

**AGREEMENT GOVERNING CONSULTANT SERVICES TO BE PERFORMED
FOR THE REGIONAL WATER SUPPLY PLAN FOR SOUTHEASTERN WISCONSIN**

THIS AGREEMENT, entered into this ___ day of _____, 2005, by and between the SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION (hereinafter referred to as the "Commission"), an areawide comprehensive planning agency comprised of representatives from the Counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha, created under and pursuant to the provisions of Section 66.0309 of the *Wisconsin Statutes*; and RUEKERT & MIELKE, INC., (hereinafter referred to as the "Consultant");

WITNESSETH:

WHEREAS, the Commission desires to engage the services of a professional staff to undertake certain aspects in the preparation of a water supply plan for the seven-county Southeastern Wisconsin Region.

WHEREAS, the Consultant has a professional staff qualified to undertake such participation.

NOW, THEREFORE, in consideration of these premises and of their mutual and dependent promises and agreements, the parties hereto contract and agree as follows:

1. Employment of Consultant. The Commission hereby agrees to engage the Consultant, and the Consultant hereby agrees to perform the services hereinafter set forth, which services are intended to assist the Commission in the preparation of a WATER SUPPLY PLAN FOR SOUTHEASTERN WISCONSIN (hereinafter referred to as the "Water Supply Plan"). The primary study area for the water supply planning is the Southeastern Wisconsin Region, including Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha Counties.

The water supply planning program is intended to develop a plan for the provision and protection of long-term sources of water for the Southeastern Wisconsin Region. The technical staffing for the Water Supply Plan preparation is proposed to be provided by a cooperative team arrangement involving the Commission staff; the Consultant; and the hydrogeology staffs of the Wisconsin Geological and Natural History Survey (WGNHS), the U.S. Geological Survey (USGS), and the University of Wisconsin-Milwaukee (UWM). The lead agency for the regional water supply plan study will be the Commission. The Consultant will be responsible for conducting selected elements of the study. This Agreement is intended to provide the overall framework contractual arrangement for the water supply consulting engineering services. This Agreement also specifically covers selected work elements for which the Consultant is authorized to proceed. Additional work elements to be conducted by the Consultant will be determined by the Commission staff as the work proceeds. Subsequent work orders will be issued by the Commission staff to the Consultant defining the scope and content of the subsequent work elements, along with the attendant cost. Work elements assigned to the Consultant under future work orders shall be subject to the provisions of the Agreement. The major work elements of the Water Supply Plan, along with the potentially assigned responsibilities of the Commission, the Consultant and other agency staffs are identified in the STUDY DESIGN (hereinafter referred to as the "Study Design") which is attached hereto as Attachment A and made a part hereof by reference.

2. Scope of Consultant Services. As specified herein, the Consultant shall perform and carry out in a satisfactory and proper manner, each of the services identified in the Study Design which are specifically assigned to the Consultant under this Agreement or subsequent work orders. The Consultant shall use the same degree of care, skill, and diligence in the performance of its services as is ordinarily possessed and exercised by a member of the same profession currently practicing. The Consultant shall furnish all labor, materials, and equipment necessary to properly complete the

specifically assigned work elements, including the documentation and deliverables described in the Study Design. All study materials, including maps, presentation materials, and reports, are to be submitted in draft and final form to the Commission staff. No press releases, reports, information, data, or any other information shall be released by the Consultant without the prior approval of the Executive Director of the Commission. The work for which the Consultant will be responsible under this Agreement shall be completed according to the schedule set forth herein for the work elements specifically covered by this Agreement. The schedule for work elements to be included in future work orders will be included in those work orders. The overall Water Supply Plan schedule is set forth in the Study Design.

3. Work Element Assignment. The specific Water Supply Plan work elements for which the Consultants is herein authorized to proceed with include the following as set forth in the Study Design:

A. State-of-the-Art of Water Supply Report. A state-of-the-art report on water supply planning is to be prepared by the Consultant. The report is to describe the current and probable future state-of-the-art in water supply source development, water treatment, transmission, and storage, and related information that may affect the formulation of alternative water supply plans and the selection of a recommended plan. Particular attention is to be given to such emerging techniques as treatment for radium removal from well water supply, aquifer storage, and water conservation. In addition, it is envisioned that this work element will include consideration of technologies which could be utilized to develop groundwater recharge options. Such technologies could include high levels of tertiary treatment for wastewater treatment plant effluent, treatment systems for groundwater or surface water which may be derived from recharged wastewater, and large-scale infiltration and recharge systems. The report should include information on pertinent unit costs over a range of facility system capacities which may be expected to be considered in the water supply planning process. Water conservation measures are expected to be an important consideration in the planning effort. The technologies to be considered are listed in Exhibit A of the Study Design.

The report is to include a description of the potentially viable measures, including data on their costs and effectiveness. In addition, a section of the report is to include a section which draws conclusions regarding the potential level of water use reduction which is practical to expect, as well as the potential highest level of reduction achievable for the study area. These conclusions would be drawn from review of the findings and included in the state-of-the-art report and by reference to programs which have been implemented. These conclusions are to be integrated with the design standards as described in paragraph 3.C. below. The report is to be based upon a careful review of the literature, review of relevant existing water supply plans and other available sources. The report is to be suitable for publication as a SEWRPC technical report.

The work products to be developed by the Consultant for this work element include: 1) a draft outline of the state-of-the-art report, including the water supply and conservation technologies to be considered; 2) draft chapters or report sections; and 3) a final report. It is expected that the draft materials will be reviewed by the Commission staff initially and revised, if needed, prior to review by the Commission Regional Water Supply Planning Advisory Committee. The report, as submitted in final form incorporating any Advisory Committee comments, will be published as a SEWRPC technical report with the Consultant named as the preparer.

B. Review of Water Supply Inventory Procedures. The Commission staff will conduct a community-specific inventory of water supply systems water use. The water supply system

inventories needed for carrying out the **Water Supply Plan** development include information on water supply facilities, water use, source water and finished water quality, local water supply system plans, water unit cost, and related water supply conditions and planning in the vicinity of adjacent to the study area. This inventory will be conducted using secondary sources and a community-specific questionnaire. The Consultant will be engaged to review the inventory procedures and data proposed to be collected.

The work products to be developed by the Consultant for this work element will include a letter report describing the findings of the Consultant's review of the water supply inventory procedures and data proposed to be collected by the Commission staff. The Commission staff will provide a memorandum, including a sample community inventory summary and questionnaire for review by the Consultant.

- C. Design Standards. Standards for the design of water supply infrastructure required to deliver water to the distribution systems shall be developed by the Consultant. Design standards shall be included for water uses, water supply source development, and water treatment transmission and storage. These design standards shall be incorporated into the aforereferenced state-of-the-art report for documentation purposes.

As input into the development of the water use standards, the Commission will develop an inventory of residential, commercial, industrial, and total municipal use on a total and per capita basis for each municipal system over a five-year period of 1999 through 2004. In addition, the commercial and industrial uses will be computed on a per acre basis for commercial and industrial lands for the year 2000. All of the aforementioned data will be aggregated by county and study area. In addition, the Commission staff will develop an inventory of available information on fire protection and irrigation, uses for all municipal systems, and for separate cooling, irrigation, and power which are not provided through the municipal system.

The work products to be developed by the Consultant for this work element include: 1) a draft listing of the design standards to be developed, 2) a draft of a technical memorandum describing the standards, and 3) a final technical memorandum describing the standards. It is expected that the draft materials will be reviewed by the Commission staff initially and revised, if needed, prior to review by the Commission Regional Water Supply Planning Advisory Committee. The final technical memorandum, as submitted in final form incorporating any Advisory Committee comments, will be published as a part of the SEWRPC technical report noted under Paragraph 3.A. above.

Additional work elements will be assigned to the Consultant by the issuance of work orders defining the scope and content of the work and the attendant cost and schedule.

4. Personnel.

- A. The Consultant represents that it is an independent contractor and that it has or will secure, at its own expense, all personnel required to perform the services under this Agreement. The Consultant will pay its employees for the services performed by them and will exercise and retain control over them in connection with the details of their work, as well as their hours of employment.
- B. All of the services required hereunder will be performed by the Consultant or under the supervision of its personnel, and all personnel engaged in the work shall be fully qualified. The Consultant shall be responsible for completing all work required under this Agreement. No work or services covered by this Agreement shall be subcontracted to any other firms without the prior written approval of the Commission.

