CITY of NOVI CITY COUNCIL

Agenda Item 6
January 7, 2008

cityofnovi.org

SUBJECT: Approval to award a contract for design and construction engineering services for the Regional Basin Retrofit/Water Quality Improvement Project for the Taft and Bishop regional stormwater detention basins to Orchard, Hiltz & McCliment, Inc. for a cost plus fixed fee contract amount of $132,379.

SUBMITTING DEPARTMENT: Engineering

CITY MANAGER APPROVAL:

EXPENDITURE REQUIRED	**$132,379 (offset by 50% grant match)**
AMOUNT BUDGETED	**$0 (to be included in 3rd Quarter amendment)**
APPROPRIATION REQUIRED	**$132,379**
LINE ITEM NUMBER	**210-211.00-865.132 (Drain Fund)**

BACKGROUND INFORMATION:

This past summer, the City of Novi was awarded a 50% matching federal grant through the Rouge River National Wet Weather Demonstration Project for improving the Taft and Bishop regional stormwater detention basins (see attached location map). The Phase II Storm Water Master Plan completed in 2006 recommended that five regional basins rated as "high priority" be improved within two years - primarily because they provide limited attenuation of flow during storm events, especially storms with durations and intensities that occur with a relatively high frequency. City Council approved the interagency agreement with Wayne County (the agency administering the grant for the U.S. Environmental Protection Agency) at its December 17, 2007 meeting.

Because the grant is federally funded, the City must meet federal regulations for soliciting, procuring and contracting engineering services for this project. Accordingly, the attached Request for Qualifications for design and construction engineering services was advertised publicly instead of soliciting proposals from the City's six pre-qualified engineering firms. Also, the selection process was strictly based on qualifications. Specifically, a two envelope system was used in which the qualifications statements were scored independent of fees, and when qualification scoring was completed, only the fee envelope from the selected firm was opened. Finally, the terms of the grant require that the City enters into a "cost plus fixed fee" contract with the consultant wherein all of the selected firm's labor would be for a fixed fee amount, and any direct engineering costs (e.g., mileage, reproduction, equipment rental, etc.) would be handled as direct reimbursable expenses.

Five proposals were received and each was evaluated using Qualifications Based Selection, with an emphasis on the each firm's experience and understanding of the project scope. The results of the staff review of qualifications are as follows:

Firm	Staff Review Score	Proposal Rank
Civil & Environmental Consultants	490	4
ECT	1100	2
Fishbeck Thompson Carr & Huber	665	3
Giffels Webster	380	5
Orchard Hiltz & McCliment	**1115**	**1**

Of the five firms that submitted proposals, Orchard, Hiltz & McCliment (OHM) had the highest staff review score and met all requirements listed in the request for qualifications (see attached OHM proposal dated December 20, 2007 and Engineering staff's qualifications scoring summary for reference).

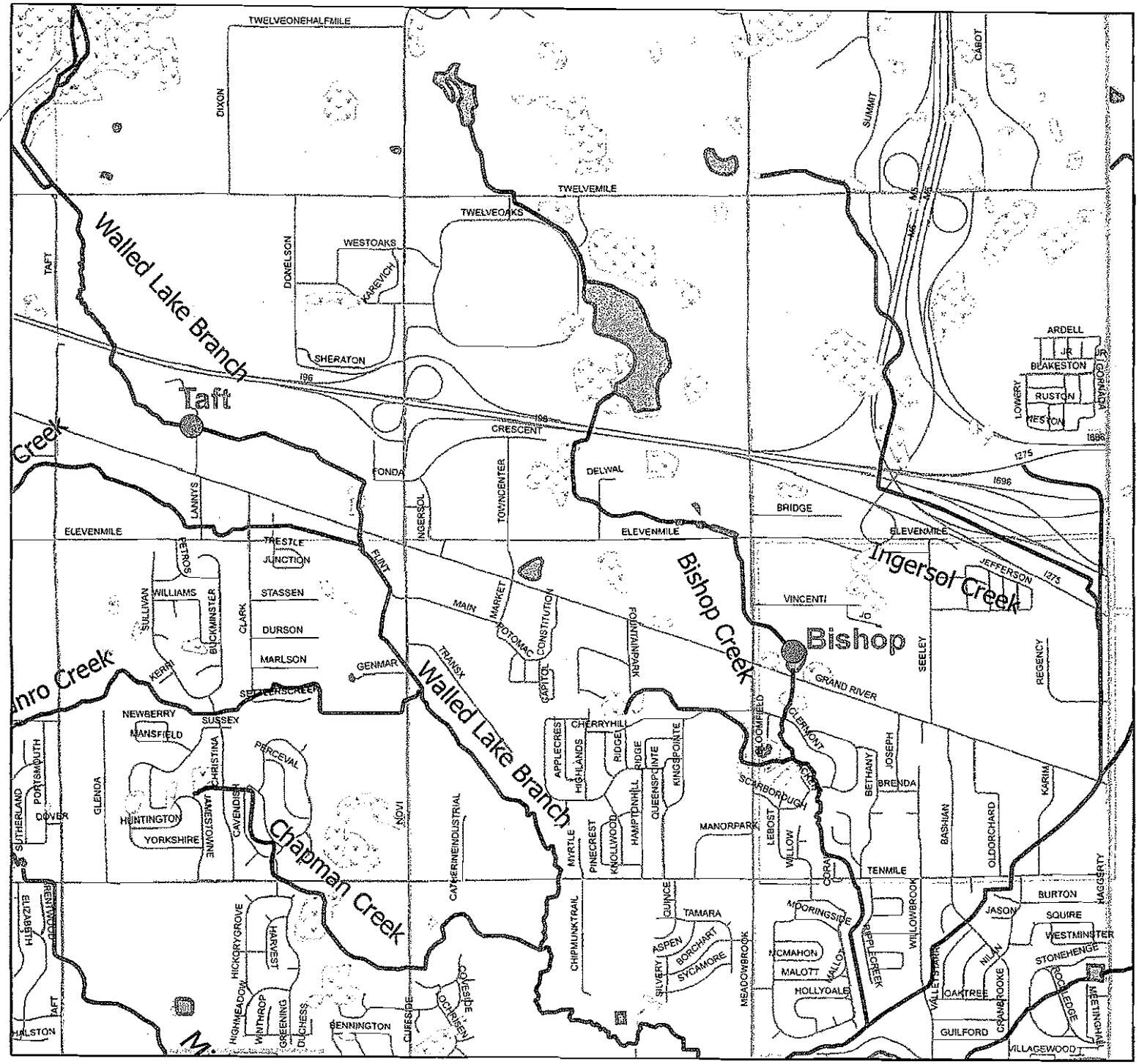
Concerning the fee amount to be awarded, OHM's proposed design engineering fee of $76,232 is nearly $9,000 lower than the $85,000 design budget submitted with the grant application. OHM's proposed construction engineering fee is $56,147 (including optional field monitoring and reporting tasks 9 and 10), for a total engineering fee of $132,379, which is also within the amount budgeted for this project (OHM's fee proposal is also attached for reference).

