

cityofnovi.org

CITY of NOVI CITY COUNCIL

Agenda Item E
February 25, 2008

SUBJECT: Approval to award an engineering contract for engineering services for the Water Distribution Study and Master Plan project to Stantec Consulting Michigan, Inc. for a not-to-exceed fee of \$33,500.

SUBMITTING DEPARTMENT: Engineering 

CITY MANAGER APPROVAL:

EXPENDITURE REQUIRED	\$33,500
AMOUNT BUDGETED	\$0
APPROPRIATION REQUIRED	\$33,500
LINE ITEM NUMBER	592-592.00-805.021

BACKGROUND INFORMATION:

During this year's goal setting session, the City Council identified some items relating to the water system that warrant further study. In addition, the State of Michigan requires that every water system complete a study of the system every five years (next study is due in 2009). The purpose of this project is to prepare a comprehensive water system master plan that addresses City Council's goals as well as the State's requirements to ensure that the long-term water supply needs of the City are addressed.

Since the completion of the most recent water study update in 2004 and a computerized model update in 2006, there has been tremendous growth in the City, changes in anticipated development patterns that affect the future build-out demand predictions of the City, and the implementation of projects recommended by the 2004 water master plan update. All of these activities affect the operation of the water system, plus there has been a recent change in the rate methodology used by Detroit Water and Sewerage Department (DWSD) to set the wholesale water rates. Therefore, this is an appropriate time to conduct a comprehensive water master plan.

The deliverable for this project will be to provide the City with a plan that, when implemented, will provide a safe, reliable, and financially efficient water system that meets the future needs of all water customers. The scope of the study will include:

- Evaluating the feasibility of alternate water supply sources (other than DWSD) that could provide water to Novi customers. The analysis will include, but not be limited to, the feasibility of using City-owned groundwater well sites.
- Evaluation of the feasibility of constructing water storage facilities in Novi to offset peak demands and decrease wholesale water costs to the City.
- Identifying existing and future water demands and pressures, and allocating them in a water model using WaterCAD software.
- Identifying existing system deficiencies and recommended solutions that would be added to the Capital Improvement Program as future projects.
- Developing a master plan map showing proposed water main sizes that would serve all customers at the time of future build-out.

The attached Request for Proposals for engineering services was sent to the six firms that City Council pre-qualified for utility-related projects. Five proposals were received and each was evaluated using *Qualifications Based Selection*, with a greater emphasis on the each firm's proposed approach because of the complex nature of the project scope. The following table summarizes the results of the proposal review process:

Firm	Total Fee	Staff Review Score	Proposal Rank
Stantec	\$33,500.00	990	1
Orchard Hiltz & McCliment	\$46,000.00	955	2
Spalding DeDecker	\$32,029.00	720	3
Fishbeck Thompson Carr & Huber	\$39,250.00	615	4
URS Corporation	\$62,315.75	470	5

Of the five firms that submitted proposals, Stantec had the second lowest fee, met all requirements listed in the request for proposals, presented the most qualified project team, and had the most comprehensive proposal (see attached Stantec's proposal dated January 22, 2008 and the Engineering Department's scoring summary for reference).

Stantec is currently providing engineering services for the Hudson Sanitary Pump Station Upgrades, the Sanitary Sewer SCADA (Supervisory Control and Data Acquisition) Implementation project, 2008 Pathway Construction engineering, and the Eleven Mile Road and Meadowbrook Road Signalization project.

The project is scheduled for completion in summer 2008.

RECOMMENDED ACTION: Approval to award an engineering contract for engineering services for the Water Distribution Study and Master Plan project to Stantec Consulting Michigan, Inc. for a not-to-exceed fee of \$33,500.

	1	2	Y	N
Mayor Landry				
Mayor Pro Tem Capello				
Council Member Crawford				
Council Member Gatt				

	1	2	Y	N
Council Member Margolis				
Council Member Mutch				
Council Member Staudt				

FEE SUMMARY FOR WATER STUDY PROPOSALS

Firm	TASK								TOTAL FEE
	1	2	3	4	5	6	7	8	
URS	\$ 1,440.60	\$9,510.90	\$ 10,951.50	\$ 13,215.30	\$ 5,421.85	\$ 2,285.85	\$ 18,845.40	\$ 644.35	\$ 62,315.75
Orchard Hiltz & McCliment	\$ 1,500.00	\$6,000.00	\$ 6,700.00	\$ 9,300.00	\$6,000.00	\$5,000.00	\$ 10,000.00	\$ 1,500.00	\$ 46,000.00
Fishbeck Thompson Carr & Huber	\$ 1,550.00	\$4,350.00	\$ 7,250.00	\$ 6,170.00	\$5,070.00	\$7,430.00	\$ 6,050.00	\$ 1,380.00	\$ 39,250.00
Stantec Consulting Michigan	\$ 1,500.00	\$5,000.00	\$ 7,000.00	\$ 3,300.00	\$5,500.00	\$2,700.00	\$ 7,000.00	\$ 1,500.00	\$ 33,500.00
Spalding DeDecker	\$ 394.00	\$8,679.00	\$ 4,908.00	\$ 4,703.00	\$3,570.00	\$ 1,728.00	\$ 6,793.00	\$ 1,254.00	\$ 32,029.00
Anderson Eckstein & Westrick	NO PROPOSAL								\$ -

SCORING SUMMARY

Project Description: Water Distribution Study and Master Plan

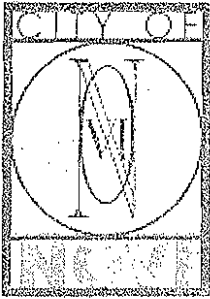
RANK 1= LOW, x= BEST (x = number of firms reponding)

TOTAL SCORES	<i>Item weight:</i>	10	5	20	10	5	Totals	Rank
	1	2	3	4	5			
Fishbeck Thompson Carr & Huber	15	15	10	14	10	615	4	
Orchard Hiltz & McCliment	10	14	23	21	23	955	2	
Stantec	20	17	20	20	21	990	1	
Spalding DeDecker	25	19	12	11	5	720	3	
URS Corporation	5	10	10	9	16	470	5	
TOTALS	75	75	75	75	75			

SCORING CRITERIA

1. Engineering Fee
2. Evaluation of Schedule
3. Evaluation of Approach, Statement of Understanding of Project, and proposed staff
4. Analysis of subjective statements applicable to the project as required on the RFP (Value added items)
5. Evaluation of past performance on City projects

MEMORANDUM



cityofnovi.org

TO: PAM ANTIL, ASSISTANT CITY MANAGER
FROM: ROB HAYES, CITY ENGINEER *RH*
SUBJECT: WATER DISTRIBUTION STUDY
DATE: FEBRUARY 4, 2008

As discussed at the last goal-setting session, we recently solicited proposals for the completion of a water distribution study, which when implemented will provide a safe, reliable and financially efficient water system that meets the future needs of all City of Novi water customers.

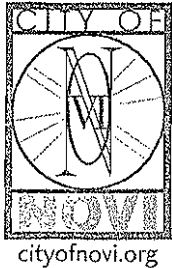
Proposals have been received from five of our six engineering consulting firms. We are currently reviewing these proposals and will make an award recommendation to City Council at the February 25th meeting. The study will be completed by June 2008.

The scope of the study will include:

- Evaluating the feasibility of alternate water supply sources (other than DWSD) that could provide water to Novi customers. This analysis will include, but not be limited to, the feasibility of using City-owned groundwater well sites.
- Evaluating the feasibility of constructing water storage facilities in Novi to offset peak demands and decrease wholesale water costs to the City.
- Identifying existing and future water demands and pressures, and allocating them in a water model using WaterCAD[®] software.
- Identifying existing system deficiencies and recommended solutions.
- Developing a master plan map showing proposed water main sizes that would serve all customers at the time of future build-out.

Please let me know if you have any questions or comments concerning this project.

cc: Clay Pearson, City Manager
Brian Coburn, Civil Engineer
Kathy Smith-Roy, Finance Director



**REQUEST FOR PROPOSALS
CITY OF NOVI**

**ENGINEERING SERVICES FOR
WATER DISTRIBUTION SYSTEM STUDY
AND MASTER PLAN
December 21, 2007**

This Request for Proposals (RFP) for **WATER DISTRIBUTION SYSTEM STUDY AND MASTER PLAN** is being sent to the firms selected in the Utility Qualification Process completed on March 19, 2007.