C. The Consultant shall **assign to the project** work elements the key staff members named in the Consultant's Statement of Qualification dated June 16, 2005. Changes in these staff and work elements assignments by the Consultant shall not be permitted, except upon the prior written approval of the Executive Director of the Commission. If key personnel of the Consultant become incapacitated to the extent that they are unable to perform under this Agreement, the Consultant shall so advise the Commission in writing and shall provide a mutually acceptable substitute of equal professional qualifications.

5. Schedule. The responsibilities of the Consultant shall commence upon execution of this Agreement. The following schedule is established for the completion of the three work elements specifically covered under this Agreement: 1) state-of-the-art water supply report—February 28, 2006; 2) review of water supply inventory procedures—October 15, 2005; and 3) design standards—February 28, 2006. The Commission staff will provide the water supply inventory procedures review materials to the Consultant on or before September 15, 2005.

6. Total Costs of Services and Compensations. The compensation paid to the Consultant for performance of work elements specifically Assigned to the Consultant under this Agreement as noted in paragraph 3, shall represent the cost and value of the services performed and shall not exceed the lump sum of \$81,500.00 for Item 3.A., \$8,500.00 for Item 3.B., and \$19,100.00 for Item 3.C. as noted in Section B above, as full and complete compensation for the Consultant's services, unless both the scope of services and attendant payment are expressly changed by a written numbered amendment to this Agreement. The compensation for work elements subsequently assigned to the Consultant shall be included in work orders specifically assigning those work elements to the Consultant and this paragraph of this Agreement will be amended accordingly. Such costs shall be developed consistent with the provisions of this Agreement.

7. Method of Payment. The amounts set forth in Paragraph 6 above, which amount shall constitute maximum, not to exceed, compensation for the Consultant's services under each work element, shall be paid by the Commission to the Consultant in the following manner:

The Commission shall pay to the Consultant on a work-progress basis based upon the costs incurred, within thirty (30) days of receipt of monthly invoices submitted by the Consultant, the amounts billed for progress made in the satisfactory conduct of individual work elements. Invoices shall be paid by the Commission up to a total of ninety (90) percent of the amount for each work element set forth in Item 6, with the final ten (10) percent being withheld until all the work under each work element is completed, after which the final ten (10) percent retainage will be paid. The same method of payment will apply to the compensation for subsequent work elements assigned to the Consultant.

8. Termination.

A. This Agreement may be terminated in whole, or in part, in writing by the Commission in the event of substantial failure of the Consultant to fulfill his obligation under this Agreement: Provided, that the Commission shall give the Consultant no less than ten (10) days written notice (delivered by certified mail, return receipt requested) of intent to terminate and an opportunity for consultation prior to termination.

B. This Agreement may be terminated in whole, or in part, in writing by the Commission for its convenience: Provided, that no such termination may be effected unless the Consultant is given not less than twenty (20) days written notice (delivered by certified mail, return receipt requested) of intent to terminate.

C. If termination for default is effected by the Commission, an equitable adjustment in the price provided for in this Agreement shall be made, but 1) no amount shall be allowed for

anticipated profit on unperformed services or other work, and 2) any payment due to the Consultant at the time of termination may be adjusted to the extent of any additional costs occasioned to the Commission by reason of the Consultant's default, or if termination for convenience is effected by the Commission, the equitable adjustment shall include a reasonable profit for services or other work performed. The equitable adjustment for any termination shall provide for payment to the Consultant for services rendered and expenses incurred up to the termination, in addition to termination settlement costs reasonably incurred by the Consultant relating to commitments which had become firm prior to the termination.

- D. Upon receipt of a termination action pursuant to Paragraphs A and B above, the Consultant shall: 1) promptly discontinue all services affected (unless the notice directs otherwise); and 2) deliver, or otherwise make available to the Commission, all data, reports, estimates, summaries, and such other information and materials as may have been accumulated by the Consultant in performing this Agreement, whether complete or in process.
 - E. Upon termination pursuant to Paragraph A above, the Commission may take over the work and prosecute the same to completion by Agreement with another party and the Consultant is held liable for any excess cost for such similar work or services.
 - F. If after termination for failure of the Consultant to fulfill contractual obligations it is determined that the Consultant had not so failed, the termination shall be deemed to have been effected for the convenience of the Commission. In such event, adjustment of the price provided for in this Agreement shall be made as provided in Paragraph C of this clause.
 - G. The rights and remedies of the Commission and the Consultant provided in this clause are in addition to any other rights and remedies provided by law or under this Agreement.
9. Excusable Delay. Except with respect to defaults of subcontractors, the Consultant shall not be in default by reason of any failure in performance of this Agreement in accordance with its terms (including any failure by the Consultant to make progress in the prosecution of the work hereunder which endangers such performance) if such failure arises out of causes beyond the control of, and without the fault or negligence of, the Consultant. Such causes may include, but not be restricted to: acts of God or of the public enemy; fires; floods; epidemics; quarantine restrictions; strikes; freight embargoes; and unusually severe weather; but in every case the failure to perform must be beyond the control, and without the fault or negligence of, the Consultant.
10. Changes. The Commission may, at any time, by written work order, make changes in the scope of this Agreement in the services or work to be performed. If any such change causes an increase or decrease in the Consultant's cost of, or time required for, performance of any services under this Agreement, equitable adjustment shall be made in the contract price or delivery schedule, or both, and this Agreement shall be modified in writing accordingly. Any claim of the Consultant for adjustment under this clause must be asserted in writing within thirty (30) days from the date of receipt by the Consultant of the notification of change unless the Commission grants a further period of time before the date of final payment under this Agreement. However, nothing in this clause shall excuse the Consultant from proceeding with the Agreement as changed.
11. Effective Dates. This Agreement is effective from the date of Execution of the Agreement until completion of the work specified unless sooner terminated as provided for herein.
12. Responsibility of the Consultant.
- A. The Consultant shall be responsible for the professional quality, technical accuracy, timely completion, and the coordination of all services furnished by the Consultant under this

Agreement. The Consultant shall, without additional compensation, correct or revise any errors or deficiencies in his services, products and deliverables.

- B. The Consultant shall perform such services as may be necessary to accomplish the work required to be performed under this Agreement, in accordance with this Agreement and the Study Design.
- C. The Consultant shall present, review, discuss, and defend as necessary the results of this work effort at any time within three (3) months after the date of submission of the final deliverables for each work element subject only to the imposition of reasonable time demands and the scheduling of meetings at the mutual convenience of both parties.
- D. Approval by the Commission, or any of the funding agencies of memoranda, work, or materials furnished hereunder shall not in any way relieve the Consultant of responsibility for the technical adequacy of the work. The Commission's review, approval, or acceptance of, or payment for, any of the services shall not be construed to operate as a waiver of any rights under this Agreement or of any cause of action arising out of the performance of this Agreement, and the Consultant shall be, and remain liable in accordance with applicable law for all damages to the Commission or the funding units of government caused by the Consultant's negligent performance of any of the services furnished under this Agreement.

13. Commission Responsibilities

The Commission shall carry out its responsibilities as set forth herein and do the following in a timely manner:

- A. Designate a person to act as Commission's representative with respect to the services to be rendered under this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define Commission's policies and decisions with respect to Consultant's services for the Project.
- B. Examine all studies, memoranda, sketches, drawings, specifications, proposals and other documents presented by the Consultant and render decisions pertaining thereto within a reasonable time so as not to delay the services of Consultant.
- C. Give prompt written notice to Consultant whenever the Commission observes or otherwise becomes aware of any development that affects the scope of timing of Consultant's services.
- D. Bear all costs incident to compliance with the requirements of this section.
- E. Provide available Commission inventory data needed for the Consultant's work, including available mapping for the study area at no cost to the Consultant.

14. Interest of Consultant. The Consultant covenants that it presently has no interest and shall not acquire any interest direct or indirect which would conflict in any manner or degree with the performance of his services hereunder. The Consultant further covenants that in the performance of this Agreement no person having any such interest shall be employed.

15. Interpretation. This Agreement shall be interpreted under and pursuant to the laws of the State of Wisconsin and all State laws or local ordinances, in any of the areas serviced, insofar as they are applicable to municipal contracts in Wisconsin, shall be and hereby are specifically made a part hereof as if set forth herein in detail.

