.m. on 30 March 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the minutes of the seventeenth, eighteenth, and nineteenth meetings. Colonel Snoke stated that the three sets of minutes members and alternate members had recently received had been revised somewhat and that if anyone wished to make any additional revisions, he should contact Mr. Elihu Jackson. Mr. Harlan Hirt, in referring to the minutes of the eighteenth meeting, page 2, paragraph 2c, stated that the Federal Government approves the interstate water quality standards and generally endorses the intrastate water quality standards. Mr. Hirt did not request that the minutes be revised.

c. Summary of activities and events since the nineteenth meeting. Mr. Granger reported that he had recently attended a meeting of members of the executive staff of the Governor's office. During the meeting, the Grand River Basin Study was discussed. Mr. Granger noted that the views expressed by the executive staff members indicated that they may already have adopted a negative attitude toward the Study. He said that it is important that the Report be politically and socially acceptable to the people. He indicated that the Eaton Rapids and Jackson local interest groups will probably seek to have the Governor comment negatively on the Report once it has been submitted to his office.

Colonel Snoke noted that the alternative plan to be included in the Addendum to Appendix Q of the Study Report will be based on the reactions and comments of the local people but will still provide for meeting some of the water resources needs of the basin.

A long discussion ensued in regard to the Study, the local people's views toward it, and the procedure the Grand River Basin Coordinating Committee should follow in submitting the Study Report to higher authority. During the discussion, Mr. Stuart Pyle pointed out that, in some instances, coordinating committees for other comprehensive studies had not allowed themselves a 45-day review period.

Minutes are not verbatim

Colonel Snoke and Mr. Cratty noted that the public has been informed of the procedure, which includes a 45-day review period, that the Coordinating Committee will follow in submitting the Study Report, and recommended adherence to the announced review procedure. It was agreed that the Coordinating Committee, in submitting the Report, will allow itself a 45-day review period during which the Study Report will be submitted to the Governor's office. The report will then be sent to the Great Lakes Basin Commission for a 90-day review period, and thence to the Water Resources Council.

Mr. Kennaugh observed that the public reaction to the Study has been in response to the suggested plan included in an early draft of Appendix Q at the time of the April 1970 public hearings. He stated that since then, there have been substantial changes in the plan as a result of their reactions, and that now an addendum to the appendix is in preparation, which will also reflect their input to the Study. He noted that the people are generally unaware of these changes and suggested that the Coordinating Committee make a news release informing the people about them. He expressed hope that the news release would bring a more favorable response to the Study throughout the basin.

Colonel Snoke noted that informing the people about the action the Coordinating Committee has taken in response to their reaction and comments was briefly discussed at the last (nineteenth) meeting.

A discussion ensued in regard to the method the Committee should use to provide this information to the people.

Colonel Snoke asked Messrs. Kennaugh and Granger to prepare a draft of a letter generally discussing the action the Coordinating Committee has taken in regard to the public reaction and comments to the suggested plan included in the early draft of Appendix Q.

Colonel Snoke asked Mr. Stuart Pyle to state the views of the Water Resources Council in regard to comprehensive studies.

Mr. Pyle's comments were general and geared around the Water Resources Council's desires that the Study Report be submitted on schedule. He also discussed the recent appointment of regional leaders for the Federal-State Programs Division of the Water Resources Council. Mr. Nicholas Barbarossa will be the new leader for the central states region.

2. PROGRESS REPORT OF THE PLAN FORMULATION SUBCOMMITTEE

Mr. John Okay reported on the Agriculture programs of the suggested plan which will be included in the Addendum to Appendix Q.

Mr. Tom Odle reported on the valley preserves aspects of the suggested plan.

Mr. Francis Baker recommended to the Coordinating Committee that three sites located on Duck Creek, Sandstone Creek, and the Lookingglass River be considered as potential artificial lake sites and be discussed as such in the addendum. The three artificial lake sites would be included in the addendum as part of a second alternative plan. Mr. Baker discussed the economic feasibility and pointed out that the Duck Creek and Lookingglass River sites had received some public support. He stated that the sites, if developed as lakes, would meet some of the water oriented recreational needs (swimming, boating and water skiing) of the State.

Colonel Snoke asked the Coordinating Committee to consider Mr. Baker's recommendations.

A discussion followed, during which Mr. Granger took issue with those who supported the recommendations.

It was agreed that no potential artificial lake sites would be discussed in the addendum as part of a second alternative plan.

3. FUNDS

Colonel Snoke announced that the Committee would receive additional funds in the amount of $30,000 as requested to complete the Study Report.

4. ENVIRONMENTAL IMPACT STATEMENT

Mr. McCallister discussed the preparation of the environmental impact statement. Agencies that will participate in the preparation of the statement include the Departments of the Army, Agriculture,and the interior; the Environmental Protection Agency; the State of Michigan; and the Michigan Grand River Watershed Council. The State will provide the moderator for the work group.

Mr. Granger furnished Colonel Snoke a draft of the letter to the public which he and Mr. Kennaugh had prepared.

After reading the letter to those in attendance, Colonel Snoke suggested that the Coordinating Committee further review it. The Coordinating Committee agreed that Colonel Snoke's further review and appraisal of the letter would be sufficient prior to mailing it out to basin residents.

The next Coordinating Committee meeting will be held on 19 April 1971 at 10:00 a.m. in the 8th floor conference room of the Stevens T. Mason Building, Lansing, Michigan.

Meeting adjourned.

Prepared by

ELIHU JACKSON
Civil Engineer

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Twentieth Meeting - 30 March 1971
Lansing, Michigan

Department of Agriculture

Mr. Arthur Cratty, Soil Conservation Service, East Lansing, Michigan
Mr. Earl Terpstra, Soil Conservation Service, East Lansing, Michigan
Mr. John Okay, Soil Conservation Service, East Lansing, Michigan

Department of the Army

Colonel Myron Snoke, Chairman, Corps of Engineers, Detroit, Michigan
Mr. Philip McCallister, Corps of Engineers, Detroit, Michigan
Mr. Robert Gregory, Corps of Engineers, Detroit, Michigan
Mr. Louis D'Alba, Corps of Engineers, Chicago, Illinois
Mr. Thomas Odle, Corps of Engineers, Detroit, Michigan
Mr. John Collis, Corps of Engineers, Detroit, Michigan
Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of Health, Education and Welfare

Mr. Donald Marshall, Public Health Service, Chicago, Illinois

Department of the Interior

Mr. Burton Atwood, Department of the Interior, DesPlaines, Illinois
Mr. Francis Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Robert Pierce, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Sumner Dole, Jr., Bureau of Sport Fisheries and Wildlife, Lebanon, O.
Mr. David Riley, Bureau of Sport Fisheries and Wildlife, Twin Cities, Minn.

Department of Transportation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Environmental Protection Agency

Mr. Harlan Hirt, Water Quality, Office, Chicago, Illinois

Water Resources Council

Mr. Stuart Pyle, Federal-State Programs Division, Washington, D. C.

Inclosure No. 1

Great Lakes Basin Commission

Mr. Leonard Crook, Great Lakes Basin Commission, Ann Arbor, Michigan

State of Michigan

Mr. Dale Granger, State of Michigan, Lansing, Michigan
Mr. John Kennaugh, Michigan Grand River Watershed Council, Lansing, Mich.
Mr. Kenneth Christensen, Michigan Department of Natural Resources, Lansing, Michigan

MINUTES OF THE

GRAND RIVER BASIN COORDINATING COMMITTEE

TWENTY-FIRST MEETING - 19 APRIL 1971

LANSING, MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 10:00 a.m. on 19 April 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the minutes of the twentieth meeting. Colonel Snoke noted that he had received a copy of the minutes of the twentieth Coordinating Committee meeting but that they had not been mailed to other members and alternates. He stated that after each had received a copy and wished to make comments regarding them, he should contact Mr. Tom Odle or Mr. Elihu Jackson.

c. Summary of activities and events since the twentieth meeting. Colonel Snoke reported that the Office of the Chief of Engineers had recently disclosed that the Corps in conjunction with the Environmental Protection Agency had received Congressional authorization to conduct pilot wastewater studies relating to waters adjacent to the five metropolitan areas of Boston, Massachusetts; Chicago, Illinois; Cleveland, Ohio; Detroit, Michigan; and San Francisco, California. He stated that notifications to this effect had been furnished to all Federal and State agencies and also to U. S. Congressmen. He stated that the Detroit District will conduct the wastewater study concerning Lake Erie in the Detroit area. Colonel Snoke stated that the District had already received funds to initiate the study immediately. The study will consist of two parts: a feasibility analysis and a report of survey scope. The Detroit District's pilot study is scheduled to be accomplished by the end of Fiscal Year 1972.

Colonel Snoke asked Mr. Harlan Hirt if he had any comments to make about the pilot studies. Mr. Hirt stated that his office had assigned one man to each of the studies to be conducted on waters in the Chicago, Cleveland, and Detroit areas. Mr. Hirt emphasized the importance of having sufficient cooperation and coordination among participating Federal, State, and local agencies.

Minutes are not verbatim

Mr. Granger reported that a water resources conference sponsored by the Interstate Water Problems Committee of the Interstate Council of Governments is scheduled to be held in Des Moines, Iowa, on 8 thru 10 June 1971. He said that the conference will pertain to the public's involvement in comprehensive water resources planning. Mr. Granger stated that Mr. Fred Rouse, Chairman of the Great Lakes Basin Commission, had received an invitation to submit an essay or paper on the Grand River Basin Study which will be discussed at length during the conference.

Mr. Jarecki noted that the Genesee River Basin Study will also be discussed during the conference.

Mr. Marshall indicated that he is no longer with the Department of Health, Education, and Welfare, and that he probably would not represent that Department in future Coordinating Committee meetings.

Mr. Cratty stated that Mr. Richard Kerr of the U. S. Forest Service Office in East Lansing, Michigan, will be reassigned to the Forest Service Office in Minneapolis, Minnesota, in the near future. He stated that the Forest Service Office in East Lansing is scheduled to close by 30 June 1971.

Mr. Kennaugh reported that the National Sanitation Foundation has invited the Michigan Grand River Watershed Council to participate in a program to establish a water quality index. He stated that other agencies invited to participate in the program include the Water Quality Engineering Division of the U. S. Army Environmental Hygiene Agency, the Michigan Water Resources Commission, the States of Pennsylvania, Maryland, and California, the city of Cleveland, and the University of Notre Dame. Mr. Kennaugh stated that the National Sanitation Foundation, in its attempt to establish an index, is now using several parameters relating to water quality control including dissolved oxygen, (parts per million and percentage of saturation), hydrogen ion (p^H), BOD, nitrates, phosphates, temperature, and turbidity. He said that each participating agency has been asked to perform a field demonstration as part of its input to the program. He stated that the data the Watershed Council is collecting from its water quality monitoring stations are viewed by the Foundation as one of the best inputs to the program. The water quality index will apply to the Grand River and also to its tributaries in the vicinity of Jackson and Grand Rapids.

2. ENVIRONMENTAL IMPACT STATEMENT

In discussing the required environmental impact statement for the Grand River Basin Study, the following observations were made.

a. The environmental impact statement will be based on the Main Report rather than on alternatives discussed in the Addendum to Appendix Q.

b. The part of the Addendum to Appendix Q on environmental considerations will be prepared by members of the Basin Plan Formulation Subcommittee.

c. The draft of the environmental impact statement will be completed by 1 June 1971 and will be discussed by the Coordinating Committee during its 15 June 1971 meeting.

d. Agencies participating in the Basin Study will be represented by the following persons in the preparation of the draft of the statement.

(1) Mr. Herbert Miller of the Michigan Department of Natural Resources will serve as chairman of the group and may also designate others to serve.

(2) Mr. Alan Irvine, Department of Agriculture.

(3) Mr. John Collis, Corps of Engineers.

(4) Mr. Robert Babb, Department of Commerce.

(5) Miss Lynne Hamilton, Department of the Interior.

(6) Mr. Winfred Ettesvold, Chairman of the Michigan Grand River Watershed Council, may designate someone of his staff to serve.

Mr. Hirt indicated that his office (the Water Quality Office, Environmental Protection Agency) had considered the possibility of providing personnel to assist in the preparation of the statement but, because of a lack of manpower, it prefers not to do so. Colonel Snoke indicated that if the Water Quality Office wishes to provide someone at a later date, it may do so.

Mr. Marshall, during the last Coordinating Committee meeting, indicated that the Department of Health, Education, and Welfare did not wish to designate someone to participate in the preparation of the draft of the statement.

3. NEWS RELEASE ABOUT STUDY

The Coordinating Committee discussed the draft of the letter to the public prepared by Messrs. Granger and Kennaugh during the last Coordinating Committee meeting. The draft, which describes alternative measures the Coordinating Committee is now taking in response to public reaction to the 1970 suggested basin plan, underwent numerous revisions before it was adopted by the Committee.

4. PROGRESS REPORT

a. Water Quality Report. Mr. Jackson discussed briefly the water quality portion of the Addendum to Appendix Q of the Study Report. He stated that because of public reaction and comments to the water quality aspects of the suggested basin plan of development included in a previous draft of Appendix Q, the alternative measures to meet the water quality needs of the basin would be based on the following:

(1) Meeting the State's water quality standards.

(2) Complying with the Environmental Protection Agency's water quality guidelines for river basins described in the agency's report entitled "Water Quality Management Planning" dated January 1971.

(3) No low flow augmentation on streams within the Grand River basin.

(4) The existing Smithville and Eaton Rapids dams located in the vicinity of Eaton Rapids will not be altered or removed.

(5) The outfalls of the Jackson State Prison and city of Jackson sewage treatment plants will not be relocated.

(6) Adopting the Grand River Basin portion of the water quality plan the State is now preparing and incorporating it into the addendum as a measure to meet the basin's short-term water quality needs. The Grand River Basin portion of the State's plan will be available by 1 May 1971.

A discussion ensued as to whether the water quality data the State is to furnish the Coordinating Committee for the addendum, should include an estimate of cost required for each community to meet its water quality needs. It was agreed on that an estimate of the total cost required for all communities in the basin to meet their water quality needs would be provided rather than a cost estimate for each.

Colonel Snoke discussed the Federal Refuse Act in regard to how it relates to industries discharging or depositing wastes directly to navigable waters or to tributaries of navigable waters. He stated that each of these industries is now required to obtain a Federal permit from the Corps in order to continue this practice. He stated that applications for Federal permits would require coordination with the affected States and also with the Environmental Protection Agency.

It was agreed that the addendum would include a discussion of the Refuse Act and also of relevant State Acts and Programs relating to industries discharging to streams in the State.

The addendum will also cite regulations pertaining to the control of pollution due to overflows from combined sewer systems.

b. Valley Preserves. Mr. Odle in discussing the valley preserves recommended that the Coordinating Committee consider designating a total of approximately 450 miles along streams as valley preserves. The following reaches were recommended:

(1) On the Grand River, from the mouth of the Portage River to the mouth 215 miles downstream.

(2) On the Red Cedar River, from the west city limit of Williamston to the mouth 20 miles downstream.

(3) On the Lookingglass River, from the west city limit of DeWitt to the mouth 30 miles downstream.

(4) On the Maple River, from the east boundary of the Maple River State Game Area to the mouth 30 miles downstream.

(5) On the Flat River, from the east boundary of the Lansing State Game Area to the mouth 40 miles downstream.

(6) On the Rouge River, from the north boundary of the Rouge River State Game Area to the mouth 40 miles downstream.

(7) On the Thornapple River from the west city limit of Nashville to the mouth 50 miles downstream.

(8) On the Coldwater River from the outlet of Jordan Lake to the mouth 25 miles downstream.

Mr. Odle stated that a total of ten counties and 61 townships would be involved. He noted that land cannot be acquired for valley preserves by condemnation, under the provisions of the Michigan "Natural Rivers" Act.

c. Wildlife. Mr. Dole discussed alternative measures to meet the wildlife needs of the basin. He stated that the basin is rich in wildlife resources that include the cottontail rabbit, fox squirrel, white-tailed deer, dabbling ducks, Canada geese, sandhill crane, ruffed grouse and ring-necked pheasant. He noted that the population of the basin's ring-necked pheasants is decreasing while the populations of the wildlife species are increasing. Mr. Dole used a map, which showed the locations of the wildlife areas, to supplement his discussion.

The Coordinating Committee expressed a desire that the wildlife areas, which would be marked off on a map included in the Main Report, be presented in color.

d. Fisheries. Messrs. Odle and Christensen discussed the fish aspects of the addendum. Mr. Odle stated that the Michigan Department of Natural Resources has recommended that several reaches of streams in the basin be protected for fish coldwater, intermediate, and warmwater species). A list of the reaches will be included in the addendum. Messrs. Odle and Christensen also discussed the need to alter and remove a number of dams on streams in the basin in order to provide for meeting fish needs. A list of these dams will be included in the draft of the addendum.

NEXT MEETING

The next Grand River Basin Coordinating Committee meeting will be held on 14 May 1971 at 10:00 p.m. in the 8th floor conference room of the Stevens T. Mason Building, Lansing, Michigan. Meeting adjourned.

Prepared by

ELIHU JACKSON
Civil Engineer

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee

Twenty-first Meeting - 19 April 1971

Lansing, Michigan

Department of Agriculture

Mr. Arthur Cratty, Soil Conservation Service, East Lansing, Michigan
Mr. Robert Fellows, Soil Conservation Service, East Lansing, Michigan

Department of the Army

Colonel Myron Snoke, Chairman, Corps of Engineers, Detroit, Michigan
Mr. Philip McCallister, Corps of Engineers, Detroit, Michigan
Mr. Robert Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas Odle, Corps of Engineers, Detroit, Michigan
Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of Health, Education and Welfare

Mr. Donald Marshall, Public Health Service, Chicago, Illinois

Department of the Interior

Mr. Robert Pierce, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Sumner Dole, Jr., Bureau of Sport Fisheries and Wildlife, Lebanon, Ohio

Department of Transportation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Environmental Protection Agency

Mr. Harlan Hirt, Water Quality Office, Chicago, Illinois

Great Lakes Basin Commission

Mr. Eugene Jarecki, Great Lakes Basin Commission, Ann Arbor, Michigan

State of Michigan

Mr. Dale Granger, State of Michigan, Lansing, Michigan
Mr. John Kennaugh, Michigan Grand River Watershed Council, Lansing, Mi.
Mr. Kenneth Christensen, Michigan Department of Natural Resources, Lansing, Michigan
Mr. James Dooley, Michigan Department of Natural Resources, Lansing, Mi.

Inclosure No. 1

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
TWENTY-SECOND MEETING - 14 MAY 1971
LANSING, MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 10:00 a.m. on 14 May 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the minutes of the twentieth and twenty-first meetings. No comments were made about the minutes of the twentieth and twenty-first meetings.

c. Summary of activities and events since the twenty-first meeting. Colonel Snoke read a letter addressed to him from Governor William Milliken of Michigan and also a news release signed by the Governor. Both the letter and news release were about the suggested plan of development to be included in the Grand River Basin Study Report. The Governor stressed the importance of the plan being socially acceptable and ecologically sound.

Colonel Snoke stated that he should provide a letter of reply to the Governor. He inquired if there were any elements of the alternatives to be included in the Addendum inconsistent with the views expressed in the Governor's letter and news release.

Mr. Dole stated that he was concerned about the planned channel improvement on the Portage River near the Audubon area. He stated that the channelization, if implemented, may result in the Audubon area being drained, thus adversely affecting the wildlife there.

Mr. Fellows suggested that the Addendum state that prior to implementing any channel improvement measures, detailed environmental and ecological studies will be carried out to assure that no impairment to the wildlife areas will occur if the measures are implemented.

Mr. Granger inquired if environmental and ecological considerations regarding channelization had been taken up in earlier stages of the Study. Mr. Gregory indicated that they had been, particularly during the work sessions held at Haven Hill.

Minutes are not verbatim

It was agreed that the Addendum would state, in the section relating to channelization, that prior to implementing any recommended channel improvement measures, detailed studies would be carried out to assure that no adverse environmental and ecological impacts will result, if the measures are implemented.

Mr. Kennaugh suggested that a similar statement be included in the section of the Addendum pertaining to navigation.

It was agreed that the Addendum would state, in the section relating to navigation, that prior to implementing any recommended navigation improvements, a review of their environmental and ecological effects will be accomplished to assure that no adverse affects will result if the navigation improvement measures are implemented.

Mr. Kennaugh suggested that a recommendation pertaining to the removal or alteration of dams, as a means of providing for fish passage, not be included in the Study Report. He stated that perhaps more detailed studies are required before it can be determined that removal or alteration of these structures is required.

A discussion ensued as to whether the removal or alteration of the dams should be recommended in the Study Report.

Colonel Snoke stated that, at this time, the Coordinating Committee is not required to recommend that the dams be removed or altered.

It was agreed that the Study Report would not recommend the removal or alteration of dams as a means of providing for fish passage.

Mr. Baker stated that a footnote should be added to the fishery discussion in the Addendum to explain or define the term "intermediate species".

2. REVIEW OF THE ADDENDUM

a. Introduction

During the review of the Addendum, a discussion developed in regard to whether the terms Plan A and Plan B should be used to refer to the plans described in Appendix Q and in the Addendum to Appendix Q. However, it was agreed that the two terms would be used.

Colonel Snoke noted that the Addendum's introductory section should state that highest priority was given to the basin's needs for improved water quality.

b. Waste Collection, Treatment, and Disposal

Colonel Snoke stated that the Subcommittee should seek the assistance of the Water Quality Office and the State in making cost estimates for meeting the basin's water quality needs for the period 1985 thru 2020.

Mr. Baker stated that those reaches of streams where total body contact is allowed should be specified in the Addendum.

Colonel Snoke noted that the State's water quality plan includes flow augmentation as a possible alternative for meeting the basin's long term needs. He suggested that the flow augmentation reference be deleted from the plan as presented in the Addendum.

Mr. Kennaugh noted that the State's water quality plan refers to the water quality plan included in the 1970 draft of Appendix Q as being that of the Corps. He requested that this reference be revised to include other agencies as being responsible for its development.

c. Valley Preserves

It was agreed that estimated costs of developing valley preserves and expected benefits would be included in the Addendum.

Colonel Snoke stated that a discussion of why the valley preserve system is now being considered should be presented in the opening paragraphs of the valley preserve section.

The Coordinating Committee requested that photographs and maps of the designated valley preserve reaches be included in the Addendum to supplement the text.

Colonel Snoke emphasized the importance of the State's support for the valley preserve system that the Coordinating Committee plans to recommend.

Mr. Kennaugh indicated that various groups would support the valley preserves.

d. Recreation

The Coordinating Committee requested that photographs and maps of the designated recreational areas also be included in the Addendum to supplement the text.

It was agreed that benefits relating to wildlife and hunting would be included in the Addendum.

It was suggested that the discussion on sports fisheries should be presented under the same topic of discussion.

Mr. Dole stated that graphics depicting waterfowl areas should be included in the discussion too.

Mr. Baker, in a reference to Mr. Dole's input, inquired if the Addendum should raise a question as to the adequacy of the suggested plan included in the 1970 draft of Appendix Q. Some revisions to Mr. Dole's input were suggested.

e. Flood Damage Reduction

Colonel Snoke stated that the beginning of the flood plain discussion should include a description of the local people's reaction to flood control measures considered by the Coordinating Committee during the Study. He requested that the Addendum state that the existing flood protection at Grand Rapids is insufficient for a 100-year flood.

Mr. McCallister suggested that the Grand River flood damage figures be included in the Addendum.

f. Agriculture

Mr. Fellows stated that the recommendations the Department of Agriculture plans to submit will include 7 early action programs.

3. NEXT MEETING

The next Coordinating Committee meeting was scheduled to be held on 15 June 1971 at 9:00 a.m.

Prepared by:

Elihu Jackson

ELIHU JACKSON
Civil Engineer

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Twenty-Second Meeting - 14 May 1971
Lansing, Michigan

Department of Agriculture

Mr. Robert Fellows, Soil Conservation Service, East Lansing, Michigan

Department of the Army

Colonel Myron Snoke, Chairman, Corps of Engineers, Detroit, Michigan
Mr. Philip McCallister, Corps of Engineers, Detroit, Michigan
Mr. Robert Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas Odle, Corps of Engineers, Detroit, Michigan
Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of Commerce

Mr. Robert Babb, National Weather Service, Lansing, Michigan

Department of Health, Education and Welfare

Mr. Donald Marshall, Public Health Service, Chicago, Illinois

Department of the Interior

Mr. Francis Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Sumner Dole, Jr., Bureau of Sport Fisheries and Wildlife, Lebanon, O.

Department of Transportation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Environmental Protection Agency

Mr. Harlan Hirt, Water Quality Office, Chicago, Illinois

State of Michigan

Mr. Dale Granger, State of Michigan, Lansing, Michigan
Mr. John Kennaugh, Michigan Grand River Watershed Council, Lansing, Mich.
Mr. Kenneth Christensen, Michigan Department of Natural Resources, Lansing, Michigan

Inclosure No. 1

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
TWENTY-THIRD MEETING - 30 JUNE 1971
EAST LANSING, MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 9:00 a.m. on 30 June 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the Minutes of Twenty-Second Meeting. The minutes of the twenty-second meeting have been prepared and mailed out to Coordinating Committee members and alternates.

c. Summary of activities and events since the Twenty-Second Meeting. Mr. Cratty gave the following report on U.S. Department of Agriculture Activities:

(1) The Michigan State Conservation Committee has approved PL-566 applications for the Red Cedar River above Williamston and for the Remy-Chandler Drain outlets into the Lookingglass River.

(2) The Jackson County Board of Commissioners has voted to proceed on the Portage River watershed application there.

(3) The Flood Hazard Analysis Report on Plaster Creek has been completed and is now being reviewed. Its presentation is scheduled for August 1971.

Mr. Dooley reported that the Bureau of Water Management, Michigan Department of Natural Resources, in about two weeks, will submit the first draft of the Grand River Basin interim water quality plan to the Environmental Protection Agency.

Mr. Kennaugh reported that the Michigan Water Resources Commission has designated the Michigan Grand River Watershed Council as the Planning Advisory Committee for the Grand River water quality plan. He indicated that the Watershed Council's comments on the interim water quality plan will probably be a minimum.

Colonel Snoke reported on activities of the Detroit District. He stated that the District, during the last several weeks, has been devoting considerable time to: (1) the Southeastern Michigan Wastewater Management Study, (2) processing of industry applications for Federal Permits which stem from the Corps' enforcement of its Refuse Act Program, and (3) the Confined Dredging Disposal Program.

Mr. McCallister also commented on the wastewater management study. He indicated that the District will submit a feasibility report on the study in July 1971.

Minutes are not verbatim

2. COMMENTS ON THE REVISED ADDENDUM

a. Waste Collection, Treatment, and Disposal. Mr. Crook stated that the discussion on land disposal (spray irrigation) should be more objective. He noted that the Muskegon land disposal project has yet to be implemented and hence should not be cited as a successful endeavor.

Mr. Marshall suggested that several parts of the land disposal discussion should be revised to make it more objective. He indicated that it should be in general agreement with the U.S. Public Health Service guidelines. Mr. Marshall furnished Colonel Snoke a copy of a portion of a U.S. Public Health Service report on land disposal.

Mr. Hirt and Mr. Fellows were in agreement with the views of Mr. Crook and Mr. Marshall.

Mr. Fellows stated that he would furnish the Plan Formulation Subcommittee with a list of land areas in the basin whose soils are suitable for spray irrigation.

Mr. Dooley stated that the discussion should cover land area and pretreatment requirements. He stated that it should not suggest that the effluents, which would be high in water quality after being spray irrigated, would not be discharged to streams.

b. Recreation. Mr. Baker discussed the recreational alternative measures included in the Addendum. He stated that the Addendum provides nine areas and also those strips of lands which comprise the designated valley preserves for recreational purposes.

It was brought out that the recreational benefits the Addendum provides for are substantially lower than those provided for in the suggested plan included in the April 1970 draft of Appendix Q.

c. Fish and Wildlife. Mr. Odle reported that Mr. Al Dole of the Bureau of Sport Fisheries and Wildlife, in recent weeks, had been occupied with other studies and consequently had devoted little time to the Grand River Basin Study. Mr. Odle stated that Mr. Dole's remaining work on the Addendum consists of refining his input which will include a set of proposals on sport fisheries and wildlife.

Mr. Atwood stated that he would contact Mr. Dole in respect to having him devote more time to the Grand River Basin Study.

Mr. Fellows referred to the discussion regarding the removal of dams to facilitate the passage of anadromous fish. He stated that the cost estimate for the removal of the dams does not include a cost for sediment removal, which would be substantial. He indicated that it should be included as part of the overall estimated cost to remove the dams.

Mr. Odle stated that he would contact Mr. Ken Christensen of the Michigan Department of Natural Resources in respect to having the Department revise the estimate to include sediment removal.

Mr. Fellows commented on the water quality discussion included in the fish and wildlife section. He noted that the Michigan Department of Natural Resources has recommended that reaches of the Rogue River and its tributaries be designated as and protected for coldwater fish. He indicated that the discussion should be revised to show clearly that drainage ditches are not included in this group of streams. He stated that he would contact the Department in respect to having it make the necessary revision.

d. Flood Damage Reduction. A discussion ensued in regard to whether specific non-structural measures should be recommended for each community having a significant flood problem.

Colonel Snoke suggested that the Addendum identify communities having significant flood problems. He suggested that non-structural measures which could best reduce flood damages for these communities be discussed. The Coordinating Committee adopted Colonel Snoke's suggestion.

Mr. Fellows stated that he had rewritten the flood plain information reports discussion incorporated into the Addendum to include a discussion on U.S. Department of Agriculture's flood hazard analysis studies. He furnished each attendee a copy of the discussion.

Mr. Fellows questioned the validity of the last sentence of the first paragraph of subtopic (b), Wildlife Management, of the Fish and Wildlife discussion. The last sentence of the paragraph states that the benefits which may be attributed to valley preserves, in the long run, will outweigh the losses in benefits assigned to reservoirs. Mr. Fellows suggested that the sentence be deleted from the paragraph unless supporting data can be provided.

A discussion ensued in respect to whether the sentence should be deleted.

It was agreed that Mr. Dole, who prepared the paragraph, would be contacted in regard to either providing supporting data or deleting the statement from the discussion.

e. Upstream Watershed Management. Mr.Kennaugh addressed a question to Mr. Fellows in regard to the third paragraph on the first page of the "Upstream Watershed Management" discussion. Mr. Kennaugh inquired about the statement that development of twenty six watersheds could be justified through bringing new land into agricultural production.

Mr. Fellows stated that the development of the twenty six watersheds could not be accomplished under the current PL-566 program. He stated that new legislation or criteria that would allow for their development will be required. He stated that he would revise the paragraph to indicate, more clearly, that prior to the development of the twenty six watersheds new legislation would be required.

f. Summary. Colonel Snoke inquired if the Addendum is to include a summary of the alternatives it discusses. It was agreed that a summary discussion would be included in the Addendum.

The next Grand River Basin Coordinating Committee meeting will be held on 14 July 1971. The Detroit Metropolitan Airport Hotel is, tentatively, the site of the next meeting.

Prepared by:

ELIHU JACKSON
Civil Engineer

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Twenty-Third Meeting - 30 June 1971
East Lansing, Michigan

Department of Agriculture

Mr. Arthur Cratty, Soil Conservation Service, East Lansing, Michigan
Mr. Robert Fellows, Soil Conservation Service, East Lansing, Michigan

Department of the Army

Colonel Myron Snoke, Chairman, Corps of Engineers, Detroit, Michigan
Mr. Philip McCallister, Corps of Engineers, Detroit,Michigan
Mr. Louis D'Alba, Corps of Engineers, Chicago, Illinois
Mr. Thomas Odle, Corps of Engineers, Detroit, Michigan
Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of Health, Education and Welfare

Mr. Donald Marshall, Public Health Service, Chicago, Illinois

Department of the Interior

Mr. Burton Atwood, Department of The Interior, DesPlaines, Illinois
Mr. Francis Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan

Department of Transportation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Environmental Protection Agency

Mr. Harlan Hirt, Water Quality Office, Chicago, Illinois

Federal Power Commission

Mr. Lenard Young, Bureau of Power, Chicago, Illinois

Great Lakes Basin Commission

Mr. Leonard Crook, Great Lakes Basin Commission, Ann Arbor, Michigan

State of Michigan

Mr. Dale Granger, State of Michigan, Lansing, Michigan
Mr. John Kennaugh, Michigan Grand River Watershed Council, Lansing, Mich.
Mr. James Dooley, Michigan Department of Natural Resources, Lansing, Mich.

Inclosure No. 1

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
TWENTY-FOURTH MEETING - 14 July 1971
DETROIT METROPOLITAN AIRPORT HOTEL
WAYNE COUNTY, MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 9:00 a.m. on 14 July 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. The list of meeting participants is Inclosure No. 1.

b. Status of the Minutes of the Twenty-Third Meeting. The minutes of the twenty-third meeting were mailed to Coordinating Committee members and alternates on 25 August 1971.

c. Summary of activities and events since the Twenty-Third Meeting. Colonel Snoke reported on activities of the Detroit District. He noted that in connection with the Federal Refuse Act program, the District Office has received more than 1000 applications from firms for the purpose of obtaining Federal Permits to discharge their wastewater directly to navigable streams. He stated that the application forms which industries are required to use, call for rather detailed information and that a number of the applications already submitted lack some of the required information. He stated that these applications would be returned for additional information.

Colonel Snoke stated that the Refuse Act also requires that industries designated as critical with respect to the Standard Industrial Classification (SIC) Code provide some additional data. He stated that the additional data which is required to be submitted by 1 October 1971 will be submitted on application forms now being prepared by the Environmental Protection Agency and that it will cover more than 40 parameters.

He also stated that the District will submit a feasibility report on the Southeast Michigan Wastewater Management Study in the near future.

2. RECOMMENDATIONS

Colonel Snoke stressed the importance of the Coordinating Committee coming to a general agreement on the recommendations to be incorporated into the Main Report. He stated that agreement on the recommendations is a prerequisite to completing the study.

a. WATER QUALITY.

Colonel Snoke and other Coordinating Committee members briefly discussed the water quality portions of Plan A and Plan B (the Addendum) of Appendix Q. He observed that the water quality discussion in Plan B consists mainly of the State's interim water quality plan for the Grand River basin. It includes no provisions for low flow augmentation as does Plan A. The State's interim plan includes more detailed information with respect to each local community's program to abate pollution.

Minutes are not verbatim

Mr. Fellows suggested that the recommendations on water quality provide for a monitoring program for the upstream watersheds, to be carried out with respect to determining the magnitude of pollutants contained in eroded materials carried by upstream agricultural runoff.

Mr. Hirt noted that the Environmental Protection Agency regards monitoring as a high priority in its overall program to abate pollution in the Great Lakes. He stated that under Section 15 of the Water Pollution Control Act (P.L. 84-660 as amended) up to $20,000,000 is scheduled to be spent within the next five years on various methods of controlling pollution on the Great Lakes. He indicated that Department of Agriculture sponsored programs, as suggested by Mr. Fellows, could possibly be funded in accordance with provisions of Section 15. He stated that under Section 15, however, local interest is required to provide a minimum of 25 percent of the total cost of such programs.

Mr. Fellows stated that questions have been raised in the past in regard to the exact requirements of local interests under Section 15. He stated that perhaps funds could be provided in the form of a grant to cover 100 percent of the cost.

Colonel Snoke observed that the Committee has before it Mr. Fellows' suggestion that the committee recommend that a monitoring program, on a basin-wide basis, be established to determine the magnitude and impact of pollution that may be due to rural agricultural runoff.

The Coordinating Committee adopted the suggestion.

Mr. Crook stated that the recommendation for the monitoring program should include a rough estimate of its cost and a statement on how it would be funded.