OHM completed the Phase II Storm Water Master Plan in 2006, provided engineering services for the Hilton Sanitary Sewage Lift Station project, and is currently the City's consulting engineer for the sanitary sewer Capacity, Management, Operations & Maintenance (CMOM) program. The design phase of this project will be completed by April 2008, and it is anticipated that the construction phase will be completed by September 2008.

RECOMMENDED ACTION: Approval to award a contract for design and construction engineering services for the Regional Basin Retrofit/Water Quality Improvement Project for the Taft and Bishop regional stormwater detention basins to Orchard, Hiltz & McCliment, Inc. for a cost plus fixed fee contract amount of $132,379.

	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				



City of Novi, MI

MDEQ CMI Grant Application

Regional Basin Retrofit for Water Quality Improvements

Exhibit 1: Site Location Map

Legend

- Detention Basin Location
- Streams
- Open Water
- Natural Wetlands
- Municipal Boundary

0 0.25 0.5 Miles

OHM
Engineering Advisors

P:\0126_0165\0163060600_Pond_Surveys_EWRG\GIS\City_map_rev020907.mxd

SCORING SUMMARY

Project Description: Regional Basin Upgrades (RPO Grant)

RANK 1= LOW, 5= BEST (scores should be evenly distributed)

SCORING CRITERIA

1. Evaluation of prior experience with engineering in-line regional basins, designing outlet control structure modifications and meeting MDEQ requirements. (30% of total score)
2. Evaluation of the experience of the principal personnel who would be assigned to the project. (20% of total score)
3. Familiarity and past experience with the City of Novi on previous projects (20% of total score)
4. Evaluation of firm's understanding of the project scope, approach and proposed schedule for completion of the project. (30% of total score)

TOTAL SCORES FROM ALL REVIEWERS

Item weight:	*15*	*10*	*10*	*15*		
FIRM/ SCORING CRITERIA:	1	2	3	4	Totals	*Rank*
Civil & Environmental Consultants	10	10	6	12	**490**	4
ECT	21	23	21	23	**1100**	2
Fishbeck Thompson Carr & Huber	14	12	17	11	**665**	3
Giffels Webster	7	8	9	7	**380**	5
Orchard Hiltz McCliment	23	22	22	22	**1115**	1
TOTALS	75	75	75	75		

cityofnovi.org

NOTICE - CITY OF NOVI
REQUEST FOR QUALIFICATIONS

Engineering Services for
Regional Basin Retrofit for Water Quality Improvements

The City of Novi will receive sealed proposals for **Engineering Services for Regional Basin Retrofit for Water Quality Improvements** according to the specifications of the City of Novi.

Sealed proposals will be received until **10:00 A.M.** prevailing Eastern Time, **Thursday, December 20, 2007.** Proposals shall be addressed as follows:

CITY OF NOVI
CAROL J. KALINOVIK, PURCHASING DIRECTOR
45175 W. Ten Mile Rd.
Novi, MI 48375-3024

All proposals must be signed by a legally authorized agent of the proposing firm.
ENVELOPES MUST BE PLAINLY MARKED

"Engineering Services for
Regional Basin Retrofit for Water Quality Improvements"

AND MUST BEAR THE NAME OF THE PROPOSER.

The City reserves the right to accept any or all alternative proposals and award the contract to other than the lowest bidder, to waive any irregularities or informalities or both; to reject any or all proposals; and in general to make the award of the contract in any manner deemed by the City, in its sole discretion, to be in the best interest of the City of Novi.

Carol J. Kalinovik
Purchasing Director
ckalinovik@cityofnovi.org

Notice dated: November 30, 2007

cityofnovi.org

REQUEST FOR QUALIFICATIONS

ENGINEERING SERVICES FOR

REGIONAL BASIN RETROFIT FOR WATER QUALITY IMPROVEMENTS TAFT AND BISHOP REGIONAL DETENTION BASINS CITY OF NOVI, MICHIGAN

November 30, 2007

The City of Novi is seeking Statements of Qualifications for services to assist in the Regional Basin Retrofit for Water Quality Improvements to the Taft and Bishop Regional Detention Basins. These services are funded by a grant under the Rouge River National Wet Weather Demonstration Project being administered by Wayne County Department of Environment and funded in part through USEPA. The grants will identify goals for disadvantaged business enterprises (DBE) participation including both minority owned (MBE) and women owned (WBE) participation. The grant requires a goal of awarding up to 30% of the dollar value for grant fundable tasks of the contracts to DBE's (20% to MBE's and 10% to WBE's). Proposers are requested to indicate their willingness and ability to comply with the DBE goals for the grant funded portions of the work tasks.

Qualified firms wishing to submit proposals should submit their qualification statements to Carol Kalinovik, Purchasing Director, City of Novi, 45175 W. Ten Mile Rd., Novi, MI 48375 prior to **10:00 AM** on **Thursday, December 20, 2007**.

Any firms desiring to be considered for the project and having the capabilities for this work shall submit five (5) bound copies and one (1) unbound copy of their statement containing the qualifications and experience of the firm. The submittal should include, at a minimum, the following:

- Background of firm; including history, areas of expertise, locations, size and resource capabilities (especially of the local office) to perform the required services.
- Summary of related experience in other communities with projects of similar scope. Include cost, description and location of the project.
- References for related projects or other communities with similar types projects.
- Resumes of individuals in the firm that would likely be involved in the project.
- Copies of MDEQ Part 91 certifications (not stormwater operator certifications) for the individuals responsible for soil erosion and sedimentation control inspections.
- Statement of understanding of the scope of services.

The complete scope of services is shown in detail in Attachment B.

Statements received will be reviewed for the following criteria with the ranking weight indicated in parentheses.

1. Evaluation of prior experience with engineering in-line regional basins, designing outlet control structure modifications and meeting MDEQ requirements. (30% of total score)
2. Evaluation of the experience of the principal personnel who would be assigned to the project. (20% of total score)
3. Familiarity and past experience with the City of Novi on previous projects (20% of total score)
4. Evaluation of firm's understanding of the project scope, approach and proposed schedule for completion of the project. (30% of total score)

The statement of qualifications **must be clearly labeled** "REGIONAL BASIN RETROFIT FOR WATER QUALITY IMPROVEMENTS--TAFT AND BISHOP REGIONAL DETENTION BASINS."

Additionally, on the accompanying form, in a **separate, sealed, appropriately labeled envelope, the consultant is to provide a fee proposal** for the work described herein. Included with the Fee Proposal shall be a detail of consultant hourly rates that can be applied to additional work as may be necessary. The contract with the selected firm will be based on a cost plus fixed fee.