16. Contingent Fees. The Consultant agrees that no person or company has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission,

percentage, brokerage, or contingent fee, excepting bona fide employees; nor has the Consultant paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee, any fee, commission, contribution, donation, percentage, gift, or any other consideration, contingent upon, or resulting from, award of this Agreement. For any breach or violation of this provision, the Commission shall have the right to terminate this Agreement without liability and, at its discretion, to deduct from the contract price, or otherwise recover, the full amount of such fee, commission, percentage, gift, or consideration and any other damages, and shall be responsible for reporting the details of such breach or violation to the proper legal authorities where and when appropriate.

17. Limitation of Liability. To the fullest extent permitted by law, the total liability, in the aggregate, of Consultant and Consultant's officers, directors, employees, agents and independent professional associates and consultants, and any of them, to Commission and anyone claiming by, through or under Commission, for any and all injuries, claims, losses, expenses or damages whatsoever arising out of or in any way related to Consultant's services, this Agreement from any cause or causes whatsoever, including but not limited to the negligence, errors, omissions, strict liability or breach of contract of Consultant or Consultant's officers, directors, employees, agents or independent professional associates or consultants, or any of them, shall not exceed the total compensation received by Consultant under this Agreement. To the fullest extent permitted by law, Consultant shall not be liable to Commission for any special, indirect, or consequential damages resulting in any way from the performance of the Services.

Since Consultant has no control over the cost of labor, materials, equipment or services furnished by others, or over the methods of determining prices, or over competitive bidding or market conditions, the Consultant's opinions of probable Project costs provided for herein are to be made on the basis of Consultant's experience and qualifications and represent the Consultant's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but the Consultant cannot and does not guarantee that proposals, bids or actual total project costs will not vary from opinions of probable cost prepared by Consultant.

18. Workmen's Compensation. The Consultant shall secure and maintain such insurance as will provide protection from claims under the Workmen's Compensation Act. The Consultant will indemnify, defend, and keep and save harmless the Commission, its agents, officials, and employees against all suits or claims that may be based on any bodily injury, or damage to property, but only to the extent that it results from a negligent error, omission, or act of the Consultant, or any person employed by the Consultant.
19. Interest of Members of Commission and Others. No officer, member, or employee of the Commission, and no members of its governing body, and no other public official of the governing body of the locality or localities in which the project is situated or being carried out who exercise any functions or responsibilities in the review or approval of the undertaking or carrying out of this project shall participate in any decision relating to this Agreement which affects his personal interest or the interest of any corporation, partnership, or association in which he is, directly or indirectly, interested; nor shall any such officer, member, or employee of the Commission or any member of its governing body, or public officials of the governing body of the locality or localities in which the project is situated or being carried out have any personal interest, direct or indirect, in this Agreement.
20. Disputes and Remedies. Any disputes arising under this Agreement regarding services to be provided under this Agreement shall be settled by arbitration. Arbitration proceedings hereunder shall be commenced within thirty (30) days after the party is made aware of the dispute by that party giving notice of its election in writing to submit the dispute to arbitration, accompanied by a written statement of the issue to be arbitrated, to the other party to this Agreement. Within fifteen (15) days after receipt of such written notice, the Commission and the Consultant shall each select

one arbitrator who shall be well qualified in the subject matter in dispute. The two arbitrators so selected shall designate a third arbitrator who shall be well qualified. The costs and expenses incurred in connection with the arbitration proceedings shall be shared equally by the parties to this Agreement. The decision of the arbitrators hereunder shall be final and conclusively binding upon the parties to such proceedings, and judgment upon award rendered by the arbitrators may be entered in any court having jurisdiction thereof.

21. Right to Work Products. All materials developed, prepared, completed, or acquired by the Consultant during the performance of the services specified in this Agreement, including all finished or unfinished surveys, data, drawings, maps, photographs, and reports, shall become the property of the Commission and shall be delivered to the Commission during the Agreement period. Such materials shall not be released by the Consultant or used for other purposes at any time without the written approval of the Commission.
22. Copyrights. No drawings, maps, photographs, documents, reports, or other data prepared or completed under this Agreement shall be copyrighted by the Consultant nor shall any notice of copyright be registered by the Consultant in connection with any such material prepared or completed under this Agreement.

Notwithstanding the above, Consultant shall retain its rights in its standard drawing details, designs, specifications, databases, computer software and any other proprietary property. Rights to intellectual property developed, utilized, or modified in the performance of the Services shall remain the property of the Consultant.

23. Discrimination. The Consultant agrees not to discriminate against any employee or applicant for employment on the basis of race, religion, sex, color, national origin, or physical handicap in the areas of upgrade, demotion, transfer, recruitment or recruitment advertising, layoff, termination, rates of pay or other forms of compensation and selection of training, including apprenticeship.
24. Disadvantaged Business Enterprise. The Commission is committed to securing the participation of Disadvantaged Business Enterprise (DBE) firms (as defined in 49 C.F.R. Part 26) in its work programs. Thus, the Consultant is encouraged to seek direct or indirect opportunities for DBEs in the conduct of this work effort. The Consultant shall ensure that DBEs have an opportunity to compete for, and perform, subcontracts and to ensure nondiscrimination in the award and administration of all subcontracts supported by this work program.
25. Audit and Access to Records. Audits conducted pursuant to this provision shall be in accordance with generally accepted auditing standards. The Consultant shall maintain books, records, documents, and other evidence directly pertinent in the conduct of this project governed by the Agreement in accordance with accepted professional practice and appropriate accounting procedures. Representatives of the Commission shall have access to such books, records, documents, and other evidence of direct cost and expenses for the purpose of inspection, audit, and copying. The Consultant will provide proper facilities for such access and inspection.

The Consultant agrees to the disclosure of all relevant information and reports. In those cases where the audit concerns any party to the Agreement, the auditing agency will afford that party an opportunity for an audit exit conference, and an opportunity to comment on the pertinent portions of the draft audit report. The party(ies) involved will be provided copies of the formal draft audit report at the time of its transmittal. Such transmission will include the written comments, if any, of the party(ies) involved.

Records shall be maintained and made available during performance of the study and until three (3) years from the date of final payment for the project. In addition, any records which relate to a "dispute" appeal and arbitration or litigation, or the settlement of claims arising out of such performance, or costs or items to which an audit exception has been taken, shall be maintained and

made available until three (3) years after the date of resolution of such appeal, litigation, claim, or exception.

- 26. Gratuities. The Commission may, by written notice to the Consultant, terminate the right of the Consultant to proceed under this Agreement if it is found, after notice and hearing, by the Commission that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Consultant, or any agent or representative of the Consultant, to any official or employee of the Commission or other involved agency with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performance of this Agreement: Provided, that the existence of the facts upon which the Commission makes such findings shall be in issue and may be reviewed in proceedings pursuant to the Remedies Clause of this Agreement.
- 27. Waiver of Subrogation and Additional Insureds. Consultant and Commission waive all rights against each other and their directors, officers, partners, commissioners, officials, agents, subcontractors, and employees for damages covered by property insurance during and after the completion of the Services.
- 28. Third Party Rights. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than Commission and Consultant.

IN WITNESS WHEREOF, the Commission and the Consultant have executed this Agreement.

SOUTHEASTERN WISCONSIN REGIONAL
PLANNING COMMISSION

Date _____

By _____
Thomas H. Buestrin, Chairman

Attest _____
Philip C. Evenson, Deputy Secretary

RUEKERT & MIELKE, INC.

Date _____

By _____
William J. Mielke, President, CEO

Attest _____
Michael F. Campbell, Senior Vice-President, COO

Attachment A

STUDY DESIGN FOR A REGIONAL WATER SUPPLY PLAN FOR SOUTHEASTERN WISCONSIN

The Southeastern Wisconsin Regional Planning Commission (SEWRPC) is undertaking the preparation of a regional water supply plan for Southeastern Wisconsin. The following sections of this memorandum describe the purpose and study area of the proposed study, identify major elements of the proposed study and the initially proposed staffing and organization for each element.

PURPOSE AND STRUCTURE OF THE REGIONAL WATER SUPPLY PLANNING PROCESS

The scope of the regional water supply plan is based upon the description set forth in the document entitled *Regional Water Supply Planning Program Prospectus*. This document was prepared under the guidance of the SEWRPC Regional Water Supply Advisory Committee. The regional water supply plan is intended to include the following major components:

- Development of water supply service areas and of forecast demand for water use.
- Development of recommendations for water conservation efforts to reduce water demand.
- Evaluation of alternative sources of supply, culminating in identification of recommended sources of supply for each service area and in recommendations for development of the basic infrastructure required to deliver that supply, including necessary treatment, storage, and transmission facilities.
- Identification of groundwater recharge areas to be protected from incompatible development.
- Specification of any new institutional structures found necessary to carry out the plan recommendations.
- Identification of any constraints to development levels in subareas of the Region that may emanate from water supply sustainability concerns.