Project Description

The purpose of this project is to prepare a comprehensive water system master plan that addresses the long term water supply needs of the City. The most recent water study was completed in 2004 with an update to the water model in 2006. Since that time, there has been tremendous growth in the City, changes in anticipated development patterns that affect the future build out demand predictions of the City, implementation of projects recommended by the 2004 water master plan update, and a change in the rate methodology used by Detroit Water and Sewerage Department (DWSD) to set the wholesale water rates — all of which affect the operation of the water system.

The deliverable for this project will be to provide the City with a plan, that when implemented, will provide a safe, reliable, and financially efficient water system that meets the future needs of all water customers. In general, the preparation of the master plan should include completing the following tasks:

- Preparation of a demand study to identify existing water system demand and to allocate the demands in the water model. The demand study should also predict future demands based on future build out of the City.
- Development of new calibrated water model (using WaterCAD software) to include current water demands. The skeletonized water model should include all water mains that are 12 inches and larger.
- Evaluation of existing pressure districts and recommendation of new pressure district boundaries.
- Identification of existing system deficiencies and recommended solutions.
- Evaluation of implementing water storage within the Novi water system to offset peak demands and decrease the wholesale water costs to the city.
- Development of a list of recommended capital improvement projects to address short term and long term needs of the water system. The CIP recommendations should include project costs, timeline for implementation and descriptions.
- Discussion of the feasibility of providing alternate water supply sources (other than DWSD) to provide water to Novi customers, including but not limited to city-owned well sites. This analysis should include a discussion of each alternative's construction cost, schedule, and permitting requirements.
- Development of a master plan map showing proposed water main sizes to serve all customers at the time of build out.

The budget for the study is \$50,000. The project is scheduled for completion in early summer 2008.

SCOPE OF SERVICES

Upon authorization by the City Council and the City Engineer, the consultant will be directed to complete the tasks listed below.

Task 1—Project Initiation. The consultant shall attend a scope verification meeting with city staff to review the scope parameters for the project. The City will provide to the consultant all information available that is relevant to the water master plan which may include but not limited to: GIS water system data, existing water system model, record drawings for booster stations and water mains as needed and available, DWSD meter flows, water use by customer, flow meter reads, and any other available information needed by the consultant to complete the scope.

Task 2—Water Demand Study. The consultant shall review available water metering data to determine the average day, maximum day and peak hour demands for the system. The consultant will contact the DWSD to obtain historical meter data for the five master meters serving Novi. The water customer usage report will be provided to the consultant in a database keyed to parcel number. This will allow the consultant to use GIS to analyze the data and allocate demands for the water model. The consultant will also analyze the water meter readings from DWSD and water customer usage to determine water system loss. As part of the demand study the consultant will provide projected flows within the system at the time of build out. *Sanitary capacity study*

Task 3—Develop a Calibrated Water Model in WaterCAD. The consultant shall create a new calibrated model of the Novi water system that includes current and future average day, maximum day and peak hour demand as developed in Task 2. The model will be skeletonized and will model all water mains that are 12 inch diameter and larger, all booster pumps, pressure reducing valves and DWSD connections. The model will also be used to accomplish the tasks listed below. The City will provide all available information to accomplish this task which includes hydrant flow data, record drawings as available, previous water models, water mains and nodes from GIS data, etc.

Task 4—Evaluation of Existing System Performance. The consultant shall use the model developed above to determine deficiencies and operational issues within the current system. One of the major issues identified by the 2006 water model update was the need for redefining the pressure districts. The addition of the West Park Booster Station to the system has changed the operation of the middle pressure district. The consultant should evaluate the operations of West Park Booster Station and the Island Lake Booster Station and provide recommendations to improve overall system performance and efficiency. The consultant shall also use the model to identify deficiencies and reliability issues within the system.

Task 5—Water Storage Options. The consultant shall review the metering data obtained from DWSD to determine the peak hour storage needs. The consultant will identify potential general locations for construction of water storage tanks. The consultant shall perform a financial analysis evaluating the construction, operation and maintenance costs of providing City-owned water storage and the peak hour costs from DWSD using their new rate methodology. The consultant will provide a recommendation to the City on the financial impact of providing water storage to offset peak hour flows.

Task 6—Evaluation of Alternate Water Supply Sources. The consultant shall identify alternative sources of water supply for the City other than DWSD. This brief study will only identify the other sources that may be available and then provide a report to discuss the potential construction costs associated with each. The study will be used to determine the financial feasibility of providing water supply to Novi customers from a source other than DWSD and not the engineering feasibility of a design (which would be a separate study at a future date). The study should also address permitting issues, timeline of implementation and other relevant discussion in planning a new water system.

Task 7—Final Report and Master Plan Map. The consultant shall produce a final report incorporating the above tasks into one document. The final report shall meet the requirements for a reliability study by the state under P.A. 399 of 1976 as amended. The consultant shall also provide an appendix separate from the report which contains relevant data and assumptions needed to reproduce results in the report. A master plan map shall also be provided which shows the locations and diameters of future water mains to be installed in the system. The master plan map will be used to provide guidance to developers and to develop future capital improvement projects.

Task 8—Presentation to City Council. A presentation of the final report to City Council will be required. The presentation should be under 15 minutes in length and identify existing strengths and weaknesses of the system and a discussion of capital improvement projects needed to improve the system.

DELIVERABLES

The consultant shall provide the following deliverables, as stated:

At the time of 90% completion the consultant shall provide:

- Five (5) copies of the draft report for review by staff.
- A CD or DVD containing the water system model for review by staff.

At the time of project completion the consultant shall provide:

- A pdf version of the completed report including appendices on CD or DVD.
- Ten (10) complete bound copies of the final report.
- Three (3) complete bound copies of the appendices for use by Engineering staff. The appendices should contain all background information and assumptions needed to recreate the outcomes stated in the report.
- A CD or DVD containing the approved water system model in WaterCAD format.

DOCUMENT AND FILE FORMAT

All documents shall be submitted to the City of Novi in an electronic format as specified by the Engineering Department.

Documents: MS Word

Digital copies of files, maps, or drawings:
files: ArcView Shape file, AutoCAD,
maps/drawings: ArcView layouts print file or
AutoCAD format (.dxf)

All digital data should correspond to:
Project – State Plane Coordinate System
Michigan, South Zone – 6401
Datum – NAD83, NAVD 88
Spheroid – GRS1980
Units – International Feet

CONSULTANT QUALIFICATIONS

The Consultant has been pre-qualified to provide engineering consulting services for 2007-2008 Utility Projects.

CONSULTANT SELECTION

As a pre-qualified consultant, the selection for this utility project will be based on an evaluation of the fee proposal, which is labeled as Exhibit A, in addition to the Consultant's project understanding, approach, schedule, staffing plan, past performance on City engineering projects, and value-added concepts that would improve the overall project (relative to cost savings, time savings, innovation, etc.).

By submitting a proposal, the Consultant agrees that neither the firm, sub-contractors, nor suppliers will discriminate against any person with respect to hiring or employment on the basis of religion, race, color, national origin, age, sex, height, weight, marital status, or a handicap that is unrelated to the individual's ability to perform tasks particular to a job or position.

The selected consultant will enter into an agreement with the City of Novi to perform the services listed in this Request for Proposals. The City's standard Consulting Engineering Agreement is included as Exhibit C.

PROPOSAL SUBMITTALS

To be considered, sealed fee proposals (an UNBOUND original and five copies) must arrive at the Purchasing Department, 45175 W. Ten Mile Road, Novi, Michigan 48375 on or before **3:00 PM** Local Prevailing Time, **Tuesday, January 22, 2008** addressed to Carol J. Kalinovik, Purchasing Director, and clearly labeled **WATER DISTRIBUTION SYSTEM STUDY AND MASTER PLAN**. There will be no exceptions to this requirement and the City of Novi shall not be held responsible for late, lost, or misdirected proposals. Submitted proposals shall include:

- The proposed approach to the project, in detail (including any value-added concepts that would improve the overall project (i.e., cost savings, time savings, innovation, etc.).
- The completed fee proposal (Exhibit A)
- A proposed schedule for the project
- A detailed cost breakdown showing the hours needed to complete each task for the project by staff (name or labor category) and hourly rate
- A rate sheet or fee schedule depicting the Consultant's hourly rates that could be applied to additional work as may be necessary, for each category of staff that would work on the project.