Mr. Granger and Mr. Fellows indicated that their offices would prepare a rough cost estimate for the program.

Colonel Snoke suggested that the recommendation indicate that the program could be conducted under the provisions of Section 15 of the Water Pollution Control Act and that Federal funds could be provided in accordance with the cost sharing arrangement in effect at the time. The recommendation should also indicate that the current cost sharing arrangement is 75 percent Federal and 25 percent non-Federal.

A discussion developed in regard to the amount of detail that should be incorporated in the recommendation.

Colonel Snoke suggested that the wording of the recommendation of the State's water quality plan could be as follows: The State has an ongoing water quality plan in effect throughout the Grand River basin in accordance with the Water Pollution Control Act (P.L. 84-660 as amended) administered by the U. S. Environmental Protection Agency. The Coordinating Committee endorses the State's ongoing plan which is fully outlined in Plan B of the Addendum to Appendix O. He stated that the recommendation should also include significant elements of the plan which should be given priority. Colonel Snoke also suggested that maps may be used to show areas or localities which are now under orders to upgrade their treatment facilities to achieve phosphorus removal, secondary treatment, or secondary treatment with phosphorus removal.

Colonel Snoke stated that if the Coordinating Committee adopts the State's water quality plan, it should recommend that the Federal Government, on a timely basis, provide funds in order that the plan may be fully carried out.

Mr. Birt noted that since the State of Michigan has set water quality standards for its streams and has also implemented a bonding program, it is generally eligible to receive maximum Federal financial assistance (55 percent of the total cost) to carry out its programs.

Mr. Granger, in discussing the plan, stated that the city of Lansing is now planning to improve its sewage treatment facilities to achieve tertiary treatment. He also stated that other communities in the basin will shortly be under orders to improve their treatment facilities to achieve tertiary treatment, too.

It was brought out that the estimated cost for the State to carry out the short term water quality plan for the Grand River basin should reflect the cost of tertiary treatment facilities to be constructed within the short term period (1970-1985) and the cost of controlling pollution due to storm water from combined sewer systems which is due to be accomplished by 1977.

Colonel Snoke asked Mr. Granger to contact the State with respect to revising its water quality plan for the basin to cover tertiary treatment planned for the city of Lansing and possibly other communities and also to cover pollution due to storm water from combined sewer systems. He also asked Mr. Granger to have the State's cost estimate ($67,000,000) revised to reflect the cost of these pollution abatement measures, if necessary.

Mr. Crook inquired if the Coordinating Committee was to include a recommendation on water supply in the Main Report.

It was brought out the communities in the basin are not expected to experience critical water supply shortages until after the year 2000. Consequently, it was agreed that no recommendation would be made in the Main Report in regard to meeting post-2000 needs. However, the Main Report will list alternatives including reservoirs which basin communities may utilize to meet these needs. It was also agreed that a statement will be included in the Main Report that if the reservoir alternative is to be adopted as a method of meeting these needs, necessary action to reserve the reservoir sites should be taken at an early date.

The Coordinating Committee also recommended that a research and development and planning program be instituted to investigate advanced waste treatment alternatives including land disposal to meet the long term water quality needs of the basin.

A discussion ensued with respect to the cost of the program. It was agreed that the estimated cost to be incorporated in the recommendations would be $2,000,000.

The Committee also recommended that a continuing improvement of the State's water quality management program be made and that the cost sharing arrangement be 50 percent Federal and 50 percent non-Federal.

Mr. Odle prepared a summary of the recommendations on water quality. Mr. Odle's summary, which underwent some revisions, is presented below.

(1) The Coordinating Committee recommended the State of Michigan's water quality enhancement program as the means of meeting water quality standards in the Grand River basin within the short term period (1970 - 1985). The Committee emphasized specific points of the State's program which were adopted as recommendations including:

(a) Taking such action as necessary to eliminate the problem of pollution due to storm water runoff from combined sewers.

(b) Continuing improvement of the State's water quality management program with provisions for the Federal government to provide up to 50 percent of the total cost of the program.

(2) The Coordinating Committee recommended that the Federal government provide financial assistance, on a timely basis, to the State and its local governments to help implement the plan under current cost sharing arrangements.

(3) The Coordinating Committee adopted as a recommendation, the Federal Refuse Act program to require industries discharging wastes directly to navigable streams or to tributaries of navigable streams to obtain Federal permits as a method of assuring that industrial discharges meet water quality standards.

(4) The Coordinating Committee recommended that a monitoring program be established, on a basin-wide basis, to monitor agricultural pollutants in upstream watershed areas.

(5) The Coordinating Committee recommended that an applied research program be instituted to investigate the applicability of advanced and currently experimental waste treatment processes including land disposal for the Grand River basin, to meet post 1985 water quality needs.

b. POWER.

Colonel Snoke noted that investigations indicate that the demand for power in the Grand River basin is not expected to become critical within the time frame of the Study. Consequently, the Coordinating Committee will not make any recommendations concerning power.

Mr. Crook inquired if any new power plant facilities were going to be constructed in the basin and if so should the Coordinating Committee concern itself with thermal pollution.

Mr. Haukedahl stated that the appendix on power, Appendix L, and also his discussions with Consumers Power Company personnel indicate that no new power plants are expected to be constructed. He added, however, that the city of Lansing is expanding its power plant facilities but that cooling towers and a water supply pond are to be included as part of the new facilities. Consequently, he indicated that he expects no thermal pollution problems to result from the operation of the new facilities. He stated that additional demands for power could be met by drawing from sources outside of the basin such as those in Ludington, Michigan.

c. VALLEY PRESERVATION.

Colonel Snoke observed that it is the State's responsibility to determine or select methods it will utilize in implementing the valley preserve system described in Plan B.

Mr. Odle noted that the valley preserve system in Plan B does not include reaches of streams extending through urban areas. He inquired if the Coordinating Committee should recommend that reaches of streams through urban areas be developed as valley preserves.

A discussion developed with respect to the suitability of valley preserves in urban areas.

Mr. Christensen suggested that the Study Report cite the valley preserves or open space programs the cities of Grand Rapids and Lansing have now under consideration.

It was generally a consensus that the Study Report should include a discussion on the programs Grand Rapids and Lansing have but make no recommendations in regard to including reaches through urban areas as part of the valley preserve system.

Colonel Snoke and other committee members indicated that the Main Report and Plan B should include a map of each functional requirement to better illustrate the recommendations on valley preserves.

Mr. Fellows stated that if the Maple River valley preserve system extended east of U. S. Highway 27, it conflicts with a plan of improvement the Maple River Intercounty Drainage Board, Soil Conservation Districts in the State of Michigan, and the U. S. Soil Conservation Service have developed for that area.

The Committee agreed that the limits of the valley preserve system could be modified somewhat to avoid conflicts, if the need arises.

Colonel Snoke stated that the recommendation on valley preserves should cite laws under which Federal financial support could be provided to the State to implement the valley preserve system.

Mr. Christensen inquired if flood plain information activities should be tied in with the valley preserve system to help justify Federal financing of the system.

It was agreed that the flood plain information activities would be included in the flood damage reduction discussion but not in the valley preserve discussion.

The Coordinating Committee recommended that the valley preserve program described in Plan B be implemented as a method of meeting a portion of the recreational needs. The Committee also recommended that the Federal government provide up to 50 percent of the total cost of implementing the valley preserve program.

d. RECREATION.

Colonel Snoke briefly discussed the nine recreational nodes described in Plan B. He observed that Plan B provides for few if any water oriented recreational needs since practically all of the multipurpose reservoirs in Plan A have been excluded from Plan B.

Mr. Christensen requested that the "designation of certain reaches of streams" not be discussed in the recreation section since it is sufficiently discussed in the water quality section. He also requested that the term "intermediate species classification" not be used.

A discussion took place in regard to how descriptive or lengthy the recommendation(s) on recreation should be. Mr. Odle observed that although there will be a discussion in the Main Report pertaining to the recommended alternatives, each recommendation proper should be rather brief.

Mr. Dole indicated that the recommendation(s) concerning the nine recreational nodes should include a discussion on how they would be managed. Colonel Snoke pointed out that the State will be responsible for the management of the nodes.

Colonel Snoke asked the Coordinating Committee if the nine recreational nodes described in Plan B should be recommended for implementation as a method of partially meeting some of the recreation and fish and wildlife needs.

Mr. Hirt inquired if the Committee should include in its recommendations provisions to satisfy some of the basin's water oriented recreational needs.

Mr. Atwood indicated that such a recommendation is desired but is not practical since basin residents have expressed considerable opposition to suggested alternatives which included reservoirs to meet these needs. He added that the Governor's office has indicated that it would not endorse a plan which included reservoirs to meet water oriented recreational needs.

The Coordinating Committee recommended that the nine recreational nodes described in Plan B be implemented as a method of partially meeting recreation and wildlife needs. It also recommended that the Federal government provide financial assistance to the State to cover the cost of implementing the nodes.

Mr. Wicks suggested that node #3 be connected to the valley preserve system. He stated that, on a long range management basis, it is advantageous to have the node connected to the valley preserve system.

Mr. Wicks' suggestion was adopted by the Coordinating Committee.

e. FISH AND WILDLIFE.

Mr. Dole indicated that because of other studies, he had devoted little if any time to the Grand River Basin Study during the past several weeks. He stated that he had prepared a number of general recommendations for the Study which may not be what the Committee wants to adopt and include in the Main Report.

Mr. Dole stated that his recommendations would be for the wise use and perpetuation of the fish and wildlife environment. His recommendations are presented below:

(1) The highest priority be given to the preservation and wise use of a number of acres of wetlands now in private ownership by the following means:

(a) By expanding the recreational nodes and valley preserves to include all contiguous wetlands.

(b) By early implementation of the Water Bank Act (Public Law 91-559).

(c) By an accelerated land acquisition program conducted by both Federal and State fish and wildlife agencies.

(d) Funds in the amount of $15,000,000 be appropriated to the Michigan Department of Natural Resources not later than 1975 to enable the Division of Wildlife to acquire in fee about 69,000 acres of lands needed to meet wildlife needs.

(2) The ongoing fisheries program of the State be accelerated with special emphasis being placed on the following:

(a) Construction of additional warmwater and trout fish hatcheries.

(b) Expansion of the lake and stream reclamation program.

(c) The coho salmon and other anadromous fisheries program.

(d) Provisions of boat and bank access for fishermen.

It was observed that Mr. Dole was recommending that the State's fisheries program be accelerated which heretofore had not been discussed in connection with Plan B. The Federal funds required to accelerate the program would be in addition to those the State now receives under the Dingell-Johnson Act (Federal Aid in Fish Restoration and Management Projects Act, P. L. 81-681).

Colonel Snoke and other Committee members indicated that Mr. Dole's recommendations should be more definitive and suggested that he and appropriate Michigan Department of Natural Resources personnel consider and prepare fish and wildlife recommendations which are more definite. He stated that the recommendations should be based on definite programs and corresponding cost estimates.

Mr. Dole and Mr. Christensen agreed to comply with the Committee's suggestion.

Mr. Dole made other recommendations which are listed below.

(1) Special consideration be given to developing a Federally assisted waterfowl sandhill crane management and research program in cooperation with the State of Michigan and private conservation agencies. In carrying out the management and research program, special attention should be given to the seven known crane and canada goose breeding grounds in the watershed.

(2) In the case of public land areas and waterways emphasis be placed on low key recreational development with the prime objective being to preserve and perpetuate the environment in an aesthetically pleasing and natural condition.

(3) A number of acres of wetlands and peripheral uplands in the waterfowl priority production zones be placed under public control and be managed by the Michigan Department of Natural Resources with the support of Federal funds. Mr. Dole stated that these lands would be in addition to the 69,000 acres mentioned above.

The Coordinating Committee indicated that these recommendations were also too general. Colonel Snoke asked Mr. Dole to confer with appropriate MDNR personnel to prepare recommendations on the fish and wildlife aspects of the study which include estimated land areas required and costs to implement the proposed alternatives.

f. UPSTREAM WATERSHED MANAGEMENT

Colonel Snoke observed that the seven streams included in the upstream watershed management program are the Upper Maple River, Haywood Creek, the Portage River, Stony Creek, the Rogue River, Perry Creek, and Liebhardt Creek. Mr. Fellows stated that the program calls for four impoundments of which two are to be located on the Upper Maple River, one on Haywood Creek, and one on the Portage River.

Mr.Fellows observed that under the accelerated land treatment program, the technical assistance part would be 100 percent Federal cost and the installation of the practices could be cost shared consisting of about 50 percent Federal and 50 percent non-Federal through the Agriculture Stabilization Conservation Rural Environmental Assistance Program.

It was brought out that the seven upstream watershed programs are scheduled to meet the short term needs and that there are 26 additional programs scheduled to meet the long term needs.

The Coordinating Committee recommended that the seven upstream watershed programs described in Plan B be implemented as part of the overall early action plan to meet the short term water resources needs of the basin.

g. NONSTRUCTURAL PROGRAMS.

Colonel Snoke noted that Plan B provides for a minimum of structures for flood protection purposes since it does not include reservoir impoundments to store floodwaters as does Plan A. He stated that in adopting Plan B, the Committee will recommend nonstructural measures to help reduce future flood damages in the basin. The nonstructural measures will include flood plain information, flood insurance, land use regulation, land use evacuation, permanent evacuation of flood plains, flood proofing, and valley preserves.

The Coordinating Committee indicated that it would be difficult to estimate the cost of the nonstructural programs.

Colonel Snoke asked that a map or drawing be included in the Main Report to show the locations where flood plain information studies have been requested and other locations where these studies are needed but have not been requested. Federal costs to carry out the studies should be given too. Colonel Snoke observed that Federal funds to carry out flood plain information (FPI) studies have been very inadequate.

Mr. Odle inquired if the Committee recommends flood plain zoning as a method of reducing flood damages, should the zoning be purely a local option or compulsory requiring the approval of the State.

Colonel Snoke and Mr. Granger indicated that the recommendation should not be compulsory requiring the approval of the State.

Mr. Granger and also Colonel Snoke suggested that the Committee recommend that the Congress support the FPI program of the Federal agencies with a substantial increase in funds to provide for an expanded improvement in technical service to the United States including Michigan and the Grand River basin in identifying flood plain areas. Mr. Granger suggested that a dollar figure be attached to the recommendation. Their suggested recommendation was adopted by the Coordinating Committee.

The Coordinating Committee also recommended the nonstructural alternatives described in Plan B as methods of reducing flood damages in the nation including the State of Michigan and the Grand River basin.

3. ENVIRONMENTAL IMPACT STATEMENT

Colonel Snoke observed that the Committee has now made enough progress in finalizing the Study Report to get underway the preparation of the draft of the environmental impact statement. He stated that he plans to contact Mr. Herbert Miller, Chairman of the Environmental Impact Statement Team about beginning the preparation of the draft of the statement.

The date for the next Grand River Basin Coordinating Committee meeting was not set.

Prepared by:

Elihu Jackson

Elihu Jackson
Civil Engineer

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Twenty-Fourth Meeting - 14 July 1971
Detroit Metropolitan Airport Hotel
Wayne County, Michigan

Department of Agriculture

Mr. Robert Fellows, Soil Conservation Service, East Lansing, Michigan

Department of the Army

Colonel Myron Snoke, Chairman, Corps of Engineers, Detroit, Michigan

Mr. Thomas Odle, Corps of Engineers, Detroit, Michigan

Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of the Interior

Mr. Burton Atwood, Department of the Interior, DesPlaines, Illinois

Mr. Robert Pierce, Bureau of Outdoor Recreation, Ann Arbor, Michigan

Mr. Sumner Dole, Bureau of Sport Fisheries and Wildlife, Lebanon, Ohio

Department of Transportation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Environmental Protection Agency

Mr. Harlan Hirt, Water Quality Office, Chicago, ILlinois

Federal Power Commission

Mr. Orel Haukedahl, Bureau of Power, Chicago, Illinois

Great Lakes Basin Commission

Mr. Leonard Crook, Great Lakes Basin Commission, Ann Arbor, Michigan

State of Michigan

Mr. Dale Granger, Department of Natural Resources, Lansing, Michigan

Mr. Kenneth Christensen, Michigan Department of Natural Resources, Lansing, Mich

Mr. Forrest Wicks, Department of Natural Resources, Lansing, Michigan

Inclosure No. 1

MINUTES OF THE
GRAND RIVER BASIN COORDINATING COMMITTEE
TWENTY-FIFTH MEETING - 9 AND 10 DECEMBER 1971
MILFORD (HAVEN HILL) MICHIGAN

1. OPENING REMARKS

a. Welcome and Introduction. The meeting was called to order at 1:00 p.m. on 9 December 1971 and the participants were welcomed by the Chairman, Colonel Myron D. Snoke. Mr. Granger and Colonel Snoke acknowledged the presence of Mr. Williams Laycock of the Michigan Department of Natural Resources. Mr. Laycock is manager of the Department's region #3 which includes the Grand River Basin. Colonel Snoke spoke in behalf of all in regard to the pleasant Haven Hill surroundings and the suitability of its facilities for the meeting. The list of meeting participants is Inclosure No. 1.

b. Status of the Minutes of the Twenty-Fourth Meeting. The minutes of the twenty-fourth meeting, which were mailed out to Committee members and alternates in October 1971, were adopted by the Coordinating Committee without change.

c. Summary of activities and events since the Twenty-Fourth Meeting. Colonel Snoke stated that at the Great Lakes Basin Commission August 1971 meeting held on Mackinac Island, he reported on the general course of action the Coordinating Committee is taking as a result of public reaction to the Study. He stated that about one hundred people attended the meeting including members of the press. He and Mr. Crook indicated that responses to his report were favorable.

Messrs. Granger, Kennaugh, and McCallister noted that they had received telephone calls concerning Colonel Snoke's report on the Study. Mr. Kennaugh stated that some of the newspaper articles regarding Colonel Snoke's report tended to be confusing.

2. PROCEDURE FOR DISTRIBUTING AND REVIEWING THE STUDY REPORT

The Coordinating Committee discussed at length the procedure to be followed in distributing and reviewing the Study Report.

Colonel Snoke stated that the procedure will generally be the "Procedure by Great Lakes Basin Commission for Review of Reports on Ongoing Comprehensive Studies" adopted in July 1970. The procedure adopted by the Great Lakes Basin Commission is presented below.

PROCEDURE[1] BY GREAT LAKES BASIN COMMISSION FOR REVIEW OF

REPORTS ON ONGOING COMPREHENSIVE STUDIES

1. When the Coordinating Committee for an ongoing comprehensive study has completed the final field draft of the report, the Coordinating Committee will distribute the report and appendices to the affected State and Federal agencies and the Great Lakes Basin Commission staff for technical review and comment to the Chairman of the Coordinating Committee to be accomplished within a 45-day period. (The Water Resources Council should receive a copy but is not expected to comment on the Coordinating Committee's final field draft.)

2. Following receipt of comments from participating State and Federal agencies and the Great Lakes Basin Commission staff, the Chairman of the Coordinating Committee will prepare the final report.

3. At the time that the Coordinating Committee distributes the final report to the State and Federal agencies on the Coordinating Committee, the Chairman of the Great Lakes Basin Commission will appoint a Review Committee for the ongoing comprehensive study. The Committee will be composed of the following:

Chairman:	Involved State (if more than one State involved, agreement among States for Chairman or for Co-Chairmen)
Secretary:	Staff member of the Great Lakes Basin Commission
Federal Representative:	Agriculture, Army, and Interior, and other Federal Departments as appropriate

The State and Federal representatives will be appointed by the Chairman after consultation with the appropriate State or Federal commissioners.

4. Upon completion of the final report, the Chairman of the Coordinating Committee will, in accordance with Section 204(3) of P.L. 89-80, transmit to the Great Lakes Basin Commission sufficient copies of the final report and appendices for distribution by the Great Lakes Basin Commission. The Commission accepts as a Commission report for review purposes the final report of the Coordinating Committee. The Chairman of the Great Lakes Basin Commission will distribute the report for the 90-day review to the Governors of the member States, heads of Federal agencies and interstate agencies that are members of the Commission, and heads of other Federal or interstate agencies that have an interest, and the Water Resources Council.

5. The Basin Commission's Review Committee will accomplish its review during the 90-day period plus any additional review thereafter required after the comments have been received. The Water Resources Council will

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[1] Adopted by the Great Lakes Basin Commission, July 21, 1970.

simultaneously pursue its review and provide informal comments to the Great Lakes Basin Commission within the same 90-day period. The Water Resources Council will arrange for the International Joint Commission review and will transmit its comments to the Great Lakes Basin Commission.

6. Following receipt of comments from the Water Resources Council, Federal agencies, interstate agencies, State Governors, and all other interested agencies, the Review Committee will prepare a proposed Great Lakes Basin Commission report, including copies of the comments of the Governors, Federal agencies, and interested agencies, for consideration and adoption by the Great Lakes Basin Commission.

7. After the Commission has acted on the Review Committee's report, the final report on the study and the Great Lakes Basin Commission report, stating the Commission's position on the relationship of any or all of the programs in the ongoing comprehensive study report to the comprehensive, coordinated, joint plan for the Great Lakes, will be transmitted to the Water Resources Council.

A discussion ensued in regard to the time and point, during the review of the Study Report, the environmental impact statement should be included as part of the Study Report.

Mr. Granger expressed doubt as to whether the statement should be attached at the time copies of the Report are furnished the public. He indicated that the statement would not exhance the acceptability of the Report to the public.

Mr. Hirt indicated that the environmental impact statement may be required and, hence, becomes a part of the Report at the time the formal 45-day Coordinating Committee review commences.

This matter was not resolved. Mr. Fellows suggested that the Corps contact its Washington D.C. office to determine the exact time and point, during the review of the Study Report, the environmental impact statement is required.

The Coordinating Committee agreed to have the Corps make this determination, and inform Committee members and alternates of its results.

Colonel Snoke raised the question as to whether the Coordinating Committee should hold a public meeting to discuss the alternatives cited in Plan B of Appendix Q and the Main Report.

Mr. Granger and other members indicated that they were in favor of holding a public information meeting but not a public hearing.

It was a consensus that the Coordinating Committee hold a public information meeting on 11 May 1972 and that the Michigan Grand River Watershed Council conduct the meeting as part of the first of several public information meetings the Council plans to conduct in the basin.

Below is a summary of the schedule and procedure the Coordinating Committee adopted in regard to transmitting and reviewing the Study Report.

a. The informal 30-day review of Appendix Q and the Main Report by the Coordinating Committee will be completed by 15 January 1972.

b. A rough draft of the environmental impact statement will be sent to the Great Lakes Basin Commission by 1 February 1972.

c. Copies of the final draft of the Main Report, all appendices, and the environmental impact statement will be sent to Coordinating Committee members for their formal 45-day review by 15 February 1972.

d. Coordinating Committee members will complete their formal 45-day review of the Study Report and furnish comments on it to the Chairman of the Coordinating Committee by 31 March 1972.

e. Sufficient copies of the Study Report including the environmental impact statement will be transmitted to the Great Lakes Basin Commission by 1 May 1972 for its formal 90-day review. At this time copies of the Study Report will be furnished the public.

f. On 11 May 1972, the Coordinating Committee will hold a public meeting to brief the public in regard to the contents of Plan B. The meeting will be conducted by the Michigan Grand River Watershed Council as part of the first of several public information meetings the Council plans to conduct in the basin.

g. The public will be advised to mail their comments to the Chairman of the Coordinating Committee. Comments received from the public will be reviewed, digested, and subsequently transmitted to the Great Lakes Basin Commission.

3. REVIEW OF APPENDIX Q

Colonel Snoke observed that most of the material included in Appendix Q had been reviewed by the Coordinating Committee in previous meetings. He requested that comments on the report be limited to those aspects which appear to differ sharply in principle from data and concepts agreed on in previous meetings. He indicated that editing could be accomplished at a later date.

Colonel Snoke observed that in both Appendix Q and the Main Report many of the photographs and graphics had not been included.

Mr. Kennaugh inquired if the Corps plans to print extra copies of both Appendix Q and the Main Report. He indicated that he would appreciate receiving extra copies to be used in connection with his Council activities.

Mr. Hirt observed that Plan A of Appendix Q discusses alternatives for meeting water supply needs in the basin but does not come to any conclusions. Mr. Odle said that this was true because the basin is not expected to experience any acute water supply needs until about the year 2000.

Mr. Hirt indicated that there should be a paragraph or so in Plan B which refers to the water supply discussion in Plan A.

The Coordinating Committee agreed to include in Plan B a reference to the water supply discussion in Plan A.

Mr. Kennaugh stated that the Michigan Grand River Watershed Council had recently (November 1971) completed water supply studies in twelve counties located in the west-central part of the State of which seven are located or partly located in the Grand River basin. He stated that much of this data gathered could be used for the water supply discussion for Plan B.

The coordinating committee agreed to use this data as part of the water supply discussion to be included in Plan B.

a. Waste Collection, Treatment, and Disposal

Mr. Hirt observed that Appendix Q should, as does the Main Report, clearly state that the State's Interim Water Quality Management Plan, which has been approved by the Governor and the Environmental Protection Agency, has been incorporated into Plan B as a method of meeting the State's short term water quality needs.

Mr. Granger agreed with Mr. Hirt and indicated that the report should state that the highest priority should be given to carrying out the State's plan.

Mr. Crook inquired if Appendix Q should include a "text book type" of disucssion on advanced waste treatment processes. He indicated that if it is to be included in the Study Report, then it should be incorporated into the water quality appendix (Appendix G) rather than Appendix Q.

It was brought out that the Coordinating Committee had agreed that the appendices already printed in final form, such as Appendix G, would not be revised or updated; revisions or additions would be incorporated into Appendix Q.

Mr. Krashen and other Committee members indicated that they preferred to see the discussion remain a part of Appendix Q. Consequently, it was agreed that the discussion on advanced waste treatment processes would remain a part of Appendix Q.

b. Valley Preservation

Colonel Snoke stated that the Coordinating Committee may receive some opposition to the valley preserve system it is recommending in the Study Report.

Mr. Granger indicated that the Committee could expect to receive some significant support from environmentalists.

A discussion ensued with respect to the "25 percent flood damage reduction" described in the last paragraph under item (8), Municipalities,

on page V-103. Colonel Snoke asked the Plan Formulation Subcommittee to revise the paragraph to show that it clearly refers to current flood damages and to the prevention of future flood damage growth.

c. Recreation

The Coordinating Committee made no requests or suggestions in regard to revising the recreation discussion in Plan B.

d. Fish and Wildlife

A discussion ensued with respect to the cost of sediment removal associated with the removal of the dams or with the provision of fish passage through the dams listed on page V-115. It was agreed that the removal and passage costs listed on page V-115 would not be revised but the lower footnote on this page would be revised to read: Sediment removal or control costs not included.

Colonel Snoke requested that Mr. Odle and Mr. Christensen confer with respect to determining where cross referencing the water quality discussion and the fish and wildlife discussion should be in Plan B.

e. Power

The Coordinating Committee requested that an addition be incorporated into Plan B to include (1) a reference to the "electric power" discussion in Plan A, (2) a statement that the demand for power in the Grand River basin is not expected to become critical within the time frame of the study, and (3) that any additional power demands within the basin could be met by drawing from sources located outside of the basin.

f. Flood Damage Reduction

The Coordinating Committee observed that the portion of Plan B regarding flood damage reduction should be strengthened in order to make it more effective and meaningful. Committee members agreed to recommend:

1. That local officials implement and enforce necessary regulations in order to provide flood damage reductions during flooding.

2. That authority be granted to the State to implement and enforce necessary regulations if local officials fail to do so in a reasonable length of time in accordance with the State's Shorelands Protection and Management Act (Act 245, Public Acts of 1970).

3. That the Congress provide sufficient funds to carry out existing flood forecasting programs.

Colonel Snoke requested that Plan B state emphatically that it is of primary importance that local communities carry out the flood damage reduction alternatives cited in Plan B in order to reduce or prevent flood damages during periods of flooding.

He noted that under current flood damage reduction programs, local communities bear the cost of implementing the programs. He stated that, however, in the River and Harbor Act of 1970 a local flood control project at Prairie du Chien, Wisconsin, was authorized. He stated that the project, which Congress has also agreed to financially support, calls for the utilization of non-structural alternatives. He suggested that the Coordinating Committee cite the Prairie du Chien project in Plan B.

Colonel Snoke suggested and the Committee agreed that another recommendation be: That the Federal government carefully consider Federal support of programs which call for the implementation of non-structural alternatives as methods of reducing and preventing flood damages in the Grand River basin.

Mr. Crook observed that benefits and costs discussed in Plan B should be based on the current interest rate. His view was supported by the Coordinating Committee.

Colonel Snoke requested that the Plan Formulation Subcommittee include in Plan B, costs regarding flood damages. He noted that if the costs are to be based on old data, the Report should clearly state so.

g. Upstream Watershed Management

Mr. Hirt referred to the last sentence in the last paragraph under item (7), Water Quality Monitoring of Agricultural Pollutants in Upstream Watersheds. He suggested that either the word "may" or "could" replace the word "will" in this sentence. There were no other suggestions made in regard to revising the upstream watershed management discussion in Plan B.

h. Navigation

Mr. Granger raised a question in regard to the Coordinating Committee making the recommendation stated in item (1)(b) on page V-180. A discussion ensued with respect to whether the Coordinating Committee should make the recommendation. It was brought out that the economic justification of each study plan described on page V-180 had not been established. Consequently, Mr. McCallister suggested and the Coordinating Committee agreed to make no recommendations on navigation. The Committee agreed, however, that Plan B state that its views on navigation are compatible with the study plans described on page V-180.

4. REVIEW OF THE MAIN REPORT

Colonel Snoke stated that it would be helpful if persons sending in comments and suggestions would furnish suggested wording of the sentences and paragraphs under consideration.

Mr. Kennaugh suggested and the Coordinating Committee agreed to include in the Main Report a summary of the recommendations and other pertinent data.

Colonel Snoke stated that we hope to make the Main Report an attractive report in order that it will be more readable and perhaps more acceptable.

Mr. Hirt suggested that those in charge of preparing the final draft of the Main Report review the Main Report of the Big Muddy River Study. He stated that the report was made rather attractive and readable by employing simple and inexpensive techniques. He stated that copies of the Big Muddy River Study Report could be obtained from the Corps' St. Louis, Missouri, District.

5. ENVIRONMENTAL IMPACT STATEMENT

Colonel Snoke observed that the tentative Enivronmental Impact Statement Subcommittee consists of the following individuals:

Mr. Herbert Miller, Chairman	State of Michigan
Mr. Alan Irvine	Department of Agriculture
Mr. John Collis	Department of the Army
Mr. Robert Babb	Department of Commerce and Transportation
Miss Lynne Hamilton	Department of the Interior
Mr. Winfred Ettesvold	Michigan Grand River Watershed Council

Mr. Crook informed Colonel Snoke that Mr. Frank Rose of the Great Lakes Basin Commission would serve on the Subcommittee.

Colonel Snoke asked Mr. Hirt to reconsider whether his office could provide someone to serve on the Committee.

Colonel Snoke observed that the Subcommittee is charged to prepare a preliminary draft of the environmental impact statement covering the overall environmental impacts of Plan B rather than a statement that would address specific projects that may result from the study.

Mr. Hirt suggested that the Subcommittee review the environmental impact statement on the Wabash River Basin Study.

Colonel Snoke inquired if the economic impacts that a study plan may have on the environment has to be covered in environmental impact statements. Mr. Argiroff stated that higher authority has not directed Districts to cover the economic impacts in statements as yet, but there has been some consideration in regard to covering these impacts.

6. PUBLIC INFORMATION PROGRAM

Colonel Snoke observed that during the Michigan Grand River Watershed Council's initial public information meeting, scheduled for 11 May 1972, the public will be briefed with respect to the Study plan (Plan B).

The Public Information Subcommittee was asked to prepare a public information booklet on Plan B similar to the one prepared for Plan A of Appendix Q. It was brought out that the public information booklet for Plan A was largely prepared by the Michigan Grand River Watershed Council and printed by the Corps.

Colonel Snoke observed that the public would be furnished copies of the information booklet on Plan B at the 11 May 1972 public information meeting.

7. PUBLIC MEETING

Colonel Snoke observed that the 11 May 1972 public meeting would be part of the Watershed Council's initial public information meeting.

Mr. Granger suggested that interested Congressmen and State Legislators be invited to the 11 May 1972 meeting. The Coordinating Committee adopted Mr. Granger's suggestion.

Mr. Kennaugh inquired about the distribution of copies of the entire Study Report (Appendices A through Q and the Main Report).

Colonel Snoke stated that a list of organizations that the Coordinating Committee has agreed to furnish copies of the entire Study Report was available.

Mr. Gregory noted that there were two lists prepared. One of the lists includes organizations scheduled to receive copies of the entire Study Report and the other list includes those organizations scheduled to receive only the Main Report and Appendix Q.

Colonel Snoke asked Mr. Gregory to furnish Mr. Granger and Mr. Kennaugh the lists for their comments and suggestions.

It was brought out that present plans call for printing 1,000 copies of the Main Report and Appendix Q and 600 copies of the other appendices.

8. OTHER BUSINESS

Mr. Hirt suggested that after the Coordinating Committee completes its formal 45-day review of the Study Report, perhaps a formal letter requiring the signatures of all Coordinating Committee members could be hand carried to each member. He stated that this could be done rather than holding a special meeting for the purpose of signing the letter.

Colonel Snoke agreed with Mr. Hirt's suggestion.

Meeting adjourned.

PREPARED BY

Elihu Jackson
Civil Engineer

LIST OF PARTICIPANTS

Grand River Basin Coordinating Committee
Twenty-Fifth Meeting - 9 and 10 December 1971
Milford (Haven Hill), Michigan

Department of Agriculture

Mr. Robert Fellows, Soil Conservation Service, East Lansing, Michigan
Mr. John Okay, Soil Conservation Service, East Lansing, Michigan

Department of the Army

Colonel Myron D. Snoke, Corps of Engineers, Detroit, Michigan
Mr. Philip McCallister, Corps of Engineers, Detroit, Michigan
Mr. Carl Argiroff, Corps of Engineers, Detroit, Michigan
Mr. Robert L. Gregory, Corps of Engineers, Detroit, Michigan
Mr. Thomas Odle, Corps of Engineers, Detroit, Michigan
Mr. Elihu Jackson, Corps of Engineers, Detroit, Michigan

Department of Commerce

Mr. Norton Strommen, NOAA, National Weather Service

Department of the Interior

Mr. Burton Atwood, Department of the Interior, DesPlaines, Illinois
Mr. Francis Baker, Bureau of Outdoor Recreation, Ann Arbor, Michigan
Mr. Sumner Dole, Bureau of Sport Fisheries and Wildlife, Lebanon, Ohio

Department of Transporation

Mr. Harry Krashen, Bureau of Public Roads, Lansing, Michigan

Environmental Protection Agency

Mr. Harlan Hirt, Office of Water Programs, Chicago, Illinois

Federal Power Commission

Mr. Orel Haukedahl, Bureau of Power, Chicago, Illinois

Great Lakes Basin Commission

Mr. Leonard Crook, Great Lakes Basin Commission, Ann Arbor, Michigan

State of Michigan

Mr. Dale Granger, Michigan Dept. of Natural Resources, Lansing, Mi.
Mr. William Laycock, Michigan Dept. of Natural Resources, Lansing, Mi.
Mr. Herbert Miller, Michigan Dept. of Natural Resources, Lansing, Mi.
Mr. Kenneth Christensen, Michigan Dept. of Natural Resources, Lansing, Mi.
Mr. Forrest Wicks, Michigan Dept. of Natural Resources, Lansing, Mi.
Mr. John Kennaugh, Michigan Grand River Watershed Council, Lansing, Mi.