The regional water supply plan will be based upon a design year of 2035. A new regional land use plan for the design year 2035 will be completed in the summer of 2005 and will serve as a basis for the development of the water supply plan. It is expected that the technical work on the regional water supply plan will be completed early in 2007, with plan adoption and documentation following during the first quarter of 2007.

The technical staffing for the regional water supply plan preparation is proposed to be provided by a cooperative team arrangement involving the SEWRPC staff; a consulting engineering firm; and the hydrogeology staffs of the Wisconsin Geological and Natural History Survey (WGNHS), the U.S. Geological Survey (USGS), and the University of Wisconsin-Milwaukee. The lead agency for the regional water supply plan study will be SEWRPC. SEWRPC will contract with a consulting engineering firm who will be responsible for conducting selected elements of the study. The elements to be conducted by the selected consultant will be determined by the SEWRPC staff as the work proceeds. Work orders

will be issued by the SEWRPC staff to the consultant defining the scope and content of the desired work element, with the attendant cost being negotiated with the consultant. The consultant will be responsible directly to SEWRPC for the satisfactory completion of all contract items.

STUDY AREA

The study area for the water supply planning is the Southeastern Wisconsin Region, including Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha Counties (see Map 1). Exclusive of Lake Michigan, these seven counties have a total area of 2,689 square miles, or about 5 percent of the total area of Wisconsin. These counties, however, account for about 36 percent of the total population of the State, about 36 percent of all jobs in the State, and about 37 percent of the total tangible wealth of the State as measured by equalized property value. Exclusive of school and other special-purpose districts, the study area contains 154 local units of government.

The study area is bounded on the east by Lake Michigan, which is an integral part of a major international transportation network. It is bounded on the south by the rapidly expanding metropolitan region of northeastern Illinois, and on the west and north by the fertile agricultural lands and desirable recreation areas of the rest of the State of Wisconsin. Map 1 also shows the boundaries of the urbanized areas within the Region as defined by the U.S. Bureau of the Census.

While the focus of the water supply planning will be on the Southeastern Wisconsin Region, it is recognized that the sources for water supply extend beyond the boundaries of that study area. Most importantly, the largest current source of supply used in the study area, Lake Michigan, is of interstate and international importance. In addition, the deep sandstone aquifer, and its important recharge areas, an important source of supply the Southeastern Wisconsin Region, extends well beyond the Region. Thus, in some cases, there will be a need to consider the water supply sources of the study area within the context of larger, related areas. As an example, the regional groundwater model developed as part of the regional water supply planning program was developed to represent the aquifer system primarily in Southeastern Wisconsin (model nearfield area), as shown in Figure 1. Because the deep aquifer underlying the seven-county Southeastern Wisconsin planning region extends well beyond that area, the analysis also considered a somewhat larger model nearfield area and a much larger farfield area in order to properly establish boundary conditions for the planning region.

MAJOR ELEMENTS OF THE STUDY

The major work elements are summarized in Table 1, along with the potentially assigned responsibilities of SEWRPC, other agency, and consultant staffs. The major work elements and attendant staff responsibilities are as follows:

1. Plan Organization and Coordination

Work Element Description

The organization and coordination for the regional water supply plan is expected to include: 1) the administrative direction of the study; 2) internal project management; 3) procurement and management of consultant and outside agency technical assistance; 4) coordination of the technical work involved with the integrated public involvement program; and 5) the provision of needed staffing for the planning work. The plan organization also includes staffing and coordination of an advisory committee to guide the conduct of the study. Other specific activities envisioned under this work element include: project schedule development and maintenance; arranging for, and

participation in project coordination meetings; project budget management; and overall project direction.

Staffing and Organization

The necessary administrative and technical staff coordination will be provided by the SEWRPC staff. This will involve the assignment of a project manager to provide direction and oversight, and will include providing project administration.

2. Formulation of Plan Objectives and Standards

Work Element Description

The formulation of plan development objectives and supporting design and planning standards is an important step in the water supply planning process. Soundly conceived water supply plan development objectives should incorporate the knowledge of many people who are informed about the watersheds involved. For purposes of the regional water supply planning program, the following definitions have been adopted in order to provide a common frame of reference:

- **Objective:** A goal or end toward which the attainment of plans, programs, and policies are directed.
- **Standard:** A statement of a condition or criterion used as a basis of plan design and for determining the adequacy of alternative plan proposals to attain objectives.

Water supply objectives and supporting standards will be developed, focusing on water use, sources of water supply, water supply protection, water conservation, and related plan implementation and plan structure considerations. The process of developing the water supply planning objectives and standards will involve: review of standard water supply practice documents and regulatory requirements and policies, consideration of current local water supply practices, consideration of regulatory and advisory agency recommendations, and consideration of input from the plan advisory committee and other public involvement activities.

It is also planned to develop, with the aid of a consultant, standards for the design of the infrastructure required to deliver the water supply to the distribution systems. As such, design standards will need to be developed for water use, water supply source development and water treatment, transmission, and storage. These design standards will be incorporated into the state-of-the-art report described under the following section of this document.

Staffing and Organization

The development of the water supply plan objectives and supporting standards will be carried out primarily by the SEWRPC staff. At appropriate points in the overall process, it is proposed to secure the services of the selected consulting engineering firm to review and comment on the objectives and standards in a near-to-final form. This is intended provide technical quality control for this important step in the overall process. The local officials and public input to be sought in developing the objectives and standards, is planned to be integrated with the public involvement work element described later in this document. The design standards for water use and water supply infrastructure will be developed by the selected consulting engineering firm as part of a state-of-the-art report, the preparation of which is to be contracted to a consultant as described in the following section of this document.

3. Inventories

Work Element Description

Reliable planning and engineering data collected on a uniform areawide basis are essential to the formulation of a sound regional water supply plan. Consequently, inventory becomes the first operational step in the planning process growing out of the study design. Much of the data required can be collated from the files of SEWRPC, the public water utilities operating within the planning area, Wisconsin Department of Natural Resources (WDNR), and the Wisconsin Public Service Commission. The following inventory operations will have to be conducted as a part of the proposed planning program. These inventory operations have been grouped into four types: 1) basic study area planning inventories, 2) groundwater resources inventories, 3) water supply system inventories, and 4) state-of-the-art water supply management inventories.

Basic Study Area Planning Inventories

The basic study area planning data inventories to be collated include mapping, land use data, demographic and economic data, and natural resources data.

- **Mapping**—Essential to any water supply planning effort is definitive knowledge of the topographic and cultural features of the planning area. Such knowledge can only be adequately obtained from topographic and cadastral maps of the required scale and accuracy. Information will be required on such natural features of the planning area as relief; on watershed boundaries, including especially on the location of the subcontinental divide; on the location of lakes and streams and of associated floodlands; and on wetlands and woodlands; as well as on such manmade features as streets and highways, railways, major and minor structures, and on real property boundary lines and municipal corporate limit lines. General base maps and orthophotographs are available for the entire Southeastern Wisconsin Region from the SEWRPC mapping program. Large-scale topographic maps are available for approximately 89 percent of the Region, and matching cadastral maps for approximately 76 percent of the Region from SEWRPC. These maps are available and adequate for use in the water supply plan development.
- **Demographic and Economic Data**—It will be necessary to inventory the socioeconomic factors which underlie urbanization within the Region and the demand for land and water resources. Data will be required on the historic and current resident population, household, and economic activity levels within the Region. The socioeconomic data will have to be available for relatively small geographic areas that can be aggregated into configurations representing existing and alternative future water supply system service areas. The data will have to be in a format that permits collation of historic and existing population, household, and economic activity levels with historic and current water use.

Demographic and economic studies required for regional land use, transportation, and public infrastructure system planning have been conducted periodically by SEWRPC since 1963. The data, which are available by U.S. Public Land Survey section and census geography, are available and adequate for use in a regional water supply plan development.