Because of the nature of the project, the proposals will be evaluated based on an increased emphasis on the consultant's proposed approach. Therefore, the evaluation criteria will be weighted as follows:

Engineering Fee	20%
Evaluation of the Schedule	10%
Evaluation of Approach, Statement of Understanding of Project, and proposed staff	40%
Analysis of subjective statements applicable to the project as required on the RFP (Value added items)	20%
Evaluation of past performance on City projects	10%

All proposals must remain valid for one hundred twenty (120) days from due date and cannot be withdrawn during this period.

Questions regarding this Request for Proposals may be directed to:

City Engineer, Rob Hayes, P.E. (248) 735-5606

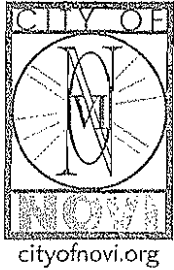
-or-

Civil Engineer, Brian Coburn, P.E. (248) 735-5632

The City of Novi reserves the right to accept any or all alternative proposals and to award the project to other than the firm with the lowest fee proposal, waive any irregularities or informalities, or both, to reject any or all proposals, and in general, to make award in any manner deemed by the City, in its sole discretion, to be in the best interests of the City of Novi.

Exhibits

- A - Fee Proposal
- B- Project Background Information
 - Water System Map
 - 2004 Water Study
 - 2006 Water Model Update
- C - Engineering Consultant Agreement



**EXHIBIT A
FEE PROPOSAL
CITY OF NOVI**

**ENGINEERING SERVICES FOR
WATER DISTRIBUTION SYSTEM STUDY
AND MASTER PLAN**

We the undersigned propose to furnish to the City of Novi services consistent with the Request for Qualifications dated January 11, 2007 and Request for Proposals dated December 21, 2007, respectively. Design fees will be paid on an hourly basis for actual work performed to a maximum as proposed. A separate fee schedule is being provided should the City request additional work on an hourly basis.

Task Description	Task Fee
Task 1—Project Initiation	
Task 2—Water Demand Study	
Task 3—Develop a Calibrated Water Model in WaterCAD	
Task 4—Evaluation of Existing System Performance	
Task 5—Water Storage Options.	
Task 6—Evaluation of Alternate Water Supply Sources	
Task 7—Final Report and Master Plan Map	
Task 8—Presentation to City Council	

TOTAL FEE FOR TASKS 1 THROUGH 8: \$ _____

PLEASE TYPE:

Company Name: _____

Address: _____

Agent's Name: _____

Agent's Title: _____

Agent's Signature: _____

Telephone Number: _____ Fax Number: _____

E-mail Address: _____ Date: _____

Proposal of Professional Services for:
**Engineering Services for
Water Distributions System Study and Master Plan**

Prepared for: **City of Novi, Michigan**

Prepared by:
Stantec Consulting Michigan, Inc.
3959 Research Park Drive
Ann Arbor, MI 48108
Ph: 734-761-1010
Fax: 734-761-1200
www.stantec.com

January, 2008



Stantec



Stantec Consulting Michigan Inc.
3959 Research Park Drive
Ann Arbor MI 48108-2216
Tel: (734) 761-1010
Fax: (734) 761-1200

Stantec

January 22, 2008

Ms. Carol J. Kalinovik
Purchasing Director
City of Novi
45175 W. Ten Mile Rd.
Novi, MI 48375-3024

Dear Ms. Kalinovik:

Reference: Engineering Services for the Water Distribution System Study and Master Plan Request for Proposals (RFP)

Thank you for the opportunity to provide our proposal for the Water Distribution System Study and Master Plan project. Based upon your RFP dated December 21, 2007, Stantec Consulting Michigan, Inc. (Stantec) is pleased to submit this proposal for Engineering Services related to this work.

We believe that we are uniquely positioned to provide the needed services for the following reasons:

- Stantec has extensive representative experience in the evaluation of water systems. This project experience includes Water System Master Planning/Project Planning, Hydraulic Modeling/Reliability Studies, Alternate Water Source Studies, DWSD Rate Negotiations and Storage Facility Analysis.
- Stantec has the above noted project experience with a vast array of municipal clients such as the City of Chelsea, Pittsfield Township, Northville Township, City of Grosse Pointe Park, Marquette Township and many others. A complete listing of project and client experience related to full scale water system studies and master plans is contained within our proposal.
- The project team assembled for your project was specifically assigned based on their experience with the past projects and experience identified above and in our proposal. This project team is fully qualified through the management and technical aspects of the work. Please refer to the summary table in the proposal for the experience of our project team.

Once again thank you for the opportunity to propose on this project and we look forward to continuing our relationship and providing engineering services to the City. Please do not hesitate to contact us with any questions. Thank you.

Sincerely,

STANTEC CONSULTING MICHIGAN INC.

Christopher P. Rybak
Senior Project Engineer
Tel: (734) 214-2537
Fax: (734) 761-1200
chris.rybak@stantec.com

STANTEC CONSULTING MICHIGAN INC.

George A. Tsakoff
Associate
Tel: (734) 214-1887
Fax: (734) 761-1200
george.tsakoff@stantec.com

Attachment: Proposal

TABLE OF CONTENTS



Proposal for:
Water Distribution System Study and Master Plan

Prepared for:
City of Novi, Michigan

<u>Section</u>		<u>Pages</u>
I	Project Understanding	1-2
II	Project Experience	3-6
III	Scope of Work	7-15
IV	Staffing Plan	16-17
V	Project Schedule	18-19
VI	Fee and Rate Information..... Required Fee Proposal Form	20-22

Submitted by:
Stantec Consulting Michigan, Inc.
3959 Research Park Drive
Ann Arbor, Michigan 48108-2216
(734) 761-1010
FAX (734) 761-1200
www.stantec.com

January, 2008



Stantec

SECTION I

Project Understanding

PROJECT UNDERSTANDING



The City of Novi maintains a water distribution system that services a community of approximately 50,000 people and has experienced significant growth in recent years. Current growth projections for the City forecast a buildout population of 80,000 by the year 2030. Along with residential growth, the City is also experiencing extensive commercial growth.

The City of Novi purchases water from the Detroit Water and Sewerage Department (DWSD) through five meter locations throughout the City. Service is maintained through several interconnected pressure districts operating off of DWSD supply pressures with some interior areas being supplemented with booster stations. Since the City does not maintain any system storage, all demands including fire flow and peak hour demands are provided by DWSD. In order to determine impacts of projected growth, DWSD improvements, and City system improvements, the City has maintained a hydraulic model of their distribution system. The model is utilized as a tool for determining system deficiencies and optimizing system operations. The most recent model updates have been a model developed in EPANET software by JCK and Associates for a Water Master Plan and a model conversion to WaterCAD software and update by URS Corporation to review constructed master plan recommendations for MDEQ reporting purposes.

The current water model has been developed utilizing correct physical length data, but is represented graphically in schematic format. This does not allow data to be geographically presented over existing City maps. The model also represents pumps that output a specific pressure rather than being modeled utilizing pump curve data, which would enable an evaluation of pump efficiency based on varying demand scenarios and their corresponding supply pressures.

It should be noted that DWSD is currently in negotiations with its customers for new water purchase contracts that would revise the fee structure for water purchase. The new fee schedule contains costs based on volume, distance and grade difference from the water source, maximum day and peak hour demands. The new fee schedule has typically shown an increase in community fees for purchasing water.



We understand that the City desires to update past water distribution system hydraulic studies and master planning. To complete this project Stantec will develop a comprehensive Water Master Plan which will address the following major objectives:

- Water System Distribution Study
- Peak Storage Feasibility Study
- Alternative Water Source Study
- Capital Improvement Plan

Water System Distribution Study

1. Enhance the WaterCAD water model to be geographically representative of the current City mapping systems.
2. Enhance model demand development to utilize coordinated billing and GIS data as a tool to propagate model demands.
3. Update distribution model with current system improvements.
4. Calibrate the model based on current system improvements.
5. Identify system deficiencies.
6. Identify operational deficiencies. Particular attention will be given to booster pump and pressure district operations.