Inclosure No. 1

ATTACHMENT 3, APPENDIX A

REPORT ON THE PUBLIC INVOLVEMENT IN THE COMPREHENSIVE WATER RESOURCES PLANNING STUDY FOR THE GRAND RIVER BASIN

In the area of Water Resources, the Grand River Basin Coordinating Committee can make comprehensive studies of all aspects of water problems. It can plan projects for the solution of these problems and it can carry the projects out when the decision has been made to put plans into effect. But ways must be found to involve the people in the planning process because they are the ones who must make the decisions as to what, in a general way is to be done. An understanding of the problem as well as the favorable and unfavorable aspects of alternate solutions, is necessary if the public is to play an informed role in the decision making process.

Attachment to Appendix A - "History"

INTRODUCTION

A significant element of the planning process for the development of the natural resources in any region is the involvement of the "grass roots" in the decision making process. Educational and informational programs are considered essential elements of the problem solving process in the Grand River Basin Water Resources Study. It is recognized that, "an effective educational program that provides local interests an opportunity to express their views on Federal, State and Regional planning studies for developing natural resources consists of utilizing all methods, techniques and facilities of the communication media." It has further been recognized that, "an informational program would best be administered by a regional agency with appropriate private, local, State and Federal assistance."

REQUEST FOR PUBLIC INFORMATION PROGRAM

The Michigan Grand River Watershed Council organized according to State Enabling Legislation Act #253 Public Acts 1964, to assist local governmental units in the river basin to plan and carry out water management programs, submitted a communication to the Grand River Basin Coordinating Committee for the purpose of implementing a Public Informational Program on the plan of the Grand River Basin Study (Exhibit No. 1).

The Watershed Council emphasized the value in conducting an Informational Program during the planning process in order to permit "grass roots" involvement. The letter also concisely laid out a suggested program presenting the plan to municipal and state agency planners, news media, state and local governmental officials, organizations and the general public. Various publications and visual-aid materials were also suggested for an effective and educational informational program.

CREATION OF PUBLIC INFORMATION SUBCOMMITTEE

The Grand River Basin Coordinating Committee concurred in the concept of a Public Information Program and requested Dale W. Granger, Representative for the State of Michigan, to serve as Chairman of the Public Information Subcommittee. The other members of the Grand River Basin Coordinating Committee and the Watershed Council were requested to designate representatives to serve on this subcommittee.

Pursuant to the action by the Grand River Basin Coordinating

Committee, the following persons served on the Public Information Subcommittee:

Robert Fellows	Department of Agriculture
Robert Schueler	Bureau of Sports Fishery & Wildlife
Robert Gregory	Department of Army
Mike Perrini	Department of Army
John H. Kennaugh	Michigan Grand River Watershed Council
Dale W. Granger	State of Michigan

Mr. Kennaugh was designated to serve as Secretary for the Public Information Subcommittee.

The Public Information Subcommittee was created to assist the Michigan Grand River Watershed Council in conducting an Informational Program throughout the Grand River Basin. Recognizing the importance of time to conduct these meetings to allow the local governmental units and the general public to be a part of the planning process, the Coordinating Committee authorized its Chairman to review and sanction the Public Informational Program to be developed by the subcommittee (Exhibit No. 2).

ROLE OF THE MICHIGAN GRAND RIVER WATERSHED COUNCIL

The Grand River Basin is the second largest basin in the State of Michigan covering an area of over 5,500 square miles. There are approximately 1 million people living in the area, governed by a multiplicity of governmental units including; 13 counties, 29 cities, 43 villages and 158 townships. The Watershed Council is composed of "grass roots" elements of these communities and provides them the opportunity to become involved in the planning aspects of a water management program and continue their involvement by carrying out the program.

One of the roles of the Watershed Council is to serve as a catalyst between the local communities and the Federal and State planners in the preparation of the Grand River Basin Plan. Implementation of the program was the responsibility of the Michigan Grand River Watershed Council with assistance from the Federal and State agencies. The Watershed Council has been represented on the Basin Plan Formulation Committee in the preparation of the Preliminary Plan

and has accepted the responsibility of presenting the suggested plan to the people throughout the Grand River Basin. Its role has been to provide information and encourage responsible "feedback" so that the concerns, attitudes and suggestions by the people will be recognized in the development of the comprehensive plan.

The Michigan Grand River Watershed Council through its Executive Secretary has effectively demonstrated how local people can be involved in regional resource planning by State and Federal agencies. A major element of comprehensive planning is social acceptance of the plan. Public involvement in the planning process is the first step toward social acceptance.

THE PUBLIC INFORMATIONAL PROGRAM

PUBLICATIONS

The Public Information Program was conducted in accordance with the approved outline developed by the Public Information Subcommittee. This section will briefly describe the various elements of the program.

INFORMATIONAL BOOKLET

The first major element of an Informational Program was the preparation of a booklet under the title, "Preliminary Plan - Grand River Basin Comprehensive Water Resources Planning Study". This booklet contains general information on the planning program under the following titles:

Watershed Management

Introductory Review to the Preliminary Plan

15 Year Need for the Grand River Basin Plan

Suggested Projects for the Grand River Basin Plan

Grand River Basin Inventory and Trends

Economic Summary

The booklet also included a two page spread with a schematic diagram of the Grand River Basin identifying the 3 Valley Preserve Areas, 14 Watershed Development Projects and 17 Reservoir Sites.

The Informational Booklet was distributed to all government officials throughout the basin immediately prior to the public release of the Preliminary Plan. The booklet was also distributed at all general meetings.

LOCATION MAPS

Location maps were prepared to generally identify each element of the plan in the Preliminary Plan. These maps were used to illustrate tentative locations and the general scope of each program.

DESCRIPTION SHEETS

Description sheets described the scope of the suggested program with regard to its physical characteristics and the benefits that could be derived from it.

INFORMATIONAL MEETINGS

MUNICIPAL AND STATE PLANNERS

The first formal meeting of the Informational Program was for the Municipal Planners, Inter-Agency State Committee and District Conservationists held Monday, 24 March 1969.

The meeting was sponsored and conducted by the Michigan Grand River Watershed Council. Representatives from each of the Federal and State agencies on the Coordinating Committee presented various aspects of the Preliminary Plan as outlined in the agenda (Exhibit No. 3). The attendance included; 10 representatives from local governmental units, 3 from State agencies and 20 from Federal agencies.

BREAKFAST FOR MICHIGAN STATE LEGISLATORS

The public release for the Preliminary Plan of the Grand River Basin Study, was given on Tuesday, March 25, 1969 at a Breakfast Meeting for Michigan State Legislators. The meeting was sponsored and conducted by the Michigan Grand River Watershed Council.

State and local officials had the opportunity to meet with the Grand River Basin Coordinating Committee. They also received information on the planning program and an overview on the Preliminary Plan for the Grand River Basin Study (Exhibit No. 4).

Attending were nine of the twenty-four state legislators serving districts in the Grand River Basin. Also attending were seven representatives from the news media, six from local governmental units, three from the State of Michigan and fifteen representatives from the Federal agencies.

PRESS CONFERENCE

A Press Conference was arranged by the Michigan Grand River Watershed Council to permit indepth discussion between representatives of the news media and the representatives from the Federal and State agencies. An agenda was prepared for the presentation, however, it was determined that a round table discussion would be more effective (Exhibit No. 5).

This meeting immediately followed the Legislative Breakfast to include all representatives from State, Federal and local governmental units and the representatives from the news media.

Exhibit No. 6 is a listing of all persons attending the initial meetings to introduce the Preliminary Plan.

MICHIGAN GRAND RIVER WATERSHED COUNCIL

Special meetings were conducted for the representatives on the Michigan Grand River Watershed Council to give them an early opportunity to review the Preliminary Plan:

April 8	Carson City
April 9	Lansing
April 10	Wyoming

The agenda for these meetings was typical for all other general meetings and meetings for the general public (Exhibit No. 7).

The emphasis at these meetings was twofold; (1) to provide an informational service to the people in the Basin, and (2) to give the local people an opportunity to respond to the suggested plan. Special emphasis was given to the fact that the Plan was in the state of development and was subject to changes, depending on local activities and concerns. Additions, deletions or changes of the plan could still be made in order to provide the necessary benefits to satisfy the projected needs of the Basin.

LEGISLATIVE BOARDS, COUNCILS AND COMMISSIONS

Special appearances were made before the legislative bodies of the County Boards of Supervisors and major cities by the Executive Secretary of the Watershed Council to present an overview of the Preliminary Plan (Exhibit No. 8). Opportunity was given for question and answers after descriptive information had been presented on various elements of the plan that would influence each respective governmental unit. Additional detailed information was subsequently forwarded to the various planning agencies for their review and comment.

REGIONAL MEETINGS FOR ELECTED OFFICIALS

Regional meetings were arranged for the elected officials from smaller cities, villages,and townships. These meetings were all conducted in the evenings and following the same format as the meetings

for the Watershed Council Regional Meetings (Exhibit No. 9). The legislative members of 15 cities, 18 villages, and 158 townships were invited to attend the eight scheduled meetings.

LOCALLY SPONSORED MEETINGS

Local organizations were encouraged to sponsor public informational meetings. Planning Commissions, Civil organizations, Soil Conservation Districts and other Conservation organizations were encouraged to serve as hosts for an Informational Meeting to provide publicity, meeting place and other local arrangements. The format of these meetings were similar to other regional meetings in the Basin (Exhibit No. 10).

Exhibit No. 11 is a recapitulation sheet reporting all the scheduled informational meetings from 23 March to 30 June. This exhibit indicates approximately the number of persons attending the meetings.

SPECIAL RADIO AND TELEVISION BROADCASTS

Public Service Broadcasts were provided by several radio and television stations throughout the Basin. These broadcasts were normally 30 minutes in length and followed the form of question and answer between the radio moderator and Executive Secretary of the Watershed Council. The most unusual broadcast was a 60 minute color television program which permitted the presentation of an overview of the Preliminary Plan and allowed the opportunity for the viewing audience to raise questions during the live broadcast to be answered by a panel of four representatives of the Federal and State agencies and the Watershed Council (Exhibit No. 12).

NEWSPAPER REPORTS

Detailed information on the suggested Basin Plan was forwarded to the newspapers throughout the Basin for their convenience in reporting. This information was used in the local papers as Public Informational Meetings were conducted in their respective areas. All reviews and reports on the news articles indicate the information was printed without bias and has provided a meaningful service to the general public.

INFORMATIONAL TOOLS AND TECHNIQUES

An Informational Program is contingent upon the availability and dissemination of understandable concepts and data. Otherwise, there will not be reasonable response or participation by the respondents.

Various tools of information were used to accomplish this prupose including; publications, visual-aid materials, direct presentations and communications. A description of some of the tools and techniques is as follows:

INFORMATIONAL BOOKLET

The general content of this booklet was previously described in the early part of this report. One additional emphasis in the booklet is the need to evaluate water management needs on a regional basis and the importance to recognize alternative programs to satisfy the anticipated needs.

DETAIL SKETCHES AND DESCRIPTIONS

A very important informational tool was the preparation of detail sketches on each of the various programs in the Basin Plan and a general description explaining the concept of the program with regard to its physical requirements and the benefits that may be derived from the program.

Throughout the Informational Program, strong emphasis was given to the fact that all water management programs suggested in the Basin Plan were "concepts" rather than projects to satisfy the anticipated demands, and that technical details of the program could only be established at such time as detailed engineering was completed and the scope of the program was defined.

TWENTIETH CENTURY RIVER FILM

The Twentieth Century River film was used to open all regional meetings and meetings for the general public. The film was selected because of its clear explanation of how the Comprehensive Water Resources Planning Study was conducted on the Potomac River Basin. Because of certain variations in procedures between the two studies, the Michigan Grand River Watershed Council added a leader and trailer to the film to better relate it to the Grand River Basin.

GRAND RIVER BASIN SCHEMATIC MAP

A large schematic map identifying the various water management programs in the Preliminary Plan was mounted for public display at each Informational Meeting. Through the use of this map, it was convenient to demonstrate the regional need for Water Management Programming and the correlation of various types of Water Management

Programs. In addition to the large wall map, small sketches were also mounted on panel boards with connecting lines to a centralized Basin map to vonveniently geographically locate the detailed sketches of the total plan.

ROLA VISION CONTROL PANEL

The Rola Vision Control Panel is a motorized unit to roll a sixty foot scroll across a 20 by 30 inch screen. This unit was used during each public informational presentation to describe the planning program and identify the various elements of the Grand River Basin Plan.

PORTABLE DICTATING UNIT

A portable dictating unit was carried at all times throughout the Informational Program to record questions, comments, attitudes and general observations after each of the meetings. The unit was also available for making on the spot notations, reminders for follow thru items and to dictate essential letters.

ATTITUDES AND FEEDBACK

The greatest importance of the Informational meetings is to give the local people an opportunity to respond to the suggested plan. The general attitude of the public is that the plan appears reasonable. Negative attitudes to the Plan are where people will be displaced or where the suggested plan may vary with local ideas. Many people could not effectively respond to the Plan because of their lack of understanding of its scope or intent. More reactions might have been realized if it involved immediate financing. Following each meeting, the most salient questions and comments were recorded.

Several suggestions were made during the Informational Program to change the Plan for various reasons. The following points are submitted for further review by the Basin Plan Formulation Committee and the Grand River Basin Coordinating Committee:

* A request was submitted to expand the navigational element of the Grand River Basin Plan to provide recreational navigation on the Grand River from Grand Rapids to Lake Michigan.

* A suggestion was made to provide more emphasis on stream channel clearance during the early action program.

* More consideration should be given to designating the total length of the Grand River as a Valley Preserve Program.

* The suggested plan should be reviewed by an Ecologist to give recognition to the broad spectrum of human and natural resource values.

* The Valley Preserve Program should provide more latitude for private ownership of property along the streams.

From Jackson Metropolitan Area Regional Planning Commission:

* "At this time, we would like to request the Grand River Watershed Council to consider including an impoundment on the Grand River south of the City of Jackson."

An individuals comment from the Village of Portland:

* "to enter strong protest on the selection of reservoir site No. 51.

"In the summer of 1968, the Portland Watershed Council devised a plan concerning the Grand River in the Portland area.

"The Portland Plan will provide a 400 acre lake behind the existing Portland Municipal Dam and can be developed with minimal expenditures of public funds."

* Flood Plain Studies should be considered a significant element of the comprehensive plan to assist communities in developing desirable land use programs.

* Request from the Cities of Grandville, Walker, Wyoming and Grand Rapids:

"to pursue a program towards the elimination of all obstructions and hazards presently found within the Grand River."

* Watershed Development Program on the Plaster Creek, Buck Creek and Lookingglass River should be included in the Comprehensive Plan.

There is a prevailing attitude that the Grand River Basin Plan is the Watershed Council's Plan, even though adequate information has been given explaining the role of the Federal and State agencies in the preparation of the study. This attitude may suggest many things, but it is apparent the Michigan Grand River Watershed Council is recognized as the agency representing and serving on behalf of the governmental units throughout the basin.

CLOSING REMARKS

A historical review of the Informational Program reveals some areas where the program may have been improved. But it can be said the objectives of the program have been accomplished. One of the greatest areas of weakness is in the limited time the program could be conducted in order to provide the greatest input to the planning process. The period of time could have been increased from three to four months and begun three months earlier to effect the most desired results.

Prepared Public Releases to announce Informational Meetings would have provided aid to local organizations. Brief news articles on the Basin Planning would have been used by the local weekly papers. A series of articles was initiated by the Watershed Council but was discontinued because of the limited number of papers utilizing these resources. The major weakness in the articles was the excessive length. Local papers were only interested in the local programs.

It is important for the completeness of this report to include a copy of the resolution adopted by the Grand River Basin Coordinating Committee, 7 May 1969 (Exhibit No. 13).

EXHIBIT INDEX

TITLE	NUMBER
COMMUNICATION FROM MICHIGAN GRAND RIVER WATERSHED COUNCIL	1
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AGENDA - INFORMATIONAL MEETING FOR PLANNERS	3
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AGENDA - INFORMATIONAL MEETINGS	7
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SPECIAL RADIO AND TELEVISION BROADCASTS	12
RESOLUTION BY GRAND RIVER BASIN COORDINATING COMMITTEE	13

Exhibit No. 1

MICHIGAN GRAND RIVER WATERSHED COUNCIL / 609 PRUDDEN BUILDING • LANSING, MICHIGAN 48933 • phone: 517 489-0552

December 4, 1968

Chairman and Members
Federal Coordinating Committee of the
Grand River Basin Study
Kent County Airport
Grand Rapids, Michigan

Gentlemen:

This letter is submitted to the Federal Coordinating Committee for a two fold purpose; the first to express our appreciation for permitting our involvement in the planning process of the Grand River Basin Study, and the second purpose to seek your permission to permit us to conduct an informational program on the preliminary draft of the basin plan.

We wish to thank you for the "open door" relationship you have made available to us to meet with your committee. You not only tolerated our presence but allowed us to share in the discussions and contribute to the decision making process. We are extremely grateful for the opportunity to serve on the Basin Plan Formulation Committee and be a co-partner in the development and drafting of the preliminary plan that has been accepted for further review preliminary to adoption.

The second purpose of this letter is equally significant to the Council and it can be even more important to the communities in the basin. We have previously expressed our concern and desire to serve a key role in relating the proposed plan for the Grand River Basin to the governmental, professional and lay people in our local communities. To fulfill this role we respectfully seek your approval to permit the Michigan Grand River Watershed Council to conduct a series of informational meetings throughout the basin. A proposed schedule of meetings is attached outlining the minimum number of meetings that should be conducted.

EXECUTIVE COMMITTEE RAPK W. BOUMA Chairman COLLINS I. THORNTON Vice Chairman ROBERT J. EASTON Secretary-Treasurer ROSCOE DeVRIES WINFRED T. ETTESVOLD WALTER I. VACLAVIK ARTHUR V. WHITTINGTON

EXECUTIVE SECRETARY, JOHN H. KENNAUGH

The meetings would be informational and educational in content, but would be presented to encourage constructive responses prior to final plan formulation. Members of the Watershed Council and its staff would assume responsibility for preparing and conducting all meetings. However, there should be at least one federal and one state representative participating on the program scheduled for governmental officials and the news media. To further assure the success of these meetings, we recommend $1,000.00 be appropriated for the reproduction of the various reports listed in the attached outline. If the appropriation of funds is not possible, approximately 3,000 sets of the suggested materials as a part of the planning program.

Another phase of the informational program that is included in the attached outline is the preparation of a series of articles to be prepared weekly for a Watershed Council captioned column in the newspapers. This column would be prepared and printed under the by-line of the Executive Secretary of the Watershed Council. Through this media the program of the Council will be discussed with particular emphasis on the Comprehensive Water Resources Planning Study. The Council staff would assume responsibility for preparing the articles. However, assistance would be needed from the federal agencies to properly prepare the reports on the Planning Study.

Another important phase for an effective informational program is presenting the program to the radio and TV audience. During the past two years our Council has been privileged to participate on several special half-hour TV programs and many radio broadcasts. During a six month program beginning in January, a coordinated radio and TV broadcast calendar should be developed. It is anticipated each of the four TV stations would sponsor one-half hour public service programs. In each of these programs there should be a panel comprised of 3 representatives, one a federal representative, one a state representative and one a Watershed Council representative. The radio broadcasts could be the responsibility of the Watershed Council staff.

BEST AVAILABLE COPY

The significant value in the described program is the opportunity given to the "grass roots" of our communities to participate in the planning process of municipal improvements designed to satisfy their long range needs. Heretofore, their involvement has been only through the representative services of the Watershed Council. It is more important that they understand the planning process and appreciate the alternative methods that have been evaluated to satisfy their long range needs. An informed public is an educated public, and an educated public is needed to support propositions designed to provide community benefits on a regional basis.

In summary, the Watershed Council recommends endorsement by the Federal Coordinating Committee to the following items:

1) Authorize the Watershed Council to conduct an informational program throughout the basin to present the "tentative plan to meet 1985 needs."

2) Authorize the expenditure of $1,000.00 for the printing of informational materials to be used by the Watershed Council in the informational programs.

3) Encourage federal and state representatives to participate in programs designed for governmental officials, municipal planners and special TV broadcasts.

4) Encourage federal and state representatives to assist the Watershed Council in developing news articles for weekly publication in the local newspapers.

Your endorsement of these recommendations will be a significant step toward correlating federal, state and local planning of our water resources. This action will further exemplify the value in establishing water management programs on a regional basis.

Respectfully submitted,

John H. Kennaugh

John H. Kennaugh
Executive Secretary

JHK:bb
Enc.

Exhibit No. [illegible]

GRAND RIVER BASIN
INFORMATIONAL MEETINGS

MUNICIPAL AND STATE AGENCY PLANNERS	FULL DAY
NEWS MEDIA	HALF DAY
WATERSHED COUNCIL REGIONAL MEETINGS	THREE EVENINGS (MINIMUM)
MUNICIPAL,STATE AND FEDERAL ELECTED OFFICIALS	NINE EVENINGS (MINIMUM)

GRAND HAVEN
GRAND RAPIDS
GREENVILLE
ST. JOHNS
NASHVILLE
LANSING
JACKSON
IONIA
SPARTA

CIVIC ORGANIZATIONS - Locally sponsored for Joint Program	LUNCHEON OR DINNER MEETINGS (AS REQUESTED)
PUBLIC FORUMS - LOCALLY SPONSORED	EVENING MEETINGS (AS REQUESTED)

PUBLICATION MATERIALS FOR DISTRIBUTION

- Basin Plan Map (small)
- Cost Data Sheet
- Benefit Data Sheet
- Sub Area Boundaries
- Preliminary Basin Needs
- Reservoir Summary Sheet
- The Planning Process Section I, App. Q
- Application of Alternatives
- Valley Preserve Districts
- Multi Purpose Reservoirs
- Small Watershed Projects
- Availability of Project Descriptions

OTHER INFORMATIONAL SERVICES

- "Twentieth Century River" film
- Weekly News Article by Watershed Council
- Monthly Newsletters

Exhibit No. 1.4

MICHIGAN GRAND RIVER
WATERSHED COUNCIL

WEEKLY NEWS COLUMN
ByLine - John H. Kennaugh

ORGANIZATION OF COUNCIL

LEGISLATIVE PROCESS OF COUNCIL-STANDING & TECHNICAL COMMITTEES

RESUME OF COUNCIL PROGRAMS

COMPREHENSIVE WATER RESOURCES PLANNING STUDY

PURPOSE
PLANNING ORGANIZATION
ROLE OF WATERSHED COUNCIL
PLANNING PROCESS
ECONOMIC BASE STUDY
POTENTIAL RESERVOIR SITES
SINGLE PURPOSE PLANS BY FEDERAL AGENCIES
REVIEW OF EACH SINGLE PURPOSE PLAN (14)
PREPARATION OF PLAN
REVIEW RESERVOIR CAPABILITIES
REVIEW BASIN NEEDS
SELECTION OF MULTIPURPOSE RESERVOIRS
SMALL WATERSHED PROJECTS
VALLEY PRESERVE DISTRICTS
1985 COORDINATED PROGRAM
POST 1985 PROGRAM

WATERSHED COUNCIL SUBCOMMITTEES

ORGANIZATION, PURPOSE AND PROGRAM

SOIL EROSION

FLOOD PLAIN INFORMATION STUDIES

WATER QUALITY CRITERIA

STREAM MONITORING PROGRAM

STREAM APPRECIATION MONTH

REPORT ON COUNCIL MEETINGS

WATER MANAGEMENT ACTIVITIES OF MEMBER UNITS

WATER MANAGEMENT LEGISLATION

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Exhibit No.

PUBLIC INFORMATION PROGRAM
by
GRAND RIVER BASIN PUBLIC INFORMATION SUBCOMMITTEE

MARCH

The United States Senators of Michigan and the Congressional Representatives whose districts are in the Grand River Basin will be contacted prior to public announcement of the suggested plan. Initially they will be advised of the status of the study and the proposed Informational Program. Special briefing on the study will be made available to the members of Congress and their staff, as requested. An opportunity will also be offered to the Congressional members to participate in any aspect of the Informational Program.

MARCH 14

The Watershed Council will mail Informational booklets to all elected officials in the Grand River Basin prior to any public news release of the program.

Five thousand booklets is the suggested number to be printed initially. The Watershed Council will distribute the booklets to governmental agencies, organizations and the general public during the Informational Program.

Additional publications for distribution by the Watershed Council should include 1000 Basin Plan maps and 250 local or sub-basin area maps with descriptions.

MARCH 24

Municipal Planners meeting for regional, city, county and township staff personnel, to permit indepth discussion of the Plan as it pertains to the planning areas of the planning agencies represented.

MARCH 25

The Watershed Council will sponsor a breakfast meeting for the Michigan Legislators to present the first public release of the Grand River Basin Plan in the Public Relations Program. The Inter-Agency Committee and other state agency representatives will also be invited to attend the meeting.

A mid-morning press conference will be conducted for representatives of the news media to present the Basin Plan in detail to equip them with background information for subsequent news reports.

The meetings for the two days were scheduled back to back to accommodate traveling limitations for governmental agencies to attend both meetings.

MARCH 26
to
APRIL 30

This period of time would be used to present informational meetings before the legislative bodies of the County Board of Supervisors and major cities of the Basin including; Jackson, Lansing, Grand Rapids, Wyoming, and Grand Haven. Kennaugh would be responsible for scheduling the meetings, and presenting the material.

The Informational Committee expressed the importance of having state and/or federal representatives at these meetings for resource purposes.

A series of regional meetings would also be conducted for the purpose of presenting the Basin Plan to the elected officials from smaller cities, villages and townships. The number of regional meetings will be determined by the impact that the proposed improvements will have on the area and the number of people affected by the plan. Tentative projections indicate there will be at least 8 or 10 regional meetings.

Public Service TV programs will be arranged with the six studios serving the Grand River Basin. Special broadcasts by radio stations will also be encouraged.

MAY 1 to JUNE 30 — Planning Commissions, Soil Conservation District Boards and service organizations will be encouraged to host public informational meetings throughout the basin.

FEBRUARY 3 to JUNE 30 — February 3, the Watershed Council has started a series of articles to be published in the weekly newspapers for the purpose of explaining the program of the Watershed Council and to give emphasis to the Grand River Basin Comprehensive Planning Study.

NOVEMBER — The Informational Committee recommends that the Grand River Basin Coordinating Committee conduct Three public hearings; one for each of the metropolitan areas to enable persons to comment on the plan as approved by the Grand River Basin Coordinating Committee.

CONTINUING PUBLIC INFORMATION SUB-COMMITTEE — The Informational Committee recommends to the Grand River Basin Coordinating Committee to continue the Public Information Subcommittee as an AD-Hoc organization for further assignments by the Grand River Basin Coordinating Committee as a means of assisting in the continuing program of the Grand River Basin Plan.

FUTURE ROLE OF WATERSHED COUNCIL — The Informational Committee recommends that the Michigan Grand River Watershed Council be encouraged to continue its role in the planning process by; maintaining the weekly publications as a continuing program; to assume a leadership role in the promotion and implementation of the plan by local governmental units; and preparation of progress reports to the governmental units on the progress and implementation of the plan.

Committee: Dale Granger, Chairman
John H. Kennaugh, Secretary
Robert Fellows
Robert Gregory
Mike Perrini
Robert Schueler

February 6, 1969

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Exhibit No. 3

GRAND RIVER BASIN
PRELIMINARY PLAN

INFORMATIONAL MEETING

A G E N D A

MUNICIPAL PLANNERS - INTER AGENCY STATE COMMITTEE - DISTRICT CONSERVATIONISTS
Monday - March 24, 1969

OPENING REMARKS	Michigan Grand River Watershed Council
Twentieth Century River	Michigan Grand River Watershed Council
OVERVIEW OF 15 YEAR DEVELOPMENT PLAN	Colonel James T. White, Jr., Chairman Grand River Basin Coordinating Committee
REVIEW OF PUBLIC INFORMATIONAL PROGRAMS	State of Michigan
REVIEW OF WATER SUPPLY & WATER QUALITY NEEDS & PROVISIONS	Federal Water Pollution Control Administration Department of Interior
REVIEW OF FISH & WILDLIFE NEEDS AND PROVISIONS	Bureau of Sport Fish Department of Interior
REVIEW OF RECREATION NEEDS & PROVISIONS	Bureau of Outdoor Recreation Department of Interior
FLOOD CONTROL NEEDS & PROVISIONS	District, Corps of Engineers
REVIEW OF AGRICULTURAL NEEDS AND PROVISIONS	Department of Agriculture Soil Conservation Service
REVIEW OF MAJOR RESERVOIR PROGRAMS	District, Corps of Engineers
REVIEW OF WATERSHED DEVELOPMENT PROGRAMS	Department of Agriculture Soil Conservation Service
REVIEW OF VALLEY PRESERVE DISTRICTS	State of Michigan
REVIEW OF NON STRUCTURAL PROGRAMS	State of Michigan
DISCUSSION FROM THE FLOOR	

Meeting Host - Michigan Grand River Watershed Council

Exhibit No. 4

GRAND RIVER BASIN
PRELININARY PLAN

INFORMATIONAL MEETING

A G E N D A

L E G I S L A T I V E B R E A K F A S T
Tuesday - March 25, 1969

OPENING REMARKS	Frank W. Bouma, Chairman Michigan Grand River Watershed Council
INTRODUCTION OF COLONEL JAMES T. WHITE, JR. Detroit District, Corps of Engineers Chairman Grand River Basin Coordinating Committee	Frank W. Bouma, Chairman Michigan Grand River Watershed Council
INTRODUCTIONS	Colonel James T White, Jr. Chairman Grand River Basin Coordinating Committee
GRAND RIVER BASIN COORDINATING COMMITTEE AND STAFF	
REVIEW PLANNING PROGRAM TO DATE	John H. Kennaugh, Executive Secretary Michigan Grand River Watershed Council
REVIEW PRELIMINARY PLAN	Philip McCallister U.S. Army Corps of Engineers
STATEMENT BY STATE OF MICHIGAN	Charles D. Harris Department of Natural Resources
STATEMENTS BY FEDERAL REPRESENTATIVES	
REVIEW OF SUCCEEDING PLANNING PROCESS	Colonel James T. White, Jr. Chairman Grand River Basin Coordinating
OPEN DISCUSSION	

Meeting Host - Michigan Grand River Watershed Council

Exhibit No. 5

GRAND RIVER BASIN
PRELIMINARY PLAN

INFORMATIONAL MEETING

A G E N D A

P R E S S C O N F E R E N C E
Tuesday - March 25, 1969

OPENING REMARKS	Frank W. Bouma, Chairman Michigan Grand River Watershed Council
INTRODUCTION OF COLONEL JAMES T. WHITE, JR. Detroit District, Corps of Engineers Chairman Grand River Basin Coordinating Committee	Frank W. Bouma, Chairman Michigan Grand River Watershed Council
GRAND RIVER BASIN COORDINATING COMMITTEE AND AGENCY STAFF	
BRIEF REVIEW OF PLANNING PROCESS	
PAST, PRESENT, FUTURE	Department of Agriculture
REVIEW OF PRELIMINARY PLAN BY SUBAREAS	District Corps of Engineers
MAJOR RESERVOIR PROGRAMS	District, Corps of Engineers
WATERSHED DEVELOPMENT PROGRAMS	Department of Agriculture Soil Conservation Service
VALLEY PRESERVE DISTRICTS	State of Michigan
REVIEW OF NON STRUCTURAL PROGRAMS	John H. Kennaugh, Executive Secretary Michigan Grand River Watershed Council
OPEN DISCUSSION	

Meeting Host - Michigan Grand River Watershed Council

Exhibit No. 6

MEETING ATTENDANCE

FOR

RELEASE OF PRELIMINARY PLAN

NAME	AGENCY
State	
Byker, Gary	State Senate
Buth, Martin	State Representative
DeStigter, Melvin	State Representative
Ford, Thomas	State Representative
Geerlings, Edgar	State Representative
Pittenger Phil O.	State Representative
Sietsema, Jelt	State Representative
Warner, Dale	State Representative
Ziegler, Hal	State Representative
Colburn, William H.	Department of Natural Resources - Recreation Resource Planning
Christensen, Kenneth E.	Department of Natural Resources - Fish Division
Dersch, Eckhart	State Soil Conservation Commission
Meyer, Bill	Bureau of Sport, Fish and Wildlife
Ownbey, C. R.	Federal Water Pollution Control Administration
Wicks, Jim	Michigan Department of Natural Resources
Municipal	
Bechtel, William	East Lansing Planning Department
Brehm, W. A.	Meridian Charter Township Planning Commission
Brown, Edwin P. Brown	Lansing Planning Department
Glick, Arthur N.	Tri County Regional Planning Commission
Maier, Herbert D.	Tri County Regional Planning Commission
Price, Ronald E.	Jackson Metropolitan Area Regional Planning Commission - Fargo Engineering
Rowden, Bill	Tri County Regional Planning Commission
White, Arlen	Jackson Metropolitan Area Regional Planning Commission

NAME	AGENCY
Associations	
Herbert, Paul	Michigan United Conservation Clubs
News Media	
Ingells, Norris	State Journal
Isbister, Cleo	Williamston Enterprise
Vestol, Bud	Booth Newspapers
Voges, Bob	Associated Press
Musser, John	WOOD - TV
Sorg, Walt	WILX - TV
Such, Andrew	WILX - TV
Federal	
Ash A. D.	U. S. Geological Survey
Babb, Robert J.	Weather Bureau
Baker, Francis	U. S. D. I. Bureau Outdoor Recreation
Barclay, Woodrow H.	Soil Conservation Service
Bathurst, Verne M.	Soil Conservation Service
Campbell, Lloyd B.	U. S. D. A. Soil Conservation Service
Crook, Leonard T.	Great Lakes Basin Commission
Fellows, Robert A.	Soil Conservation Service
Gregory, Robert	U. S. Army Corps of Engineers
Halstead, Robert G.	Soil Conservation Service
Hamp, John W.	Soil Conservation Service
Jarecki, E. A.	Great Lakes Basin Commission
Kerr, Richard L.	U. S. Forest Service
Krashen, Harry	Bureau of Public Roads
McCallister Philip	U. S. Army Corps of Engineers
Nelson, Carl F.	Bureau of Outdoor Recreation
Oshel, Loren	U. S. D. A. Soil Conservation Service
Perrini, M. J.	U. S. Army Corps of Engineers
Roberts, Glen H.	U. S. Army Corps of Engineers
Shaffer, L. G.	U. S. Weather Bureau (Kansas City, Mo.)
Somers, Wendell	U. S. D. A. Soil Conservation Service
Young, Leonard	Federal Power Commission
Grand River Watershed Council	
Bouma, Frank	Chairman
Easton, Robert	Secretary-Treasurer
DeVries, Roscoe	Executive Committee
Ettesvold, Winfred	Executive Committee
Vaclavik, Walter	Executive Committee
Whittington, Arthur	Executive Committee
Sweinberger, Ralph	Member
Barros, Barbara	Secretary
Pavona, Mary	Secretary
Kennaugh, John H.	Executive Secretary

Exhibit No. 7

AGENDA

INFORMATIONAL MEETINGS

PRELIMINARY PLAN
GRAND RIVER BASIN
COMPREHENSIVE WATER RESOURCES PLANNING STUDY

OPENING REMARKS

FILM - "TWENTIETH CENTURY RIVER"

COMPREHENSIVE PLANNING ON THE POTOMAC RIVER BASIN

OVERVIEW OF PRELIMINARY PLAN

SUGGESTED PLAN FOR GRAND RIVER BASIN

QUESTION AND ANSWER PERIOD

OPEN DISCUSSION WITH FEDERAL AND STATE PLANNERS

Exhibit No. 8

MEETING SCHEDULE

LEGISLATIVE BOARDS, COUNCILS AND COMMISSIONS

April 1	Gratiot County Board of Supervisors	9:00 a.m.
April 8	Ionia County Board of Supervisors	9:30 a.m.
April 9	Montcalm County Board of Supervisors	1:00 p.m.
April 11	Kent County Board of Supervisors	9:00 a.m.
April 15	Jackson County Board of Supervisors	10:00 a.m.
	Barry County Board of Supervisors	2:00 p.m.
	Eaton County Board of Supervisors	3:30 p.m.
	Ingham County Board of Supervisors	7:30 p.m.
April 16	Ottawa County Board of Supervisors	1:30 p.m.
April 17	Livingston County Board of Supervisors	10:00 a.m.
April 21	Grand Haven City Council	7:30 p.m.
April 22	Wyoming City Commission	12:00 Noon
	Muskegon County Board of Supervisors	4:00 p.m.
April 29	Grand Rapids City Commission	1:00 p.m.
May 13	Jackson City Commission	7:30 p.m.