- **Land Use Data**—Since land use is an important determinant of water use, a land use inventory will be required for the water supply planning. Such an inventory must provide definitive data on the existing and probable future amount, type, intensity, and spatial distribution of the various land uses in sufficient detail to enable the establishment of historic

patterns and trends and provide a basis for the preparation of areawide land use and related water supply plans.

Supplementary data may have to be collected on market values, local land use plans and zoning ordinances, and the suitability of generalized site locations that may be required for the development of alternative water supply system configurations within the Region.

SEWRPC has periodically, since 1963, conducted definitive inventories of the existing land use patterns within the Region. The regional land use inventory provides data on 67 categories of land use. The land use inventory data are available and adequate for use in the regional water supply plan development. Additional data will be collected as needed.

- **Natural Resource Base Data**—Because of the relationship between natural resource conservation and recreational use and water supply management, definitive data will be required on the natural resource base of the Region. The data should include data on the location, extent, and quality of wetland, woodland, and wildlife habitat areas within the Region, and on the location and extent of related park and open space reservations. The data should include the identification of natural areas and critical species habitats requiring protection. Data will also be required on the location and extent of the floodland areas within the Region.

SEWRPC has, since 1963, periodically inventoried the woodland, wetland, and wildlife habitat areas of the Region and has identified natural areas and critical species habitats deserving protection and management. The mapped data have been compiled on ratioed and rectified aerial photos, having a scale of one inch equals 400 feet, and are available in hardcopy and digital format. SEWRPC has also conducted and collated hydrologic and hydraulic studies to determine the 100-year recurrence interval flood stages along about 805 miles of stream channel. The related 100 year recurrence interval flood hazard lines have been mapped on 1 inch equals 100 feet and one inch equals 200 feet scale, two foot contour interval topographic maps.

SEWRPC has also mapped all existing park and outdoor recreation sites within the Region, and has delineated SEWRPC-defined environmental corridors within the Region. The environmental corridors encompass concentrations of natural resource elements, including woodlands, wetlands, wildlife habitats, surface waters and associated floodlands and shorelands, as well as sites having cultural and recreational value. Importantly, these corridors also encompass areas of both groundwater recharge and discharge within the Region. The location, extent, and preservation of these corridors must be an important consideration in any regional water supply planning program.

The natural resource inventory data described above are available and adequate for use in the regional water supply plan development.

Public Utility Service Areas—An inventory of the existing and proposed sanitary sewer and water supply service areas within the Region will be required. The existing and planned sanitary sewer system service areas within the Region have been delineated by SEWRPC in cooperation with the WDNR as a part of its areawide water quality management planning program. The sanitary sewerage system service areas, the attendant sewage treatment plant locations have been mapped from system plans acquired at various scales for individual

municipal and sanitary district facilities. These sanitary sewerage system maps have been maintained current through the year 2000. SEWRPC has also completed an inventory of the year 2000 service areas of the municipal water supply systems within the Region. The inventory of areas served by public sanitary sewer service and water supply systems is available for use in the water supply plan development. That inventory is considered to be adequate for the plan development with some checking and updating needed for the water supply service areas. In addition, the planned water supply service areas will be developed as part of the analyses and forecasts work element described in a subsequent section of this document.

Groundwater Resources Inventory

Given the degree of dependency of much of the Southeastern Wisconsin Region upon groundwater as the primary source of supply, definitive data must be assembled on the hydrogeology of the groundwater aquifers underlying the Region, including data on the historical consumption of groundwater and the historical progression of water levels, or potentiometric surfaces, throughout the primary aquifers. The data required should include data on the permeability, transmissibility, and specific capacities of the aquifers, and the susceptibility of the aquifers to contamination. Because many lake levels, low streamflows, and wetland complexes are maintained by groundwater discharges, the relationships between the groundwaters and surface waters of the study area must also be established. Two inventory-related activities provide this information.

- **Basic Groundwater Inventory**—In 2001, SEWRPC, in cooperation with the Wisconsin Geological and Natural History Survey (WGNHS) and the WDNR, completed a regional groundwater resource inventory and analysis. The extensive work is documented in a report setting forth the findings of the inventory and analysis was published in June 2002. Utilizing existing well logs and available geological survey and detailed soil survey data, definitive data were developed on such factors as depth to bedrock, depth to water table, groundwater flow patterns, potential for groundwater contamination, and sources of groundwater contamination. A series of county maps was developed at a compilation scale of 1:48000 presenting the results of the inventory and analysis, the mapped data being available in both hardcopy and digital format. The series included maps showing the topmost bedrock units and specifically the areal extent of the Maquoketa shale unit; depth to bedrock; bedrock outcrops; depth to water table, water table elevation; potentiometric surfaces for units deeper than the water table; the surfaces and thicknesses of the primary aquifers underlying the Region; hydrogeologic properties of the surficial deposits, and susceptibility of the shallow aquifer to contamination. The maps were based on carefully designed criteria to be useful in regional groundwater protection studies and related land use planning; and the maps, as well as the data and analyses on which the maps are based, are essential for the development of mathematical models that permit simulation of the performance of both the shallow and deep aquifers underlying the Region. The data and maps developed by the regional groundwater resource inventory and analysis will be available and adequate for use in the regional water supply planning effort. Indeed, the inventory and analyses were undertaken specifically to provide data essential to sound regional water supply planning.

One additional groundwater-related inventory will be conducted for use in the plan. That inventory will include the collation and collection of data needed for the delineation and mapping of the important groundwater recharge areas in the Region. This data collection and the actual delineation of these areas is planned to be conducted as part of the analyses and forecast work element.

In June 1999, SEWRPC, in cooperation with the WGNHS, the U.S. Geological Survey (USGS), the WDNR, the University of Wisconsin-Milwaukee, and 35 municipal water utilities which utilize groundwater as a source of supply, undertook the development of a mathematical model that would permit simulation in an integrated manner of the performance of the shallow and deep aquifers underlying the Region. The model was intended to allow simulation of water levels, and the dynamics of the interactions between the shallow and deep aquifers in a manner adequate to address such issues as the effect of land use activities on the groundwater resources, wellhead protection, groundwater recharge and storage, well interferences, locations of new major water supply wells, water conservation, and optimization of groundwater use. The new regional aquifer performance simulation model is completed and is currently being documented in a technical report. This model was developed, in part, to be used as a tool for developing a regional water supply plan.

Together these two groundwater-related activities provide the inventory information needed for the regional water supply plan development.

Water Supply System Inventories

The water supply system inventories needed for carrying out the water supply plan development include information on water supply facilities, water use, source water and finished water quality, local water supply system plans, unit cost of facilities, water conservation measures, related water supply conditions and planning in the vicinity of adjacent to the study area, and water law. These inventories are summarized below:

- **Water Supply and Related Facilities**—Information, including mapping, will have to be obtained on the location, sizes, and capacities of the major Lake Michigan water intakes and treatment plant locations, the major municipal well locations, and the related major transmission lines, and the water storage facilities.
- **Water Use Data**—Data will have to be assembled on historic and current water uses within the Region. The historic and current uses must be identified in terms of total quantity, intensity, and spatial distribution for each of the major municipal water supply systems in the study area. To the extent available, data should also be assembled on water use for private onsite high-capacity wells used for cooling, irrigation, and power, and other uses which are not supplied with water through the municipal water supply system. Data will also have to be assembled to enable the development of unit costs for supplying water from each of the major sources of supply within the Region.
- **Water Quality Data**—The suitability of a water supply for various uses is directly related to the quality of the water. It will, therefore, be necessary to establish an understanding of the quality of the surface and groundwater resources of the Southeastern Wisconsin Region and the suitability of the various sources for municipal and industrial uses. The data should define the physical, chemical, and bacteriological quality of both source water and finished water, as appropriate, for system-level water supply planning. The required data will have to be collated from the records of the major water utility systems and the WDNR. In this respect, the groundwater quality data collated should be adequate to characterize the quality of the water for use by municipal and industrial supply sources and to identify any needed treatment prior to transmission and distribution. The required data are not intended to identify localized problems, such as those associated with private onsite sources of water supply. This inventory step is intended to be based upon data which can be collated from existing sources.