Peak Storage Feasibility Study

1. Based on new DWSD contract negotiations, identify the benefits of providing storage to reduce peak flows and their associated cost.
2. Identify locations for future storage.

Alternative Water Source Study

1. Identify alternative sources for supplying water to the City other than DWSD.
2. Identify general cost benefits to providing an alternative water source.
3. Identify relevant issues to developing a new water source such as permitting and timelines.

Capital Improvement Plan

1. Prioritize system deficiency improvements and growth improvements.
2. Develop costs for system deficiency improvements.
3. Identify schedule for improvements.

Recent improvements to the City's infrastructure and DWSD regional improvements are providing different operational parameters than those utilized in previous studies. The Master Plan will include all of the project assignments to aid in prioritizing infrastructure improvements, optimizing system operations and developing a future capital improvement plan.



Stanfec

SECTION II

Project Experience

PROJECT EXPERIENCE



Stantec's staff and project experience includes master planning and modeling of water distribution systems ranging in size from regional systems of 32 MGD average day demands with 20 pressure districts, to rural water systems covering multiple counties, to municipal systems ranging in size from 1,500 to 125,000 people. In addition, Stantec has regional capabilities for water studies related to large metropolitan areas to draw on as a resource during this work and for quality control purposes.

Stantec is currently involved with several Michigan communities performing water reliability studies, master plans, alternate water source studies, new well field development, storage studies, and DWSD contract negotiations. Stantec has on-going relationships with many of these communities for their water needs in regards to planning and engineering analysis services. A listing of these communities and a summary of the project experience type related to each community is included in the table following this section of the proposal. The following is a brief written summary of services provided for each project type.

Feasibility Studies

Stantec can directly relate the experience of these projects to the tasks listed in the request for proposal. Stantec's current 1 million gallon elevated tank project for Northville Township required a feasibility study to determine the cost benefits of providing a tank within a new pressure district that Stantec developed. When DWSD contract negotiations began, the impact of this tank on peak hour flows was reviewed. It was determined that the community peak demand would have a 1.5 MGD reduction due to the new tank. In addition, Stantec recently completed location and construction of a new well in Marquette Township and has received a contract for an additional well field location investigation.

Modeling

Due to the development of new models and ongoing model updates of various community water distribution systems, Stantec is up to date with new modeling software and techniques. Stantec is involved with creating new models or converting models between software packages on a regular basis. Stantec is currently developing a new model in WaterCad software for the City of Burton, in H2ONET software for the City of Marshall, and updating water models for two communities on an annual basis. Stantec is also familiar with converting models into EPANET software on a regular basis for DWSD review.

DWSD Rate Negotiations, Cost Benefits and Engineering Coordination

Stantec is currently working with Northville Township with their DWSD contract negotiations. Northville Township is one of the first pilot communities to begin the updated contracting process with DWSD. Due to the community's location and high elevation on the DWSD system, Stantec understands how a community can benefit from reducing peak flow demands since fees are developed based on distance from the water treatment plant (WTP), elevation above the WTP, and associated peaking factors. Distance and elevations cannot be changed; however, peak flows are an element of the billing process that can be reviewed to determine the feasibility and cost benefits of reducing peak flows in the system.



DWSD Rate Negotiations, Cost Benefits and Engineering Coordination (continued)

Stantec has also assisted several communities in planning for the future supply grade variations from DWSD using water system modeling. These models have been used to analyze the impact of higher and lower supply grades on system pressures. In this manner, future pressure problems can be diagnosed and planned for before they occur. DWSD has provided large ranges of future supply grades in response to requests for hydraulic grade line projections for several communities. Both Northville and Salem Townships supply grades have been estimated to vary between 975 and 1030 feet under future conditions. This range equates to a DWSD supply pressure that is expected to vary by 25 psi, which presents significant operational challenges for both communities. Stantec has provided design assistance to both communities to help deal with this situation. In Northville Township, Stantec’s booster station design has incorporated variable frequency drives which will allow the output grade (pressure) of the station to remain constant over the varying range of supply grades.

Stantec’s preliminary design for the new water system in Salem Township also incorporates a booster station with VFD’s for the same purpose. In addition, the Salem design incorporates an automatic station bypass which will allow the water system to operate directly off of DWSD when the supply pressure is high and to operate with the booster station when the supply pressure is low.

Geographic Information Systems

Stantec also has extensive experience in developing GIS mapping of community utilities. Stantec has developed GIS utility mapping for the City of Pontiac, Northville Township, Pittsfield Township, and Ann Arbor Township and has begun development of a GIS utility system for the City of Burton. Stantec also utilizes GIS as an analysis tool for water modeling for development of existing and future system demands. Stantec is familiar with the GIS data management process, data sharing agreements, and data confidentiality when necessary.

Funding

It should also be noted that Stantec has extensive experience with successfully procuring Drinking Water Revolving Fund (DWRF) and State Revolving Fund (SRF) grants and loans for municipalities that have a need for improvements, yet need assistance with funding. While we have assisted numerous communities with funding alternatives, we have most recently had funding successes for municipal clients such as Marquette Township (approximately \$4 million in funding). This project started with an alternative water supply evaluation followed by a DWRF project plan, and completion through the design and construction of the recommended alternative (well field, transmission main, and water storage tank).

In addition to Revolving Funds, Stantec has been successful in setting up numerous Special Assessment Districts (SAD) to fund development driven projects. We have recently completed an SAD for a water extension in Marquette Township. We are also in the construction phase of water and sewer extensions in the Village of Pinckney.

PROJECT EXPERIENCE



Our experience with available funding sources and their requirements will allow us to provide the City with solid advice for pursuing funding for projects identified during the course of this project. We have also been successful in assisting various communities in evaluating project costs associated with their planning activities into the above-mentioned funds.

As noted earlier in our proposal, please review the following table for a summary overview of Stantec Ann Arbor's vast level of experience for the type of work outlined in this Request for Proposal.

RELATED EXPERIENCE



**STANTEC CONSULTING MICIGAN
REPRESENTATIVE WATER SYSTEM EVALUATION EXPERIENCE
(Master Planning, Modeling, Storage, DWSD Rate Negotiation)**

Project	City of Chelsea	Pittsfield Township	Northville Township	Marquette Township	Village of Quincy	Salem Township	City of Grosse Pointe Park	Ann Arbor Township	City of Howell	City of Southfield	Village of Lexington	City of Burton	City of River Rouge	City of Marshall
Year of Services	2007	Ongoing	Ongoing	2005	Ongoing	Ongoing	2008	Ongoing	2007-2008	1999-2000	2001	Ongoing	2007	2007-2008
Water System Master Plan/Project Plan		◆		◆	◆	◆	◆	◆	◆		◆		◆	◆
Hydraulic Modeling/Reliability Study	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Alternative Water Source			◆	◆			◆		◆		◆			◆
DWSD Rate Negotiation			◆			◆	◆							
Water System Includes Storage Facilities	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆		◆



Stantec

SECTION III

Scope of Work

SCOPE OF WORK



The City has recognized the need to develop a Water Master Plan that will provide the City with an understanding of growth impacts, the impacts of system storage, operations improvements, and infrastructure upgrade needs and technologies available for water main replacement or rehabilitation. The City will be able to assist Stantec in developing this master plan by providing the existing water model, available GIS information and system billing data as well as operations and maintenance information for the existing water system.

PROJECT SPECIFIC METHODOLOGIES

Based on Stantec's experience, several specific methodologies have been identified for use in modeling the City's water system.

1. **Review of background data** - The existing model is to be provided by the City utilizing WaterCAD software. This model will be reviewed with the City for accuracy of water main locations and sizes, demand allocations, demand patterns, pump characteristics, storage characteristics and operational controls. The model will also be reviewed for configuration efficiency for future updates within the scenario management setups. A model provided with good scenario management can expedite future upgrades and interim analyses between updates.
2. **Modeling water loss** – The modeling of water loss can be developed in several ways. Once the loss values are quantified they can be distributed throughout the system as a percentage of individual parcel usage, modeled as a known loss due to hydrant usage, or applied regionally at known locations. In all cases the demand can be identified as water loss demands for tracking purposes.
3. **Projecting future flows** – Future demands can generally be developed by two methods. The first method increases demands based on population projection increases, while still maintaining typical per capita per day demand ranges. However for this system, the population projections would need to be integrated with the future land use master plan of the City and be coordinated with future non-residential development.