Exhibit No. 9

MEETING SCHEDULE

REGIONAL MEETINGS FOR ELECTED OFFICIALS

April 16 Jackson County Regional Meeting

Village of Parma; Townships of Springport Tompkins, Rives, Henrietta, Waterloo, Parma, Sandstone, Blackman, Leoni, Grass Lake, Spring Arbor, Summit, Napoleon, Liberty and Columbia; Work Unit Conservationist and District Board: Drain Commissioner and Staff.

April 17 Ottawa and Muskegon Counties Regional Meeting

Villages of Spring Lake and Coopersville; Townships of Spring Lake, Grand Haven, Crockery, Robinson, Polkton, Allendale, Blendon, Chester, Wright, Tallmadge, Georgetown, Moorland, Casnovia, Fruitport, Sullivan and Ravenna; City of Hudsonville; Work Unit Conservationists and District Boards; Drain Commissioners and Staffs.

April 23 Clinton and Shiawassee Counties Regional Meeting

Villages of DeWitt and Fowler; Townships of Lebanon, Essex, Greenbush, Duplain, Dallas, Bengal, Bingham, Ovid, Westphalia, Riley, Olive, Victor, Eagle, Watertown, DeWitt, Bath, Fairfield, Middleburg, Owosso, Sciota, Bennington, Shiawassee, Woodhull, Perry and Antrim; City of St. Johns: Work Unit Conservationists and District Boards; Drain Commissioners and Staffs.

April 24 Kent and Newaygo Counties Regional Meeting

Villages of Caledonia, Casnovia, Cedar Springs, Kent City, Sparta and Grant; Townships of Tyrone, Solon, Nelson, Spencer, Sparta, Algoma, Courtland, Oakfield, Alpine, Plainfield, Cannon, Grattan, Grand Rapids, Ada, Vergennes, Lowell, Cascade, Paris, Byron, Gaines, Caledonia and Bowne; Cities of East Grand Rapids, Rockford, Granville, Lowell and Walker; Work Unit Conservationists and District Boards; Drain Commissioners and Staffs.

Exhibit No. **9.1**

April 28 Ingham and Livingston Counties Regional Meeting

Villages of Leslie and Fowlerville; Townships of Delhi, Meridian, Lansing, Williamston, Locke, Alaiedon, Wheatfield, Leroy, Aurelius, Vevay, Ingham, White Oak, Onondaga, Leslie, Bunkerhill, Stockbridge, Conway, Handy, Howell, Iosco and Marion; Cities of East Lansing, Williamston and Mason; Work Unit Conservationists and District Boards; Drain Commissioners and Staffs.

April 30 Montcalm and Gratiot Counties Regional Meeting

Villages of Edmore and Carson City; Townships of Cato, Belvidere, Home, Pierson, Maple Valley, Pine, Douglass, Day, Ferris, Montcalm, Sidney, Evergreen, Crystal, Eureka, Fairplain, Bushnell, Bloomer, New Haven, Newark, North Star, Hamilton, North Shade, Fulton, Washington and Elba; City of Greenville; Work Unit Conservationists and District Boards; Drain Commissioners and Staffs.

May 1 Eaton and Ionia Counties Regional Meeting

Villages of Portland, Lake Odessa, and Saranac; Townships of Delta, Sunfield, Roxand, Oneida, Windsor, Benton, Chester, Vermontville, Kalamo, Carmel, Eaton, Eaton Rapids, Hamlin, Brookfield, Bellevue, Otisco, Orleans, Ronald, North Plains, Lyons, Ionia, Easton, Keene, Boston, Berlin, Orange, Portland, Danby, Sebewa, Odessa and Campbell; Cities of Ionia and Belding, Eaton Rapids and Grand Ledge; Work Unit Conservationists and District Boards, Drain Commissioners and Staffs.

May 14 Barry County Regional Meeting

Villages of Middleville, Nashville and Woodland; Townships of Thornapple, Irving, Carlton, Woodland, Castleton, Hastings, Rutland, Yankee Springs, Orangeville, Hope, Baltimore, Maple Grove, Johnstown; City of Hastings; Work Unit Conservationist and District Board; Drain Commissioner and Staff.

Exhibit No. 10

MEETING SCHEDULE

LOCALLY SPONSORED MEETINGS

DATE	HOST
June 5	Williamston City Planning Commission
June 9	Sparta Hunting and Fishing Club
June 17	West Michigan Environmental Action
June 19	Livingston County Federation of Republican Women
June 23	Montcalm Soil Conservation District
July 23	South Grand Rapids Rotary
Sept. 11	Grand Rapids Electro Platers' Association
Oct. 2	Jackson League of Women Voters
Oct. 18	Michigan Federation of Business and Professional Women
Nov. 4	Lansing River Forest Garden Club
Nov. 18	Environmental Health Department - Ferris State College
Dec. 17	Southwest Michigan Sanitarium's Seminar
	Grand Rapids Chamber of Commerce

BEST AVAILABLE COPY

Exhibit No. 11

CONFIRMED SCHEDULE

BASIN PLAN INFORMATIONAL MEETINGS

APRIL				
1	Tuesday	Gratiot County Board Meeting	9:00 a.m.	14
8	Tuesday	Ionia County Board of Supervisors	9:30 a.m.	11
		Watershed Council Regional Meeting, Carson City	7:30 p.m.	2
9	Wednesday	Montcalm County Board of Supervisors	1:00 p.m.	10
		Watershed Council Regional Meeting, Lansing	7:30 p.m.	32
		Livingston County Board of Realtors	7:30 a.m.	40
10	Thursday	Watershed Council Regional Meeting, Wyoming	7:30 p.m.	27
11	Friday	Kent County Board of Supervisors	9:00 a.m.	41
15	Tuesday	Jackson County Board of Supervisors	10:00 a.m.	37
		Barry County Board of Supervisors	2:00 p.m.	14
		Eaton County Board of Supervisors	3:30 p.m.	28
		Ingham County Board of Supervisors	7:30 p.m.	95
16	Wednesday	Ottawa County Board of Supervisors	1:30 p.m.	27
		Jackson Regional Meeting, Jackson	7:30 p.m.	19
17	Thursday	Livingston County Board of Supervisors	10:00 a.m.	22
		Ottawa and Muskegon Regional Meeting, Grand Valley State College, Allendale	7:30 p.m.	6
21	Monday	Grand Haven City Council	7:30 p.m.	28
22	Tuesday	Wyoming City Council	12:00 Noon	14
		Muskegon County Board of Supervisors	4:00 p.m.	19
23	Wednesday	Clinton, Shiawassee Regional Meeting, St. Johns	7:30 p.m.	19
24	Thursday	Kent, Newaygo Regional Meeting, Calvin College	7:30 p.m.	6
28	Monday	Ingham, Livingston Regional Meeting, Mason	7:30 p.m.	33
29	Tuesday	Grand Rapids City Council	1:00 p.m.	37
30	Wednesday	Montcalm, Gratiot Regional Meeting, Stanton	7:30 p.m.	6
MAY				
1	Thursday	Eaton, Ionia Regional Meeting, Portland High School	7:30 p.m.	19
12	Tuesday	Jackson City Council	7:30 p.m.	35
14	Wednesday	Barry County Regional Meeting, Central School	7:30 p.m.	6

Exhibit No. 12

SCHEDULE

SPECIAL RADIO AND TELEVISION BROADCASTS

April 7	WZZM - TV	Farm Station	30 Min.	Grand Rapids
	WZZM - TV	Focus	30 Min.	Grand Rapids
	WJFM - Radio		30 Min.	Grand Rapids
April 8	WKZO - TV	Face Michigan	30 Min.	Kalamazoo
April 22	WJFM - Radio		30 Min.	Grand Rapids
April 24	WILX - TV		30 Min.	Jackson
May 14	WJCO - Radio		30 Min.	Jackson
May 24	WJIM - TV		60 Min.	Lansing
July 11	WILS - Radio		15 Min.	Lansing
Oct. 3	WILS - Radio		15 Min.	Lansing

Exhibit No. 13

RESOLUTION

WHEREAS, a Type II study for the Grand River Basin was authorized by Congress in 1963 and a Coordinating Committee established to conduct a comprehensive water resources planning study, and

WHEREAS, the Grand River Basin Coordinating Committee is comprised of six Federal agencies and the State of Michigan to jointly develop a long-range comprehensive plan for the Grand River Basin, and

WHEREAS, the Michigan Grand River Watershed Council was authorized in 1966 by Governor George Romney to assist and advise the State of Michigan on behalf of all local governmental units in the Grand River Basin in the preparation of the plan, and

WHEREAS, the representatives of the Grand River Watershed Council have diligently, faithfully, and effectively participated with the Grand River Basin Coordinating Committee and the Basin Plan Formulation Subcommittee to an extent heretofore unprecedented in this type of planning, and

WHEREAS, the Michigan Grand River Watershed Council has effectively assumed the responsibility and is conducting an intensive informational program on the preliminary plan to inform, educate and solicit "grass roots" feed back as part of the planning process,

THEREFORE, BE IT RESOLVED, that the Grand River Basin Coordinating Committee commends the Michigan Grand River Watershed Council for its initiative and willingness to accept its role and effectively represent the local governmental units in the preparation of the plan, and its continuing effort to involve "grass roots" participation in the planning process.

BE IT FURTHER RESOLVED, the Grand River Basin Coordinating Committee will continue to assist the Michigan Grand River Watershed Council as it serves in behalf of the local governmental units.

Adopted by unanimous action of the Grand River Basin Coordinating Committee this 7th day of May, 1969.

Submitted by R. S. Fellows, Alternate Member (Soil Conservation Service) for the Grand River Basin Coordinating Committee.

February 6, 1969

APPENDIX B

BASIN DESCRIPTION

GRAND RIVER BASIN
COMPREHENSIVE PLANNING STUDY

Compiled by the
U. S. ARMY ENGINEER DISTRICT, DETROIT
Corps of Engineers

GRAND RIVER BASIN
COMPREHENSIVE PLANNING STUDY

APPENDIX B

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SUMMARY

From its headwaters in Northeastern Hillsdale County at elevation 1040 feet, the Grand River flows northward to Lansing, Michigan, where it makes an abrupt bend and meanders westerly to Grand Haven where it discharges into Lake Michigan.

The Grand River wanders 260 miles through a Basin 135 miles long and up to 70 miles in width. With a drainage area of 5,572 square miles, the Grand River Basin encompasses all or part of nineteen counties. The topography of the basin is a function of Pleistocene Glaciation with moraines and outwash plains dissected by streams. Kettles occur sporadically on outwash plains and usually are filled with water as swamps or lakes. Till plains, moraines, kames, and esker systems of the Port Huron morainic system are the predominant surface feature with relief of 50 to 60 feet. Sixty-three percent of the basin is taken up by pasture and cropland. Forests occupy 15 percent of the area. The Basin has an excellent system of highways and is well served by railroad and airline facilities. The harbor at Grand Haven has a minimum draft of 21 feet, and there is a channel 100 feet wide and eight feet deep extending 17 miles upstream. Above this point, the River is not suitable for commercial navigation. The soils of the lower Basin from Lowell westward are very fertile. Oil and natural gas reserves are estimated at 10.7 million barrels and 51,300 million cubic feet respectively. Clay, sand, gravel, gypsum, limestone, sandstone, and marl are natural mineral resources which occur in sufficient amounts to meet projected needs. The basin enjoys a moderate continental climate and annually experiences 155 frost-free growing days. Average temperature ranges from 70°F. in July to 25°F. in January. Precipitation averages 31 inches annually and the annual snowfall is about 45 inches. The population of the basin exceeds 1,000,000. The Basin still retains its agricultural character, but light and heavy industry has grown to be important in the cities of Jackson, Lansing, Grand Rapids, and Grand Haven. Detailed information and data concerning the Basin that are relevant to the Comprehensive Basin Planning Study are in this and several other appendices.

SECTION I

INTRODUCTION

1. PURPOSE

Appendix B is intended to provide a concise description of the Grand River Basin. It is divided into sections on physical characteristics, available transportation facilities, geological makeup, history of development, archaeological resources, and current land treatment practices. Basin hereafter means the Grand River Basin.

a. The topography of the Grand River Basin is a product of glaciation somewhat altered by the elements of time and man. Glacial drift and numerous glacial deposits in the form of till plains, moraines, eskers, kames, and outwash plains form the surface features of the basin.

b. Transportation facilities are well developed in the Basin. The highway system is extensive and includes several sections of new interstate highways. Water transportation is limited to small pleasure craft in most streams because of the limited depth of water. Rail freight lines are numerous but commercial airline service is limited to the three largest cities.

c. The Basin was largely a wilderness area well into the 1800's. Fur trading and the cultivation of scattered small farms were the pursuits of the few white inhabitants. Improved transportation led to a land boom in the 1830's with the lumbering industry coming into prominence between 1840 and 1870. The cut-over lands resulting from the lumbering industry were easily converted to farm lands and thus farming became a predominant occupation around the turn of the century. Two-thirds of the Basin area is presently cropland and pasture.

d. The Basin's agricultural character persists today, but industrial growth has been important, as urban areas now occupy about eight percent of the land. The Basin's light and heavy industry is concentrated in three metropolitan areas - Jackson, Lansing, and Grand Rapids.

e. Several dams and a lesser number of reservoirs are present on the Grand River and its tributaries. These are normally very small and most have not been used actively for the protection of flood plains against excessive river flows.

f. The most important known mineral resources in the Basin are fuels and non-metallic minerals. Petroleum and natural gas constitute the fuels. The non-metallic minerals include sand, gravel, clay, shale, sandstone, gypsum, limestone, marl, and natural salines. There are no known coal deposits of importance. All of the Basin's commodities, except petroleum and natural gas, are relatively abundant from the standpoint of local demand.

g. Conservation of land resources in the Basin has been initiated in several ways; however, much remains to be done. Definite programs of development for recreation, flood control reservoirs, floodwater protection projects, and farm and forest management are essential. Land treatment measures are needed to satisfy current needs for land resources and also to conserve this resource for future needs.

h. It is estimated that 1,000,000 people live in the Basin. People living in urban centers of 2,500 or more population are grouped as follows:

County	City	1960 Population
Barry	Hastings	6,375
Clinton	St. Johns	5,629
Eaton	Eaton Rapids	4,052
	Grand Ledge	5,165
Ingham	East Lansing	30,028
	Lansing	120,035
	Mason	4,522
Ionia	Belding	4,887
	Ionia	6,754
	Portland (Village of)	3,330
Jackson	Jackson	50,720
Kent	East Grand Rapids	10,924
	Grand Rapids	202,269
	Grandville	7,975
	Kentwood	15,852
	Lowell	2,545
	Walker	8,271
	Wyoming	50,145
	Sparta (Village of)	2,749
Montcalm	Greenville	7,440
Ottawa	Grand Haven	11,066
	Hudsonville	2,649
	Spring Lake (Village of)	2,798

SECTION II

PHYSIOGRAPHY

2. LOCATION AND EXTENT

a. General. The Grand River Basin drains into Lake Michigan at Grand Haven, and is the second largest primary water drainage basin in Michigan. It is located in the southern part of the Lower Peninsula as shown in Plate B-1. The Basin is oval in shape and is about 135 miles long with a maximum width of 70 miles. It is bounded on the north by the Muskegon River and Saginaw River watersheds, and on the south by the Kalamazoo River watershed. The Basin, which has a drainage area of 5,572 square miles, includes all or part of nineteen counties. These counties and their drainage areas are presented in Table B-1. The economic base study area is limited to eleven of these counties.

b. Specific Location. The source of the Grand River is a series of small lakes located in the northeastern corner of Hillsdale County and southern Jackson County in south central Michigan. The drainage divide elevation is about 1,040 feet in these upper reaches of the Basin. From its source, the Grand River winds northward through Jackson County and is first impounded in the City of Jackson. North of Jackson, the Grand is joined by the Portage River flowing in from the east. The river crosses the 900-foot contour just south of the northern border of Jackson County, then swings to the west and receives Sandstone Creek from the south.

The Grand then flows to the northwest, passing through the southwest corner of Ingham County, and then entering Eaton County where it flows over Smithville Dam, two miles south to the City of Eaton Rapids. On its continued northward flow it twice again swings temporarily to the east, entering Ingham County. On the most northern of these meanderings, the Grand is joined by the Red Cedar River as it enters the City of Lansing. The Red Cedar and its tributaries drain Ingham County and the Western part of Livingston County where its headwaters abut with the Huron River flowing to the Detroit River and the Shiawassee, which drains the southern part of the Saginaw Basin to the north.

TABLE B-1

GRAND RIVER BASIN
DRAINAGE AREAS BY COUNTY

County	Area in Square Miles		Percentage of County Area in Basin
	County	In Basin	
Allegan	829	4	0.5
Barry	549	397	72.0
Calhoun	709	9	1.0
Clinton	571	571	100.0
Eaton	567	474	84.0
Gratiot	566	223	39.0
Hillsdale	601	5	0.8
Ingham	559	543	97.0
Ionia	575	575	100.0
Jackson	705	441	63.0
Kent	862	841	98.0
Livingston	571	129	23.0
Mecosta	563	19	3.0
Montcalm	712	537	75.0
Muskegon	504	119	24.0
Newaygo	857	42	5.0
Ottawa	564	366	65.0
Shiawassee	540	267	49.0
Washtenaw	716	10	1.0
TOTALS	12,210	5,572	

As the Grand flows west from Lansing, it crosses the 800-foot contour at Delta Mills in north central Eaton County. Flowing then west across the southwestern corner of Clinton County and into southern Ionia County, it turns north toward its junction with the Maple River. At Portland, in southeastern Ionia County, the Grand crosses the 700-foot contour and receives the Lookingglass River, which drains southern Clinton County and eastern Shiawassee County to the east. The river is impounded by two dams (Wager Dam is now out) between Portland and Lyons where the Grand is joined by the Maple River. The Grand's size is greatly increased from this point on due to the influence of the Maple, which, with its tributaries, drains much of Clinton, southern Gratiot, and western Montcalm Counties to the north and a portion of Shiawassee County.

Coursing westward into Kent County, the Grand is joined by the Flat River from the north at Lowell and by the Thornapple from the south at Ada. While the Flat River arises in the north, where it drains central Montcalm County, the Thornapple joins the Grand after a long course from the southeast, from whence it drains most of Eaton and Barry Counties. From Ada, the Grand swings north into central Kent County as if to meet the Rogue River which arises south of the Muskegon drainage in southern Newaygo County and flows through Kent County to its junction with the Grand at Belmont. The Grand now doubles back to the south where, before continuing its western course, it flows through the City of Grand Rapids at the 600-foot contour. From Grand Rapids the river flows westward into Ottawa County and swings slightly to the northwest through Allendale then to Grand Haven where it discharges into Lake Michigan.

3. TOPOGRAPHY

a. Sub-basins

(1) Upper Grand and Portage River Basins. This area of the Grand River Basin is one of moderate relief with typical rolling glacial topography. The area is generally above 1,000 feet in elevation. Numerous lakes are present and about 10 percent of the area is covered with swamps or marshes. Bedrock formations outcrop in several locations, protruding through sandy glacial drift deposits which are usually less than 100 feet in thickness.

(2) Red Cedar, Lookingglass and Maple River Basins. The area is generally low in relief with gently rolling land, low hills, and shallow valleys. The northeastern part includes flat lands which have developed on extinct glacial lakes. The few lakes that are present are small and shallow with many large swamps and marshes scattered throughout the region.

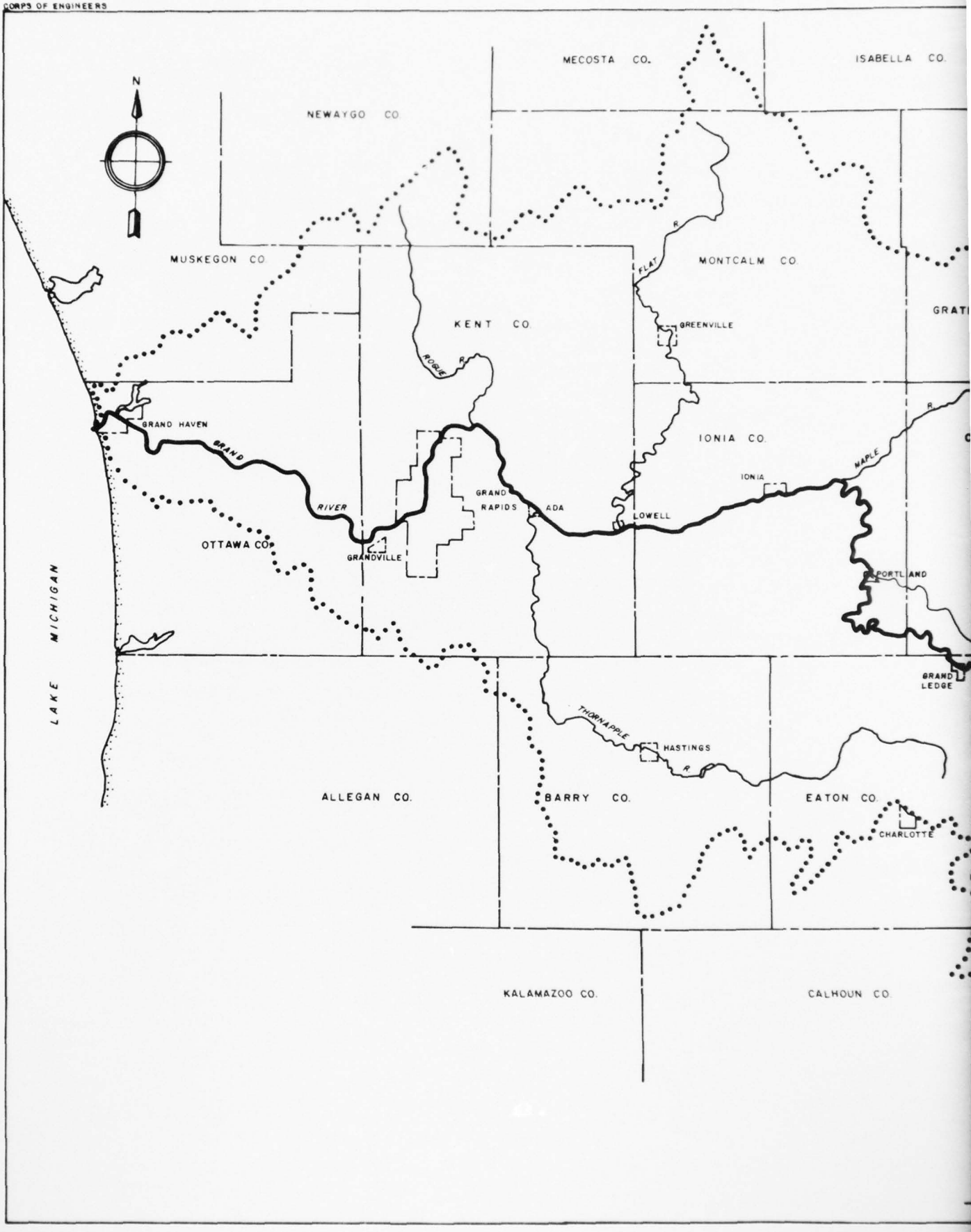
(3) The Flat, Rogue, and Prairie Creek Basins. The area includes some rugged relief features with rolling hills and highlands standing above deep valleys. The southern part of the area is one of dissected highlands and deeply entrenched valleys with steep, well drained slopes. Hills in the southern section are approximately 275 feet above the Grand River while in the northern sections hills rise to about 200 feet above adjacent lowlands. These relief characteristics give rise to relatively fast-flowing steep-gradient streams. The northern two-thirds of these basins are dotted with lakes, swamps, and marshes.

(4) The Thornapple River Basin

(a) The Thornapple Basin is topographically and physiographically divided into two parts. The upper part has less relief, more areas of flat and gently rolling topography, includes only a few lakes, and with the exception of the extreme eastern part, is well drained. The soils and underlying glacial sediments in this upper part contain much more clay and silt than the lower part.

(b) The lower part is more rugged and includes numerous lakes and large closed depressions. The glacial drift is sandier and includes some extensive areas of sand and gravel.

(c) Areas of maximum local relief are along the Thornapple River and its tributaries. Relief between the flat bottom lands along the streams and tops of the adjacent hills increases in the downstream direction. In the upper reaches, the local relief is about 50 feet. Relief increases at Vermontville to 140 feet and to over 200 feet at Hastings. Downstream from Hastings the local relief continues to become greater, reaching 200 to 225 feet. The maximum of 250 foot elevation difference is reached between bottom lands adjacent to the Grand and the tops of the nearby hills.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GRANDVILLE
PORTLAND
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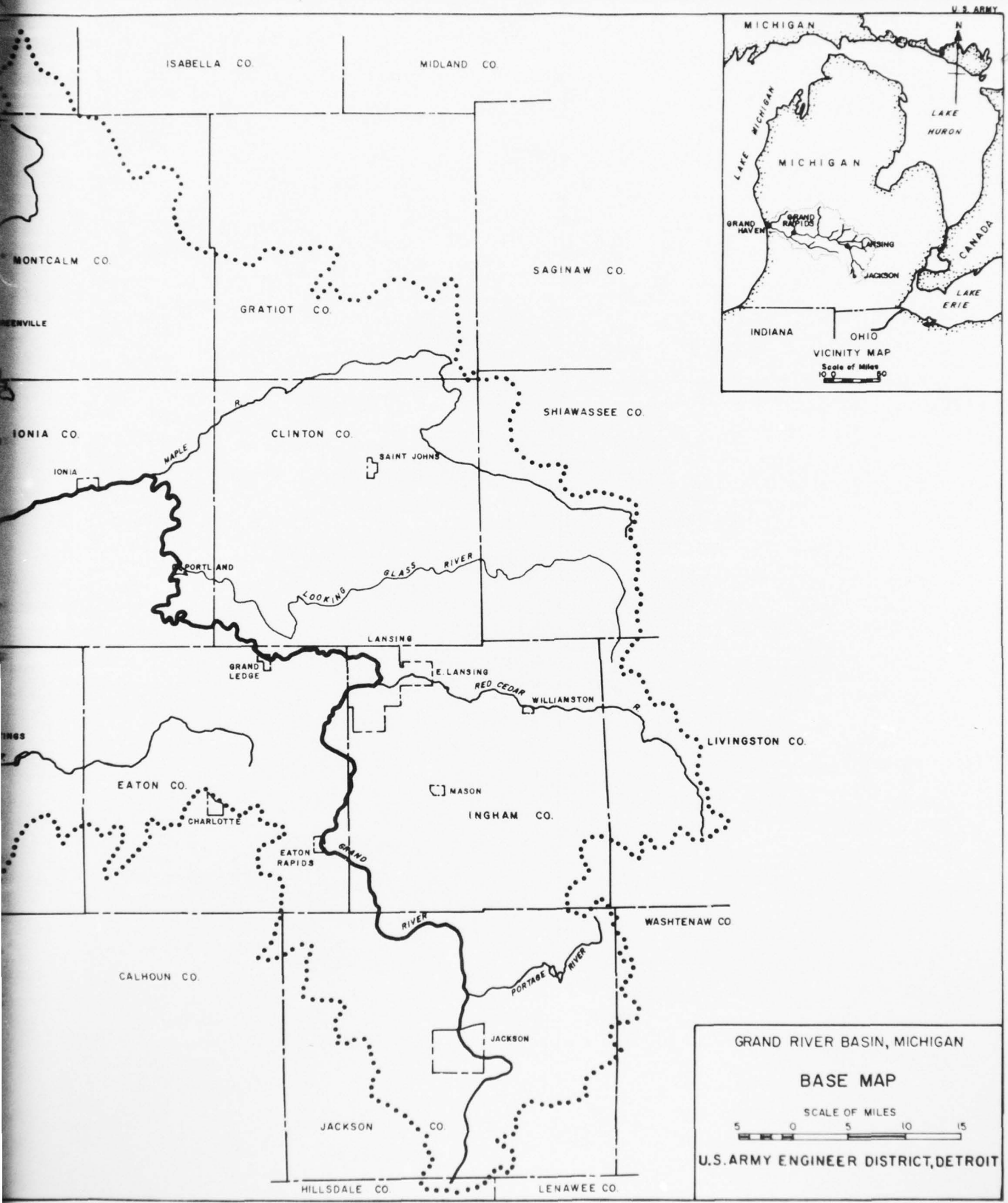

GRAND RIVER BASIN, MICHIGAN

BASE MAP

SCALE OF MILES

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U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE B-1

(5) Lower Grand River and Crockery Creek Basins. The lowest part of the Grand River Basin ranges from fairly rugged topography along the entrenced main stream of the Grand River in the Grand Rapids area to a low flat plains area along the lower reaches of the stream. Much of this area, however, is flat to gently rolling. Many of the tributary streams of this area flow through steep walled valleys, where they join the entrenched valley of the Grand River. The streams are commonly twenty or more feet below the surrounding uplands.

b. Glacial Influence. The topography of most of the Basin may be briefly described as undulating, dissected by water courses, with occasional small plains studded with bogs and small lakes. The size and general shape of the Grand River Basin are controlled by the topography of the underlying bedrock surface; however, most of the surface features of the Basin result from glacial deposition and erosion. Till plains, moraines, and esker systems provide local relief of between 50 and 80 feet. All of these are features of the Port Huron morainic system. A north-south line of rugged topography is located near the center of Kent County. The features of this area were formed by the meeting of two glacial lobes. As the Grand River flows generally northward from Jackson to Lyons, it successively cuts a series of moraines formed by the Saginaw lobe of the Port Huron glacial phase - these are, from the south to the north, the Kalamazoo, Charlotte, Lansing, Grand Ledge, Ionia, and Portland moraines. The river then turns west, recutting the Ionia, Grand Ledge, Lansing, and Charlotte moraines as these swing to the north. Just east of Grand Rapids, the Grand cuts the Valparaiso moraine of the Lake Michigan lobe of the Port Huron system. To the west of the same city, the river transects the Lake Border moraine of the Lake Michigan lobe and flows westward into the beds of former glacial lakes. As the Grand flows to Lake Michigan, it cuts three major beach systems of Glacial Lake Michigan: Glenwood at 640 feet dating from 13,000-12,500 years before present; Calumet standing at 620 feet and dating from 12,000 before present; and finally, Toleston at 605 feet which shortly follows Calumet in time. The Allendale delta, which covers about 100 square miles in the vicinity of Allendale, was formed by glacial outflow through the Grand Valley at the time of the Glenwood stages of Lake

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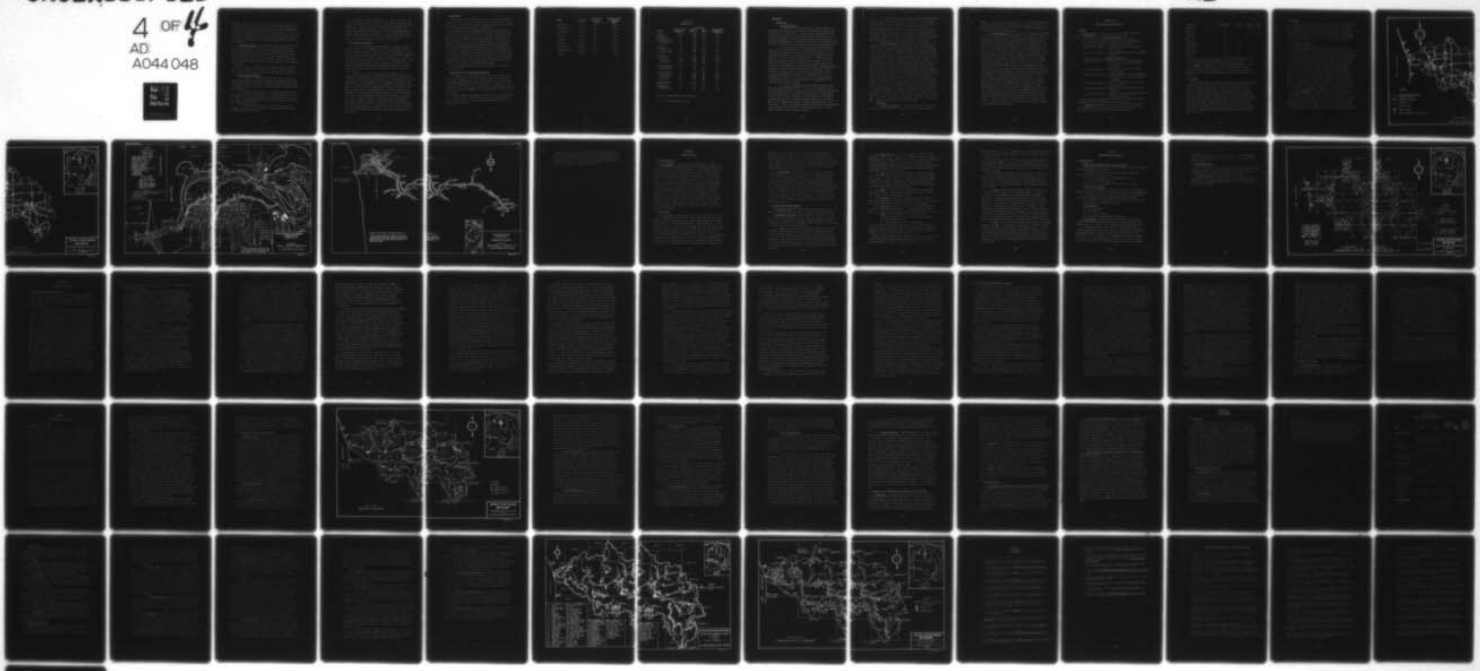

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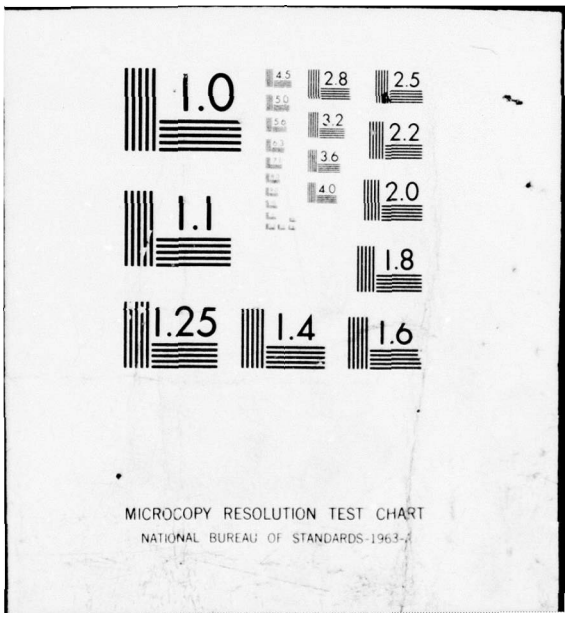
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Chicago. During the period of the final Cary retreat to the time of the Cary-Port Huron interval and again during the Port Huron advance, the Grand River valley provided the main outlet for the glacial discharge and melt waters which accumulated in the Huron and Erie Basins. This flow found its way through Imlay Channel of the thumb area of Michigan, or later through the Saginaw Basin into the Grand Valley from whence it spilled into Glacial Lake Chicago and then southward through the Chicago River to the Mississippi.

c. General Basin Relief. From Lake Michigan to the high point in the Basin (located in southern Jackson County), the elevation difference is approximately 700 feet. Local relief in the northeastern Basin area ranges from 200 to 275 feet above the Grand River banks; however, such characteristics constitute less than 1/5 of the total Basin area. The major part of the Basin is flat and featureless. Maximum local relief in areas above Maple Rapids, Portland, and Hastings generally varies between 50 and 75 feet.