PLEASE DO NOT INCLUDE ANY FEE INFORMATION IN THE ENVELOPE CONTAINING THE STATEMENT OF QUALIFICATIONS.

Award of this project shall be solely based on evaluation of these initial statements of qualifications. Statements shall not contain price information. Once a selection is made based on the qualifications, the sealed fee envelope for the selected consultant will be opened to determine the fee.

The City of Novi will not discriminate again any individual or group because of race, sex, religion, age, national origin, marital status or handicap. The City of Novi reserves the right to accept or reject in whole or in part, any and all statements, to waive irregularities and to act in the best interest, as determined by the city council of the City of Novi. This advertisement is being made for the purpose of conforming to Environmental Protection Agency Procurement Regulations 40 CFR Part 31.

The construction of the project must be fully complete no later than December 31, 2008.

Questions regarding this Request for Qualifications may be directed to: Civil Engineer, Brian Coburn, P.E. at bcoburn@cityofnovi.org or (248) 735-5632, or City Engineer, Rob Hayes, P.E. at rhayes@cityofnovi.org or (248) 735-5606.

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CITY OF NOVI

FEE PROPOSAL

REGIONAL BASIN RETROFIT
FOR WATER QUALITY IMPROVEMENTS
TAFT AND BISHOP REGIONAL DETENTION BASINS

We the undersigned propose to furnish to the City of Novi services consistent with the Request for Qualifications dated November 30, 2007. Further, we are separately providing a separate estimate of hours and detail of cost. 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.

THIS FEE PROPOSAL MUST BE SUBMITTED IN A SEPARATE SEALED AND APPROPRIATELY LABELED ENVELOPE. PLEASE DO NOT INCLUDE FEES WITH THE STATEMENT OF QUALIFICATIONS.

Phase	**Amount**
Design Phase (including bidding)	$ _____
Construction Phase	$ _____
Total Fee	$ _____

PLEASE TYPE:

Company Name: _____

Address: _____

Agent's Name: _____

Agent's Title: _____

Agent's Signature: _____

Telephone Number: _____ Fax Number: _____

E-mail Address: _____

Date: _____

ATTACHMENT B

Wayne County Department of Environment
Rouge River National Wet Weather Demonstration Project
Round VIII – Part B Funding for Regional Basin Retrofit for Water Quality Improvements
City of Novi

CONTACT INFORMATION

Mr. Robert Hayes, P.E., City Engineer
City of Novi
45175 W. Ten Mile Road
Novi, Michigan 48375-3024
Phone: 248-347-0454
Fax: 248-735-5683

ALTERNATE CONTACT

Mr. Brian T. Coburn, P.E.
City of Novi
45175 W. Ten Mile Road
Novi, Michigan 48375-3024
Phone: 248-347-0454
Fax: 248-735-5683

PROJECT PURPOSE AND OBJECTIVES

The Middle One Subwatershed Management Plan identifies excessive storm water flows leading to significant erosion, sedimentation and loss of habitat as key concerns of the subwatershed. The goals of the proposed project are to reduce the frequency of bank full events downstream of the Taft and Bishop regional detention basins. The City of Novi identifies an action item in their SWPPI that discusses retrofitting existing detention basins to reduce storm water quantity and improve storm water quality. By performing the proposed project, Novi will be addressing the following goals of the Middle One Subwatershed Management Plan:

- Reduction of excessive storm water flows that cause bank erosion, sedimentation and loss of habitat for fish and macroinvertebrates.
- Reduction of high sediment levels that contribute to a degradation of aesthetics, can limit light to aquatic plants that carry urban pollutants.

Proposed Project Description

The proposed project consists of retrofitting two (2) regional detention basins. The Taft Basin is located along the Walled Lake Branch of the Middle Rouge River, and the Bishop Basin is located along Bishop Creek. These two basins are identified in the City of Novi's Storm Water Master Plan Update as providing inadequate attenuation. The lack of attenuation is causing stream bank erosion from excessive bank full flows in the vicinity of the Taft and Bishop Basins. The lack of attenuation varies based on the storm event and is also specific to each basin. It should also be noted that from our field investigations over the years, we have observed an increase in what appears to be unnatural stream bank erosion. This is a sign of an increase in the number of bank full events that occur as compared to a pre-developed condition.

The basin control structures will be redesigned to provide attenuation at high frequency events (i.e. 1, 2 and 10-year. Currently it appears that most of the regional basins were designed to attenuate larger events above the 10-year.

The City of Novi is, therefore, applying for a Round VIII, Part B RPO grant to retrofit the two existing regional detention basins. This will be accomplished by retrofitting the outlet control structures, installing in-line sediment traps, retrofitting wet pond areas, and stream restoration and native plantings in the wet pond areas. By reducing the frequency of bank full events, the stream banks downstream of each basin will naturally reestablish vegetation. As vegetation is reestablished, stream banks will repair more quickly after larger storm events. Water quality will be improved for both basins and their associated streams due to a decrease in unnatural sedimentation.

A. Anticipated Impact/Benefits of the Project to the River/Subwatershed/Watershed

The anticipated benefit of this project is to reduce the excessive storm water flows in order to reduce erosion, sedimentation and increase habitat for fish and macroinvertebrates. This project should also reduce the high sediment levels that contribute to the degradation of aesthetics and limit the light to aquatic plants.

B. Project's Consistency with the Goals and Objectives of the Subwatershed

This project addresses the following two goals of the Middle One Subwatershed Management Plan:

- Reduction of excessive storm water flows that cause bank erosion, sedimentation and loss of habitat for fish and macroinvertebrates; and
- Reduction of high sediment levels that contribute to a degradation of aesthetics; can limit light to aquatic plants that carry urban pollutants.

Implementation of the retrofits for each basin will reduce the bank full events which will allow the banks to naturally reestablish vegetation. This will decrease erosion and sedimentation in downstream reaches of each stream. By encouraging retrofit applications to existing detention basins, this project will be a showcase for other regional detention basins that are not performing as originally designed.

C. Cooperative, Innovative, or Demonstrative Nature of the Project

It is planned that the City of Novi will provide a narrative of their experience on this project with before and after photos as an aid to other communities considering detention basin retrofits. The stream bank inventory will be performed before and for two (2) years after the project to assess benefits. The assessment will extend past the duration of the RPO grant.

Task Descriptions:

Task #1 – Project Administration, External Coordination and Reporting

The purpose of this task is to provide proper oversight and administration of the grant management process. Under this task, the City will procure professional services of an engineering consultant to provide design as well as construction administration and inspection services. The City of Novi will conduct the following to procure the consultant:

- Prepare and advertise a Request for Qualifications (RFQ) as required by 40 CFR 31 (Code of Federal Regulations Volume #40, Part 31)
- Evaluate responses according to a predetermined selection process and select the service provider based on qualifications.