- **Local System Plans**—All locally prepared water supply system plans will have to be collated for use in the regional system plan preparation. The information assembled should include engineering reports prepared by municipal water utilities, together with adopted system improvement and extension plans, and any such plans currently under preparation. Particular attention will need to be given to infrastructure replacement, as well as expansion, needs, and plans.
- **Related Water Supply Conditions and Planning**—It is recognized that important aspects of water supply planning, such as groundwater aquifer and surface water characteristics, are interregional in nature. However, it is also expected that the majority, as well as the most difficult and important, of the water supply problems of the seven-county Southeastern Wisconsin Region can be soundly addressed by focusing on water resources and the uses of those resources within the Region. Notwithstanding, interregional factors will be considered as may be found necessary and to the extent practical in the inventory phase of the proposed water supply planning effort. Available data on ongoing water supply planning in the northeastern Illinois area and in Wisconsin counties adjacent to the Southeastern Wisconsin Region will be reviewed and collated, as needed. In this regard, it should be noted that the regional groundwater aquifer performance simulation model previously noted has been developed considering groundwater conditions in an area extending beyond the boundaries of the seven-county Southeastern Wisconsin Region in order to properly delineate groundwater divides located in the surrounding area and to establish appropriate boundary conditions for the model.
- **Water Supply Law Inventory**—An inventory of the legal framework governing the planning, engineering, financing, operation and maintenance of municipal water supply systems within the Region will be required. The inventory should include: decisions by the Wisconsin Public Service Commission affecting the planning, engineering, construction, operation, maintenance, and financing of municipal water supply facilities within the Region, including matters affecting water rates; and policies and practices followed by the major municipal water utilities operating within the Region, particularly those which may have intermunicipal service agreements for water supply. Importantly, the water law inventory should include analyses of the International Great Lakes Charter, the draft 2001 Great Lakes Charter Annex, and of the Federal and state laws affecting the use of Lake Michigan water, and the diversion of such water across the subcontinental divide traversing the Region. It is intended that a technical memorandum be prepared documenting this inventory. The memorandum will be published as a SEWRPC technical report.
- **Unit Costs for Selected Water Supply Facilities**—In order to develop the estimated costs of alternative water supply future conditions scenarios and alternative plans, it is planned to develop unit costs and current charges for selected water supply facilities over a range of sizes expected to be encountered in the planning process.

State-of-the-Art of Water Supply Report and Design Standards

A state-of-the-art report on water supply planning is to be prepared by the consultant. The report is to describe the current and probable future state-of-the-art in water supply source development, water treatment, transmission, and storage, and related information that may affect the formulation of alternative water supply plans and the selection of a recommended plan. Particular attention is to be given to such emerging techniques as treatment for radium removal from well water supply, aquifer storage, and water conservation. In addition, it is envisioned that this work element will

include consideration of technologies which could be utilized to develop groundwater recharge options. Such technologies could include high levels of tertiary treatment for wastewater treatment plant effluent, treatment systems for groundwater or surface water which may be derived from recharged wastewater, and large-scale infiltration and recharge systems. The report should include information on pertinent unit costs over a range of facility system capacities which may be expected to be considered in the water supply planning process. Water conservation measures are expected to be an important consideration in the planning effort. The report should include a description of the potentially viable measures, including data on their costs and effectiveness. A section of the report should be included which sets forth conclusions regarding the practical and potential highest level of water reduction which can be achieved by water conservation measures within the study area. The technologies to be considered are listed in Exhibit A which is attached hereto. The report is to be based upon a careful review of the literature, review of relevant existing water supply plans and other available sources. The report is to be suitable for publication as a SEWRPC technical report.

Standards for the design of water supply infrastructure required to deliver water to the distribution systems shall be developed by the Consultant. Design standards shall be included for water uses, water supply source development, and water treatment transmission and storage. These design standards will be documented in a technical memorandum which will be incorporated into the aforementioned state-of-the-art report as a supplement or appendix for documentation purposes.

Staffing and Organization

The basic study area inventory, including mapping; land use, demographic and economic data and natural resources data; and the groundwater resources inventories will be collated and documented by the SEWRPC staff, with one exception. The exception is the collation of hydrogeologic data needed to delineate the important groundwater recharge areas in the study area. The staffing for that effort is to be provided through an agreement to be developed with the WGNHS, in cooperation with the USGS and University of Wisconsin-Milwaukee. The inventory work and the analyses to delineate and map the areas is included under the section of this document describing the analyses and forecasts plan element.

For purposes of obtaining the water supply system inventories, the SEWRPC staff will obtain all available data from secondary sources, such as the Wisconsin Public Service Commission and the WDNR, as well as from available water supply facilities planning reports. That data will be summarized for each public utility system and transmitted to each utility, along with a map of the existing water supply service area and a request for supplemental information, verification of the data provided, and local water supply system plans. The request for information will be designed to minimize the efforts of the utility staff. As the inventory data collection procedure is developed, the services of the consultant will be sought to review the data collected and comment on additional data needs.

The consultant will be engaged to conduct the state-of-the-art water supply facilities inventories, including documentation. In addition, a legal firm may be retained to prepare a technical memorandum on water supply law. That technical memorandum will be summarized in the planning report documenting the plan and published as a SEWRPC technical report. That report to be prepared documenting the inventories will be published as a SEWRPC technical report.

4. **Analyses and Forecasts**

Work Element Description

Inventories provide factual information about historic and current situations. Analyses and forecasts prepared utilizing the inventory information are necessary to provide estimates of future needs. With respect to water supply, these future needs must be determined from a sequence of interlocking forecasts. Demographic and economic activity projections and forecasts provide estimates of future growth within the Region. These projections and forecasts can, in turn, be translated into future demands for the various types of land uses, into land use plans, and attendant water use. These future demands for water can then be scaled against the existing water supplies and related facilities to identify deficiencies. The analyses and forecasts needed include the following:

- **Technical Analyses and Forecasts of Population, Household, Economic Activity, Land Use, and Water Use Data**—The existing inventory of population, household, economic activity and land use data, as well as similar data developed for the year 2035 under the regional land use plan will be related to water use data to establish water supply planning and facility design standards and conditions. Planned 2035 conditions public water service areas will be developed and water demand under current and planned 2035 conditions will be established. In addition, estimates will be developed on existing and planned 2035 conditions and water uses for areas not expected to be served by public water supply systems. The relationships existing between the existing and planned public water supply facility service areas and planned sanitary sewerage system service areas will have to be analyzed. Particular attention will have to be given in the analyses to the identification of any conflicts between, or duplications of service areas, as indicated by locally prepared plans.

Analyses will also be conducted of available inventory data obtained on water supply planning in the areas immediately surrounding the seven-county Southeastern Wisconsin Region. Such analyses will include review and incorporation as may be found appropriate of ongoing or recently completed groundwater and water supply plans prepared for adjacent areas.

- **Technical Analyses of the Existing Water Supply Facility Data**—The inventory data collated and collected on the existing public water supply facilities within the study area will have to be assembled in a form suitable for system planning. This will require the preparation of water supply facilities and directly related water supply infrastructure maps at a uniform scale suitable for use in capacity analyses. Such maps should be prepared and would show other water supply facilities directly related to the sources of supply, including selected major transmission mains, elevated and ground storage reservoirs, major pumping stations, and the tributary service areas at critical locations in the systems.

The existing facilities will have to be analyzed with the aid of a consultant to identify existing water supply capacities available to serve existing and projected water demands. The focus of this analysis will be to demonstrate the water supply capacity and quality needs through the year 2035 based upon the current water supply facilities. Specific water supply capacity and quality issues will be defined for each water service area. In this regard, it should be noted that the focus of the regional water supply plan is intended to be the source of supply and the directly related infrastructure. Subsequent local water supply facilities planning will be needed to analyze and evaluate the water supply distribution system associated with the water supply facilities.

- **Groundwater Resources Analyses**—Two special groundwater-related analyses are to be developed to support the water supply planning. One analysis would be conducted to identify and map the most important groundwater recharge areas in the study area. That analysis will require consideration of hydrogeologic characteristics, coupled with modeling of groundwater flow characteristics. The second groundwater resources analysis will include the development of a groundwater sustainability analysis for eight selected demonstration areas. Each area would be about six square miles in size and would be selected to represent a range of hydrogeologic conditions. The areas would be analyzed to determine the number of individual household wells which could be sustained without significant impacts on the shallow groundwater aquifer system. Both of these analyses would be carried out utilizing the available groundwater resources inventory and groundwater modeling.

Staffing and Organization

The technical analyses and forecasts of population, household, economic activity, land use, and water use will be carried out by the SEWRPC staff. The consultant will be engaged to carry out the technical analysis of the existing water supply facility data. This work effort will include the preparation of a technical memorandum, including appropriate mapping, documenting the analysis.