Bunday Hill at elevation 1,282 feet in Somerset Township, Hillsdale County, is the highest point in the Basin, while the lowest elevation is near the mouth of the river at 581 feet in Grand Township, Ottawa County.

d. Lakes, Swamps and Marshes

(1) Glaciation is responsible for the many lakes, swamps, and marshes in the Basin. The lakes were formed when depressions left by the receding glacier filled with water. Subsequent filling of many of these glacial lakes with muck, peat, marl and other sediments have since produced swamps and marshes.

(2) Swamps and marshes make up a significant part of the Looking-glass, Maple, and Red Cedar River Basins. The upper reaches of the Flat and Rogue River Basins include extensive and numerous swamps, marshes, and many lakes, as does the middle part of the Thornapple Basin and the upper part of the Grand River Basin.

(3) The Upper Grand River Basin is flat and has poor natural drainage. This is evidenced by the lakes, swamps, and artificial drains distributed throughout the area.

(4) The entire Basin contains numerous lakes, most of which are less than 200 acres in area. There are only 26 lakes with surface areas greater than 2[illegible]0 acres of lake surface waters within the Basin (Bibl. No.16, Data Book). Examples of the larger lakes are Spring Lake near Grand Haven, Ottawa County, the largest with 925 acres. Crystal Lake, Montcalm County, contains 724 acres, and Webber Pond, Ionia County, has 766 acres (Bibl. No.14, Michigan Lakes and Ponds). The majority of lakes in the Basin are quite small and under ten acres in surface area.

4. MAIN STEM AND TRIBUTARIES

a. The main stem of the Grand River traverses a distance of 260 miles from its source in the northeastern corner of Hillsdale County to its mouth at Grand Haven on the southeastern shore of Lake Michigan. The total drop in the river is 460 feet, with a fairly steep slope from the headwaters to Ionia, and a very flat slope from Ionia to Lake Michigan. The total area drained by the Grand and its tributaries is 5,572 square miles. River beds of the Grand are generally wide, varying from under 90 feet in the reaches above Jackson to over 500 feet close to Grand Haven. The flood plains on the main stem vary from a few hundred feet to a half mile or more in width.

b. The runoff in the Basin is from six major tributaries which discharge into the Grand River. The Red Cedar Rvier enters the Grand River in the City of Lansing and has a drainage area of 472 square miles (including Sycamore Creek). The Lookingglass Rvier, drainage area 290 square miles, enters at Portland; the Maple River, drainage area 970 square miles, enters above Ionia; the Flat River, drainage area 500 square miles enters after passing through Lowell; the Thornapple River, flowing northward out of a drainage basin of 875 square miles enters between Lowell and Grand Rapids; and the Rogue River, drainage area 255 square miles, comes in just above Grand Rapids. These six streams, in combination with the Portage River near Jackson, comprise a total of 3,866 square miles of drainage area, slightly more than 69 percent of the entire Basin (Bibl. No.16, Data Book). The remaining drainage area is accounted for by about thirty minor tributary creeks with drainage areas ranging in size from 65 square miles to two square miles.

5. STREAM SLOPES

a. The general downward slope of the Grand River from its headwaters to the vicinity of Grand Ledge is approximately 1.9 feet per mile. From Grand Ledge to Ionia the river slopes 3.2 feet per mile with an approximate 0.5 foot per mile slope from Ionia to Lake Michigan.

b. The average slopes of the major tributary streams range from 2.7 to 3.8 feet to the mile, while the slopes of the minor tributary streams range from 1.0 to eleven feet to the mile. From the confluence of the Maple River with the Grand, the drop is approximately fifty feet to the mouth of the Grand River. This is an average slope of 0.5 foot per mile and may be considered gradual when compared to some of the tributaries which have average sloped above ten feet per mile. From the headwaters of the Grand to the Maple River confluence the drop in river elevation is 410 feet over a distance of approximately 166 miles, for an average slope of 2.5 feet per mile. This is a greater slope than that for the western-most portions of the river and points out the general land mass pattern of exaggerated relief areas in the eastern section of the Basin with more gently sloping land patterns approaching Lake Michigan.

c. Certain physical features of the major and minor tributaries are shown in Table B-2.

6. STREAM CROSS SECTIONS AND CHANNEL CAPACITIES

a. In general, cross sections of the Grand River are typical for a river which flows through an area of moderate relief. The valley floor of the Basin westward from the approximate mid-Basin area is quite flat, with a gently sloping gradient to Lake Michigan. This results in wide shallow river beds in this reach. Existing channel capacities vary greatly throughout the Basin and depend on the characteristics of the reach under consideration.

b. Channel capacity is the amount of water, in cubic feet per second (cfs), a stream within a certain reach can carry without overflowing its banks. The width of the river and channel capacity near nine cities of the Basin are as follows:

City	River Mile	Average River Width (feet)	Average Channel Capacity (cfs)
Grand Haven	0-10	600	18,700
Eastmanville	20-30	500	10,000
Grand Rapids	30-40	400	4,630
Lowell	70-85	200	4,750
Portland	100-120	270	4,490
Lansing	120-160	220	3,670
Eaton Rapids	160-190	145	1,940
Tompkins Center	190-205	120	1,500
Jackson	215-235	65	1,000

TABLE B-2

STREAM SLOPES*

Stream	Length of River (Miles)	Elevations Headwaters (Ft.)	Elevations Mouth (Ft.)	Average Slope Ft./Mile
Grand River	260	1,040	580	1.8
Rogue River	50	800	610	3.8
Thornapple River	86	900	615	3.3
Coldwater River	33	860	720	4.2
Mud Creek	15	860	790	4.7
Flat River	73	900	620	3.8
Prairie Creek	29	800	630	5.9
Libhardt Creek	20	840	630	10.5
Maple River	71	840	630	3.0
Fish Creek	33	1,000	645	10.8
Stony Creek	30.5	830	640	6.2
Pine Creek	20	750	650	5.0
Lookingglass River	70	900	710	2.7
Sebewa Creek	14	860	730	9.3
Red Cedar River	46	960	820	3.0
Sycamore Creek	22.5	1,000	820	8.0
Sloan Creek	16	920	840	5.0
Deer Creek	14	930	860	5.0
Sandstone Creek	23	1,000	900	4.3
Portage River	35	956	910	1.3
Orchard Creek	17	980	915	3.8

Underlined streams indicate major subbasins.

* U. S. Army Corps of Engineers Data

7. VEGETATION

a. Forest Lands

(1) Original Conditions

(a) Ecologically, the southern part of lower Michigan, including the drainage basin of the Grand River, belongs to the Carolinian biotic province. This province is commonly known as the oak-hickory formation and extends south into the central eastern United States. Since the Grand River Basin lies near the northern margin of this province, it possesses high percentage of the species more typical of the Canadian biotic province, which constitute the lake forest formations of northern Michigan.

(b) Prior to 1830, the Basin was practically covered by a virgin stand of mixed hardwoods. In the southwestern part of the State, there are now, and were in the 1700's, isolated small prairies four to eight miles wide which are linked biologically to the larger aboriginal prairies of central Illinois and western Indiana. In Berrien and Cass Counties, these were the original prime land for settlers. Within the Basin, early explorers spoke of pockets of prairie land along the Grand River and at the headwaters of some of the tributaries. These were probably not natural prairies but burned-over lands which Indians had clared for cornfields and garden plots. Prairies which have been noted in early accounts were located near Hastings on the Thornapple River; north of Grand Rapids at the mouth of the Rogue River; at Lyons near the mouth of the Maple River; north of Lansing and south of the Lookingglass River; near Charlotte; and west of Jackson.

(c) In this original land cover of mixed hardwoods, there were occasional stands of oak trees. Those oak stands located along the Grand River were less dense and were used as the first sites for settlements. Along the sandy shore of Lake Michigan, including most of Ottawa County and part of Kent County, there was a southward extension of the northern coniferous forests, which included white pine, Norway pine, and hemlock. Small isolated swamps which abound in the Basin contained cedar, balsam, and tamarack. Some of these swamps have been drained within the last several years, producing rich celery beds and truck gardening plots, but many remain virtually in their original conditions.

(d) The same cannot be said for the hardwood and mixed forests. In 1830, except for the small prairies, a few oak clearing in which the trees had been girdled and cleared away, and settled land in the vicinity Jacksonburgh (now Jackson), the Basin was completely forested. By 1840 the lumbering boom had begun. By 1850 there were sawmills in most of the towns along the Grand River, with the center of hardwood lumbering at Grand Rapids. Within thirty years virtually all of the commercially valuable timber stands had been cleared off. Within the Basin today there are probably no remnants of the virgin forests except in a few swamps.

(2) Present Conditions. Woodlands today are restricted to lands difficult to till - along watercourses, hilly lands, and second-growth stands maintained between fields as a windbreak. Woodlots are maintained in many farms as sources of commercial fireplace logs. There are a number of small farms with stands of spruce and Scotch pine that are cut and sold locally as Christmas trees. The secondary growth in these woodlots reflects the composition of the earlier forests. The high morainic systems of the upper reaches of the Basin support a flora characterized by black, red, and white oaks, and hickories. Other diverse deciduous species such as cherry and walnut are present but they are not common. The flood plain of the river supports elm, red maple, silver maple, ash, sycamore, cottonwood, tulip, butternut, and beech. On the middle and lower stretches of the river, the valley supports the same flora, but the surrounding upland sites support sugar maple, beech, elm, basswood, and ash in addition to oak and hickory. On the sandy soils near the mouth of the River, white and Norway pines, as well as aspen, cedar, tamarack, elm, ash, red maple, and yellow birch are intermingled with the oak. Throughout the Basin, there have been no significant changes in the acreages of the forest lands since 1945. The total of 15.1 percent in forests is located, for the most part, in Kent, Montcalm, and Ottawa Counties in the northern and western sections of the Basin. The forest in this area is extensive and consists of hardwoods with small interspersed areas of pine and other softwoods.

b. Farm Lands

(1) Original Conditions. In the early 1800's the existing farm land consisted of small plots located in natural clearings or burned over

timber lands. These were used principally for growing corn and garden crops to feed the farmer's family. Farming greatly increased with the decline of the lumbering industry around the turn of the century with wheat, corn, potatoes and hay as the principal crops.

(2) Present Conditions. Most of the land not covered by residences, urban centers, and forests is under cultivation. The center of the Basin and the upper valley is primarily used for dairy and general farming. The northwestern fruit and dairy region dips down into northeastern Ottawa County and west central Kent County. The region around the mouth of the Grand River is engaged mainly in dairying, poultry raising, and truck gardening. The northwestern parts of Kent and Montcalm Counties are part of the large region of dairying, potato raising, and truck gardening. Ottawa, Gratiot, and Kent Counties are the most important counties in terms of value of agricultural products. Each produced 20 to 25 million dollars worth of agricultural products in 1964. Throughout the rest of the basin agricultural production ranged between 10 and 20 million dollars per county in 1964. Clinton, Gratiot, Ingham, and Shiawassee Counties are on the fringe of the area of sugar beet production which centers on Saginaw Bay. They are also on the periphery of the major dry bean producing region. From 500,000 to 1,700,000 bushels of winter wheat, and from one to four million bushels of corn, are harvested per county annually. Clinton, Gratiot and Shiawassee Counties are also major producers of soybeans. Montcalm County, at the northwestern edge of the Basin, has the largest potato production in the Basin (1.5 million hundredweight in 1964). Basin-wide production of hay averages fifty to seventy thousand tons per county annually, but Kent, Ionia, and Clinton Counties produce more than one hundred thousand tons each. Fruit and vegetable production are most important commercially along the lower Grand River in Kent and Ottawa Counties. Other crops include cucumbers, onions, mint, celery and small grains. Over half of the Basin is devoted to cropland; pasture comprises less than ten percent of the Basin.

SECTION III

BASIN TRANSPORTATION FACILITIES

8. HIGHWAYS

a. Highway System. The Basin has an excellent system of improved highways. Those extending in a north-south direction are:

US 131 - connecting Kalamazoo, Grand Rapids and Big Rapids;

US 127 and US 27 - connecting Jackson, Lansing, Ithaca and Alma;

Michigan State Highway 47 - from Webberville to Owosso;

Michigan State Highway 66 - connecting Nashville, Ionia, Stanton, and Six Lakes;

Michigan State Highway 37 - connecting Hastings, Grand Rapids, Sparta, and Bailey.

Highways extending in an east-west direction are:

Interstate Highway 96 - extending entirely across the Basin from Howell, through Lansing, Grand Rapids to Muskegon;

Interstate Highway 94 - extending east and west across the Basin through Jackson;

Michigan State Highway 43 - connecting Webberville, Lansing, Woodbury, and Hastings, then continuing southward to Kalamazoo;

Michigan State Highway 21 - connecting Owosso, Muir, Ionia, Lowell and Grand Rapids;

Michigan State Highway 45 - extending from Grand Rapids on to Lake Michigan;

Michigan State Highway 57 - connecting Clio, Ashley, Greenville, Cedar Springs and Kent City.

There are numerous secondary and county roads that traverse the Basin in east-west and north-south directions. (See Plate No. B-2).

b. Bus Service. Numerous bus routes serve the Grand River Basin and two nationally known car rental agencies are located in Lansing, Jackson, and Grand Rapids. An excerpt from the bus schedule follows:

Bus Line	Grand Rapids	Lansing	Jackson	Ionia
Indian Trails	X	X	X	
North Star	X	X	X	
Short Way	X	X	X	X
Silver Star	X			
A.B.C.	X			
Brooks Bus	X	X	X	
Indiana Motors	X	X	X	
Lake Shore	X	X	X	
S.E. Trailways	X	X	X	
Valley Coach	X	X		
Greyhound	X	X	X	X

Private taxi service, which is available in small cities as well as large, can be used to augment the other modes of surface transportation.

c. Trucking. The Basin is well served by truck transportation. Every city in the Basin is served by one or more ICC regulated firms. Most of the larger cities within the Basin have direct interstate and intrastate connections, while services to the smaller towns are provided through intrastate lines.

9. RAILROADS

A recent merger between The New York Central Railroad and The Pennsylvania Railroad resulted in the formation of the Penn Central Railroad. The Penn Central now serves the entire basin: Jackson, Eaton Rapids, Charlotte, Hastings, Grand Rapids, Grand Haven, and Muskegon operating east to west; and Mason, Lansing, and Owosso operating north to south. The Chesapeake and Ohio Railroad, operating in a general east-west direction, serves Lansing, Lake Odessa, Grand Rapids, Hudosnville, and Grand Haven, extending northwesterly from Grand Ledge, it serves Ionia, Lowell, Greenville, and Stanton. The Grand Trunk Western Railroad operates east and west from Owosso through Ionia, Lowell, Grand Rapids, and Grand Haven. Another section of the Grand Trunk Western extends southwest from Durand through Lansing and Charlotte. (See Plate No. B-2).

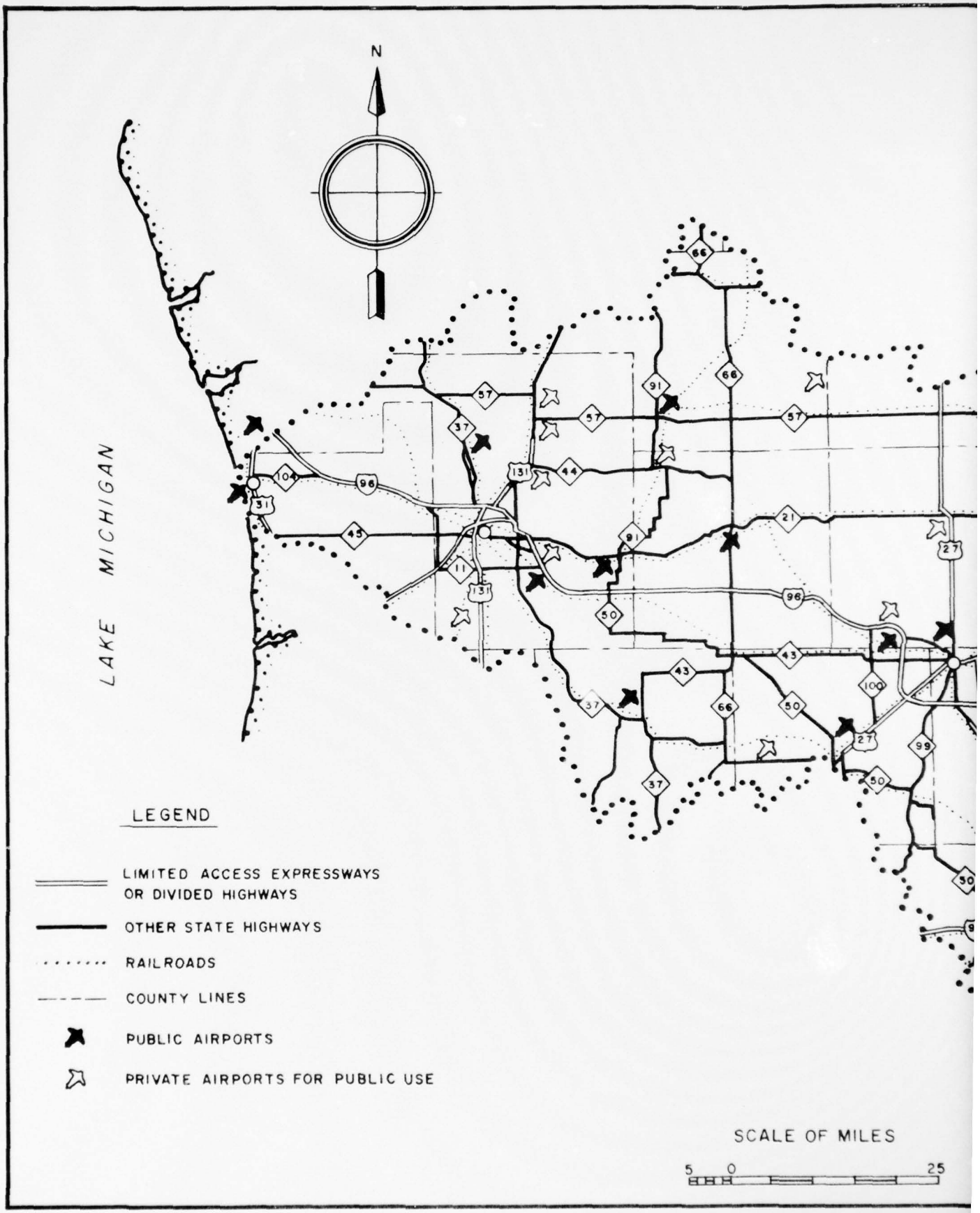
10. AIRLINES

The commercial airlines that serve the Basin are United and North Central Airlines. United Airlines from Chicago, Illinois, and Detroit serves Grand Rapids and Lansing; North Central Airlines serves Jackson, Lansing, and Grand Rapids. The Cities of Eaton Rapids, Mason, Owosso, Charlotte, Ionia, Belding, Greenville, and Sparta have airports, and private airplanes may be rented or leased to reach areas that the commercial airlines do not serve. (See Plate No. B-2).

11. WATERBORNE TRANSPORTATION

a. Commercial Usage. Water transportation on Grand Haven Harbor, Spring Lake, and the ensuing 14.5 miles upstream on the Grand River consists of commercial and pleasure boat traffic. The harbor's project depth is 21 feet, with an eighteen foot deep turning basin west of the Grand Trunk Western Railroad Bridge. From this bridge a channel 18 feet deep, 100 feet wide and 3100 feet long leads into Spring Lake. The channel in the Grand River above the entrance to Spring Lake is eight feet deep, 100 feet wide, and 14.5 miles long. (See Plate Nos. B-3 and B-4) The navigation season usually opens in April and terminates in December. During the season, approximately 2,794,000 tons of commercial cargo are transported within the Grand River Basin. The products that are shipped are bituminous coal, gasoline, natural gas, fuel oil, building cement, limestone, sand, slag, gravel, and crushed rock. Commercial transportation on the Grand River is limited to a maximum distance of about 17 miles, from the mouth of the Bass River downstream to the harbor at Grand Haven. The present channel dimensions limit the size and capacity of commercial vessels on the river.

b. Recreational Usage. The number of pleasure craft using the harbor and approximately fifteen miles of the Grand River upstream to the Bass River is estimated to be 4600 vessels. Little information concerning existing recreational boating traffic on the total length of the Grand River is available. However, there are significant numbers of recreational boats that make use of the river. Usage is mainly by small local outboard craft. This type of waterborne recreational transportation has increased significantly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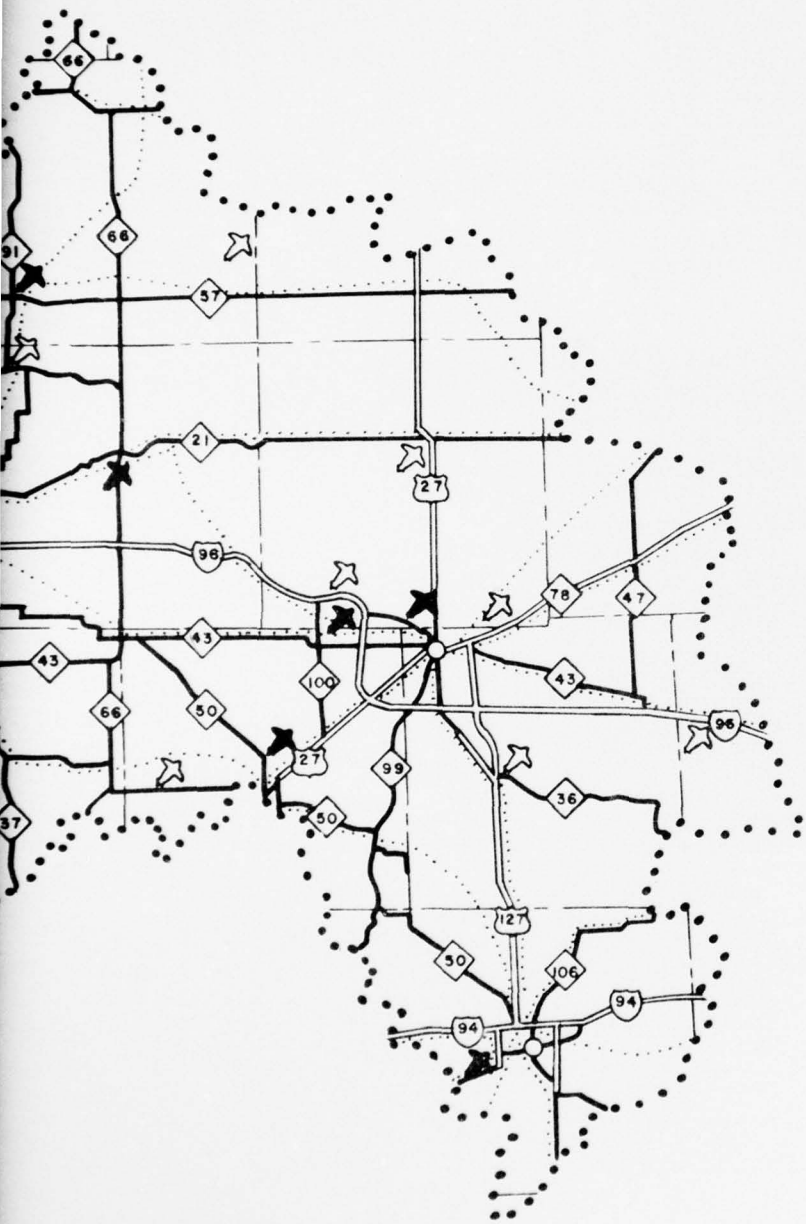

SCALE OF MILES

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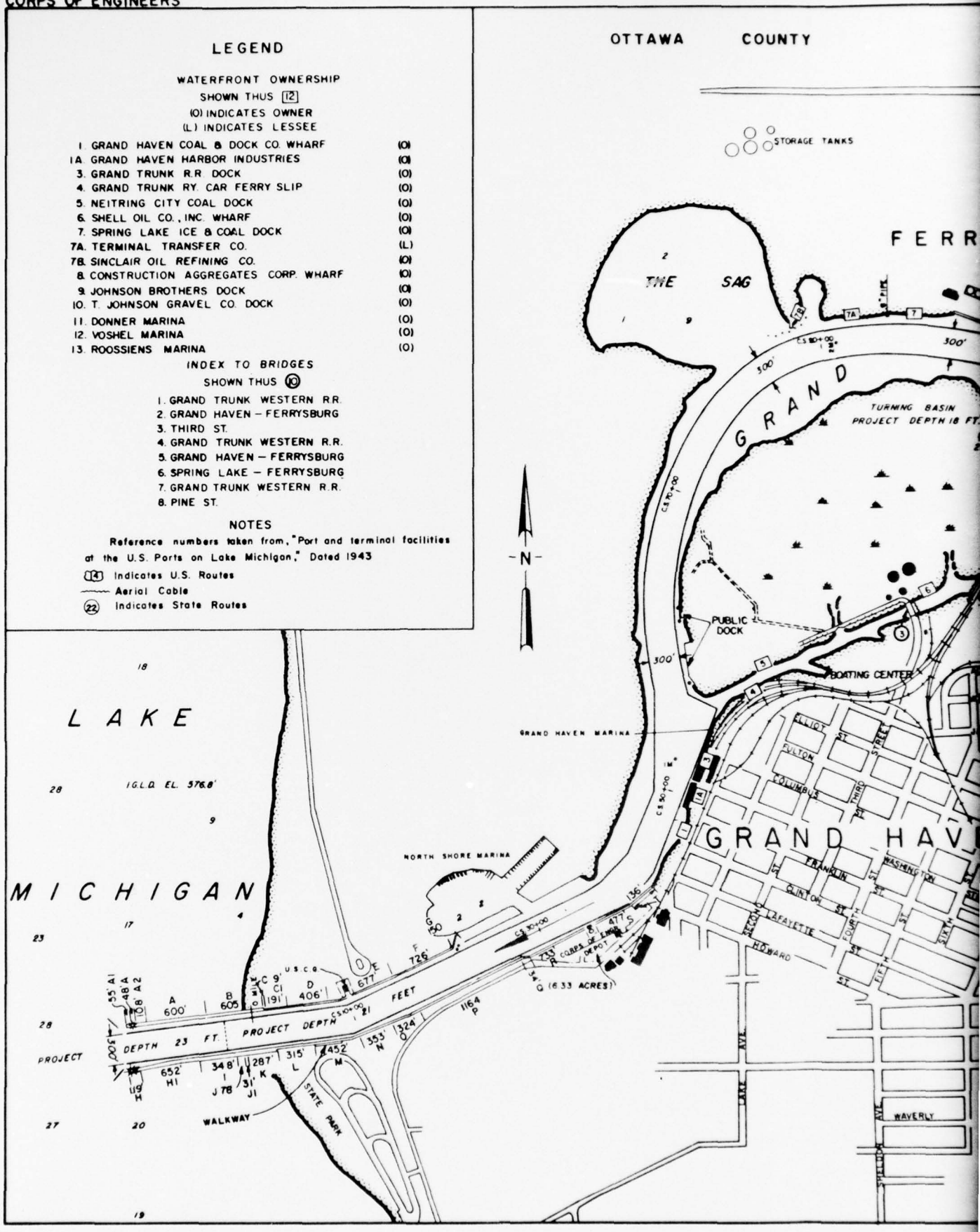
GRAND RIVER BASIN, MICHIGAN

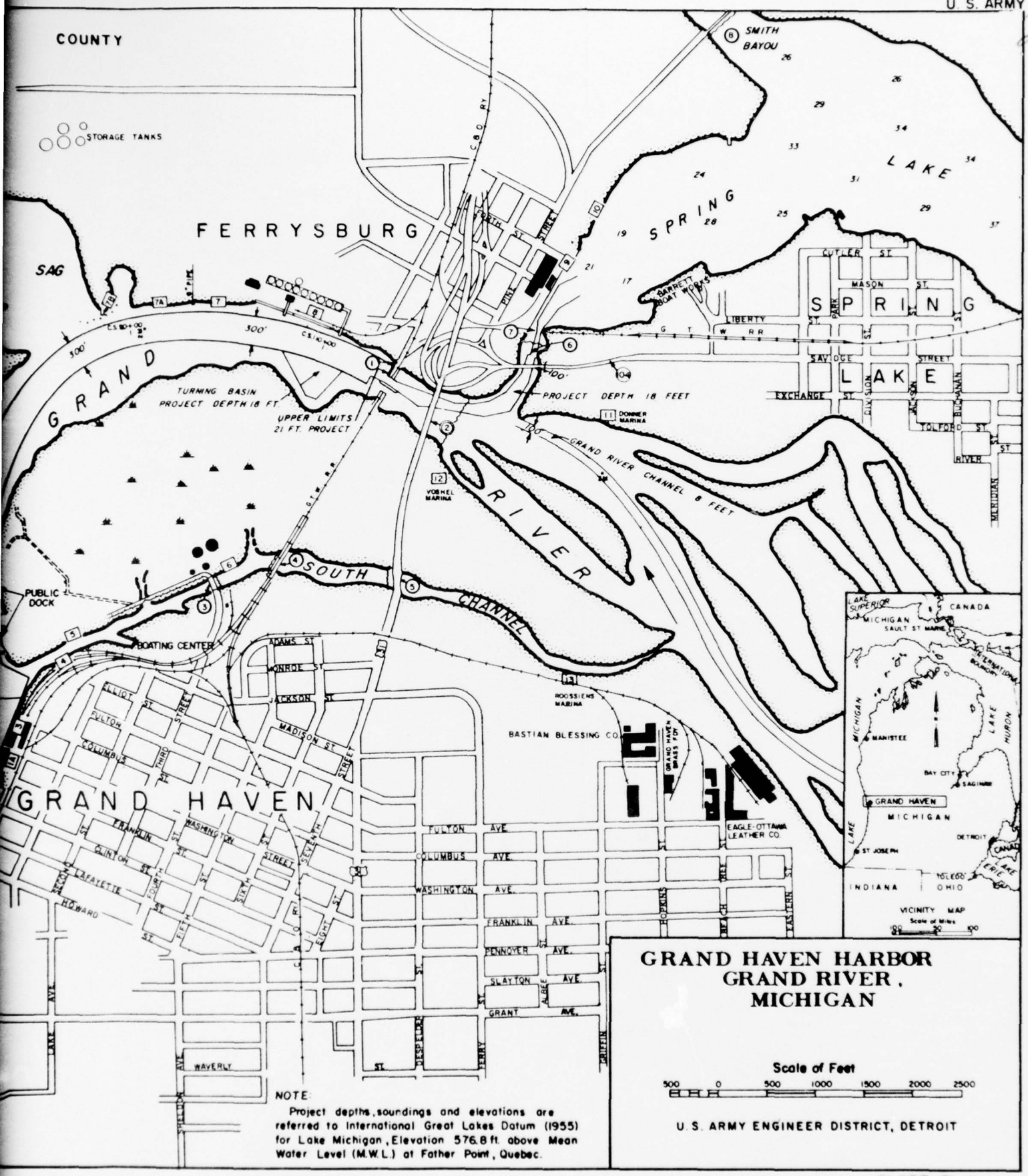
TRANSPORTATION FACILITIES

U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE B-2

CORPS OF ENGINEERS

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STORAGE TANKS
SMITH BAYOU
FERRYSBURG
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SPRING LAKE
GRAND RIVER
TURNING BASIN PROJECT DEPTH 18 FT.
UPPER LIMITS 21 FT. PROJECT
PROJECT DEPTH 18 FEET
GRAND RIVER CHANNEL 8 FEET
SOUTH CHANNEL
PUBLIC DOCK
BOATING CENTER
GRAND HAVEN
BASTIAN BLESSING CO.
EAGLE-OTTAWA LEATHER CO.
DORNER MARINA
VOSHEL MARINA
ROOSSIENS MARINA
BARRETT BOAT WORKS
C&O RY.
G.T.W. R.R.
NOTE:
Project depths, soundings and elevations are referred to International Great Lakes Datum (1955) for Lake Michigan, Elevation 576.8 ft. above Mean Water Level (M.W.L.) at Father Point, Quebec.
LAKE SUPERIOR
MICHIGAN
CANADA
SAULT ST. MARIE
MANISTEE
BAY CITY
SAGINAW
GRAND HAVEN
DETROIT
ST. JOSEPH
TOLEDO
OHIO
INDIANA
LAKE ERIE
LAKE HURON
VICINITY MAP
Scale of Miles
GRAND HAVEN HARBOR
GRAND RIVER, MICHIGAN
Scale of Feet
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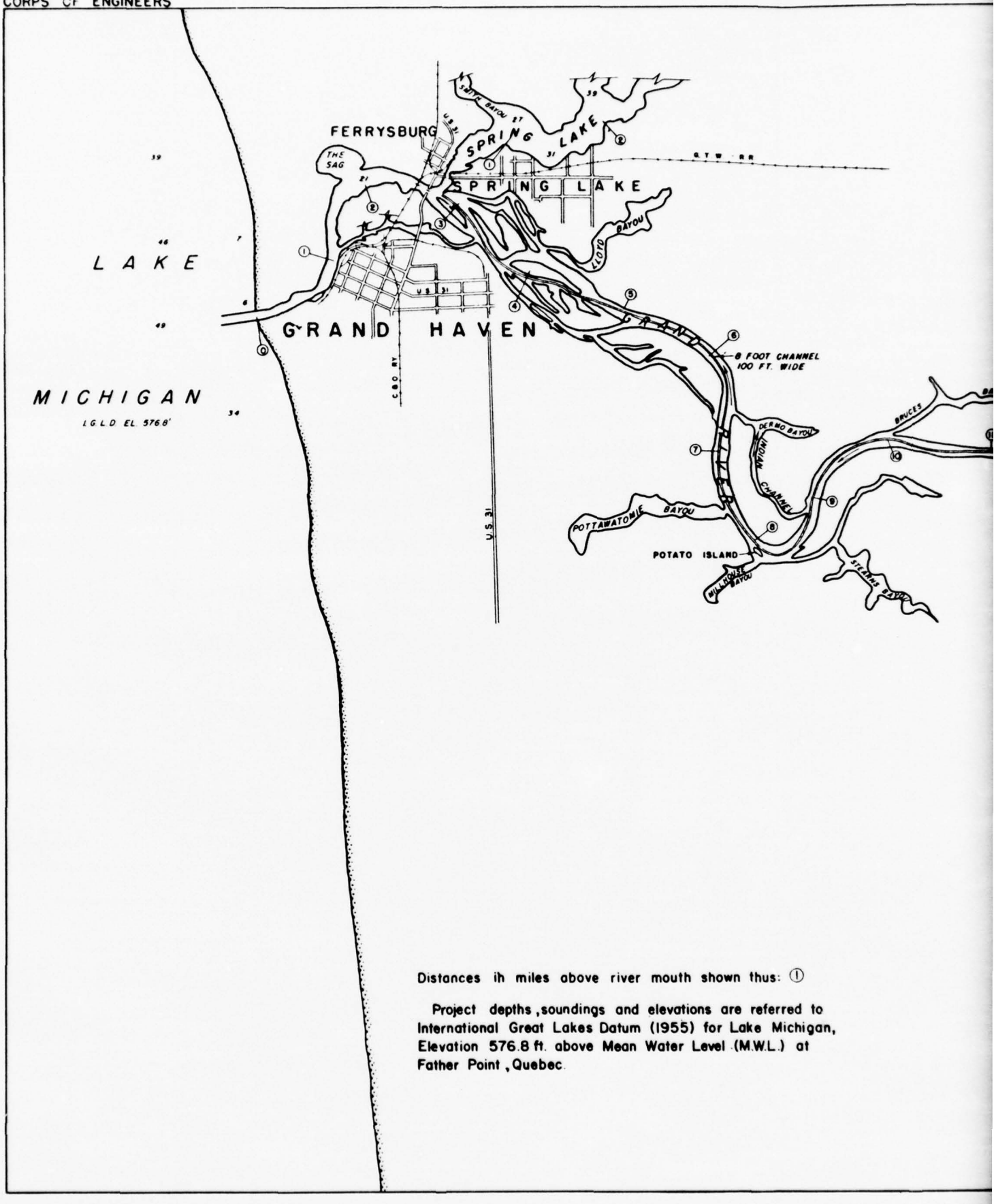
U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE B-3

CORPS OF ENGINEERS



Distances ih miles above river mouth shown thus: ①

Project depths, soundings and elevations are referred to International Great Lakes Datum (1955) for Lake Michigan, Elevation 576.8 ft. above Mean Water Level (M.W.L.) at Father Point, Quebec.