The second method utilizes the coordination of GIS parcel information with billing records. GIS would be utilized to identify parcels that are not currently supplied water and designate them for possible future development. These parcels would be identified to corresponding model nodes for future growth analysis. (It is assumed that land use information is also available in GIS). By combining the data sets, future demands for undeveloped areas can be identified and coordinated with model nodal demands. Coordination with the City will identify substantial development areas as well as growth in-fill to identify short term, medium term, and long term (build-out) growth within the City. For the work under this proposal, it is Stantec's intent to utilize this latter methodology to project future flows.

4. **Modeling elevations** – Stantec intends to use existing topography data provided by the City to develop the elevation of future condition nodes in the model. Stantec also has several methods to obtain additional topographic data if necessary.

SCOPE OF WORK



5. **Modeling fire flow conditions** – Most modeling software today has a fire flow analysis tool that allows the user to set the minimum system pressure (typically 20 psi) as well as the minimum node pressure allowed during the analysis. Next, the required flow is set and the analysis is run. The results are reviewed against the land usage and ISO requirements to determine deficiencies. The key to this analysis is to remove nodes, pumps, valves, and reservoirs from the analysis that may be used to construct the source conditions or remove the ground storage / pump station that would have less than minimum pressure under any scenario causing all nodes to have no available fire flow. These key items that are removed are typically not on the system delivery pressure side of the analysis and are therefore acceptable to remove. To study a specific location, the fire flow condition will be added to the maximum day demand scenario and all system pressures would be reviewed.
6. **Field flow testing** – Field test locations will be chosen based upon the ability to segregate a water main and develop a flow in the main that is a minimum of 5 feet per second. The segregation of the water main will be such that customers will remain in service through isolation of valves and system looping. The best testing condition is to set-up on three hydrants with one being the flow hydrant and the other two hydrants measuring pressure differential; however, two hydrants can also be used with one of the hydrant's being used for both flow and pressure measurement.

Familiarity with the meter and pump station flow and pressure conditions is a key component to the field test. The last concern is familiarity with the condition and operational status of valves that should be closed for testing purposes.

7. **Calibrating the model** – The infrastructure calibration will be performed by reviewing the age of the system and applying C-factor adjustments to regional areas of pipe to match field flow test results. The modeling software can allow different areas to be set up as zones so that adjustments are managed on a district type basis. Modeling results will be compared to field test results to establish the viability of the C-factor value. During a calibration working session, C-factor values can be verified by City personnel who perform pipe repairs and are familiar with the level of water main calcification. This is also where results can turn up valves that are set in a closed condition to be verified by personnel who are familiar with the history of the system.

DETAILED WORK PLAN

In order to efficiently complete the scope of work outlined in the RFP, we have provided a detailed work plan with specific tasks described below.

1. Data Collection and Project Initiation

During the initiation of this project, Stantec will attend a project initiation meeting with the City and summarize the information necessary to assist with the project. This data includes, but will not be limited to:

- Current updated model with existing demands and water mains
- GIS data, including water mains, roadways, parcels, orthophotography and other baseline data
- DWSD meter data



- Land use zoning
- Summary of future service areas
- Contract Supply Agreements (flows and pressures) including latest agreement negotiation information on new DWSD contracts
- Previous water system studies and models
- Previous flow tests and ISO reports
- Billing and/or demand records for customers
- Listing of top 20 usage customers
- Collect existing data on water system operations, system pressures, and recurring problems
- Collect existing and future land use, service area, population data and projections for the City

2. Water Model Review

Stantec will review the existing water model and prepare a new hydraulic model of the City's water system including future development of known or proposed projects. The model will be used for facility sizing, operational studies, planning studies, determining system deficiencies, and identifying system improvements.

a. GIS and Modeling Program Review

As part of the water system hydraulic modeling, Stantec will review the City's GIS and water modeling goals and identify any software enhancements to meet their future goals. Additional considerations will be given to staff experience, cost, future needs, and other City software integration possibilities.

b. Review of Computer Model

Stantec will review the existing hydraulic model network that simulates the water system serving the City of Novi. The review will include all model element attributes. Stantec understands that the existing distribution system currently operates with multiple pressure districts with no elevated storage tanks and two booster pumping facilities. In general, the model will include, but not be limited to, the following:

- Every pipe 12-inches in diameter and larger. Additional smaller pipes may be included should they be identified as key looping pipes that have significant impacts on the model. Pipe roughness factors will be determined as accurately as possible based on the pipe age, material, condition and field testing. A description of the pipes will also be included in the model to identify pressure zone.
- Nodal elevations and demands

Upon review of system demands, the model will be tested to be sure the demands have been computed correctly and the boundaries conditions, i.e., supply sources, are properly represented. A model quality control review will be

<p>Model Element Attributes</p> <p>Pipes:</p> <ul style="list-style-type: none"> • Diameter • Length • Roughness Factor • Material (if known) • Pressure Zone <p>Nodes:</p> <ul style="list-style-type: none"> • Elevations • Demands • Demand Pattern • Pressure Zone <p>Pumps:</p> <ul style="list-style-type: none"> • Elevation • Pump Curves • Control Settings <p>Tanks/Reservoirs:</p> <ul style="list-style-type: none"> • Elevations • Dimensions • Hydraulic Grade Line (HGL) <p>Control Valves:</p> <ul style="list-style-type: none"> • Elevations • Valve Types • Control Settings
--



performed to ensure that all model components are accurately represented within the model, including pipe connectivity, correct pipe diameters, and lengths.

c. Scenario Management Development

Stantec will develop scenarios for physical and operational controls to simulate the various analyses for the master plan. Scenarios that will be included are average day demands, maximum day demands, peak hour demands, extended period simulation for maximum day demands, maximum day plus fire flow demands, and any other scenario necessary to analyze the system as proposed herein. Stantec's approach is to develop an intuitive procedure for managing different physical or operational model scenarios as a template for which the City can further use and develop alternative scenarios within the model software. This will combine scenarios required for analysis for this Master Plan, as well as newly proposed scenarios developed by Stantec to maximize the efficiency of this powerful model software feature.

3. System Demands

Under this task, the existing and future system demands will be estimated by Stantec based on information and records provided by the City. The system demand analysis will include the following:

- Develop GIS parcel billing to node coordination
- Review and develop nodal customer service areas
- Review the existing top 20 customers and develop assumptions on their usage pattern
- Evaluate the impact of large water users on the system
- Determine the per capita water consumption based on water records and compare to typical values for other water systems
- Review system operating records and interview system operators to determine peak hour usage. Year 2007 data will specifically be reviewed due to the significant dry weather summer season.
- Develop average day, maximum day, and peak hour demand multipliers
- If available, review diurnal usage patterns for the system. If not available, develop a diurnal demand pattern.
- Evaluate the system losses and determine if they are reasonable
- Develop future growth projections based on population, future land use, parcel service areas, City input and develop water demands based on future growth projections
- Develop correlation between growth projections and existing and proposed model nodes to create nodal customer service areas
- Develop future demands to system build-out (Year 2030) based on growth projections
- Review growth projections with the City
- Identify routes to future growth areas
- Assign future demands to model nodes
- Review existing Insurance Service Office (ISO) and other hydrant and fire flow reports for modeling fire flow demands
- Develop required fire flow demands based on land usage information and ISO requirements



4. Hydrant Flow Testing

In cooperation with the City, Stantec will prepare a map showing recommended test locations and procedures for a fielding testing plan. Locations of testing will be based upon but not be limited to:

- Pipe age
- Customer complaints
- Preliminary hydraulic results
- City recommendations

The map and plan will be reviewed and adjusted as necessary by the City and accepted prior to the day of implementing the field testing procedures. For budgetary purposes, Stantec has assumed that one day of field tests will be required.

Stantec will require collection and recording of system boundary conditions during the field measurements. For example, the boundary condition during flow tests should correspond as close as possible to the actual hour of the test. This data will consist of not less than pressure and flow (and note whether rising or falling) at meters, and pumps in operation. Adequate flow tests will be conducted to represent system conditions during average demand conditions, although maximum demand conditions are preferred. Stantec will prepare field calibration flow test templates to record field measurements. These templates will also be included in the field calibration plan.