Also as part of Task #1, Novi will provide quarterly progress reports with invoice documentation to the Wayne County RPO, describing each activity by task along with its status of completion.

Deliverables: Quarterly progress reports to Wayne County RPO, RFQ document, advertisement, and selection procedures.

Task #2 – Field Investigation & Topographic Survey

Under this task, the City of Novi and consultants will perform a field investigation at each basin as well as a stream bank inventory upstream and downstream of the basins. Specific work efforts include:

- Visit each basin and conduct a habitat assessment downstream of both the Taft and Bishop basins. Existing site conditions will be documented in field notes and digital photographs. A stream bank erosion inventory and site numeric ranking will be performed downstream of the basins to assist with the qualitative monitoring of the proposed retrofits.
- Obtain topographic survey cross sections upstream and downstream of the two basins as well as at each basin.

Deliverables: Results of habitat assessment, site numeric ranking spreadsheet, digital photographs, topographic survey.

Task #3 – Conceptual Design

Under this task, the City, with assistance from a Consultant, will evaluate the data obtained in Task 1 and develop preliminary plans for the pond retrofits at Taft and Bishop Basins. The City and their Consultant will meet with the MDEQ and stakeholders to obtain input. Based on input from stakeholders, the plans will be revised and presented to the MDEQ for input. Specific work efforts include:

- The Consultant will develop conceptual design plans including a proposed meandering stream at Taft Basin, location of in-line sediment trap upstream of Taft Basin, riparian corridor enhancement, preliminary in-stream habitat improvements, and outlet retrofits. Habitat improvement for the Bishop Basin will include stump islands, potentially an in-line sediment trap and riparian buffers.
- The conceptual plans will be provided to project partners, regulatory agency personnel and stakeholders. The plans will be revised based on input and submitted to the MDEQ for initial comments.
- The Consultant will develop preliminary construction cost estimates for all construction elements.

Deliverables: Conceptual plans, summaries of meetings, cost estimates.

Task #4 – Hydrologic and Hydraulic Analysis

Under this task, the Consultant will develop a hydraulic model of the existing and proposed conditions to determine the sizing of the basin outlet retrofit. Water surface elevations and hydraulic data will be computed to support the project design and permitting process. A steady state hydrologic model has been prepared and backwater analyses have been developed for both creeks for recurrence intervals up to the 100-year. Based on this information, we will develop stage-discharge relationships for each existing structure. The proposed retrofits will maximize attenuation by picking the smallest retrofitted outlet size that shows decreased flow rates for the smaller storms (e.g. 1-year, 2-year, 10-year) while not increasing and/or maintaining the stage for the 100-year flow. Specific work efforts include:

- The City Consultant will develop a hydraulic model of the basin and its upstream/downstream channel slated for restoration for both the existing and proposed conditions. The analysis will be developed for the 1, 2, 10, 50 and 100-year storm events.
- Based on the hydraulic results, the Consultant will determine the appropriate channel and floodplain size, channel slope, in-stream habitat structures and sizes of created wetland areas and associated control structure modifications.

Deliverables: Completed hydraulic calculations along with summary report.

Task #5 – Regulatory Coordination and Permitting

Under this task, the City, with assistance of a Consultant, will coordinate activities with the appropriate regulatory agencies. Close coordination and regular meetings will be held with regulatory agencies to facilitate close communication. Specific work efforts include:

- Meet with the MDEQ and project partners to set timetables and discuss initial concepts prior to initiating the design.
- Meetings will be held as needed to facilitate communication with the MDEQ.
- Based on the agreed upon conceptual design, the City Consultant will prepare and submit for permits.

- The Consultant will prepare permit application materials as necessary and obtain necessary construction permits.

Deliverables: Permits

Task #6 – Final Engineering Design and Preparation of Contract Documents

Under this task, the Consultant will prepare a final design and prepare contract documents. Specific work efforts include:

- The Consultant will finalize the engineering design and apply for necessary permits.
- The Consultant will prepare final engineering plans and contract documents.
- The City of Novi will review the engineering plans and contract documents.
- The Consultant will incorporate City comments into the plans.
- The Consultant will forward engineering plans and contract documents to the MDEQ, Surface Water Quality Division, Nonpoint Source Engineer for review and comment.
- The Consultant will revise engineering plans and contract documents based upon MDEQ comments.
- The Consultant will develop an Engineer's Estimate of project costs.

Deliverables: Permits and easements required for construction, final plans and contract documents, Engineer's Estimate

Task #7 – Project Construction and Construction Administration

Under this task, the City will administer and observe construction of the project. Specific work efforts include:

- Once a contractor is accepted by the City and DEQ, contracts will be processed, and a pre-construction meeting will be conducted and documented.
- During construction, coordinate critical activities, meetings with residents, contractors, and government agencies.
- Process contractor pay requests and other construction documents, and will provide overall project supervision.

Deliverables: Completed construction

Task #8 – Stream Bank Assessment & Final Project Report

Under this task, the City's Consultant will monitor the stream banks downstream of each basin.

- The stream banks downstream of each basin will be monitored for two (2) years.
- Submit an electronic copy of all before and after photos and other project-related photos with the final report. Photos and assessment will continue to be taken past the duration of this RPO grant.
- Prepare final grant closeout report.

Deliverables: (1) electronic copy of all before and after photos and final project report.

PROJECT SCHEDULE

The project is expected to have a duration of approximately 16 months from authorization to begin work (anticipated to be August 1, 2007) with final grant reporting completion, November, 2008. The project

schedule has been included with the attachments at the end of this proposal.

PROJECT BUDGET

The estimated total project cost for this work is $405,000. The federal grant funding requested is 50% of this amount or $202,500. A summary of the tasks with associated costs is shown in the table below. A table showing detailed cost breakdown has been included with the attachments at the end of this proposal.

Task	Task Cost	Effort
1. Project Administration, External Coordination and Reporting	$ 15,000	Admin
2. Field Investigation & Topographic Survey	$ 10,000	Planning
3. Conceptual Design	$ 10,000	Design
4. Hydraulic analysis	$ 10,000	Design
5. Regulatory Coordination and Permitting	$ 10,000	Planning
6. Final Engineering Design and Preparation of Contract Documents	$ 20,000	Design
7. Project Construction and Construction Administration	$320,000	Construction & Construction Admin
8. Stream Bank Assessment & Final Project Report	$ 10,000	Admin

Total Cost = $405,000
Federal Grant Funds Requested = $202,500

LOCAL MATCH

The local match is expected to be provided through the City of Novi Drain Fund.