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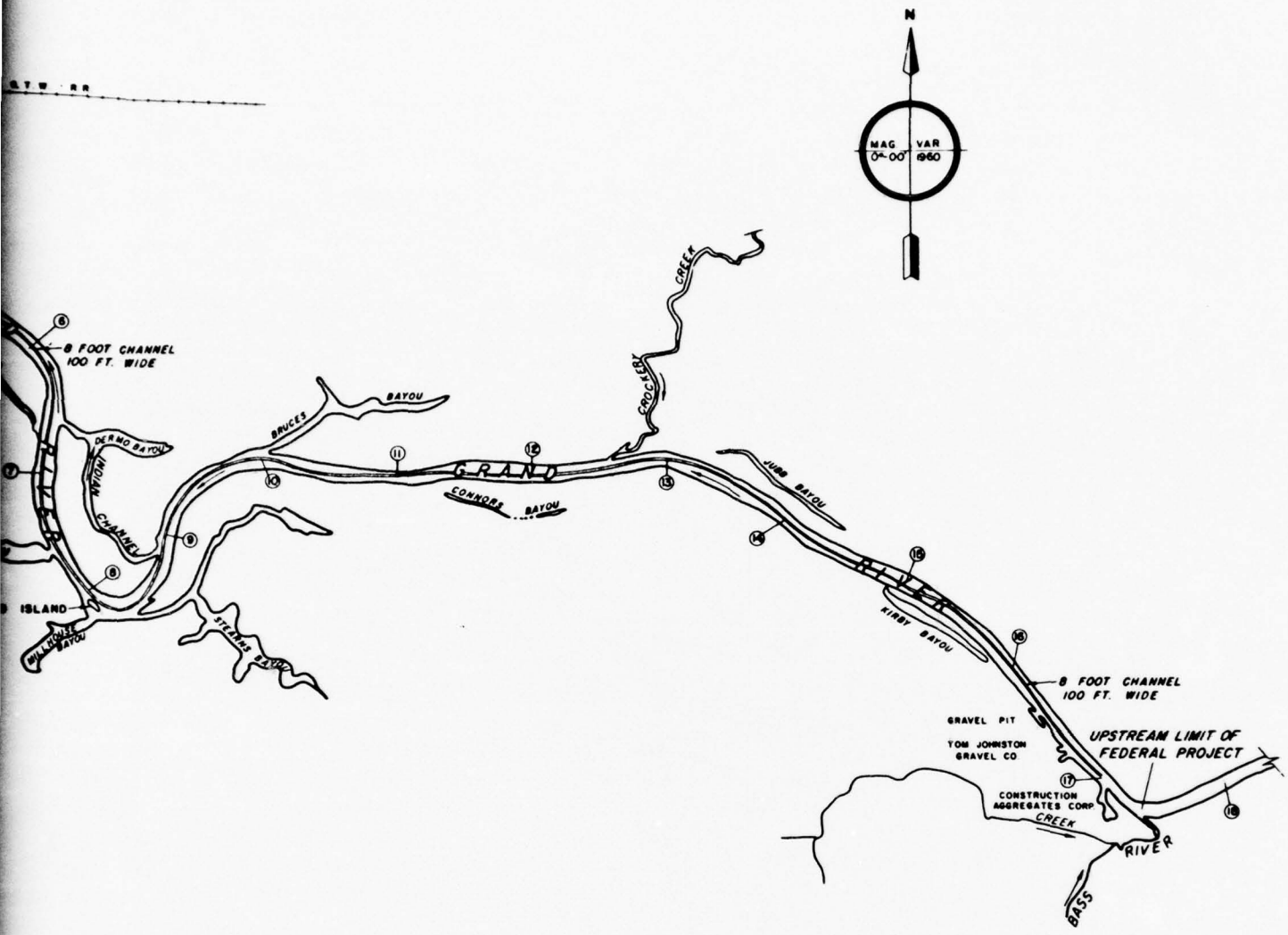
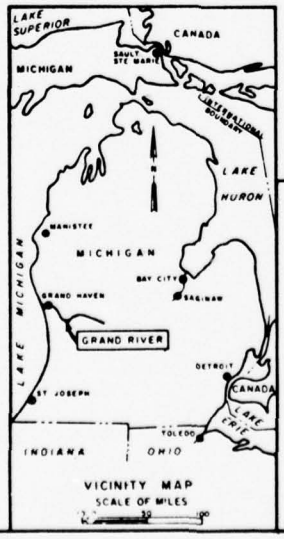




shown thus: ①

ons are referred to
) for Lake Michigan,
Level (M.W.L.) at

GRAND RIVER, MICHIGAN

COMMERCIAL NAVIGATION

Scale of Feet

3000 0 3 6 9 12000

U. S. ARMY ENGINEER DISTRICT, DETROIT

PLATE B-4

in recent years, and this trend is expected to continue throughout the Basin. Some of this expected future growth, however, may not materialize under existing channel conditions. Navigation aids are not placed on the major portions of the river, and numerous bars, snags, and other hazards make the river dangerous to boating in many reaches.

SECTION IV

GEOLOGY AND SOILS

12. GENERAL DISCUSSION

a. Rock Formation. The lower peninsula of Michigan is formed as a basin of sedimentary rock of Pennsylvanian and Mississippian Systems. The Grand River arises in a bedrock area made up of Lower Marshall Sandstone of Mississippian origin. It then flows north over two Pennsylvanian formations, the Parma sandstones and various sandstones of the Grand River group. Eaton sandstones are exposed by down-cutting of the river at Grand Ledge. As the Grand River flows westward from Lyons, it again crosses the Parma sandstones and begins to cross a series of three Mississippian formations. The first is Bayport Limestone near Saranac. The Michigan formation, composed of sandstone shales and limestones, is exposed at Grand Rapids and is valuable commercially since it forms the basis of a gypsum cement and brick-tile industry in the Grand Rapids area. Before entering the Lake at Grand Haven, the Grand River again crosses the lower Marshall sandstone formation. While the Grand River flows over these bedrock formations, the valley of the river is cut into till which overlies them. Only at Grand Ledge and at Grand Rapids does the river expose the bedrock formations.

13. MINERAL FUELS

a. Oil and Gas. Oil and gas production of the Grand River Basin is in the Counties of Barry, Gratiot, Ionia, Jackson, Kent, Montcalm, and Ottawa. There are twelve oil and gas producing zones in the Paleozoic rocks of the Grand River Basin. Wells vary in depth from 1,500 to 4,700 feet. Structurally, production is from anticlines, domes, reefs, and fault zones. Most producing zones are under five feet in thickness but they range from one foot to more than 1200 feet in thickness; they are in the rocks of the Mississippian, Devonian, Silurian, and Ordovician Systems. The thick Devonian System rocks have produced most of the oil in the past. At present, the most important oil producing rocks are of the Trenton-Black River formation of the Ordovician System which account for approximately 75 percent of the

oil produced in the Grand River Basin. Most Basin gas production is in association with oil, however, non-associated gas production has been obtained from Mississippian sandstones. Zones of non-associated gas production range from one to sixteen feet in thickness at depths of 870 to 1,251 feet. Based on oil and gas production in 1966, the reserves of these fuels are estimated to be 10.7 million barrels and 51,300 million cubic feet, respectively. (Bibl. No.7, Appendix F).

b. Coal and Lignite. The occurrence of these fuels is very rare in the Grand River Basin. Some isolated thin seams or lenses of coal occur in a few shale formations of the Paleozoic era. The eastern portion of the Basin lies in the Michigan coal belt which is thirty miles wide and extends from Jackson county northeasterly to Saginaw Bay on Lake Huron. The coal found in this belt is rarely more than three or four feet in thickness; most seams are but a few inches thick and are limited to a few acres in area. Coal reserves in the entire coal basin of Michigan have been estimated at about 220 million tons, but most of it is in seams too thin to be mined (Bulletin I, 1964, Michigan Department of Conservation, Geol. Survey Div.) No commercial coal production is being carried out in the Basin at this time.

14. ORES AND OTHER ECONOMIC MINERALS

a. Metallic Minerals. Metallic minerals are not known to occur in the Basin in sufficient quantities to be of any significant economical value.

b. Non-Metallic Non-Fuels. Mineral commodities produced in the Basin include marl, sand and gravel, clay, and peat from Pleistocene Series formations; shale from Pennsylvanian System formations; gypsum, limestone, dolomite, and sandstone from Mississippian System formations. Natural salines are produced from Devonian System formations.

(1) Marl. Marl or bog lime is an earthy mixture of calcium carbonate which has been hydraulically and chemically deposited in swamps, lakes, and stream channels in the glacial drift. Deposits of marl have a wide distribution throughout the State of Michigan, including the Grand River Basin. They range in area from less than an acre to several square miles, with thicknesses from less than a foot to fifteen feet. Production of marl in the Basin comes principally from the Counties of Barry, Jackson, and Ottawa.

(2) Sand and Gravel. All of the counties in the Basin are well endowed with sand and gravel deposits. The commercial deposits are found concentrated in the glacial features - moraines, eskers, kames, outwash plains, and glacial channels. Deposits are also found in lake beds and river channels, formed during the Pleistocene period of glaciation. Large reserves of sand and gravel are associated with the eskers in Ingham County and the moraines in Kent and Ottawa Counties.

(3) Peat. The individual peat bogs within the Grand River Basin vary in size from less than an acre to many acres and may contain several kinds of peat. Thickness ranges from a few feet to more than forty feet. The deposits are largely in muskeg and grass sedge marshes in basins of glacial origin. Present production of peat in the Basin comes principally from Eaton, Ingham, Kent and Shiawassee Counties.

(4) Shale. Shales occur in the Saginaw formation of the Middle Pennsylvanian System. These shales have exposure occurrences in Barry, Eaton, Jackson, Ottawa and Shiawassee Counties.

(5) Sandstone. The Eaton and Ionia sandstones of the Upper Pennsylvanian System were formerly quarried in Eaton County. Large reserves of this stone are exposed along the Grand River near Grand Ledge.

(6) Limestone. Bayport Limestone of the Mississippian System is quarried in Eaton and Jackson Counties. Exposures also occur in Kent County. The thickness of the Bayport formation ranges from 40 to 100 feet.

(7) Brines. Brine is produced in the Basin as follows:

(a) Brine produced for the extraction of salts and salines.

(b) Brine produced with oil.

(c) Brine produced primarily for highway use.

Salts and salines are produced from brine in a variety of processes. The principal products are chlorine, bromine, calcium compounds, and magnesium compounds; however, literally hundreds of products are derived from brine directly or in combination with other raw materials.

There are eight principal brine producing formations or formation groups in the stratigraphic sequence ranging upward from the Trenton Group of the Middle Ordovician System to the Marshall formation. These formations

also yield some oil and/or gas. However, the occurrence of brines without oil or gas is much more common. Moreover, nearly all oil wells yield brine in addition to oil.

Brines for the extraction of salts and salines are produced from the Sylvania Sandstone member of the Detroit River formation at a depth of about 5,000 feet. These brines and the brines produced primarily for highway uses are not believed to be associated with oil. Brine reserves have not been calculated.

Brines for highway use from wells tapped specifically for this use are widely scattered throughout the Basin. At least six wells in Eaton, Gratiot, Ionia, and Jackson Counties provided brine for highway use during 1964 at a rate of about 585 barrels per day. Oilfield brine for highway use is believed to have been confined mainly to Kent, Ottawa, Montcalm and Ionia Counties.

(8) Gypsum. Gypsum occurs in adequate supply in the upper part of the Michigan Formation of the Mississippian System. In the Basin it is exposed in a former quarry a few miles southwest of Grand Rapids in Kent County. The largest gypsum deposits have been found in the Grand Rapids area. Here gypsum occurs in five seams dipping gently to the east. These vary in thickness up to a maximum of about twelve feet and are separated by shale seams from one to three feet in thickness. The top non-commercial grade gypsum seam averages five feet in thickness. Below the top seam and the ensuing two-foot thickness of shale is a twelve foot gypsum seam; most production has been from this seam. Present production is from two underground mines near Grand Rapids where the gypsum beds are eight to twelve feet thick and occur at depths ranging from 75 to 100 feet.

(9) Clay. Glacial lake clays and formation clays are the two types present in the Basin. Small amounts of glacial clays are widely scattered throughout the Basin but have been of little commercial value. The formation clays are obtained from the Saginaw formation of the Middle Pennsylvanian System and include shale and an unconsolidated clay, normally called "fireclay". Shale and fireclay are mined for manufacture of clay products. Reserves are believed to be considerably greater than the demand through the year 2020.

SECTION V

MAPS AND AERIAL PHOTOGRAPHS

15. PRESENT STATUS

a. Federal Sources of Maps and/or Aerial Photography

(1) Geological Survey, Bureau of Mines, Bureau of Outdoor Recreation, all of the Department of the Interior.

(2) The Soil Conservation Service and Commodity Stabilization Service of the Department of Agriculture.

(3) The Corps of Engineers of the Department of the Army.

(4) The Federal Power Commission.

(5) The Bureau of the Census of the Department of Commerce.

b. Michigan Source of Maps

(1) Michigan Departments of Aeronautics, Agriculture, Conservation, Health, Highway, Public Service, State Police, Water Resources, and Waterways.

(2) Concentrated aerial photography and mapping for certain highway locations has been done by the Michigan State Highway Department.

(3) Counties and municipalities. Plat, Tax, road and district maps.

(4) Regional or intergovernment agencies.

c. Private Sources

(1) Utility companies.

(2) Rand McNally.

(3) R. L. Polk and Company.

(4) Automobile clubs and motor oil companies.

d. Type of Mapping. The various available mapping can be described as either base maps, transportation system maps, topography maps, private ownership maps, utility maps, soils or geology maps or miscellaneous maps.

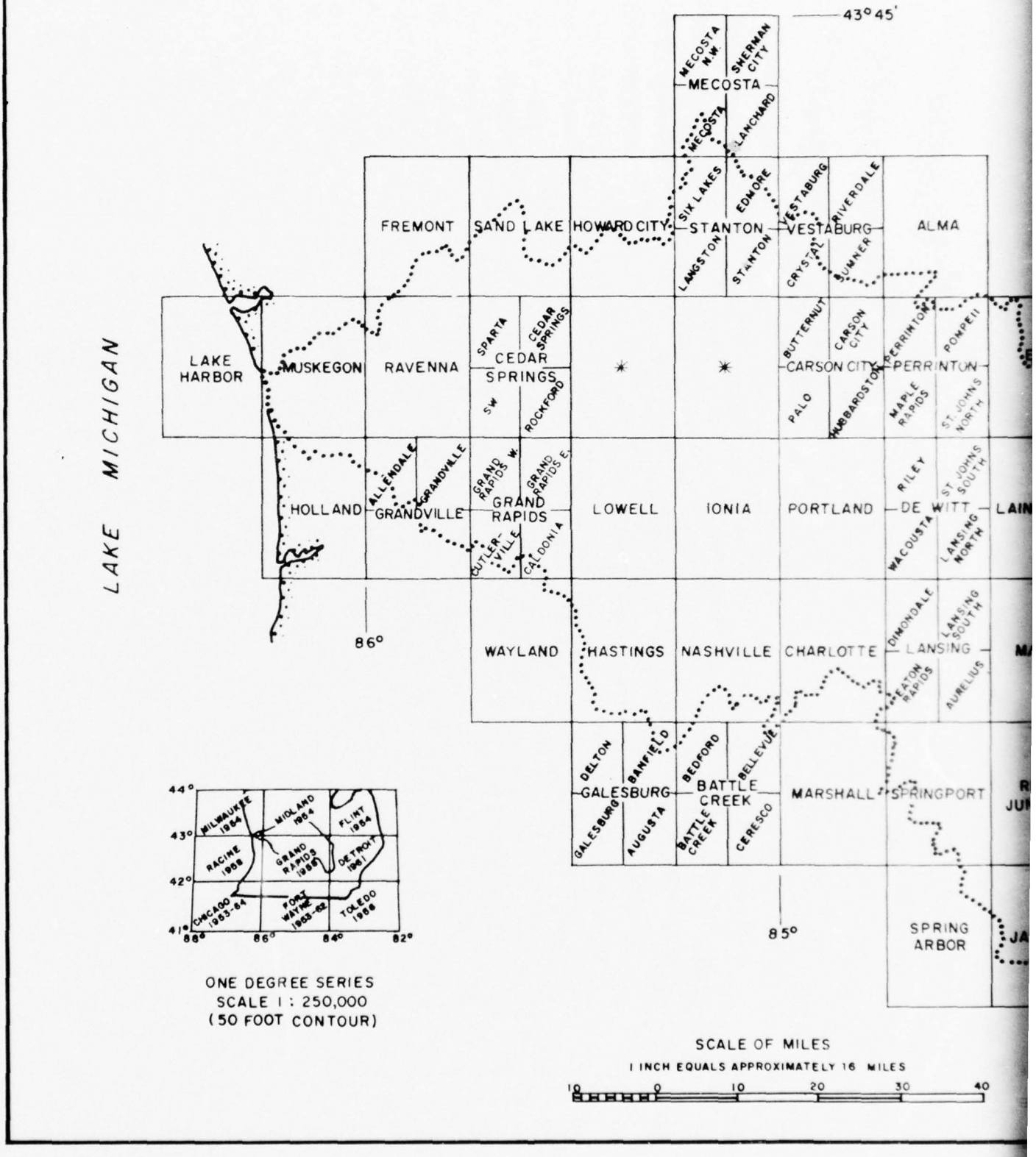
e. In connection with the Grand River Basin study certain areas of the Basin were photographed by aerial means and a portion of the area photographed were mapped to a scale of one inch equals 200 feet with a four foot contour interval. Reservoir sites photographed for mapping purposes are: Nos. 7, 16, 19, 22, 23, 42, 46, 47, 47A, 50, 51, 57, 58, 59, 62, 65, 67, 73, and 144. From part of these photographs, maps have been prepared

for reservoir sites Nos. 7, 57, 58, 59, 62 and 63. The photogrammetric data and maps are available at the Detroit District Engineer's Office, Corps of Engineers.

16. PLANS FOR THE FUTURE

The U. S. Geological Survey has a continuing program of mapping throughout the United States, including Michigan. See Plate B-5. Requests concerning specific areas should be directed to that agency.

Systematized cataloging of available maps and a central map library for the State of Michigan has been proposed by the Michigan Department of Commerce under a cooperative mapping program. This is a planning study and yet to be implemented.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LAKE MICHIGAN
MECOSTA N.W.
SHERMAN CITY
MECOSTA
MECOSTA
LANCHARD
FREMONT
SAND LAKE
HOWARD CITY
SIX LAKES
EDMORE
STANTON
VESTABURG
RIVERDALE
ALMA
LANGSTON
STANTON
CRYSTAL
SUMNER
LAKE HARBOR
MUSKEGON
RAVENNA
SPARTA
CEDAR SPRINGS
CEDAR SPRINGS SW
ROCKFORD
BUTTERNUT
CARSON CITY
PALO
HUBBARDSTON
PERRINTON
MAPLE RAPIDS
POMPEII
ST. JOHNS NORTH
HOLLAND
ALLENDALE
GRANDVILLE
GRAND RAPIDS W.
GRAND RAPIDS E.
GRAND RAPIDS
CUTLERVILLE
CALEDONIA
LOWELL
IONIA
PORTLAND
RILEY
DE WITT
ST. JOHNS SOUTH
WACOUSTA
LANSING NORTH
86°
WAYLAND
HASTINGS
NASHVILLE
CHARLOTTE
DIMONDALE
LANSING
LANSING SOUTH
EATON RAPIDS
AURELIUS
DELTON
GALESBURG
BANFIELD
AUGUSTA
BEDFORD
BATTLE CREEK
BELLEVUE
CERESCO
MARSHALL
SPRINGPORT
85°
SPRING ARBOR
44°
43°
42°
41°
88°
86°
84°
82°
MILWAUKEE 1954
MIDLAND 1954
FLINT 1954
RACINE 1958
GRAND RAPIDS 1956
DETROIT 1961
CHICAGO 1953-54
FORT WAYNE 1953-62
TOLEDO 1956
ONE DEGREE SERIES
SCALE 1 : 250,000
(50 FOOT CONTOUR)
SCALE OF MILES
1 INCH EQUALS APPROXIMATELY 16 MILES
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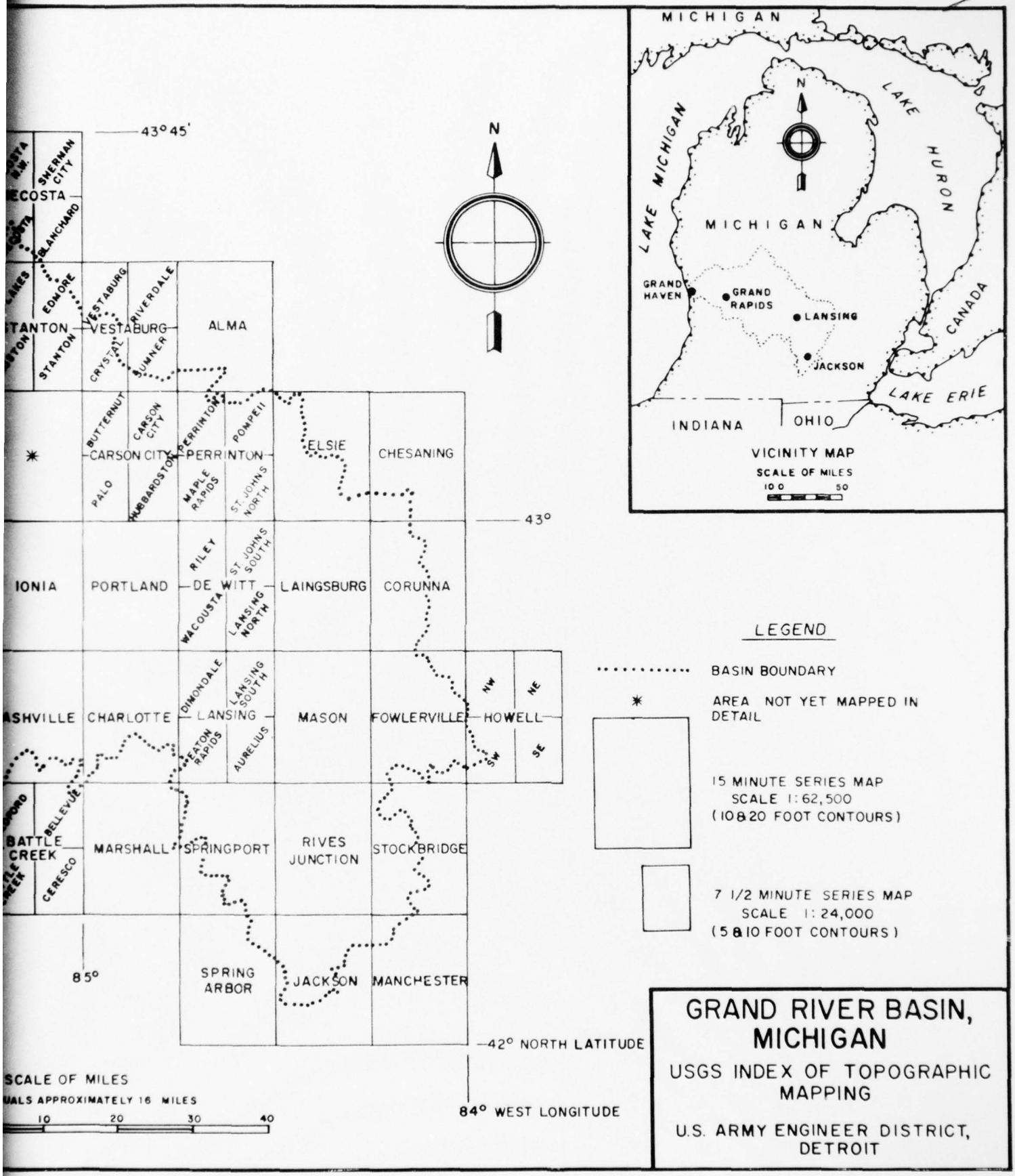


GRAND RIVER BASIN, MICHIGAN

USGS INDEX OF TOPOGRAPHIC MAPPING

U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE B-5

SECTION VI

HISTORY OF THE BASIN

17. EXPLORATION AND EARLY DEVELOPMENT

a. For the first half century of European exploration and commerce in the Great Lakes, the Grand River valley remained on the periphery of the activity. Thus, its earliest history can be seen only in terms of a wider sphere of operations which includes the more northern area of the Lakes, and Europe as well.

b. By the beginning of the seventeenth century, Montreal served as the center for fur trade from the Upper Great Lakes - Superior, Michigan, and Huron. In what was then the unexplored west, trade boundaries were maintained by Indian tribes who were friendly to one faction and hostile to another. The League of the Iroquois, trading with the British, dominated the southern shores of the St. Lawrence River, and Lakes Ontario and Erie. They terrorized the northern parts of Ohio, Indiana, and Illinois, and much of the lower peninsula of Michigan with hostile raiding excursions. The more northerly tribes, the Hurons and Algonquins, were friendly to the French. By the first decade of the 1600's, fur trading parties from these northwesterly tribes had carried descriptions of the western lakes to Montreal. In their journey they would have passed eastward along the passage that later became the principal fur route to the French Empire - through either the Straits of Mackinac between Lakes Michigan and Huron, or along the portage which bypasses the rapids at Sault Ste. Marie between Lakes Superior and Huron, into Georgian Bay, and from there by river and portage into the Ottawa River and on to Montreal.

c. The Frenchman, Etienne Brule, is apparently the first European to see this country. He had spent the winter of 1610 living with the Hurons in Georgian Bay; had learned their language and customs, and presumably in 1622 in a journey of western exploration, passed through what is now Sault Ste. Marie into Lake Superior. In all probability, *coureurs de bois*, French trappers able to winter in the forests with the Indians

and return to Montreal with beaver pelts, were quick to follow Brule, but they have left no records.

d. Catholic missionaries, first the Recollects, a branch of the Franciscan Order, then the Jesuits and Sulpicians, were close behind the earliest explorers in traveling west. In 1641, the Jesuit priests, Father Joques and Father Raymbault, preached to the Chippewa gathered at Sault Ste. Marie. From this point on, contacts between Europeans and Indians of upper lakes increased as missionaries, trappers and traders, and emissaries sent by the King of France entered the west. However, the route these early parties took stayed well north of country threatened by Iroquois raiding parties. Their westward travels either followed the north shores of Lakes Huron and Michigan into the Green Bay region of Wisconsin, or coasted along the south shore of Lake Superior. All records indicate that the western end of Lake Superior was reached by Europeans at least thirty years before the mouth of the Grand River.

e. In 1658 Medard Chouart, Sieur des Groseilliers, intent on increasing the lucrative flow of furs to Montreal and traveling with Pierre Esprit Radisson, took this northwesterly route through Sault Ste. Marie. His descriptions of travel are vague, perhaps deliberately so in order to confuse competing merchants, but he found the northwestern fur country so rich he returned to Paris and urged strongly for a French port of entry through Hudson Bay. Ignored and angered, he went with his information to the British, who forthwith, in 1670, founded the Hudson's Bay Company which has flourished profitably as a fur trading company ever since.

f. Ten years after Groseilliers' journey, Fathers Jacques Marquette and Claude Dablon founded the first mission in Michigan at Sault Ste. Marie. The next year, 1669, Father Marquette, was sent further west to re-establish the mission at Chequamegon (now Ashland, Wisconsin), which had been founded in 1660 by Father Menard for Hurons and Ottawas fleeing westward to escape the increasingly bold forays of the Iroquois. But these tribes soon found themselves threatened by Siouian tribes to the west. They retreated eastward and the mission was abandoned in 1670.

g. The Lower Peninsula of Michigan would have been left for some decades more to the native Ottawas, Pottawatomie, Huron, and Miami if it had not been for events taking place to the east and southeast.

h. The Iroquois, determined to wage a war of extermination against the French and their Indian allies, virtually wiped out the ancestral Huron settlement in Georgian Bay in the 1650's and forced the survivors west to the Michigan Upper Peninsula. For a decade the Iroquois raided south of the lakes into Illinois, and in 1662 a large war party passed through Sault Ste. Marie into Lake Superior, where they were finally routed by a combined band of Chippewa and Ottawa. These forays, and the terrorizing tales of torture for French and friends of the French, were having a serious effect on the fur trade, and in 1665 a well trained regiment under General de Tracy sent out to fight the Iroquois in the east, defeated them, and forced a treaty in 1667 which promised free travel to the French along the lower lakes.

i. This route, much easier and safer than the Ottawa River journey, was first traveled, from west to east, by Adrien Jolliet who left Sault Ste. Marie in 1669 guided by a returning Iroquois prisoner. Crossing overland from Lake Erie to the western end of Lake Ontario, he met LaSalle and the two Sulpician priests, Fathers Dollier and Galinee, on their way to the discovery of the Ohio River. Jolliet persuaded the two priests to winter over, and then, in the spring, to travel northward to the mission at Sault Ste. Marie. On this trip Father Galinee, how kept a journal, provides the first descriptions of southern Michigan: the Detroit River, Lake St. Clair, and the St. Clair River, and the eastern shore of Lake Huron.

j. In 1671 Father Marquette, accompanied by Huron and Ottawa Indians, established the Mission of St. Ignace at the Streits of Mackinac. The Mackinac region prospered for nearly two centuries as a fur trading center.

k. Under orders from the Intendant of New France, Louis Jolliet came to St. Ignace in 1673 to join Father Marquette in a journey to find the Mississippi River of which the Indians at Chequamagon had told Marquette. The first stage of their journey followed the fur route along northern Lake Michigan to Green Bay, by then a well-known route. They found and

traveled down the great river, but on the return, Marquette became ill, and spent the winter and summer of 1674 at Green Bay. In the fall he returned to preach to the Illinois as he had earlier promised, but continued to weaken, and in April of 1675, certain that he had not long to live, tried to return to St. Ignace. Proceeding by the shortest route, he canoed up the west coast of Michigan as far as the mouth of the Pere Marquette River where he died. His voyage took him past the mouth of the Grand River. This is the first record we have of a European seeing this part of Michigan.

l. Four years after the death of Marquette, LaSalle, anxious to increase the supply of furs coming out of the west, commissioned the building of a sailing vessel, the GRIFFIN, on the shores of the Niagara River above the falls. On the 27th of August, this remarkable ship, unique in an era and place of birchbark canoes, anchored at St. Ignace. Early the next month, LaSalle piloted the GRIFFIN to Green Bay, where it was to be loaded with furs for the trip back to Niagara. LaSalle and his party of French and Indians, who stayed behind to barter for more furs, were to meet the returning GRIFFIN at the mouth of the St. Joseph River in southwestern Michigan. The GRIFFIN was never heard of again. Dr. George Quimby (George I. Quimby, "Indian Culture and European Trade Goods," the University of Wisconsin Press, 1966) marshalling all possible evidence in a brilliant piece of detective work concludes that the small ship, less than forty-five feet long and twenty feet wide, with a capacity of 45 tons, foundered in a fierce storm shortly after LaSalle left and sank in coastal waters between Point Detour and Seul Choix Point.

m. LaSalle waited in vain on the St. Joseph, and with Lt. Henri de Tonty spect the winter in building a fort at the mouth, calling it Fort Miami. In March 1680, giving up the GRIFFIN for lost, he crossed southern Michigan on foot, following an eastward course to what is now Ann Arbor. In doing so, he must have crossed the Grand River not far from its headwaters in the vicinity of Jackson. From Ann Arbor, he rafted part way down the Huron River, eventually making his way into Ontario.

n. Either this trip stimulated *coureurs de bois* to further trading journeys into the interior of southern Michigan, or information gathered by earlier traders was added to the explorations of LaSalle's party. Whatever the source, by 1685 the full course of the Grand River appears to have been known. Minet, an engineer on LaSalle's expedition who had access to a large map by LaSalle, since lost, drew a map in 1685 entitled "Carte de la Louisiane," in which Michigan and the upper Great Lakes are greatly distorted, but in which "la grande riviere" is shown rising in the south in its approximately correct position, flowing north, and then west to Lake Michigan. A later expedition by LaSalle in 1682 added to the known geography of the Great Lakes. In 1688, Marco Vincenzo Coronelli, using information made available to him by Abbe Bernon and Abbe Renaudot, who, in turn, had learned from LaSalle, drew the map "American Settentrionale Colle Nuoue Scoperte." This shows the "Grand Riu o'de Sakinand," in this case flowing due west from a headwaters close to a river which flows into Saginaw Bay (Sakinand B."). A portage indicated between these two shows that by this time the short route from Lake Huron to Lake Michigan - from Saginaw Bay, down the Saginaw River to the Shiawassee River near Owosso, portaging across to the Maple River and down to the Grand River - was known to the French. Jean-Baptiste Louis Franquelin's map of 1688 also shows this portage between "La Grande Riviere" and Saginaw Bay and another portage at the southern headwaters of the river with a series of lakes which would include the Big and Little Portage Lakes northeastward of Jackson to the "R. aux Ours" which is the modern Huron River.

o. By 1685, British fur traders coming through the lower lakes from Albany threatened the monopoly of the French. In an attempt to stem this, Daniel Greysolon, Sieur Duluth, in 1686, built Fort St. Joseph at the head of the St. Clair River (the present site of Port Huron), and in 1687 mobilized a military force of 200 *coureurs de bois* and 500 Indians, including Chippewa, Huron, Menominee, Winnebag, Potawatomie, Illinois, Fox, Kickapoo, and Muscouten. Three years later a series of French and English wars began which was to last for ninety years.

p. The Fort Miami built by LaSalle had been abandoned, and in 1690 another Fort St. Joseph was established on the St. Joseph River twenty-five miles up from the mouth near the present site of Niles, and along with a Jesuit mission for the Pottawatomie and Miami. In 1694 an attack on this fort by the Iroquois was repulsed, and although Iroquois raiding parties continued to threaten southern Michigan, their reign of terror was virtually over. This time of peace from the Iroquois resulted in a reduction of the development of the Great Lakes region. Michigan was now safe, and at Fort de Buade at St. Ignace, many thousands of Indians gathered at trading time with their furs. In Europe, beaver pelts became a glut on the market, so depressing the price that merchants pressed the French king to control the supply. Simultaneously, Jesuit missionaries complained that riotous French *coureurs des bois* were ruining the Indians and they also exerted pressure on the king to outlaw the fur traders.