5. Model Calibration

Once the model has been assembled and verified, and the model demands coincide with acceptable system average day demands, Stantec will field calibrate the model to no more than 5 to 10-percent deviation (energy line and flow rate) from observed system values. The City of Novi will provide the required equipment and personnel to assist Stantec in the field calibration. As part of the calibration effort, Stantec will be present for the required pressure and flow tests in the system. The pipe roughness coefficients (C values) shall be the last variable adjusted in the model to reach calibration.

The model is to be calibrated by utilizing hydrant flow tests and known boundary conditions. The distribution system calibration includes the following tasks:

- Determine system demands for testing periods
- Develop model calibration to overall system demand conditions
- Develop model calibration scenarios and determine coefficient adjustments to calibrate model to flow test scenarios
- Review calibrated model with City personnel. It should be noted that on aging systems, pipe coefficients are not only representative of aging pipes, but also valves that are unknowingly partially or fully closed.
- Finalize calibrated model

Stantec proposes a model calibration review with City personnel. During the review, City staff can provide any input or comment related to model simulations. As a result, Stantec will demonstrate to City staff that the

SCOPE OF WORK



Preliminary water treatment alternatives related to typical groundwater will also be reviewed so that the City's customers are provided with water that is similar in quality to what is provided by DWSD. Under this task, the following will be performed:

- Review available information on the areas aquifers. This will include, but will not be limited to, review of published data related to the areas hydro-geological background and existing area well record maintained by MDEQ/health departments.
- Evaluate capacities needed for new system components (wells, booster stations, and/or treatment)
- Develop a conceptual opinion of probable cost of the construction cost associated with each evaluated component
- Identify permitting needs and develop construction time line
- Summarize findings in a report

It should be noted that study recommendations may need to be confirmed through actual field investigation (hydro-geological analysis and aquifer performance testing). This can be discussed further with City staff upon completion of the study.

9. Storage Feasibility Analysis

The City currently maintains no storage tanks and operates the system by maintaining peak hour and fire flow demands utilizing DWSD regional storage. As part of the planning process for this study, Stantec will analyze the feasibility of utilizing peak hour demand storage to provide cost benefits to the City. Recent changes in DWSD contracts and associated maximum day and peak hour fees have provided a basis for the City to review the need for system storage. The storage facility analysis will consider elevated and ground storage and the impacts of future growth. The storage analysis includes the following tasks:

- Identify potential storage locations
- Review ground storage and elevated storage options and obtain the City's opinion on storage types
- Analyze storage operations in the system utilizing the extended period simulation within the modeling software
- Develop existing conditions peak hour costs based on the new DWSD rate structure
- Determine costs of new facilities, operations and maintenance
- Determine any cost benefits between the two methods of providing peak hour demands

10. Capital Improvements

Stantec will utilize all proposed recommendations and develop a plan for the City to consider during review of future budgets and developments. Under this task, the following will be performed:

- Develop descriptions of system deficiency improvements
- Develop descriptions of system growth improvements
- Prioritize system deficiency improvements and growth improvements

SCOPE OF WORK



Stantec

- Develop costs for system improvements
- Identify schedule for improvements

11. Master Plan Report

Stantec will prepare a Final Report on the Master Plan that discusses the ability of the City's current water system to meet performance objectives described in the scope of work for this proposal. The Final Report will compile, describe, and summarize the finding for the project. It will include a chapter on each project task and the finalized versions of the task deliverables. In each chapter, Stantec will discuss assumptions, analyses, and results. In addition to the chapters for the project tasks, Stantec will include a chapter describing the current water system facilities and the technical memorandums developed during the project. Data for each facility will be listed and tabulated illustrating the pertinent design information. Figures will be included to graphically illustrate the system facility locations and pressure zones.

The Final Report will form the Water System Master Plan and will contain at the front of the report an Executive Summary. This summary will highlight and summarize important and significant information and aspects of the report. Any basis of design analysis information developed to support the results of this study will be provided under separate appendices to the report.

12. Council Presentation

Stantec will develop a PowerPoint presentation to the City Council which will present the findings of the Water Master Plan. The presentation will be provided to the City for review and comment prior to the actual presentation. Stantec will also provide a presentation board summarizing the recommendations for discussion at the Council presentation.

Preliminary Table of Contents for Report

- I. Executive Summary
- II. Water Demand Projections
 - A. Land Use
 - B. Consumption vs. Production Data
 - C. Diurnal Demand Patterns
 - D. Peak Factors
 - E. Current and Projected Water Demands
- III. Existing System Facilities
 - A. Pressure Zones
 - B. Existing Facilities
- IV. Hydraulic Model of Water System
 - A. Model Software
 - B. Model Development and Preparation
 - C. Field Flow Testing
 - D. Model Calibration Process
- V. Existing System Model Analysis
 - A. Existing Condition Analyses
 - B. Fire Flow Analysis
 - C. Storage Analysis
- VI. Future System Model Analysis
 - A. Future Development Projects
 - B. Scenario Analyses
- VII. Water Resources and Supply
 - A. Alternate Water Source
 - B. Water Storage Feasibility
- VIII. Conclusions and Recommendations
 - A. Existing System Recommendations
 - B. Future Recommendations
 - C. Cost estimates

SCOPE OF WORK



VALUE ADDED OPTIONS

FUNDING REVIEW (INCLUDED TASK)

Stantec understands the importance of securing funding resources to facilitate the implementation of water system needs, specifically, when these needs stem from deficiencies in the existing system. Stantec further understands that growth related system improvements may in some cases be secured by allocating system improvement costs to developers. As a value added enhancement, Stantec would evaluate the short and long term improvement needs for the water system, evaluate possible funding options (DWRf, SAD, capital improvements), and recommend funding strategies for the specified improvement . Under this option, Stantec would also initiate contact with funding agencies, if applicable, to further evaluate the feasibility of the recommended options. There would be no additional cost for this service, which is already included in the base fee contained in the fee proposal portion of this proposal.

ADDITIONAL MODEL DEVELOPMENT (OPTIONAL TASK)

Stantec understands that the current request is to model the major distribution lines of the system of 12-inch diameter and greater. As a value added enhancement, Stantec would include all pipes of the distribution system in the hydraulic model. The inclusion of these pipes would provide the City with the opportunity to review localized pressure and fire flow deficiencies. This enhancement would include demand development based on the additional nodes developed to include all pipes within the City.

Please note this task would not include an investigation of potential capital improvements for water mains of less than 12 inch diameter, only the hydraulic analysis described above. This is due to the unknown number of deficiencies in water mains less than 12 inches. After review of the deficiencies by Stantec and the City, a determination of required deficiency improvements can be developed and a separate fee (to include them in the master plan) could be negotiated. The cost for this additional hydraulic modeling option would be \$5,500 in addition to the base fee contained in the fee proposal portion of this proposal. This task would be incorporated into the provided schedule without increasing the final completion date of the Master Plan.



Stantec

SECTION IV

Staffing Plan

STAFFING PLAN



NOV-08-000000

EXPERIENCED PROFESSIONAL STAFF

We have assembled a highly experienced team to provide the best possible professional services for this project. Our team is intimately familiar with all aspects of water distribution and master plan studies providing planning, analysis and engineering services. The following is a brief summary of the team that has been specifically assembled for this project.

Name	License	Responsibility	Years of Experience	Years with Firm	Educational Background
George A. Tsakoff		Project Manager	11	11	BSE
Christopher P. Rybak	PE, CFM*	Lead Project Engineer	17	7	BSE
Aaron A. Uranga	PE	Hydraulics Engineer	11	9	BSE, MSE
Dima S. El-Gamal	PE, GISP*	GIS, Grant & Loan Specialist	14	10	BSE, MSE, PhD
Ishwar M. Naik	PE	QA/QC	36	36	BSE

*Note: CFM is Certified Floodplain Manager certification and GISP is Geographic Information System Professional certification.

PROJECT TEAM

George A. Tsakoff will serve as Project Manager and provide overall project coordination between the City and Stantec staff. This coordination will take place with the Lead Project Engineer and Hydraulics Engineer during the preparation of the water study to ensure efficiency and customer service. George has extensive project and client management experience with several of Stantec's established municipal clients including the City of Novi. Over the past four years, George has worked with the City of Novi's Engineering, Building and Finance Departments on a mix of private development consultation and public improvement engineering and administration efforts and is familiar with City processes, procedures and most importantly the expectations for a high quality project, on-time and within budget.