The staffing for the two groundwater resource-related analyses is planned to be provided through an agreement with the WGNHS, the USGS, and the University of Wisconsin-Milwaukee. The results of that analysis would be documented in a technical memorandum, including appropriate mapping.

5. Preparation, Test, and Evaluation of Alternative Plans

Work Element Description

A sound regional water supply planning program should include the preparation and presentation of a number of feasible alternative water supply plans for comparative analyses, and public evaluation prior to selection of a recommended plan for adoption and implementation. The consultant will assist the SEWRPC staff in the formulation of such alternative plans and their evaluation. Alternative plans may include proposals for the use of various combinations of water conservation measures and groundwater sources of supply, as well as for the expansion of the use of Lake Michigan as a source of supply within the constraints of current law, regulations, and public policies. The design year of the alternative plans is intended to match the design year of the new regional land use plan, 2035.

Each alternative plan must be quantitatively tested to establish the ability of the proposed facilities to meet existing and forecast water supply demands, as well as to provide a level of water quality within adopted standards. Each alternative plan will carry with it potential impacts on land and water use patterns, allocation of resources, public investment policies, and broadly defined community benefits and costs. Therefore, the related physical, economic, social, legal, and environmental impacts of the alternative plans considered must be comparatively analyzed and presented in a clear, understandable form to elected public officials and interested citizens for evaluation.

Under this work element, it is proposed to consider a full range of options and management measures related to water supply sources. An analysis will be conducted to screen those sources of supply to a limited number which are considered the most viable for use as a significant source for the study area. Following that screening, it is planned to develop and evaluate in detail a number of future condition scenarios and alternative plans. On a preliminary basis, it is expected that six or seven future condition scenarios or alternatives will be developed and evaluated.

For each scenario and alternative plan, an evaluation of the cost, environmental impacts, implementability, and other factors will be developed and evaluated. This will require modeling of the shallow and deep aquifers utilizing the regional groundwater model. Each alternative plan will also include specific assumptions regarding water conservation and the water supply needs for uses beyond the public water supply service area.

It should be noted that the alternative plans developed are to be focused on alternatives for water system sources of supply and directly related infrastructure. For each municipal water supply system, there may be a need to conduct additional system-specific utility system planning in order to plan for the other components of the water supply system over the long-term.

Staffing and Organization

The development and evaluation of the scenarios and alternative plans is planned to be completed under a cooperative arrangement involving SEWRPC staff, the consulting engineering firm, and the WGNHS and USGS. The SEWRPC staff and the consulting engineering firm will jointly develop conceptual future conditions scenarios and alternative plans. The technical development and costing of the scenarios and alternatives will be done by the consulting engineering firm. That work would be documented in a technical report, including appropriate supporting mapping. The technical description and cost of the scenarios and alternative plans work will be documented in a technical report, including supporting mapping. The groundwater modeling needed to describe the impact of each scenario and alternative plan would be carried out by the WGNHS and the USGS.

6. Recommended Plan Selection and Documentation

Work Element Description

Following public informational meetings related public and official outreach activities on the alternative plans considered, one plan should be selected as the recommended plan to be used to guide the long range development of regional water supply systems within Southeastern Wisconsin. The recommended plan may consist of the initially preferred alternative plan, or may be a refined version of that alternative plan which would include additional components which would be found to be sound. The recommended plan should include specific recommendations related to water conservation, protection of important groundwater or recharge areas, and protection of groundwater resources which, in turn, may impact important surface water resources. The recommended plan is to be prepared with the assistance of a consultant.

The recommended plan should clearly delineate those areas of the Region which are to be served by public water supply systems. The plan should indicate the physical water supply and related facilities necessary to provide the recommended water supply service. This should include the approximate location and configuration and size and capacity of the water supply facility, including Lake Michigan water intakes and treatment plants and municipal wells, as well as related infrastructure needed to deliver that supply. Importantly, the aquifers to be used as sources of supply should be identified. The types and levels of treatment required should be indicated. Estimates of system development costs will be prepared and presented, along with information on potential staging of the facilities.

The recommended water supply plan should be based upon careful analyses of the capacities of the existing facilities, probable future load factors, water law constraints, and the organizational structures and management policies of the existing water utilities. The water supply systems should be designed as a set of integrated subsystems for the Region as a whole, with each link in each subsystem carefully fitted to projected loadings and the affect of each proposed facility on the

remainder of the subsystem and on future land use development patterns quantitatively tested and evaluated. The estimated impact of the recommended plan on the aquifers will be documented. An environmental assessment should be developed and presented for the recommended plan.

Staffing and Organization

The selection and documentation of the recommended water supply plan is to be a cooperative effort between the SEWRPC staff and the consulting engineering firm and agencies engaged to develop and evaluate the future condition scenarios and alternative plans. The WGNHS and USGS would provide groundwater aquifer modeling to describe the impact of the recommended plan. That analysis would be documented in a technical memorandum. The consulting engineering firm would provide a technical description and cost estimate for the recommended plan, along with documentation in a technical memorandum. The SEWRPC staff would provide the remaining tasks, including an environmental evaluation of the recommended plan.

7. Plan Implementation Recommendations

Work Element Description

Upon agreement on the recommended water supply plan and supporting cost data, recommendations should be made with respect to the organizational and financial arrangements under which the recommended plan and its component subsystems can be implemented. The fiscal implications of the recommended plan should be determined and any potential Federal and State financial assistance for the plan identified. Impacts of the recommended plan on water costs should be determined. Any necessary legislative, regulatory, and administrative measures required for plan implementation should be addressed. The possibility of utilizing private corporations for the provision of water supply services to portions of the Region should be considered.

Staffing and Organization

The plan implementation recommendations will be prepared and documented by the SEWRPC staff. The consulting engineering firm involved will be engaged to review and comment on the plan implementation recommendations. Should the implementation analysis indicate a need for special legal or fiscal analysis which require specialized expertise over and above that which can be provided by the SEWRPC staff, consultant services will be secured for that purpose.

8. Plan Documentation

Work Element Description

The documentation of the regional water supply plan will be primarily accomplished in three reports. The first report set forth a clear written and graphic description of the regional water supply management plan for Southeastern Wisconsin. The second report will include the results of the state-of-the-art inventory and analysis. The third report will document the results of the inventory and analysis of water supply law.

Staffing and Organization

The SEWRPC staff will be responsible for the preparing publication of the required planning report. The writing of that report would, however, be a cooperative effort between the SEWRPC staff and the consultant engaged for the conduct of the planning program. In this regard, the SEWRPC staff will draw heavily upon the technical memoranda to be prepared by the consultant in writing the portion of the report for which the technical consultants are engaged.

9. **Public Involvement Program**

Work Element Description

An important element of the water supply planning process is the development and implementation of a public involvement process. That process will be designed to provide information about, and access to, regional water supply planning and programming activities; obtain public input; and consider public input when recommendations are made. The public involvement program will include the participation of an advisory committee, public officials, and other targeted outreach and coordination, and other activities, such as the use of a project website and periodic newsletter articles.

Staffing and Organization

The public involvement program work element is to be carried out by the SEWRPC staff and the University of Wisconsin-Extension education staff assigned to work on regional planning programs in Southeastern Wisconsin.

SUMMARY

After examining a number of alternative approaches to fulfilling the administrative direction and technical staffing for the regional water supply plan preparation, it is planned to utilize a cooperative planning team arrangement involving the SEWRPC staff, consulting engineering and legal firms, and the groundwater technical staff of the WGNHS, the USGS, and the University of Wisconsin-Milwaukee. The work elements and the recommended responsible party are summarized in Table 1.

SCHEDULE

An estimated time schedule for the accomplishment of the major elements of the proposed water supply plan program is provided in Figure 2. The schedule anticipates consultant selection and approval for the consultant to initiate work by August 1, 2005.