SELECTING WAYNE COUNTY SERVICES FOR ILLICIT DISCHARGE ELIMINATION, PUBLIC EDUCATIN AND OUTREACH

The City does not intend to contract with Wayne County for illicit discharge elimination services, public information, or other activities as part of the project.

SCHEDULE FOR COMPLETING PREVIOUSLY AWARDED GRANT PROJECTS

The City of Novi has completed the following two RPO grants: Walled Lake Stream Bank Stabilization, and the Novi GIS Outfall Survey.

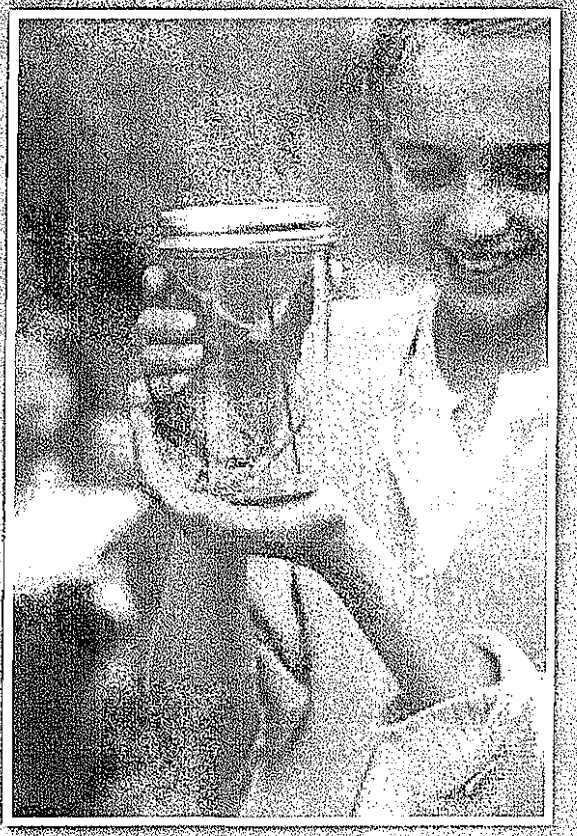
City of Novi
Regional Basin Retrofit for Water Quality Improvements for Taft & Bishop Basins
Timetable of Activities

	Tasks	Quarter 1			Quarter 2			Quarter 3		
		Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08
1	Project Admin, Ext Coordination & Reporting									
2	Field Investigation & Topographic Survey									
3	Conceptual Design									
4	Hydraulic Analysis									
5	Regulatory Coordination & Permitting									
6	Final Engineering Design & Preparation of Contract Documents									
7	Project Construction and Construction Administration									
8	Stream Bank Assessment & Final Project Report									

	Tasks	Quarter 4			Quarter 5			Quarter 6		
		Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08
1	Project Admin, Ext Coordination & Reporting									
2	Field Investigation & Topographic Survey									
3	Conceptual Design									
4	Hydraulic Analysis									
5	Regulatory Coordination & Permitting									
6	Final Engineering Design & Preparation of Contract Documents									
7	Project Construction and Construction Administration									
8	Stream Bank Assessment & Final Project Report									

Note:
1. Please note that stream banks will continue to be assessed two (2) years after the construction has been completed, past the duration of this grant.

Qualifications for Engineering Services for Regional Basin Retrofit for Water Quality Improvements – Retrofit Existing Regional Detention Basins



Engineering Advisors Engineering Advisors Engineering Advisors Engineering Advisors Engineering Advisors Engineerir

OHM, with our division, Hitch, is an award winning consulting engineering firm focused on serving government agencies on infrastructure issues. Every day, our staff of more than 180 engineers, architects and specialized technicians strives to fulfill the company's mission, Helping Build Better Communities for Tomorrow.

- A dedicated project manager who understands the City's needs
- Experts in the field of hydrology, hydraulics, and regional basin design
- Extensive knowledge of MDEQ permitting requirements for this project
- Unmatched historical knowledge and understanding of the City's storm water system

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

OHM
Advancing Communities℠

In association with: Niswander Environmental, LLC

OHM
Engineering Advisors

December 17, 2007

Carol J. Kalinovik, Purchasing Director
City of Novi
45175 W. Ten Mile Road
Novi, MI 48375

Re: Engineering Services for Regional Basin Retrofit for Water Quality Improvements

Dear Ms. Kalinovik:

Orchard, Hiltz & McCliment, Inc. (OHM), along with Niswander Environmental, LLC, is very excited to work with the City of Novi on the Regional Basin Retrofit and Water Quality Improvements project. The project team has extensive experience with Novi's storm water system and with regional basins in the area. We have the history, background and expertise ideally suited to help you accomplish your goals in the required grant time. Working with OHM brings you the following advantages:

- A dedicated project manager who understands the City's needs
- Experts in the field of hydrology, hydraulics, and regional basin design
- Extensive knowledge of MDEQ permitting requirements for this project
- Unmatched historical knowledge and understanding of the City's storm water system

We thank you for considering our firm for this project and look forward to working with your office. Enclosed with our proposal is our detailed work plan that we believe will accomplish your goals. If we can provide any further information or clarification for your evaluation, please feel free to call Ron Cavallaro or me at (734) 522-6711.

Respectfully,
ORCHARD, HILTZ & McCLIMENT, INC.

John J. Hiltz, PE
Vice President, Operations

34000 Plymouth Road | Livonia, Michigan 48150
p. (734) 522-6711 | f. (734) 522-6427
www.ohm-advisors.com

cityofnovi.org

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Engineering Services for
Regional Basin Retrofit for Water Quality Improvements –
Taft and Bishop Regional Detention Basins

OHM

In conjunction with:

Niswander Environmental, LLC

Section 1 – **Firm Background**

Firm Background

Orchard, Hiltz & McCliment, Inc. (OHM) is a regional provider of civil engineering, surveying, and computerized information system services. Headquartered in Livonia, MI, OHM has been serving public organizations and agencies with personalized style since 1962. Today, OHM employs more than 180 full-time employees. The professional reputations of our employees are our most valuable asset.

OHM's corporate offices are located in Livonia. We have branch offices in Houghton and Lansing and maintain a large field office in Auburn Hills. In 2003 and again in 2007, we were named **ACEC-Michigan Firm of the Year.**

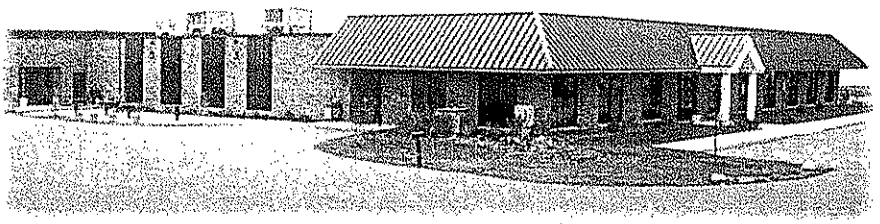
OHM is proud that half our staff members are civil engineers and more than half of those are registered professional engineers. We have three professional surveyors, five information technology professionals, several survey crews and a host of skilled technicians, computer-aided designers, field and construction inspectors, as well as office professionals.