q. Yielding to these pressures, King Lousi XIV closed the west to all but the missionaries in 1696, and Forts de Buade and St. Joseph were abandoned. This state of affairs did not last long. Cadillac, hoping to make his fortune in the country, sought permission to build a fort and maintain a seigniory between Lake St. Clair and Lake Erie, and in 1701 built Fort Pontchartrain du Detroit. Cadillac was so successful in dealing with the Indians that the Ottawa, Huron, Chippewa and Miami moved their major villages next to his fort, and shortly the missions at St. Joseph and St. Ignace were abandoned for lack of natives. Ten years later, political intrigue drove Cadillac from Detroit, and inept Indian relations led to enmity of the Fox Indians of Wisconsin and a blockage of the fur trade through Wisconsin to the west. To counter this threat, a fort, Fort Michillimackinac, was built in 1715 on the south side of the Straits to serve, among other purposes, as a staging area for an attack on the Fox villiage.

r. For the next forty-five years, in spite of an European war between the French and English and North American aspects of this battle in the East, Michigan was relatively peaceful. European influences were strongest along a route from Detroit to St. Ignace and Sault Ste. Marie and on to Green Bay in Wisconsin on the western Lake Michigan shore. The complex of French

trading companies, consisting of *hivernans*, who wintered over with Indian hunting camps, the *coureurs des bois*, who managed the trading crews, the *engages*, servants of the *coureurs des bois* and the *voyageurs*, the boatmen, undoubtedly traveled the Grand River valley and other valleys of interior Michigan but there are few records of this. In 1755 Langlade, and inhabitant from Michillimackinac, apparently established a post, called Gabagouche on the Grand. Attempts at colonizaiton in Michigan were not too successful. in 1749, in spite of many dispensations there were only 900 French in Detroit. Roughly, 200 more had settled at St. Ignace and Fort Michillimackinac and none elsewhere.

s. In 1760 with the formal cessation of hostilities between the French and English, a situation of greater hostility arose in Michigan. The *laissez-faire* attitude of the French had led to amicable relations with the Indians. The British, who took over the forts at Detroit and Michillimackinac and re-established Fort St. Joseph on the St. Joseph River, quickly angered the Indians with their cold business proceedings and attempts to buy land. Unquestionably the Indians were urged on, or at any rate not hindered, by the French inhabitants. This enmity reached a climax in 1762 with a general rebellion beginning with the Senecas in the east and led in Michigan by Pontiac, and more than 800 Chippewa, Huron, and Pottawatomie in the region of Detroit. Detroit was besieged by Pontiac for 153 days; the English garrison at Fort Michillimackinac was massacred, or taken prisoner, by Chippewa and visiting Sauk, and, in 1763, St. Joseph was overrun by Pottawatomies from Detroit. Fort St. Joseph was not re-garrisoned, but, in 1780, a group of local French militia took it over and were almost immediately overrun by British traders. To avenge this act, a force of Spanish militia came up from St. Louis, routed the traders as an act of the war between England and Spain, and raised the Spanish flag over St. Joseph for the single day of Fetruary 12, 1781.

t. The Revolutionary War swirled around Michigan, but did not greatly affect it. Even after its end with the Treaty of Paris in 1783, British garrisons were retained at Forts Michillimackinac and Detroit, ostensibly to protect the new Americans form the Indians. In this same year appears

one of the very few documentary references to the Grand River. Major de Peyster, writing to General Haldimand on the 7th of January, in reference to threats made by the Indians, says, "*Lieut. Du Quindre is gone off to stop the Ottawas of Michillimackinac who winter at the Grand River.*"

u. For the next forty years, Detroit and southeastern Michigan increased in importance to eclipse the area of the Straits. Through the 1790's, Detroit remained virtually a British city, and was a staging area for Indians of many tribes under the leadership of such British volunteers as the infamous Simon Girty who harassed and massacred American settlers spreading into the west.

v. After a series of battles, the most famous being the Battle of Fallen Timbers near Toledo, in which Mad Anthony Wayne defeated a sizeable force of Indians and British, Ohio was ceded to the United States. Fort Lernoult at Detroit was turned over to United States troops in 1796. In this same year, civil government was established and Wayne County was formed, which then included the territory bounded by Milwaukee, Chicago, Cleveland, Toledo and Detroit.

w. It was an uneasy peace which was shattered by the War of 1812 - the British retaking Detroit, and the bloody Indian massacre of settlers on the River Raisin under the tacit approval of British troops. In 1815, when an enduring peace was finally achieved, a major land survey was undertaken to select land to be made available to veterans of the War of 1812. The results of this survey held back the settlement of southern Michigan for many years to come. On the advice of his surveyors, Edward Tiffin, Surveyor General, declared the land in Michigan worthless and diverted the surveyors to Illinois and Missouri where veterans were given land. Largely through the efforts of Governor Cass, this impression was overcome and interior settlement began. The first inland communities were along the east-running rivers west of Detroit. Between 1817 and 1826, Oakland, Washtenaw and Lenawee Counties were established, but the western part of the state had only a few isolated trader's cabins.

x. Along the western part of the Grand River valley, conditions were little changed throughout the eighteenth century and the beginning of the

nineteenth. In 1778 and 1780, Louis Chabollier and Pierre Constant are said to have traded along the Grand River. On October 31, 1779, the British sloop FELICITY, entered the mouth of the Grand River, noting twelve feet of water over the sand bar at the mouth. Around 1809, Joseph La Framboise and his Ottawa wife established a trading post along the river about two miles west of the present city of Lowell. (An earlier post established by Framboise had been variously located on Thornapple River, at the juncture of the Thornapple and Grand and one mile up the Flat River from its mouth.) After Joseph was killed, Madame La Framboise maintained the post until 1821 when she sold it to Rix Robinson. Robinson, who was in charge of gathering furs for the American Fur Trading Company throughout the Grand River and Kalamazoo Valleys, left the Framboise post and moved the trading center to a point a short distance west of the present city of Ada.

y. At this time the eastern part of the Grand River Basin was essentially wilderness. Two fur trading posts were established shortly after the War of 1812, one run by Mr. Bacrotie at Jackson, the other at the north end of Jackson County on the Grand operated by Battise. In 1816, Henry Bolieu floated down the Saginaw River into the Shiawassee River and built a trading cabin near a large Indian village close to the present town of Vernon. From here easy portages could be made into the Lookingglass River flowing into the Grand at Portland, or the Maple River flowing into the Grand at Muir. In 1820, Whitmore Knaggs built a trading post close to Bolieu's cabin, and the locality became known as Knagg's Place, later Knaggs Bridge.

z. In the decade from 1810 to 1820, the Grand River Basin was largely Indian territory; the dominant tribe was Ottawa, although, with an increasing pan-indian culture, tribal distinctions were probably less significant than they had previously been. There were at least three or four Ottawa villages along the Grand River in what is now Ottawa County. Cleared Indian farm lands and villages were reported for this period at Grand Rapids, at "Little Prairie," (Grandville), at the mouth of the Thornapple River (Ada), the mouth of the Flat River (Lowell), the mouth of Prairie Creek (Ionia), the mouth of Maple River (Lyons), and prairies near the present cities of Charlotte and Jackson. Posts of the American Fur Trading Company are reported near many of these villages.

18. FACTORS AFFECTING PERMANENT SETTLEMENT

a. French, British and American fur trading companies, in sequence, had tried to discourage the purchase of land by settlers, but population pressures in the east and improved means of transportation were leading to an increase in settlement in southern Michigan. In 1818, "WALK-IN-THE-WATER", the first of many steamships, completed the trip from Buffalo to Detroit, making immigration feasible. The next step was to make land nominally owned by the Indians available for purchase by the settlers. The first of these treaties affecting the Grand River Basin was the so-called Treaty of Saginaw with the Chippewa which ceded the land of the Upper Grand River to the United States in 1819. Two years later in the Treaty of Chicago, the Ottawa, Pottawatomie, and Miami ceded all of the remaining land from the south bank of the Grand River to Lake Michigan, although the land from the north bank of the Grand north to the tip of the Lower Peninsula was not ceded until the Treaty of Washington in 1836.

b. In surveying land for settlement plots, the Sciawassa exploring party, entering the basin from Saginaw Bay, visited the Upper Grand River Basin in 1821, but apparently did no surveying along the river. During the next year, the Chippewa Indians in Saginaw Bay became unruly and a fort was built within the limits of the present city of Saginaw. In less than a year, malaria, which proved to be a scourge along the Grand River and interior Michigan, forced the abandonment of this fort.

c. In western Michigan, missionaries were again beginning to share Indian contacts with the trappers and fur traders. At the end of 1822, the Reverend Isaac McCoy founded the Baptist Carey Mission in an attempt to save the remaining Pottawatomie from exploitation and degradation. The next year, the Baptists founded the Thomas Mission at Grand Rapids, but both missions had limited success in reducing the whiskey consumption and increasing the farming activities of the Indians.

d. Settlement was slow in all of this territory which had been dominated by the fur trade. In 1820, the census of Michigan Territory, which included the present state of Wisconsin, showed only 8,765 persons. Federal land laws after the War of 1812 had also hampered settlement. Land could only be

purchased in parcels of 320 acres, at $2.00 per acre, and few would-be settlers were wealthy enough to buy. But in 1825, a number of factors combined to increase settlement in interior southern Michigan. In that year, the Erie Canal was completed and large numbers of settlers moved west. The Detroit to Chicago Road, following an old Sauk Indian trail, was surveyed that same year, as was the Territorial Road, which left the Chicago Road at Dearborn and passed through what are now Ann Arbor, Jackson, Battle Creek, Kalamazoo, and St. Joseph. However, by the end of 1825, there were still only nine white families between Tecumseh and the Carey Mission (Niles); seven of these in Berrien County, and two in Cass County.

e. In 1826, Louis Campau moved his fur trading post from Saginaw Bay to Grand Rapids (the site is the present Campau Square between Pearl Street and Monroe Avenue). In the same year Lucius Lyons spent four months along the Grand River surveying the lands released by the Treaty of 1821. He, too, decided to settle at Grand Rapids, competing with Campau for land within the present city. Also in 1826, Louis Genereau and his Ottawa wife and son set up a post at the mouth of the Maple River. In 1828, the young brother of Campau's wife, Daniel de Marsac, spent the winter with the Ottawa Indians, at their village of Segwun (present city of Lowell), on the Flat River. In 1831, he established a trading post there on the south bank of the Grand River, just east of the mouth of the Flat River and on the bank of Kopf Creek. De Marsac was later boycotted by the Ottawa Indians because of the way he treated his Ottawa wife. Nonetheless his trading post flourished and he bought large tracts of land along the Grand River. In 1846, he turned the post over to John Hooker who managed it until the last of the Flat River Ottawa moved north in 1857.

f. In the late 1820's, the settlers slowly began moving into the Grand River valley. The most desirable lands were the small prairies near the mouths of tributaries which the Indians had already cleared for farming. The next most desirable locations were oak clearings in the mixed hardwood forests where the oak trees could be girdled and removed, thus producing open lands for small farms. Land parcels were reduced to eighty acres, at $1.25 per acre, putting land purchases within reach of many more settlers. In 1829 there were

enough settlers in the interior to establish counties along the Grand River such as Eaton and Ingham, and in 1832 the counties of Ottawa, Kent, Ionia, and Clinton. By 1830 two stagecoaches a week were traveling the Chicago Road from Detroit to the southwestern part of the state. A map by John Farmer, drawn in 1829 was printed in 1831 ("An Improved Map of the Surveyed Part of the Territory of Michigan" (8 miles to an inch), by John Farmer, 1831, V. Balch and S. Stiles Engravers, New York, in Michigan State University archives collection) provides much graphic information for the Grand River Basin of this time. Indian villages, timberlands, and prairies, and roads and trails are indicated. The only white settlements in the Basin indicated on this map are the "Reverend McCoy's Mission" (Thomas Mission) at Grand Rapids, the Genereau Trading Post on the north bank of the Grand near the mouth of the "R. du Plain or Maple River" and the towns of Montcalm and "Jackson'sburgh" (Jackson) both close together in Jackson County. The map shows gypsum beds along the river, located south of the present city of Grand Rapids, and a bed of iron ore located at the present site of Grand Ledge. The map also states that the Grand River is navigable for 240 miles for batteaux.

g. In 1831, Louis Campau and Lucius Lyons platted their respective parts of Grand Rapids, and by 1832, the city had nine cabins, a mission, a post office and a sawmill. A stage route was authorized and surveyed from Grand Rapids to Detroit in 1832, and although this direct route was not completed until 1838, stages were running between the two cities via a northern route through the Saginaw Valley, Flint, and Pontiac. This stage made stops at the Slater Mission (Grand Rapids), the Rochester Colony (Ionia), Scott's Place (Clinton County), Byron (Shiawassee County), and Pontiac. By this time there were approximately twenty American Fur Trading Company posts in the Grand River Basin. In addition to those mentioned before, Louis Campau had posts at Lowell, Hastings, and Eaton Rapids; William had a post near Lyons, and Lousi Moreau had a post near Middleville.

h. Improved transportation quickly led to a land boom beginning in 1833. In this year there were less than one-half million settled acres in all of Michigan Territory (which still included most of the State of Wisconsin). In three years time the domesticated acreage increased to four million acres.

Village lots in Grand Rapids, worth 25 dollars in 1833, were worth 560 dollars by 1835, and the population had increased from 100 to 1,000. A number of wildly ambitious schemes were undertaken, such as a canal from Mt. Clemens, on the eastern part of the State, across to Kalamazoo. In 1835, workers hired for the construction of locks and a canal around the rapids at Grand Rapids were loading their families on flat-bottomed scows and floating down the Grand River from Jackson (presumably with portages around Eaton Rapids and Grand Ledge). Four land routes were simultaneously under development to cross Michigan from east to west. In 1835, there were two stagecoaches weekly between Detroit and Chicago along the Chicago Road, and Branch County alone had 33 taverns along the coach route. Land speculation, particularly in the Grand River Basin, reached its peak in 1837, the year that Michigan became a state. Lax banking laws led to the formation of countless wildcat banks, some deliberately hidden in the woods along little tributary streams of the Grand. Paper profits and land speculation terminated abruptly with the financial panic of 1839.

i. Fortunately, this situation was quickly followed by the sounder profits to be derived from the vast stands of white pine and hardwoods along the Michigan rivers. By 1840, the Grand River was a major commerce route for the lumbering industry.

j. In 1839, the Grand River had been made navigable for small steamships between Grand Haven and Grand Rapids. Grand Rapids became the center for the logging industry and began its rise to eminence in furniture manufacturing. Logging dominated the valley of the Grand River from 1840 to 1870 to a far greater extent than the fur trade had in the preceding two centuries. As the great stands of timber were cut off, the open farmlands drew increasing numbers of settlers. The completion of the Detroit-Milwaukee Railroad to Grand Haven in 1858 ended the wilderness period of the Grand River Basin.

19. DEVELOPMENT SINCE 1850

a. Influence of Lumbering. From the middle 1800's until the early 1900's, many communities enjoyed a booming lumbering business. At this time, the center of Michigan's 2.7 million population was in Gratiot County, about ten to fifteen miles northwest of the present city of Ithaca.

b. Problems Due to Conversion to Agricultural Land Use

(1) Suitability of Land to Agriculture. The Grand River Basin suffered while Michigan's land use changed from lumbering to farming. Most early observers of the land settlement process in Michigan assumed that the plow would follow the axe across the Michigan landscape. Owners of timberlands expected to cut their merchantable timber and then sell the partially cleared land to prosepective farmers. This happened with thousands of acres, but problems developed because much of the land area proved to be ill-suited for sustained agriculture use. The day of reckoning came early for many settlers as the word spread that the cutover land was not suitable for an agricultural endeavor. The demand for cutover land disappeared and owners stopped paying taxes on all but their choice land holdings.

(2) Tax Problems. Michigan experienced severe property tax delinquency problems in 1932 when 17.2 million acres of land was tax delinquent. By 1941, 4.5 million acres reverted to the State and thousands of additional acres were saved from possible tax reversion by Federal purchase programs under which lands were acquired for national forests, wildlife refuges, and military purposes.

c. Post World War II - Land Use. Farming has continued as the primary land use, occupying sixty-three percent of the land area in the Basin. With the regrowth of new timber, forests now occupy 15 percent of the area. The remaining 22 percent is used for outdoor recreation, cities, and miscellaneous urban development. The latter 22 percent has shown a marked increase in the last two decades. This trend is the result of the concentration of our population in metropolitan communities, the rise of automobiles and all-weather roads, increased standards of living, and the growing affluence of the average urban worker. The farmland is expected to decrease in the future because of urban and related non-farm use.

SECTION VII

ARCHAEOLOGICAL RESOURCES

20. RECENT INDIAN SETTLEMENTS

a. Tribal affiliations of the Indians of the Grand River Basin were well-known by the beginning of the nineteenth century, but throughout the eighteenth and latter part of the seventeenth centuries there had been so much movement of villages and tribal groups that it is difficult to reconstruct the tribal territories. In this, historic sites archaeology has not helped greatly. Apparently within a very few years of their contact with the French the Indians developed a virtual pan-Indian material culture. The traditional stylistic variations of pottery, arrowheads and stone tools which had earlier distinguished tribal groups were supplanted by the ubiquitous brass kettles, glass bottles and iron knives and axes introduced by the traders. Even traditional objects such as shell ornaments, stone beads, and stone pipes were now made in European factories for the Indian trade, and there is little distinction between an Ottawa, Chippewa, or Huron grave of the early seventeen hundreds.

b. By combining archaeological and historical evidence, it appears virtually certain that Pottawatomie extended northward along the Lake Michigan shore to some distance north of Grand Haven. There is no evidence, however, to suggest that the Pottawatomie extended any further into the interior of the Basin. By the time of earliest records, most of the Grand River valley was occupied by Ottawa. However, this is a northern tribe and they may only have moved south into the fur-rich valley after the threat of raids by the Iroquois was over. In 1742, when Charles Langlade left Michillimackinac to trade along the Grand River, he took Ottawa Indians from the village of L'Arbre Croche with him, and, when he established a trading post on the Grand in 1755, many Ottawa families are reported to have moved down to the valley. The situation with the Chippewa (Ojibwa) is similar. They also are a northern tribe, and, although some moved to Detroit with Cadillac in 1703, the major move of Chippewa south in to Saginaw Bay probably took place after this time. By the middle 1700's, they had moved into the northeastern part of the Basin

from Saginaw Bay, down the Saginaw and Shiawassee River. There is little evidence that they had villages west of the middle Maple River, although one account reports Ojibwa around Frambois's Trading Post in 1796. Other tribes living in the southern part of Michigan, the Miamai in the southwest and the Huron (Wyandot) in the southeast, are not reported to have lived in the Basin.

By the time of the Pontiac uprising in 1763, the Pottawatomie were regularly traveling along the southern tier of counties between Detroit and St. Joseph, crossing the Grand River Baisn near Jackson. Shortly after the War of 1812, when trading posts were established in this region, there was a line of Pottawatomie villages between Ypsilanti and St. Joseph; this includes a group of villages near Jackson. From 1827 to 1837, the trading post established by Louis Moreau at Middleville, in Barry County, was dealing with Pottawatomie, and Farmer's 1831 map indicates Pottawatomie along the Lake Michigan shore north and south of Grand Haven.

All of the posts along the lower and middle Grand River traded with the Ottawa, and several villages have been located on the map, although very few have been located archaeologically. Villages located on the Farmer map of 1831, include the following: In Ottawa County, a "Green Encampment," which appears to be an Indian village; a village at the border of Ottawa and Kent Counties; a village at the bend of the Grand River below Grand Rapids; Muck-a-ta-sha's village just north of this; Banjeuting's Village at Grand Rapids; Prairie Village at the mouth of the Rogue River; Nog-gee's village of 72 families at the "Forkds of the Grand River" (southwest bank of the mouth of the Thornapple River); Kewagooshcum's village of 40 lodges on the northwestern bank at the mouth of the Flat River; Co-coose's village with a population of 200 at the mouth of the Maple River; P. Shinmaeon's village five miles south of the mouth of the Lookingglass River; and Indian village on the Red Cedar River near Okemos, and several villages (presumably Pottawatomie) near Jackson.

Additional known villages recorded by Hinsdale, many of them later than 1830, are: Nanommadowba at Pottawatomie Bayou, six miles below the mouth of the Grand; Onamontapes at the mouth of Crockery Creek, Sagenish

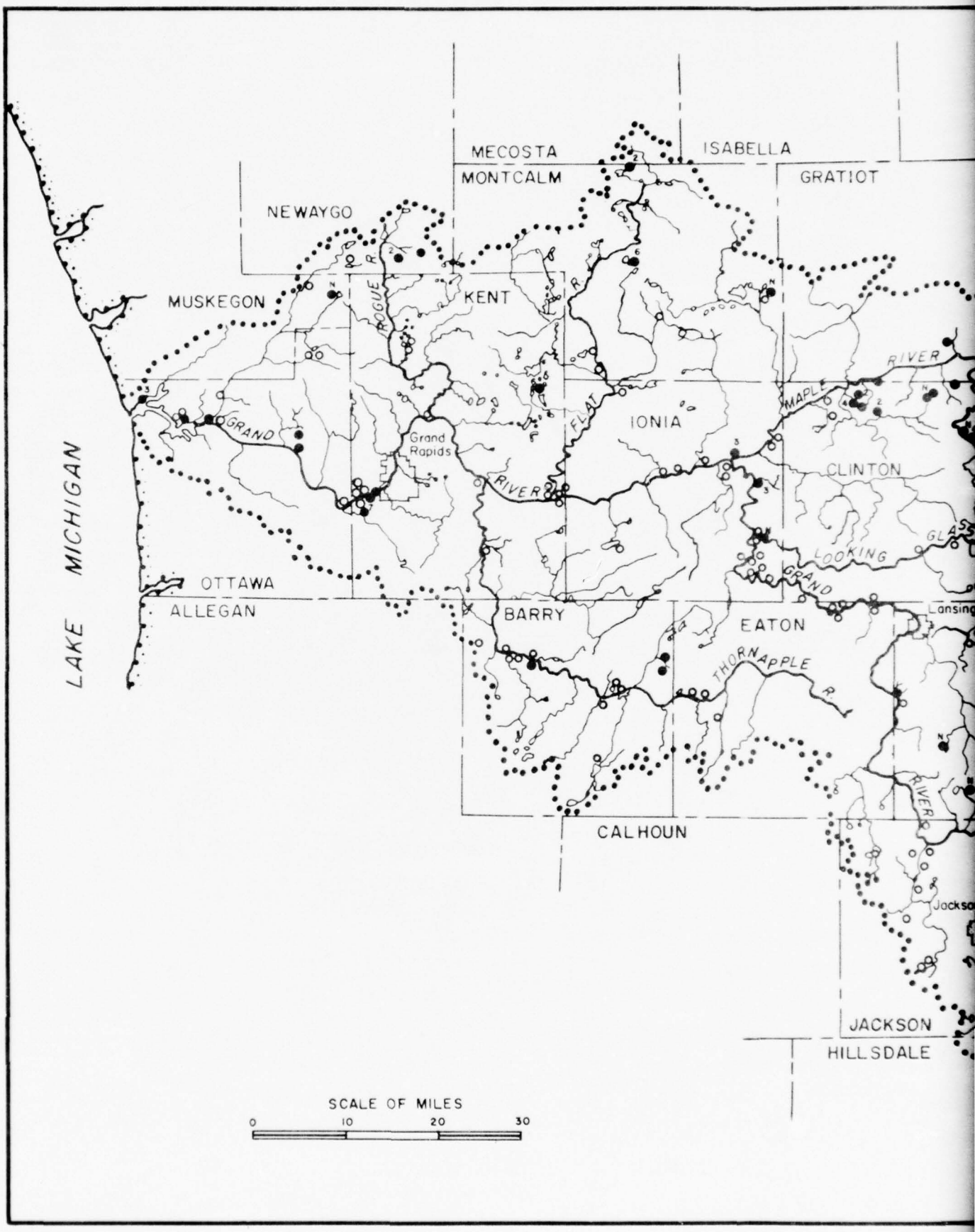
in the east of Ottawa County; Astoquet at Grandville, Nonoquahezich and Muckatasha at Grand Rapids, Rogue's village at Plainfield; Nogee's at Ada; Kewagooshcum's at Lowell; Maketoquets on the Maple; Shitumoron's at the mouth of the Maple; Wabwahnaseepe's on the Lookingglass; and Metea's at the head of the Grand River, south of Jackson.

21. THE PREHISTORY OF THE GRAND RIVER BASIN

a. General Discussion. Unfortunately, we know practically nothing of the prehistoric occupation sites of the Grand River valley. Even less is known of sites in other areas of the drainage basin. While numerous sites have been reported from this huge area (See map - Plate B-6 - and archaeological bibliography) neither the Grand River valley nor any other part of the Grnad River Basin has been subject to systematic site survey. In fact, only two sites in this entire drainage system have been excavated by professional archaeologists. Fortunately, most of the amateur archaeologists of the valley belong to three large and well-organized chapters of the Michigan Archaeological Society - the Jackson Chapter at Jackson; the Upper Grand Valley Chapter in Lansing; and the Wright L. Coffinberry Chapter in Grand Rapids. Members of these chapters have been cooperative in surveying and reporting the locations of archaeological sites in the Basin. These sites have been recorded in the Michigan Archaeological files at the University of Michigan and occasionally reported in the Wright L. Coffinberry Newsletter or the Michigan Archaeologist, the official publication of the Michigan Archaeological Society.

b. Periods of Occupation. The following is a brief description of the generalized occupation periods represented in the Basin. Wherever possible, bibliographic citation will be provided as a reference for more complete coverage of this data. The bibliography included at the end of this section of the report is essentially a complete listing of the published sources for archaeology in the Basin of the Grand River.

(1) Paleo-Indian Period. Numerous fluted point finds in the Grand River Basin testify to an occupation by Paleo-Indian hunters as early as 12,000 years ago. These people were the first to settle this area. They seem to have preferred the higher, well-drained part of the Basin


MECOSTA
ISABELLA
MONTCALM
GRATIOT
NEWAYGO
MUSKEGON
KENT
ROGUE R.
FLAT R.
RIVER
MAPLE
IONIA
GRAND
Grand Rapids
RIVER
CLINTON
LOOKING GLASS
GRAND
LAKE MICHIGAN
OTTAWA
ALLEGAN
BARRY
EATON
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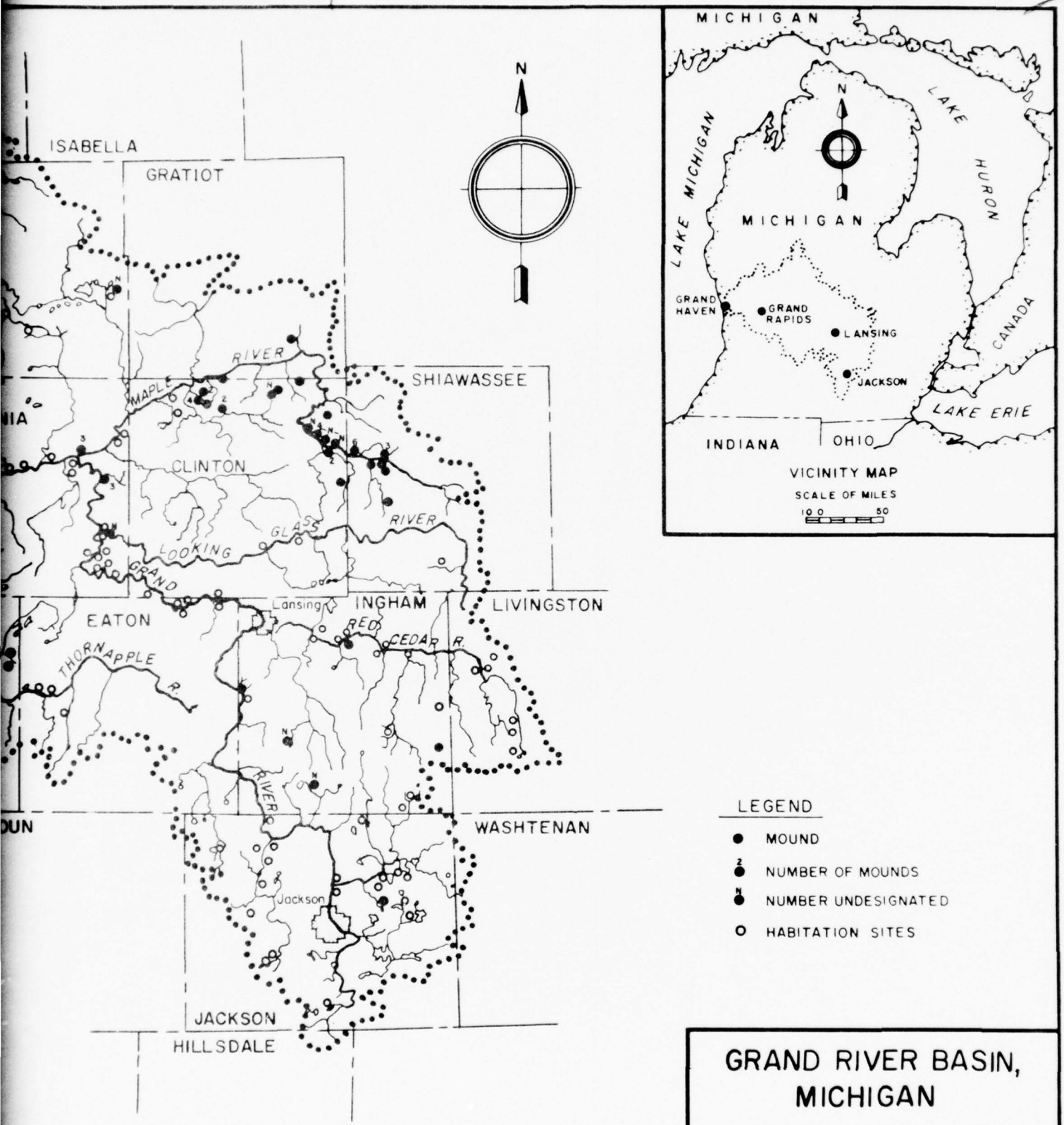


LEGEND

- MOUND
- 2 NUMBER OF MOUNDS
- N NUMBER UNDESIGNATED
- HABITATION SITES

GRAND RIVER BASIN, MICHIGAN

ARCHAEOLOGICAL SITES

U.S. ARMY ENGINEER DISTRICT,

PLATE B-6

which was probably an open spruce-fir forest at that time. Here they hunted caribou, and small game species perhaps musk oxen, mammoth, and mastodon. The scattered fluted point finds and the few small camps upon which Paleo-Indian artifacts have been recovered indicate that the dwellings were small and widely scattered. Although no Paleo-Indian sites have actually been excavated in this area, work with surface collections by Peru (1965) and Fitting (1963) have helped to correlate fluted point finds with glacial features and to define the morphological and metric attributes of some of the fluted point types. The Hi-Lo Site (formally the Flat River Site) described by Fitting is located on a high terrace of the Flat River near Fallasberg, Michigan. The Hi-Lo Site seems to represent the latest occupation in the fluted point tradition in western Michigan which Fitting places at approximately 8,000 to 10,000 years ago.

(2) Early Archaic Period. Following the late Paleo-Indian occupations, the Baisn was occupied by groups of people who made long lancolate projectile points of the Plano tradition. These groups lived in the closed spruce-fir forests which invaded the Grand Basin soon after the retreat of glacial ice. They survived by hunting the large animals of the Northern forest such as the moose and woodland caribou. While early archaic sites have been excavated in the Basin, surface finds are usually associated with the higher terrace systems of the Grand River and its tributaries. In a study of the distribution of early archaic projectiles in southern Michigan, Peske (1963), points out that the early archaic peoples of the Upper Grand drainage usually manufactured points form argellite and occasionally quartzite. During the same period, people living near the mouth of the Grand River, like those of the southwestern part of the state, manufactured the same style of points except that they were made of flint.

(3) Middle Archaic Period. About 6,000 years ago, the spruce-fir forest of southern Michigan was replaced by pine forests with a strong deciduous element. We know little of the people who lived and hunted in these forests aside from the fact that their lithic technology contained new elements. These include large side and corner-notched projectiles and a variety of ground stone implements such as banner stones and grooved axes.

Artifacts of the Middle Archaic period are found abundantly in the Basin and frequently appear in the collections of amateur archaeologists. No specific Middle Archaic sites have been identified in this study.

(4) Late Archaic Period

(a) By 2,000 B.C., the predominance of the deciduous forests probably led to a new way of life for peoples living in central lower Michigan and although we have access to some information about the burial practices of Late Archaic peoples we know practically nothing about the way they lived. Inferences based on information from Late Archaic sites outside of the Basin and on the kinds of tools these people manufactured lead us to believe that they had a varied economy based on the hunting of deer and elk; the collection of seeds, berries and nuts, as well as the harvesting of mollusca and fish. The medium size side-and corner-notch projectiles which characterize occupation sites of the Late Archaic period have been found on the intermediate terraces of the Grand. The Smith Site near Lansing and the Little Egypt Site near Portland are examples. Neither of these sites have been excavated.

(b) The burial complex of the Late Archaic which is represented in the Basin is partially influenced by the Glacial Kame from Ohio and south central Michigan and Red Ocher from Illinois and southwestern Michigan as well as by Old Copper from the northern part of the state. Turkey tail points, cache blades, copper implements and shell gorgets typical of Late Archaic burials have been found throughout the Basin, but no specific burial sites of this period are known. A notable Late Archaic find was a large cache of blades on the upper Grand near Dimondale.

(5) Early Woodland Period. The Early Woodland period is signaled in the Grand valley by the appearance of thick interior-exterior cord-roughened pottery of the type known as Marion Thick or Fayette Thick. Presumably, people making this pottery continued the hunting and gathering way of life of their Late Archaic predecessors. It is also likely, however, that the seeds of wild plants played a much more important role than their subsistence economy and that these people were utilizing some domestic crops such as squash, gourds, pumpkins, and sunflowers. Flanders (1963) has

examined the occurrence of Marion Thick pottery in southern Michigan and describes two localities on the lower Grand where this pottery has been found. There is no evidence of Early Woodland on the upper Grand, a fact which seems to be conditioned in part by a preference of Early Woodland peoples for flat alluvial valleys.

(6) Middle Woodland Period

(a) By perhaps as early as 200 B.C., people with a Middle Woodland culture moved up the Illinois River valley and settled the alluvial valleys of southwestern Michigan including the Grand. These cultures seem to have flourished until about A.D. 300 to A.D. 400, but we can say with some certainty that the florescence of the Middle Woodland developments in the Grand valley took place during the first century before and after the birth of Christ.

(b) During the early 1940's, George Quimby (1941, 1943, 1944) described the Middle Woodland Goodall focus of Northern Indiana and southwestern Michigan. This study ended serious work on the Middle Woodland occupations of the area until 1963, when highway construction threatened the spectacular and largely undug Norton Mound group near Grandville, Michigan. The danger to these mounds was averted and they were excavated under the direction of Richard Flanders (1966). Flanders' report on the Norton Mound group, as well as the Spoonville site, located along Crockery Creek near Nurica in Ottawa County, points up the close similarity between Michgian and Illinois Middle Woodland culture. The Norton Mounds are built over subsurface burial pits containing both extended and bundle burials. A partial list of the artifacts associated with these burials includes Havanna ware vessels, quadralobate Hopewellian vessels with cross-hatched cambered rims and zone dentate decoration, animal effigy platform pipes, caches of Snyders points, mica sheets, copper celts and awls, carved turtle shell dishes, and many other exotic burial items. Radio carbon dates for the Norton Mound group are A.D. 160±200 (M-1488), A.D. 100±100 (M-1490), and 10 B.C. ±120 (M-1493). The importance of the Norton site was recognized by the National Park Service when they declared it a National Historic Site.