* * *

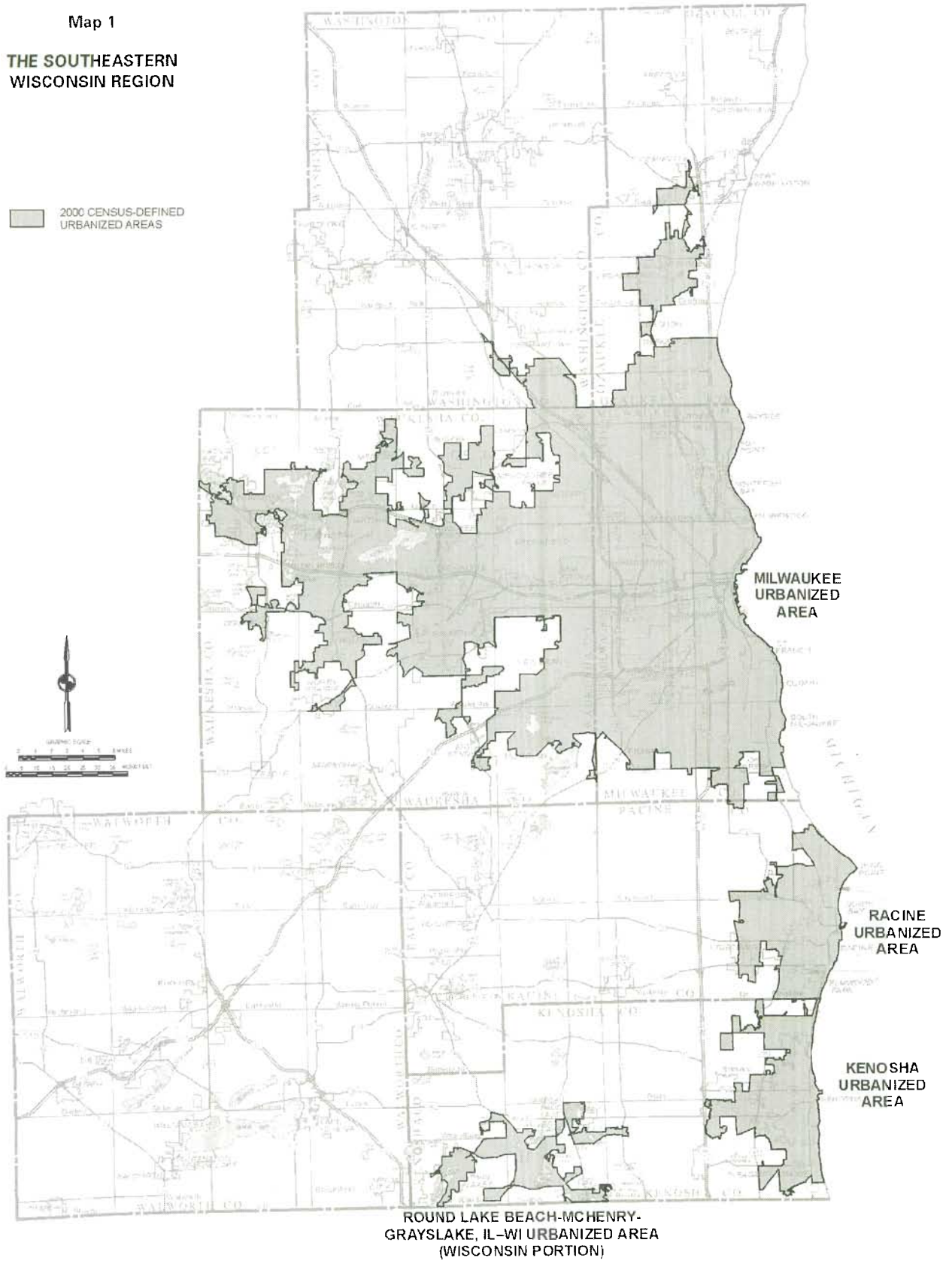
Attachments

#110337 V2 - RWSP CONSULTANT SERVICES AGREEMENT
310-1001
RPB/pk
09/01/05

Map 1

THE SOUTHEASTERN WISCONSIN REGION

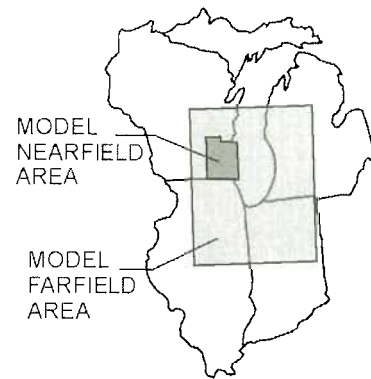
2000 CENSUS-DEFINED URBANIZED AREAS



Source: U.S. Bureau of the Census and SEWRPC

Figure 1

AREA OF SOUTHEASTERN WISCONSIN SIMULATED IN MODEL



SOUTHEASTERN WISCONSIN MODEL NEARFIELD AREA

Source: U.S. Geological Survey, University of Wisconsin-Extension, Wisconsin Geological and Natural History Survey, and SEWRPC.

Exhibit A
A REGIONAL WATER SUPPLY PLAN
FOR SOUTHEASTERN WISCONSIN
LISTING OF TECHNOLOGIES TO BE INCLUDED IN THE STATE-OF-THE-ART REPORT

State-of-the-Art Report

- Surface Water Treatment Technologies
- Groundwater Treatment Technologies
 - Arsenic
 - Radium
 - Future Regulations
 - Pesticides/Herbicides
 - Nitrate
 - Desalination
- Groundwater Source Development
 - River Bank Filtration
 - Water Budgets
 - Horizontal Wells
 - Water Banking
- Aquifer Storage and Recovery
- Groundwater Recharge
 - Stormwater
 - Treatment Plant Effluent
 - Rain Gardens
 - Surface Water/Point of Discharge
 - Infiltration Basins
 - Recharge Wells
 - Water Quality/Monitoring Needs
 - Recharge Ranches
 - Landspreading/Irrigation
 - Wetlands/Prairie Restoration
- Water Transmission
 - Pipelines
 - Reservoirs
 - Open Channels/Rivers
 - Water Return Flow Options
 - River Channel Restoration for Return Flow Purposes
- Water Storage
 - Elevated
 - Ground Level
 - Water Banking
- Conservation
 - Fixtures/Appliances
 - Education
 - Gray Water Use
 - Landscaping
 - Rain Barrels
 - Mandatory Restrictions
 - Water Rates/Incentives
 - Automated Meter Reading
 - Industrial/Commercial
 - System Water Loss Reduction
 - Wastewater Treatment Plant Effluent Reuse
- Costs
 - Curves
 - Tables

Table 1

PRELIMINARY ALLOCATION OF WORK TASKS FOR SEWRPC REGIONAL WATER SUPPLY STUDY

SEWRPC Staff ^a	Civil Engineering Firm	Law Firm	Wisconsin Geological and Natural History Survey/ U S Geological Survey/ UW-Milwaukee	SEWRPC Plan Documentation
<ul style="list-style-type: none"> • Overall project management • Develop objectives and standards • Basic planning inventories and analyses • Groundwater resources inventories (completed) • Water supply facilities inventories • Conceptual development of alternative and recommended plans • Environmental evaluation of recommended plan • Develop plan implementation recommendations • Planning report preparation • Public involvement activities 	<ul style="list-style-type: none"> • State-of-the-art report (system design factors, facility costs and effectiveness, conservation measures) • Review and comment on water supply facility inventory procedures • Water supply technical analyses • Technical development and costing of alternative and recommended plans • Review and comment on plan implementation recommendations 	<ul style="list-style-type: none"> • Water law report • Review and comment on plan implementation recommendations 	<ul style="list-style-type: none"> • Groundwater recharge analysis • Groundwater/development sustainability analyses • Evaluation of groundwater and surface water impacts of alternatives and recommended plans • Review and comment on plan implementation recommendations 	<ul style="list-style-type: none"> • State-of-the-art technical report • Water law technical report • Planning report

^aIncludes assigned UW-Extension agent.

Figure 2

PROPOSED TIMING OF MAJOR WORK ELEMENTS FOR A WATER SUPPLY
 PLANNING PROGRAM FOR THE SOUTHEASTERN WISCONSIN REGION

Work Element	2005												2006												2007					
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Study Design and Organization																														
Formulation of Objectives and Standards																														
Inventory																														
Basic Study Area Inventories																														
Groundwater Resources Data																														
Water Supply System Inventories																														
Water Law																														
State-of-the-Art Water Supply Management																														
Analyses and Forecasts																														
Population, Household, Economic Activity																														
and Land Use and Water Use																														
Existing Water Supply Facilities																														
Groundwater Analyses																														
Preparation, Test, and Evaluation of Alternative Plans																														
Plan Selection																														
Plan Implementation																														
Publication of Report																														
Public Involvement																														

Source: SEWRPC