OHM provides civil engineering, surveying, construction administration and / or geographic information system services to the following:

- Cities of Ann Arbor, Auburn Hills, Farmington, Farmington Hills, Ironwood, Lincoln Park, Livonia, Hancock, Negaunee, Northville, Novi, Oak Park, Pontiac, Rochester Hills, Romulus, Southfield, Sylvan Lake, Westland and Ypsilanti
- Townships of Augusta, Bridgewater, Brighton, Brownstown, Cohoctah, Deerfield, Dexter, Freedom, Groveland, Hamburg, Huron, Lima, Lodi, Marion, Milan, Northville, Northfield, Orion, Plymouth, Scio, Superior and Ypsilanti
- Villages of Dexter and Maybee
- Michigan Department of Transportation
- Wayne County Department of Environment
- Wayne County Department of Public Services
- Wayne County Airport Authority
- Oakland County Department of Public Works
- Oakland and Washtenaw County Drain Commissions
- Livingston, Oakland, and Washtenaw County Road Commissions
- Livingston Community Water Authority
- Ypsilanti Community Utilities Authority

The professional reputations of our employees are our most valuable asset. Their dedication to providing quality services to our clients is instrumental to the continuing success of our company.

Through our commitment to serving only the public sector, OHM is familiar with federal, state, and local codes and ordinances pertaining to site plan reviews, infrastructure studies, designs, construction and mapping projects.



OHM headquarters:

34000 Plymouth Road
Livonia, MI 48150
p: (734) 522-6711
f: (734) 522-6427

Offices: Lansing, Houghton, & Auburn Hills

Putting state-of-the-art technology to work for our clients is a key element to our success. OHM's commitment to training our staff to be proficient with the latest computer applications and in the creation of innovative software programs makes us a leader in this rapidly changing industry.

▶ Computer Services

OHM's Information Technology Group is responsible for the development, maintenance and operation of all computer resources within the firm. This department operates 170 engineering design, CAD, GIS and mapping workstations. This group also maintains all computer hardware and software for word processing, desktop publishing, E-mail collaboration, and Internet services. We have 16 server-class Pentiums that we support on our Wide Area Network.

OHM uses several products for engineering design, CAD, GIS and mapping applications. These include:

- Land Development Desktop for coordinate geometry, parcel descriptions, highway design, digital elevation modeling, and mass grading calculations
- CAiCE computer aided civil engineering and surveying
- ARCGIS and ARCIMS for Windows for GIS and mapping
- Star Net Least squares adjustment for horizontal and vertical control
- Geopak

In addition to the various design products, OHM uses AutoCAD and Microstation to meet the computer aided drafting needs of our clients. OHM has developed translation and application software to enhance our system use and better serve our clients.

▶ Environmental and Water Resources

The Environmental and Water Resources Group (EWRG) is comprised of a specialized team of engineers focusing on serving our clients with a wide variety of needs. We are offering experienced technical knowledge in the areas of water supply, distribution and vulnerability, sanitary sewer collection, storm water management, wetlands and watershed issues, groundwater and environmental engineering matters, and infrastructure asset management related analyses. This group of talented experts is experienced in the latest engineering and technological advances. The EWRG enables OHM to provide computerized modeling, analysis, and design of surface and sub-surface hydraulic processes (e.g. backwater profiles, open channel hydraulics, groundwater flow modeling, water supply network analyses), and statistical modeling, analyses, and optimization techniques.

The EWRG also is proficient in developing custom, client need driven applications using modeling languages such as Matlab or hybrid applications facilitating exchange of data and information between a variety of public domain and proprietary tools.

Several experts in the EWRG are well versed in utilizing GIS type concepts and products to facilitate modeling, optimization, and asset management related decision-making efforts.

Finally, in the area of utility infrastructure asset management, an emerging field, the EWRG along with additional experts within the OHM, have been establishing a strong level of experience base, which is made pragmatic and applicable for the needs of municipal clients.

A sample of numerical applications used by the EWRG include:

- Drinking Water: Haestad Methods Products (e.g. WaterCAD, Culvert Master), MWH Soft products (e.g. H2oNet, H2oMap), public domain applications (EPANET), Pipe2000, Surge2000

- Sanitary Sewer: public domain applications (EPA SWMM), XPSWMM, Hydraflow Products, a variety of custom tools generated in Matlab or other modeling platforms
- Storm Sewer: Hydraflow products, public domain applications (e.g. HEC HMS, TR-55, HEC RAS)
- Statistical Modeling, Analysis, and Optimization: Data centric applications such as Matlab generated custom statistical analyses tools, water main break replacement pattern predicting custom statistical applications, temperature and rain inflow generated sanitary sewer response curves etc.
- GIS: ArcView, ArcInfo, Geocoding, and 3D visualization / modeling related applications for mapping, decision support, and analysis purposes.

Computer Aided Drafting and Design (CADD)

Realistic illustrations save time and money by reducing delays arising from the inability to visualize what is being proposed. Computer renderings can be output to paper, transparencies, slide film, or used as a still picture on videotape. Animation can be output to DVD or played back on the computer. These types of media can be used in proposals, environmental assessments, funding applications, public meetings, project walk-throughs, and media presentations.

OHM has 80 CADD workstations in use on various projects. The PC compatible units with Pentium and Xeon processors are part of OHM's 170-station Windows 2003 network. Computer drawings, word processing and standard details are transferred from one design group to another using the computer network. Completed drawings are transferred through the network server and are plotted to one of three plotters. Intermediate drawings may also be obtained by sending plots to one of our four HP network printers, which include two Oki color laser and five Cannon Image Runners.

We process all survey data and generate Computer Aided Drafting and Design, (CADD) base maps for CADD using Land Desktop (LDT) and Large Format Printers. One of two CADD software packages is used: AutoCAD or Microstation. Coordinate geometry capability is provided by Civil 3D, Caice, LDT and Geopak. IBM compatible computers are used to assist in engineering design, software development, cost estimating, desktop publishing, and word processing. Various compilers are available for developing software applications or compiling source codes obtained from other vendors.

Transportation Engineering

Roads and Highways

OHM's Roads Group uses Land Development Desktop (LDD) for the majority of its design work. LDD enables OHM personnel to visualize how proposed roadway improvements affect existing conditions in a three-dimensional environment. This is done by constructing digital terrain models of existing and proposed surfaces and merging the two to create a simulated post-construction model.