(c) Middle Woodland artifacts have not been recorded from the Upper Grand valley, again a reflection of the decided preference of early cultures for low swampy alluvial valleys. A single exception may be the Root Site near Lansing which has produced some Havanna-like pottery (Griffin) 1962).

(7) Late Woodland Period. With the appearance of people who depended upon the cultivation of crop plants, such as, corn, beans, and squash, for a livelihood, we find numerous villages along the low terraces of the Grand River and its tributaries. Although these Late Woodland sites constitute the great majority of all sites reported from the Grand Basin, they are poorly known. Presumably the people who occupied these villages were semi-sedentary farmers who left their villages only for seasonal hunting. As a result, Late Woodland villages are frequently large and are characterized by the debris of more permanent habitation - pot sherds, flint chippage, the bones of animals consumed as food, sone artifacts, the remains of hearth, and refuse pits - all in abundance. Sites of this nature were occupied from about 500 A.D. until the time of Europen contact. As a result of their late temporal position, they are often located on or just above the flood Plain of modern water courses. One of the most noteworthy Late Woodland sites along the Grand River is the Lyons Prairie Site near Lyons at the confluence of the Grand and Maple. Its broad alluvial valley with rich soil must have supported a very large Late Woodland communtiy, for the present-day fields and forests of the entire area are covered with the broken pottery vessels and debris of the Late Woodland flint knappers. It is important to note that this is not an unusual situation along the valley of the Grand River.

22. THE THREAT TO THE ARCHAEOLOGICAL RESOURCES OF THE GRAND BASIN

a. Urban Sprawl. The archaeological sites of the Grand River Basin and particularly those along the Grand River and its larger tributaries are in imminent danger from a totally destructive and irreversible process - urban sprawl. A glance at a map showing the occurrence of known archaeological sites in the Basin will quickly indicate to the reader that most of these sites are located in the same areas inhabited by modern populations,

that is - on the rivers, where the rivers drop in elevation, or where they join other rivers. Thus many sites are located near Jackson, Eaton Rapids, Lansing, Grand Ledge, Lyons, Lowell, Ada, Grand Rapids, and Grand Haven. The gowth of these cities and towns have already destroyed dozens of sites. The great Converse Mound Group in Grand Rapids and the late historic Ada Site at Ada are examples. The continued expansion of these communities, especially along the rivers, which are choice building sites, are everyday threatening and destroying new sites. Subdivision stakes have already been placed over the entire Root Site near Lansing.

b. Impoundments. A second threat to the sites of the Grand River valley is impoundment. A few sites between Portland and Lyons have already been covered by water. The potential danger is great, however, since most of the sites in the Basin are located on the lower terraces and flood plains of the major streams. It should be pointed out here that damming along the lower Grand River, from Lyons downstream, would be much more destructive in this regard than in the upper part of the valley. This is due to the fact that the lower valley is much broader and contains more sites than the steeply terraced valley of the Upper Grand.

c. Highways. Highway construction is another factor of importance in considering the endangering of archaeological sites. Michigan does not have a highway salvage program. The near destruction of the Norton Mound group by the construction of Interstate Highway I-96 is only an example of one such instance.

23. RESEARCH POTENTIAL

a. Geochronology and archeology of the terrace system of the Grand River. It is apparent even on the basis of the small amount of information now at our disposal that the river terraces of the Grand contain sites of different periods. Thus, Paleo-Indian and Early Archaic sites are on the high terraces, Middle Archaic sites are located only on intermediate terraces, while later sites are primarily located on low terraces and the present flood plain. It would be interesting to document this distribution and to establish the age of the sites on these terraces as a means of establishing a terrace chronology and, at the same time, a geochronological technique for dating sites.

b. The prehistoric settlement systems of the Grand River Valley. Since the valley can be divided easily in two parts consisting of the upper and lower valley, and since these parts are geologically, physiographically, and ecologically very different, it would be interesting to compare the kinds of prehistoric occupations in the two parts of the valley. It has already been mentioned, for instance, that Middle Woodland sites occur only in the lower valley, while Late Woodland sites are spread over both parts. It would be interesting to try to find out why and to compare and contrast the size, and demography for populations belonging to the same cultural tradition but occupying distinct parts of the valley. The available and obtainable data would certainly permit significant statements concerning the ecological adaptations and settlement systems of these groups.

c. The Grand River as a channel of transportation and communication for prehistoric peoples. While relatively little is known of the prehistory of the Grand River valley, a great deal is known of these developments in the southwestern, southeastern, and Saginaw valley areas of Michigan. The intervening Grand River Basin and the valley are literally a blank on the archaeological map. The little that we do know, however, seems to indicate that at some periods the Grand was important in the movement of the people, and at others in the movement only of styles and ideas. We know, for instance, that Early and Middle Woodland peoples settled on the mouth of the Grand and in the Saginaw basin. To get from one place to the other, they must have passed up the river without settling it. Paleo-Indian projectiles in the Basin are like those of the southwestern part of the state, while those of the Early Archaic period are like the points in the eastern part of the state only generally resembling those in the southwestern part of Michigan. The Grand is the only major river system in Michigan's lower peninsula that provides a link between the waters of Lake Huron and Lake Michigan. It would seem, therefore, to provide an excellent laboratory for the study of communication and transportation during prehistoric times.

SECTION VIII
LAND TREATMENT

24. RESERVOIRS

Reservoirs in the Grand River Basin are generally small in area and are formed behind power and flood control dams. Most of the reservoirs have a large growth of vegetation. This vegetation has increased organic settlement and thus greatly reduced the storage capacity and recreational area of the reservoirs. (Bibl. No.5, Appendix D) Very little reservoir acreage is devoted solely to recreational purposes. Boating is difficult in many of the reservoirs due to the lush aquatic plant growth which also restricts swimming and fishing. Many of the reservoirs of the Basin have definite stream channels which, in many cases, follow the approximate courses existing before the reservoir construction. This has caused increased vegetation growth and sedimentation in the low velocity areas of the reservoir outside of the definite channel boundaries. Table B-3 lists the present reservoir sites in the Basin developed for hydropower. Plate B-7 shows the potential reservoir sites located and inventoried by the Corps of Engineers. Plate B-8 shows those sites located and inventoried by the U. S. Department of Agriculture, Soil Conservation Service.

25. FLOODWATER RETARDING STRUCTURES

a. Flood Conditions. A Basin-wide flood has the probability of occurring once in forty years. Minimum conditions necessary for such a flood include: adequate precipitation to cause about 1.5 inches of runoff uniformly throughout the basin simultaneously. This usually occurs during the months of February through April. (Bibl. No.5, Appendix D) The most noteworthy Basin flood characteristics are that the Grand River peak flows at Lansing usually coincide with the peak flows from the Red Cedar River, excluding the Portage River flows and the runoff from the area upstream of Jackson.

b. Federal Projects. No Federal flood control projects have been constructed in the Basin. Two major projects have been authorized by Congress to include flood control measures. One is for the Grand and Red Cedar Rivers at Lansing and East Lansing. The intensive plan of protection includes widening,

deepening, and cleaning out of sections of the existing Grand River and Red Cedar River, and construction of diversion channels, drop structures, a diversion dam, and levees. The other project is at Grandville and consists of a levee system and associated inter-drainage work on the left bank of the river, embracing the area of concentrated development. Construction of these projects has not been started. Three watershed projects have been authorized: Catlin-Waters on the Maple River, Muskrat Creek between Stony Creek and Lookingglass River, and Fowlerville in northwestern Livingston County near Fowelerville. Their specific location is shown in Appendix M, Plate 3.

TABLE B-3

GRAND RIVER BASIN
RESERVOIR SITES (POWER DEVELOPMENT)

Name	Location	River	Installed capacity KW	Gross head (ft.)	Annual power generation KWHR (million)
CONSUMERS POWER CO.					
Ada	Sec 34, T7N, R10W	Thornapple	2,000	20	6.7
Cascade	Sec 16, T6N, R10W	Thornapple	2,560	28	8.0
La Barge	Sec 15, T5N, R10W	Thornapple	700	19	6.7
MIDSTATE SERVICE CO.					
Middleville	Sec 23, T4N, R10W	Thornapple	350	12	1.5
Irving	Sec 31, T4N, R9W	Thornapple	600	7	2.3
VILLAGE OF LOWELL					
Lowell (municipal)	Sec 7, T7N, R8W	Flat	795	18	2.7
CONSUMERS POWER CO.					
Lowell	Sec 35, T7N, R9W	Flat	900	34	5.1
Belding	Sec 10, T8N, R8W	Flat	400	10	1.4
Webber	Sec 33, T7N, R5W	Grand	3,250	26	9.1
VILLAGE OF PORTLAND					
Portland (municipal)	Sec 20, T6N, R5W	Grand	375	20	2.4
CITY OF LANSING					
N. Lansing (municipal)	Sec 9, T4N, R2W	Grand	200	9	1.1
Moores Park (municipal)	Sec 21, T4N, R2W	Grand	1,000	15	2.6
MILLER DAIRY FARMS					
Spicerville	Sec 8, T1N, R3W	Spring Brook	450	9	1.5
TOTAL			13,580		47.8

c. Local Projects

(1) Grand Rapids. After the 1904 flood, Grand Rapids constructed flood retaining walls and levees with interior drainage along the banks of the Grand River within the city limits. Since this construction, flood damage has been restricted to the southwestern section of the city that is not protected by the walls.

(2) Jackson. The city of Jackson has experienced no flooding of consequence since the city modified the Grand River channel by encasing it in a concrete conduit placed on the existing riverbed through the central business district and by widening and straightening the river channel from Jackson Road to Bemy Road, approximately eight miles north of Jackson.

(3) Eaton Rapids. Three dams on the Grand River at Eaton Rapids exert a significant influence on floods and low flows. One of two power dams is located approximately two miles upstream from Eaton Rapids at Smithville while the other is at Eaton Rapids. A dam within Eaton Rapids is used for water supply and scenic purposes.

(4) Lyons. Flood flows at Lyons are affected by two dams on the Grand for power development. One at Lyons is a low head dam with only minor effects on Grand flows. A dam at Weber, six miles above Lyons, is the highest head structure on the Grand River. Operation of this dam has significant effects of Grand River flows at Lyons.

(5) Lowell. The Flat River has a power dam located in Lowell just upstream from its Grand River confluence. This dam has significant effects in Lowell with such effects dependent on coincidental Grand River flows.

(6) Other projects. No other flood control projects of importance have been constructed by other Basin communities. Lowhead power dams with limited storage capacity have been constructed but these have little effect on downstream flood conditions.

26. FARM AND FOREST PRACTICES

a. Farms. More than one-half of the Grand River Basin is presently cropland. The area utilized as cropland is expected to decrease in the future because of urban and related non-farm use. The uplands in the Grand

River Basin have gone through a cycle of gully formation. These gullies began as a result of sheet erosion due to extensive cultivation. This cultivation accelerated runoff until the topsoil was carried away by sheet erosion. Gully systems gradually developed in sloping fields. Much of the scar from this erosion has, in subsequent years, been smoothed by grading and grass waterway establishment but is still in evidence in some areas.

(1) Irrigation

(a) Type of demand. The irrigation season in the Basin begins in late April or early May, and continues through early September. The areas which are irrigated are for the most part adjacent to Lake Michigan. In the Lower Basin, truck crops account for more than one-third of the agricultural irrigated acres with raspberries, blueberries, flowers, and nurseries also having a significant acreage. In the Upper Basin, above Ionia, specialized crops, such as mint, account for the greatest acreage in agricultural irrigation. These are followed by potatoes, field crops, cucumbers, pickles, and melons. Non-agricultural irrigation of golf courses, cemeteries, and parks accounted for approximately 1,600 acres of the total Basin irrigation demand. (Bibl. No.8, Appendix G)

(b) Satisfaction of demand. Average annual water use through irrigation is over 11,000 acre-feet, with the source of supply approximately split evenly between ground and surface waters. Even with consideration of an expected increase in Basin irrigation needs, the demand on existing water resources will be minor when compared to the total water usage in the Basin.

(2) Farm Pollution. The Basin faces a problem typical of any watershed area having considerable farmland. This problem is the pollution of streams by fertilizers, insecticides, herbicides, and pesticides. The magnitude of this problem is unknown in the Basin; little research has been done in this field. Present estimates of the use of fertilizers in the Grand River Basin show that approximately 8,000 tons of nitrogen, and 15,000 tons of phosphate have been used annually with a projected increase of four and two-fold respectively by the year 2020. Based on a sampling study of rural land runoff by the GLIRB, it is estimated that there is an annual

total soluble phosphate runoff of about 940,000 pounds per year in the Basin. (Bibl. No.8, Appendix G) Agricultural pesticide treatment is a growing concern and is considered to be the major source of stream pollution. Pesticides and herbicides used in the Basin, include, D.D.T., Diazinon, Guthron, Malathion, Parathion, Sevin, Thiodan, and Toxaphene. There is little information concerning the amounts that presently are used in the Basin. The amounts of land-applied pollutants that enter the streams of the Basin depend on many factors; methods of applying the chemical treatments, quantities applied, type of soil, topography, rainfall, land use practices, and soil cover. Reduction of this pollution can be accomplished by specific land treatment improvement measures.

(3) Needs. Dominant problems in the farmland areas of the Basin must be controlled to a greater degree. A land treatment program is required which will provide for continuous utilization of land resources to satisfy current needs and also to conserve this resource for future needs. Such a program would reduce runoff, land erosion, and sediment load in streams. Erosion control by terraces, contour farming, grassed waterways, erosion control structures, and crop management should be practiced on more of the land. Excess water should be better controlled by tile drains, field ditch drainage, and diversion terraces. There is a lack of information concerning land use practices and the quantities of pesticides and fertilizers applied within the Basin. Collection of data concerning application rates of these on a yearly basis throughout the Basin would be very helpful in identifying potential water-quality problem areas. A sound treatment program will produce well-managed lands by improving control of water runoff, enhancing underground water supplies, and upgrading stream quality.

(4) Assistance available. State and Federal agencies will assist in carrying out land treatment measures in soil and water conservation of farms. Michigan State University has a Cooperative Extension Service which provides recommendations for management and treatment. A cost sharing assistance program is available through the Agricultural Stabilization and Conservation Service. Credit to be applied for conservation measures is available from the Farmers Home Administration. Other agencies providing technical assistance

include the Michigan Department of Conservation, U. S. Forest Service, and the U. S. Soil Conservation Service. (Above information form Appendix M) All lands in the Basin are located within soil conservation districts which are authorized by State law and governed by local people. These districts provide assistance to farmers, governmental subdivisions, and other land owners in planning and applying conservation management and land treatment measures on their lands.

b. Forest Practices

(1) Progress. In the last twenty years, many positive improvements have been carried out in forested areas. Growing stock and growth have increased and, on the average, stands have become better stocked. Denuded and idle forest lands have been replanted in many areas and land protective systems have become organized.

(2) Problem areas. Although progress has been made in forest land treatment, some practices of management should be improved upon.

(a) The protection of forests in the Basin is essential for protection of land areas. Good forest management practices help a watershed retard storm runoff, prevent soil erosion, and improve water quality. Forest management includes, trees, grass, and shrub planting, timber stand improvement, and forest fire control.

(b) Prevalence of poor cutting and logging practices, and lack of interest in timber-stand improvement and tree planting in some areas reflect the land owner's lack of concern for the productivity of their forest land.

(c) Grazing and burning of forest lands inhibits or prevents stand regeneration and causes quality losses to mature timber. The percent of woodland being grazed is still excessive, although it has been reduced considerably due to educational programs of farmers. Forest fire losses have been kept at a relatively low level in recent years due to an organized fire protection system.

(d) Approximately 397,000 of the 536,250 acres of forest land in the Basin need better forest management (from Appendix M). Improvement is required in the protection of timber stands from animals, insects, and diseases and also in the reinforcement of present timber stands.

(e) More than 6,500 acres of forest land in the Basin are classified as having a prominent erosion problem.

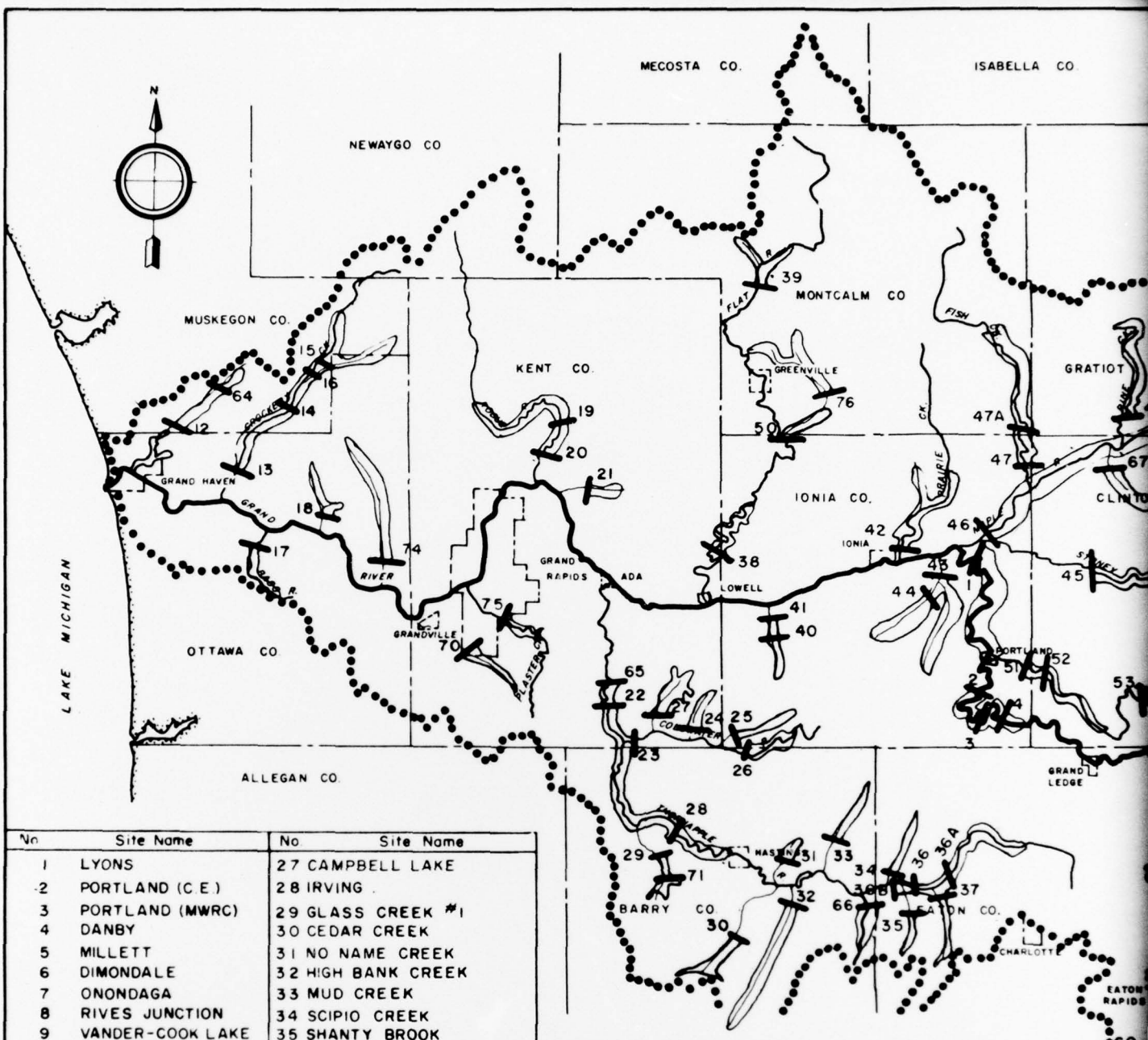
(f) More intensive silviculture must be applied to greater land area since such practice is badly needed on about 323,000 acres. Such treatment includes release, thinning, and removal of cull and poor risk trees.

(g) Fifty percent of the forest lands in the Basin need protection from insects and diseases. The high loss rate suggests that a cutting program is not now directed to removing over-mature and decadent trees which provide a source of refuge for many insects and diseases.

(3) Influence of private ownership. Over ninety percent of commercial forest land is privately owned. The average size of the plots is twenty acres. Many owners are unfamiliar with, or uninterested in, forestry practices and many lack the necessary capital for stand improvement. The small size of most holdings also is a detriment to efficient management. Private ownership is an important factor in determining the amount and type of forest management to be applied.

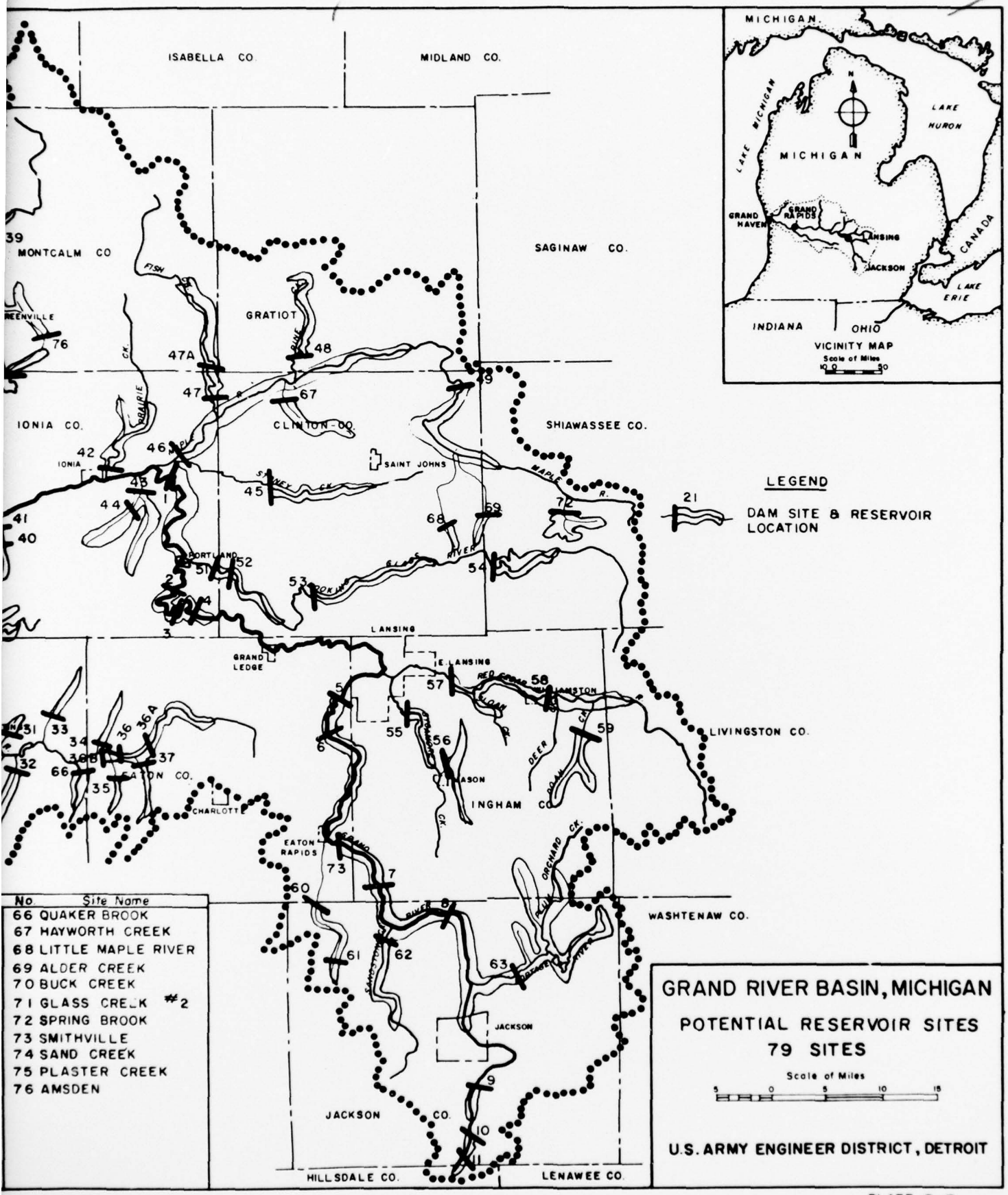
(4) Influence of public ownership. Public forest land accounts for a very small acreage (approximately six percent) of Basin forest land. Nevertheless, a good example is being set by wise management of the public forests. No State forests are located in the Basin, but municipal, county, and State governments own and manage some forest land. Federal agencies control most of the public forests in the Basin.

(5) Available assistance. Public assistance programs of both Federal and State agencies are available to improve present forest practices. County agricultural agents, extension service foresters, soil conservation technicians, and State foresters have encouraged tree planting on private land to shift idle land into use and to control erosion.



No	Site Name	No	Site Name
1	LYONS	27	CAMPBELL LAKE
2	PORTLAND (C.E.)	28	IRVING
3	PORTLAND (MWRC)	29	GLASS CREEK #1
4	DANBY	30	CEDAR CREEK
5	MILLETT	31	NO NAME CREEK
6	DIMONDALE	32	HIGH BANK CREEK
7	ONONDAGA	33	MUD CREEK
8	RIVES JUNCTION	34	SCIPIO CREEK
9	VANDER-COOK LAKE	35	SHANTY BROOK
10	LIBERTY	36	VERMONTVILLE (MWRC)
11	GRAND LAKES	36A	VERMONTVILLE (C.E.)
12	NORRIS CREEK #1	36B	VERMONTVILLE
13	LOWER CROCKERY CR.	37	LACEY CREEK
14	UPPER CROCKERY CR.	38	LOWER FLAT RIVER
15	RAVENNA #1	39	UPPER FLAT RIVER
16	RAVENNA #2	40	LAKE CREEK (WATERVILLE)
17	BASS RIVER	41	LAKE CREEK (SARANAC)
18	DEER CREEK	42	PRAIRIE CREEK
19	ROCKFORD	43	LIBHART CREEK #1
20	CHILDSDALE	44	LIBHART CREEK #2
21	BEAR CR. (CHAUNCEY)	45	STONY CREEK
22	LEBARGE	46	MUIR
23	LOWER COLDWATER	47	FISH CREEK
24	BEAR CR. (FREEPORT)	47A	FISH CREEK
25	DUCK CREEK	48	PINE CREEK
26	FREEPORT	49	ELSIE

No.	Site Name	No	Site Name
50	DICKERSON CREEK	66	QUAKER BROOK
51	LOOKINGGLASS (MWRC)	67	HAYWORTH CREEK
52	LOOKINGGLASS (C.E.)	68	LITTLE MAPLE RIVER
53	WACOUSTA	69	ALDER CREEK
54	LAINGSBURG	70	BUCK CREEK
55	SYCAMORE CREEK	71	GLASS CREEK #2
56	MUD CREEK	72	SPRING BROOK
57	OKEMOS	73	SMITHVILLE
58	WILLIAMSTON	74	SAND CREEK
59	DOAN CREEK	75	PLASTER CREEK
60	SPRING BROOK #1	76	AMSDEN
61	SPRING BROOK #2		
62	THOMPKIN'S CENTER		
63	PORTAGE LAKE		
64	NORRIS CREEK #2		
65	ALASKA		



No	Site Name
66	QUAKER BROOK
67	HAYWORTH CREEK
68	LITTLE MAPLE RIVER
69	ALDER CREEK
70	BUCK CREEK
71	GLASS CREEK #2
72	SPRING BROOK
73	SMITHVILLE
74	SAND CREEK
75	PLASTER CREEK
76	AMSDEN

GRAND RIVER BASIN, MICHIGAN

POTENTIAL RESERVOIR SITES

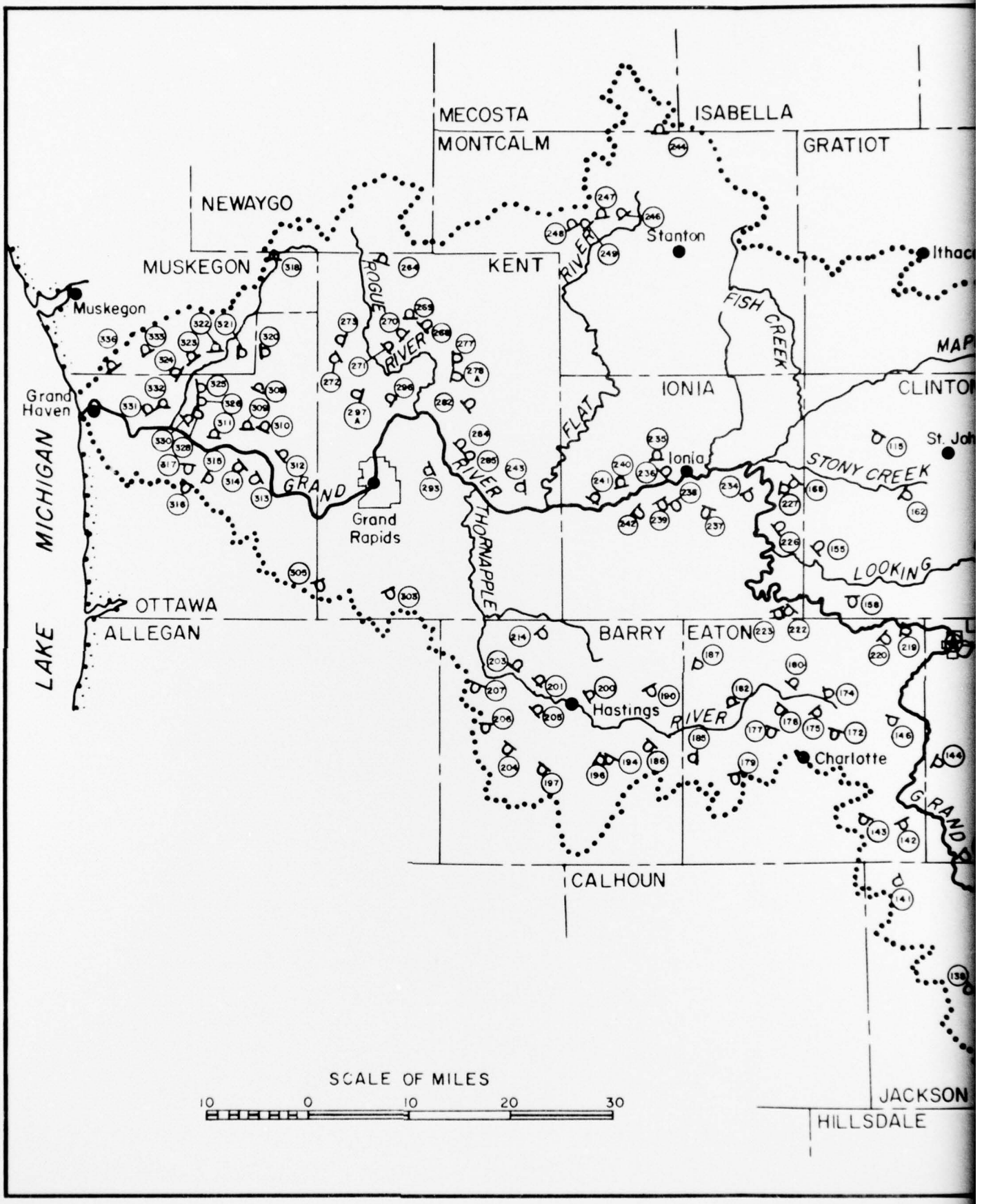
79 SITES

Scale of Miles

5 0 5 10 15

U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE B-7


MECOSTA
ISABELLA
MONTCALM
GRATIOT
NEWAYGO
Stanton
MUSKEGON
KENT
Muskegon
ROGUE RIVER
FISH CREEK
Grand Haven
IONIA
CLINTON
FLAT RIVER
Ionia
St. Joh
STONY CREEK
GRAND RIVER
Grand Rapids
THORNAPPLE RIVER
LOOKING
LAKE MICHIGAN
OTTAWA
ALLEGAN
BARRY
EATON
Hastings
RIVER
Charlotte
GRAND
CALHOUN
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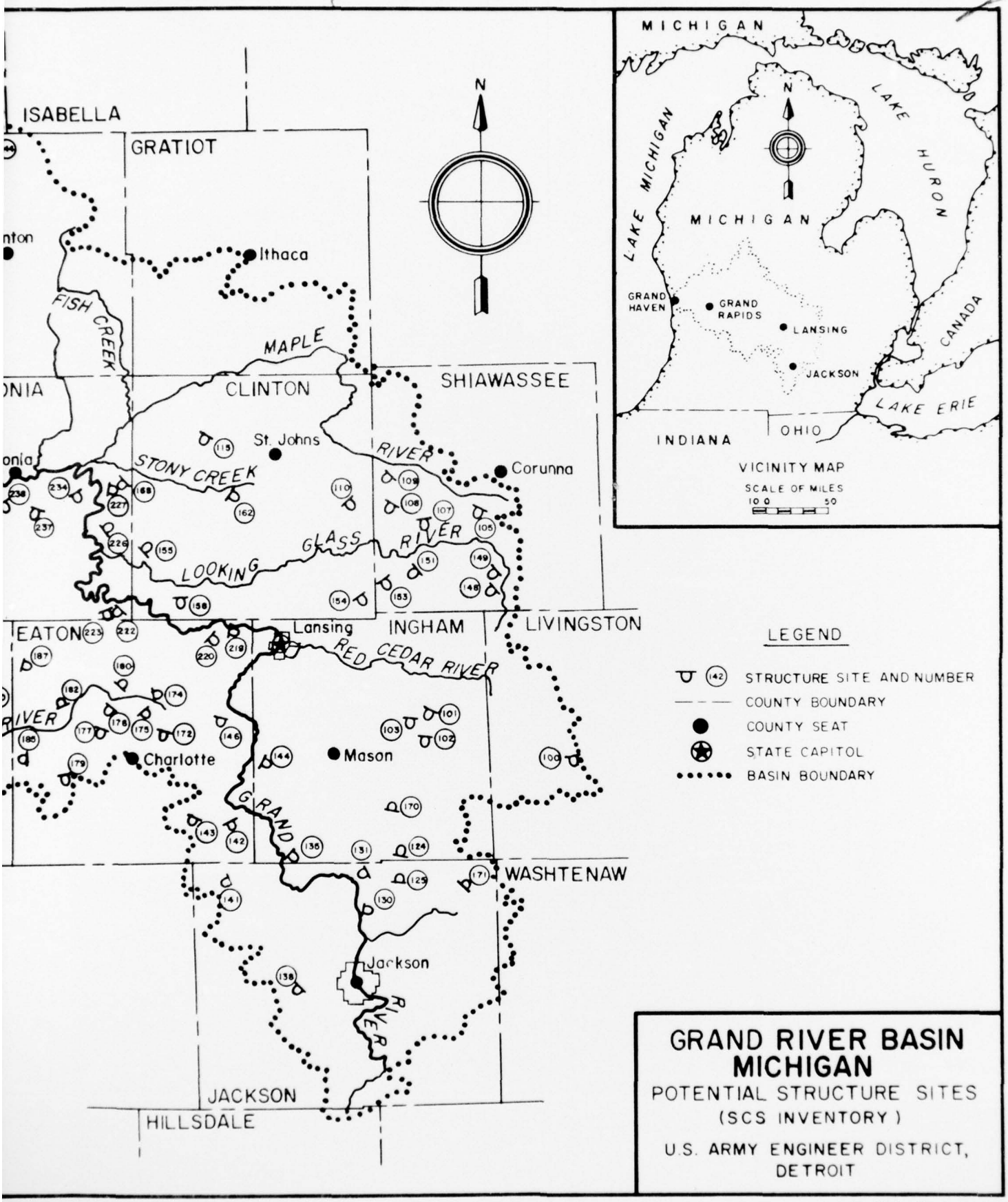
SCALE OF MILES
10 0 10 20 30



GRAND RIVER BASIN MICHIGAN

POTENTIAL STRUCTURE SITES
(SCS INVENTORY)

U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE B-8

SECTION IX

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