Christopher P. Rybak, PE, CFM will serve as Lead Project Engineer, responsible for Hydraulic Modeling. His diverse engineering skills span across a vast array of projects. With experience in many aspects of engineering including water distribution systems, GIS, and sewer collection systems, Chris has extensive expertise in the specialty of hydraulic modeling. Past experience in this category includes water distribution and surge modeling to develop master plans and project designs. Chris has unique experience with several software programs including H2ONET, XP-SWMM, PC-SWMM, ARC 9, HEC-RAS, HEC-HMS, WaterCAD, and KYSURGE. Chris also serves as Water Resources Group Manager and is responsible for the day-to-day activities of the group, including coordinating Stantec staff, overseeing and guiding the design process, and overseeing efforts to meet quality control standards. His past water modeling projects include but are not limited to the City of Flint, City of Mishawaka, City of Albany, City of Lafayette, Hooser Hills Water District, Northwest Indiana Water Authority, and Erie-Huron Water District. A full resume for Chris is available upon request.

Aaron A. Uranga, PE, MSE, will serve as Hydraulics Engineer for the project. Aaron possesses a Master's Degree in Hydraulics and is a member of Stantec's Environmental Engineering Group, which has a focus on

STAFFING PLAN



water system engineering from evaluation and studies through project construction. He has nine years of hydraulic modeling and design experience related to water systems. Aaron's relevant project experience has included hydraulic network analyses, feasibility studies for storage facilities (elevated and ground), water distribution system improvements, and detailed water pumping facility evaluation and design. Some specific and recent large scale work efforts include preparation of a Design Basis Report for Northville Township on their recent water systems capital improvement project (new tank, booster station and distribution main) and preparation of a Water Systems Study for Pittsfield Township.

Dima S. El-Gamal, PE, GISP, PhD, will serve as GIS Facilitator as well as Grant and Loan Funding Specialist for this project. She is responsible for assisting clients with hydraulic analysis and funding of water and wastewater improvement projects (grants and loans). She reviews project recommendations, evaluates funding eligibility, communicates with Regulatory Agencies, and supervises completion of funding reports. With a Doctorate in Civil/Environmental Engineering and 10 years of experience, Dr. El-Gamal has performed numerous feasibility studies, project work plans, hydrogeological evaluations, water and wastewater studies, as well as environmental site assessments and permit applications. She currently manages all of the GIS utility mapping projects and is a major resource for our GIS technical staff. She has published/presented local and international papers in the fields of Civil/Environmental Engineering and GIS. With her diversity of knowledge and background, Dima brings innovative, technical and managerial skills to any application.

Ishwar M. Naik, PE, Principal, will serve as Quality Assurance / Quality Control for the project. Ish has a Bachelor's Degree in Civil Engineering and over 30 years of engineering experience, all with the Stantec Ann Arbor Office. Ish is currently overseeing a large water system project in Grosse Pointe Park that includes plant, pumping and distribution system components and water distribution system master plans in the Cities of Howell, River Rouge and Marshall. Additionally, Ish has recently supervised completion of the City of Berea's Water System Improvements and is currently the Principal-in-Charge for many of our clients who own and operate large and small water systems.



Stantec

SECTION V

Project Schedule

PROJECT SCHEDULE



We have prepared the project schedule with the following items in mind:

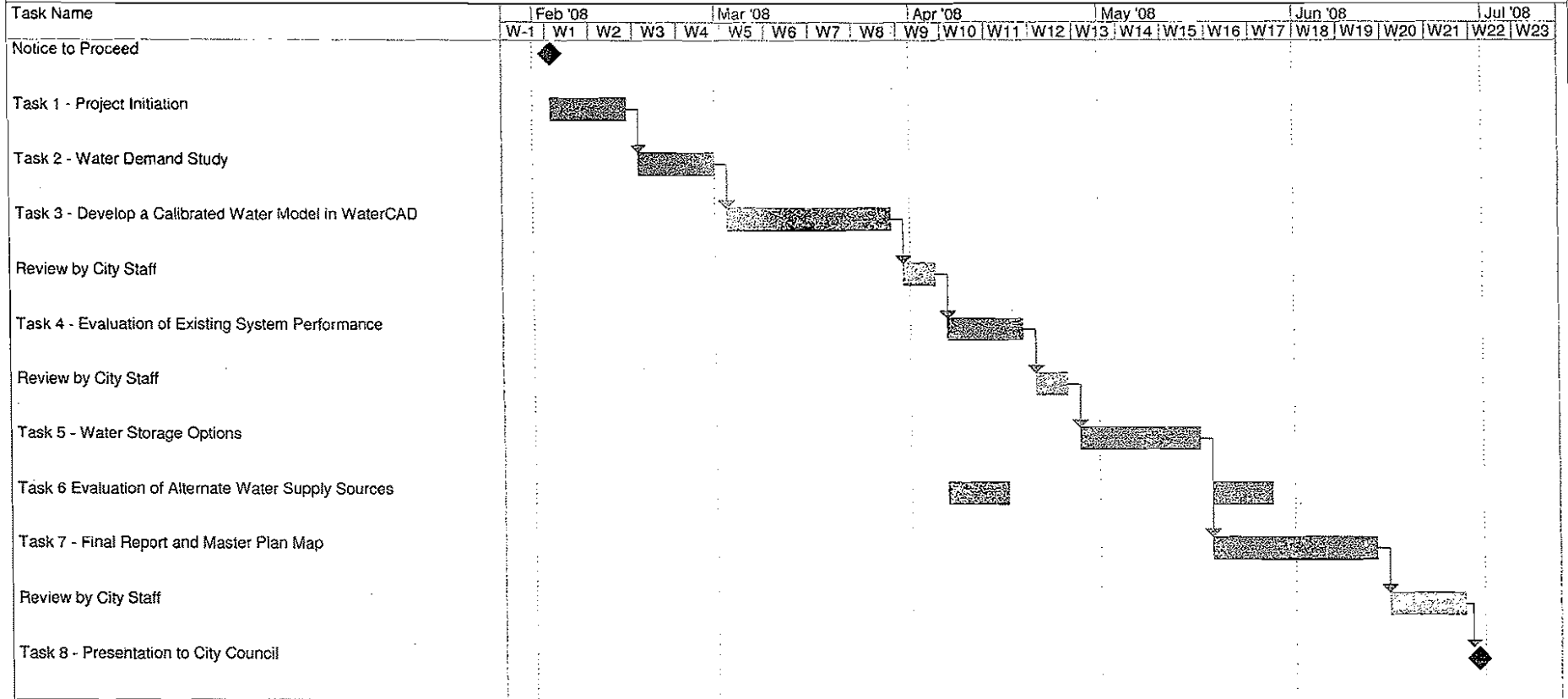
- Our recent experience with similar projects and how that experience relates to the project timeline.
- The City's desire to have the project completed in early summer of 2008.

Please refer to the attached project schedule for additional details.



**City of Novi, Michigan
Engineering Services for
Water Distribution System Study and Master Plan**

Proposed Project Schedule



Project: Water System Master Plan
Date: Tue 1/22/08

Task	■	Milestone	◆	Owner Review	■
Progress	■	Summary	▶		



Stantec

SECTION VI

Fee and Rate Information

FEE AND RATE INFORMATION



Attachment A
The completed fee proposal from Exhibit A in the RFP is attached.

Attachment B
Our rate schedule as requested in the RFP follows. We understand that the rate schedule may be used for additional work as may be necessary.

FEE AND RATE INFORMATION



Stantec

**EXHIBIT A
FEE PROPOSAL
CITY OF NOVI**

**ENGINEERING SERVICES FOR
WATER DISTRIBUTION SYSTEM STUDY
AND MASTER PLAN**

We the undersigned propose to furnish to the City of Novi services consistent with the Request for Qualifications dated January 11, 2007 and Request for Proposals dated December 21, 2007, respectively. Design fees will be paid on an hourly basis for actual work performed to a maximum as proposed. A separate fee schedule is being provided should the City request additional work on an hourly basis.