Softdesk provides the engineer with the resources to design nearly all aspects of a project. The productivity tools automate the plan generation process, reduce errors and improve efficiency. The digital plan drawing files are prepared in AutoCAD or MicroStation format. OHM has the ability to produce rendered images and animations of proposed projects offering a realistic before and after view of a project before the dollars are committed. Rendering transforms three-dimensional wire frame models into photorealistic images by using surface textures and shadows. A series of rendered images can create a series of frames for animation.

When the animation is played, it simulates motion along a camera path. If this path is elevated above the model surface, the viewer can get a bird's eye view of the project. Similarly, when the path is near the modeled surface, the animation simulates walking or driving through a project.

Traffic Engineering

OHM uses the latest transportation planning and traffic engineering software to evaluate and analyze the problems besetting clients, assuring accurate, cost-effective analyses. For example, Synchro/SimTraffic™ is a powerful tool to model traffic operations at intersections. It allows the designer the opportunity to optimize traffic signal timing plans, develop offsets for proper coordination between signals, and calculate the intersection capacity and level of service.

The operation of the intersection(s) can then be simulated and animated to help visualize the problems at specific locations. The animation can be saved and played back on a computer for use in public meetings and other open presentations. Changes in signal timings or adding turn signals can be easily done on the fly, providing the opportunity to readily answer the "What if ..." questions often raised by a community's constituents.

▶ Bridges and Structures

Bridge designs and inspections are done using current structural design software. When crossing streams and rivers, HEC-2 and HEC-RAS hydrology simulation software are used to analyze hydraulic impacts. Structural programs, such as Enbeam C, Fastframe, Enercalc, Bridge Girder Analysis and LEAP are used to provide up-to-date, cost efficient designs and analyses.

▶ Construction Engineering/Contract Administration

OHM is certified in the use of MDOT's computerized construction "FieldManager" software system. This software is mandatory on MDOT funded projects, but can also be used on locally funded municipal projects. The system electronically records and documents all construction related aspects of a project, including daily reports, completed items of work, contract modifications, and tested material stock. When prompted, the software generates pay estimates for completed work. "FieldManager" streamlines the process of project documentation and significantly reduces the amount of time required for projects administration.

▶ Surveying Automation

Our Survey Group combines skilled professionals and the latest equipment to perform accurate surveying to our clients. OHM's seven survey crews provide global positioning, construction staking and topographic, right-of-way, easement preparation, boundary and geodetic control surveys. To enhance our CADD capability and improve our design efficiency we have eight electronic total survey stations. These instruments are equipped with data collectors or electronic field books. This automates our topographic surveying, survey calculations, design, earthwork calculations and subsequent construction layout. Our electronic total stations are classified to perform first order work by the National Geodetic Survey.

Our Survey Group is equipped with the latest in technology, training and certifications. All Survey Crew chiefs have laptop computers for real-time data collection. With skilled staff, two fully robotic instruments, four Trimble real-time Geodetic Receivers, and a host of other instruments, our team performs surveys of the highest quality, in tight timeframes.

CADD
Land Desktop 2007
AutoCAD 2007
Civil 2007
MicroStation J
CAiCE

LevProc
StarNet
Trimble Total Control
Trimble Geomatic Office
TDS ForeSight DXM
TDS Survey Pro

Global Positioning System

- Three Ashtech Dual Frequency Geodetic Receivers and
- Two Trimble Dual Frequency Geodetic Receivers with radios for Real Time Kinematic work.
- All equipment is survey-grade and is capable of producing centimeter accuracy results.

Global Positioning Systems (GPS)

OHM owns ASHTECH Real Time GPS receivers and post-processing software that provide our survey team with centimeter accuracy. GPS is used to determine State Plane Coordinates for horizontal control on projects and to provide coordinates and elevations for aerial mapping. Kinematics, pseudo Kinematics and rapid static techniques are effective to determine project coordinates to the centimeter level of accuracy. "Rapid Static" and "Real Time" techniques are being used in some control and topographic applications. "Real Time" is also being used in some layout applications.

Website/Application Development

OHM's website, located at www.ohm-advisors.com, provides visitors with a comprehensive overview of the services we provide, projects in progress, employment opportunities, as well as a chronological history of the firm. The site also offers a client access area to allow for secure file interaction. The site was built and is being maintained with the latest Internet tools including Flash and Dreamweaver.

In addition, the IT Group uses cutting edge tools such as Oracle, SQL Server, and Cold Fusion to develop and maintain data-driven web applications.

Geographic Information Systems (GIS)

OHM's GIS Group has provided professional consulting and technical support in the implementation and installation of more than 15 community geographic information systems throughout Southeastern Michigan.

The group can provide a full range of GIS services including strategic plan development for GIS implementation, data automation/ conversion and integration, database development, application development, spatial web integration, GPS data collection, and general consulting services.

Our staff provides customized training and support services for the following third-party products:

- ARCGIS
- ARCIMS
- ARCVIEW 3.x
- ARCGIS Extensions

As an ESRI-certified Consultant, Developer, and Business Partner we are able to call on the full range of services available through ESRI and their network of business partners. The group is service-oriented element of OHM that prides itself in tailoring systems to our clients needs while maintaining industry standards for data sharing and integration.

NISWANDER ENVIRONMENTAL, LLC

10524 E. Grand River Ave.
Suite 103
Brighton, MI 48116
phone. 810.225.0539
fax.810.225.0653
www.niswander-env.com

Finding Solutions in a Complex World

Who we are:

Niswander Environmental is certified as a Women's Business Enterprise (WBE) by the Women's Business Enterprise National Council in partnership with the Michigan Women's Business Council (No. 243298). Niswander Environmental offers environmental solutions for developers, municipalities, non-profit organizations, and transportation agencies. Niswander Environmental's staff bring over 40 years of combined professional experience, including work in the academic, public sector, and consultant arenas, which gives them a unique perspective and ability to provide solutions to the most complex environmental problems. Our staff have the expertise needed to lead you through the often confusing myriad of environmental regulatory laws and requirements.

What we do:

Niswander Environmental provides cradle-to-grave service including site assessments, project planning, site design, construction oversight, and long-term monitoring. Niswander Environmental specializes in wetland services, treatment wetlands, ecological assessments, threatened and endangered species assessments, GIS services, site planning, green building, stormwater management, and NEPA clearance. Niswander Environmental prides itself in customer intimate services that identify your needs and will develop and implement cost effective, innovative solutions.