Task Description	Task Fee
Task 1–Project Initiation	\$1,500
Task 2–Water Demand Study	\$5,000
Task 3–Develop a Calibrated Water Model in WaterCAD	\$7,000
Task 4–Evaluation of Existing System Performance	\$3,300
Task 5–Water Storage Options	\$5,500
Task 6–Evaluation of Alternate Water Supply Sources	\$2,700
Task 7–Final Report and Master Plan Map	\$7,000
Task 8–Presentation to City Council	\$1,500

TOTAL FEE FOR TASKS 1 THROUGH 8: \$33,500

PLEASE TYPE:

Company Name: Stantec Consulting Michigan, Inc.

Address: 3959 Research Park Drive, Ann Arbor, MI 48108

Agent's Name: George A. Tsakoff

Agent's Title: Associate

Agent's Signature: *George A. Tsakoff*

Telephone Number: 734-761-1010 Fax Number: 734-761-1200

E-Mail Address: george.tsakoff@stantec.com Date: January 21, 2008



Stantec

2008 Fee Schedule

Title	Hourly Rate	Description
Technician	\$43 - \$49	<ul style="list-style-type: none"> • Entry-level position • Works under the supervision of a senior professional • Recent graduate from an appropriate post-secondary program or equivalent • Generally, less than four years experience
Engineering Assistant Construction Technician Environmental Technician	\$55 - \$67	<ul style="list-style-type: none"> • Junior-level position • Independently carries out assignments of limited scope using standard procedures, methods and techniques • Assists senior staff in carrying out more advanced procedures • Completed work is reviewed for feasibility and soundness of judgment • Graduate from an appropriate post-secondary program or equivalent • Generally, four years work experience
Senior CADD Technician Project Engineer Designer Senior Engineering Designer	\$74 - \$87	<ul style="list-style-type: none"> • Fully qualified professional position • Carries out assignments requiring general familiarity within a broad field of the respective profession • Makes decisions by using a combination of standard methods and techniques • Actively participates in planning to ensure the achievement of objectives • Works independently to interpret information and resolve difficulties • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, six years experience
Senior Designer Senior Project Engineer Project Manager	\$95 - 113	<ul style="list-style-type: none"> • First level supervisor of first complete level of specialization • Provides applied professional knowledge and initiative in planning and coordinating work programs • Adapts established guidelines as necessary to address unusual issues • Decisions accepted as technically accurate, however may on occasion be reviewed for soundness of judgment • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, nine years experience
Senior Project Manager Associate Registered Surveyor	\$123 - \$144	<ul style="list-style-type: none"> • Highly-specialized technical professional or supervisor of groups of professionals • Provides multidiscipline knowledge to deliver innovative solutions in related field of expertise • Participates in short and long range planning to ensure the achievement of objectives • Makes responsible decisions on all matters, including policy recommendations, work methods, and financial controls associated with large expenditures • Reviews and evaluates technical work • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, ten years experience with extensive, broad experience
Principal	\$152 - \$181	<ul style="list-style-type: none"> • Senior level consultant or management function • Recognized as an authority in a specific field with qualifications of significant value • Provides multidiscipline knowledge to deliver innovative solutions in related field of expertise • Independently conceives programs and problems for investigation • Participates in discussions to ensure the achievement of program and/or project objectives • Makes responsible decisions on expenditures, including large sums or implementation of major programs and/or projects • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, fifteen years experience with extensive professional and management experience
Survey Crew	\$147	



Stantec

2008 Fee Schedule

Title	Hourly Rate	Description
Technician	\$43 - \$49	<ul style="list-style-type: none"> • Entry-level position • Works under the supervision of a senior professional • Recent graduate from an appropriate post-secondary program or equivalent • Generally, less than four years experience
Engineering Assistant Construction Technician Environmental Technician	\$55 - \$67	<ul style="list-style-type: none"> • Junior-level position • Independently carries out assignments of limited scope using standard procedures, methods and techniques • Assists senior staff in carrying out more advanced procedures • Completed work is reviewed for feasibility and soundness of judgment • Graduate from an appropriate post-secondary program or equivalent • Generally, four years work experience
Senior CADD Technician Project Engineer Designer Senior Engineering Designer	\$74 - \$87	<ul style="list-style-type: none"> • Fully qualified professional position • Carries out assignments requiring general familiarity within a broad field of the respective profession • Makes decisions by using a combination of standard methods and techniques • Actively participates in planning to ensure the achievement of objectives • Works independently to interpret information and resolve difficulties • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, six years experience
Senior Designer Senior Project Engineer Project Manager	\$95 - 113	<ul style="list-style-type: none"> • First level supervisor of first complete level of specialization • Provides applied professional knowledge and initiative in planning and coordinating work programs • Adapts established guidelines as necessary to address unusual issues • Decisions accepted as technically accurate, however may on occasion be reviewed for soundness of judgment • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, nine years experience
Senior Project Manager Associate Registered Surveyor	\$123 - \$144	<ul style="list-style-type: none"> • Highly-specialized technical professional or supervisor of groups of professionals • Provides multidiscipline knowledge to deliver innovative solutions in related field of expertise • Participates in short and long range planning to ensure the achievement of objectives • Makes responsible decisions on all matters, including policy recommendations, work methods, and financial controls associated with large expenditures • Reviews and evaluates technical work • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, ten years experience with extensive, broad experience
Principal	\$152 - \$181	<ul style="list-style-type: none"> • Senior level consultant or management function • Recognized as an authority in a specific field with qualifications of significant value • Provides multidiscipline knowledge to deliver innovative solutions in related field of expertise • Independently conceives programs and problems for investigation • Participates in discussions to ensure the achievement of program and/or project objectives • Makes responsible decisions on expenditures, including large sums or implementation of major programs and/or projects • Graduate from an appropriate post-secondary program, with credentials or equivalent • Generally, fifteen years experience with extensive professional and management experience
Survey Crew	\$147	



Stantec

**City of Novi, Michigan
Water Distribution System Study and Master Plan
Proposed Fee Schedule
February 13, 2008**

Tasks	Title	Project Manager/QA/QC	Lead Project Engineer	Hydraulics Engineer	Systems Engineer	GIS Management Grant & Loan Specialist	GIS Technician	QA/QC Principal in charge	Word Processing	Direct Expenses	Total Hours
	Employee Name	George Tsakoff	Christopher Rybak	Aaron Uranga	Phil Garman	Dima El-Carmal	TBD	Ishwar Naik	Various		
	Billing Rate	\$115	\$105	\$92	\$72	\$108	\$57	\$140	\$47		

PROJECT SCOPE

Task 1 - Project Initiation	3	4	2	2	1	1		2	\$ 48	15
Task 2 - Water Demand Study	1	5	13	32	1	8	1		\$ 20	61
Task 3 - Develop a Calibrated Water Model in WaterCAD	1	7	18	45	1	14	1			87
Task 4 - Evaluation of Existing System Performance	1	4	10	25			1		\$ 65	41
Task 5 - Water Storage Options	2	7	15	32	1	4	2		\$ 25	63
Task 6 - Evaluation of Alternate Water Supply Sources	2	8	10	8	7		1		\$ 30	36
Task 7 - Final Report and Master Plan Map	2	7	14	37	2	14	1	13	\$ 75	90
Task 8 - Presentation to City Council	3	3	3	2	2	2			\$ 35	15

PROJECT SUMMARY

TOTAL HOURS	15	45	85	183	15	43	7	15		408
TOTAL LABOR	\$1,725	\$4,725	\$7,820	\$13,176	\$1,620	\$2,451	\$980	\$705		\$33,202
TOTAL DIRECT EXPENSES									\$ 298	\$298
PROJECT GRAND TOTAL (TASKS 1 - 8)										\$33,500

NOTE: ONLY PARTIAL HOURS FOR FUNDING REVIEW ARE INCLUDED IN THIS HOURLY SUMMARY BECAUSE A MAJORITY OF THIS VALUE ADDED OPTION IS A PRO BONO SERVICE TO THE CITY.

NOTE: ONLY PARTIAL DOLLAR AMOUNTS ARE SHOWN FOR DIRECT EXPENSES RELATED TO THIS PROJECT BECAUSE A PORTION OF THE DIRECT EXPENSES WILL BE PRO BONO TO THE CITY.