Wetland Services include:

- delineations and functional assessments
- wetland, stream, and floodplain permitting
- mitigation location, design, construction, and monitoring
- watershed management
- treatment wetlands design, construction, and monitoring
- stream restoration
- water quality analysis
- mitigation banking

Ecological Assessments include:

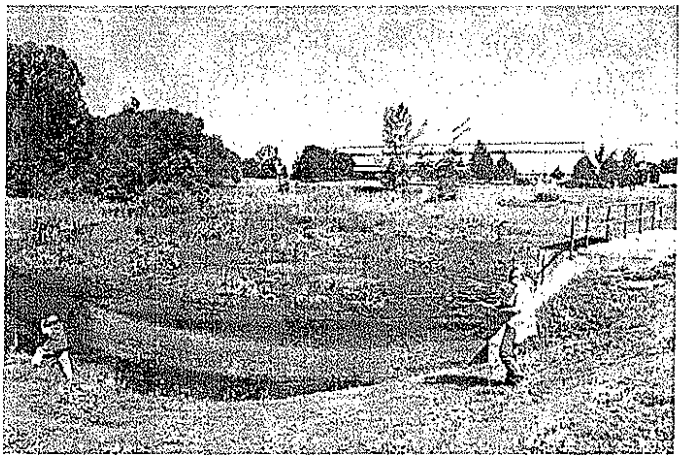
- natural features inventories
- threatened and endangered species surveys
- woodland/tree surveys
- site plan development
- EIS/EA's

Geographic Information Systems Services include:

- mapping
- optimum site selection
- constraints analysis
- site planning
- natural features analysis and priority area ranking

Section 2 – Related Experience References

City of Novi
Storm Water Master Plan Update Phase II



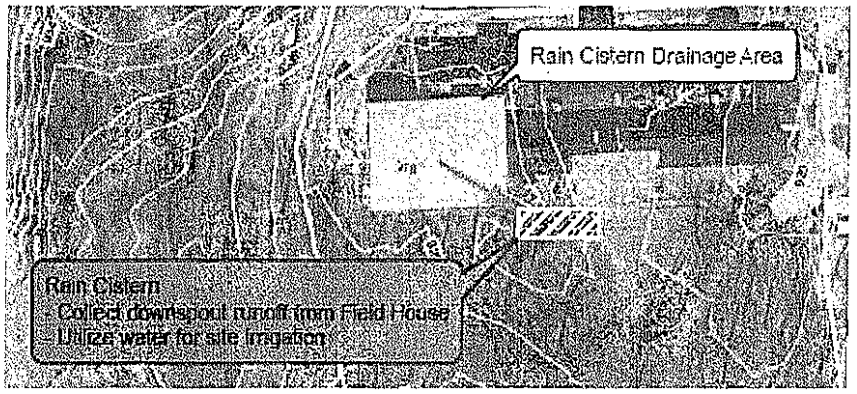
Client Contact Information
City of Novi
Rob Hayes, PE
(248) 347-0454
45175 W. Ten Mile Road
Novi, MI 48375-3024

Project Cost and End Date
$59,949 – February 2007

The City of Novi hired OHM to complete Phase II of their Storm Water Master Plan Update. The two main goals of the Update were to determine improvements necessary to increase existing regional detention basin effectiveness in stream water quality and flood protection, and to provide recommendations for improvement to the City's Soil Erosion and Sedimentation Control (SESC) program. The City requested that specific tasks be performed in order to meet these goals. OHM was able to provide a work plan for these requested tasks, but also presented options for the City to meet their goals via a more streamlined work plan that was more cost effective to the City. The City chose the more streamlined approach. As part of the project, OHM gathered and reviewed background information related to the City's regional basins and SESC program. A field investigation of all the City's regional basins was performed. During field visits, visual problems and potential opportunities for improvements were documented on a site evaluation form, developed by OHM. Problems documented included sedimentation, stream bank erosion, invasive vegetation, problems with outlet structures, debris accumulation, etc. The data collected at each site was used to populate a numeric ranking in order to prioritize improvements. A regional basin topographic survey was also performed for several of the regional basins, which were chosen based on previous studies that identified these basins as providing minimal attenuation. The topographic survey was compared to the original design information for these basins. The SESC program was evaluated based on a field investigation and measurements that were used to help identify the amount of sedimentation occurring and the origin of the sediment. Finally, a selected number of sediment removal structures located throughout the City were evaluated for sediment removal effectiveness based on field measurements. Recommendations for future use and placement of these structures were provided.

After the completion of the Master Plan Update, OHM assisted the City of Novi with grant applications for both Clean Michigan Initiative (CMI) and Rouge Programs Office (RPO) funding. The requested grants were for regional basin improvements for the Taft and Bishop Basins as identified in the Master Plan Update. The proposed improvements include basin outlet retrofits in order to provide greater attenuation, installation of in-line sediment traps, and the planting of native vegetation. The City was successfully chosen to receive over $200,000 in RPO funding.

City of Auburn Hills
Storm Water Retrofits for City Properties



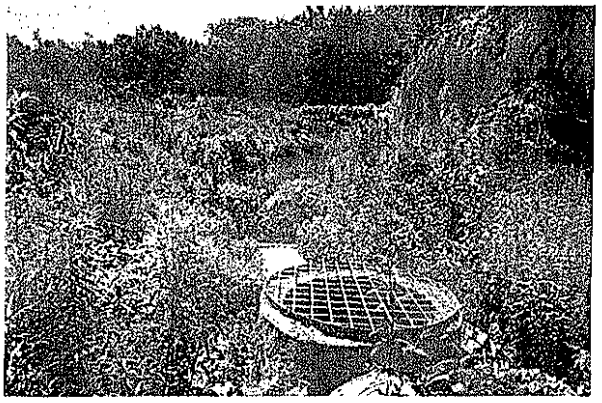
Client Contact Information
City of Auburn Hills
Shawn Keenan, Water Resources Coordinator
(313) 224-3620
1827 N. Squirrel Road
Auburn Hills, MI 48326

Project Cost & End Date
$50,000 – July 2007

The City of Auburn Hills, in its efforts to meet the goals set forth in the Clinton River Watershed's Management Plan, hired OHM to identify retrofit opportunities for City-owned properties. The project was one of the only storm water projects in Michigan submitted for State Revolving Fund (SRF) funding. The goal of the retrofits was to reduce runoff quantity and improve quality through enhancing infiltration and filtration. The City identified seven (7) potential City-owned sites. These sites were evaluated in terms of its site-specific hydrology, soil conditions and current storm water conditions. For each of the sites, various storm water BMPs were identified that could help improve water quality. Of the seven (7) sites, four (4) were identified as selected alternatives for the SRF Project Plan based on price and the impact to storm water quality. For these selected sites, various storm water BMPs, including bioretention, bioswales, a level spreader, and a cistern, were recommended.

Specific to the development and submittal of the SRF Project Plan, the following sections were completed as required: 1) the project background, 2) analysis of alternatives, 3) selected alternative, 4) environmental impacts, 5) mitigation, and 6) a summary of public participation. This project received an S2 Grant at $45,000. The Project Plan is expected to be submitted to the DEQ in July of 2008.

City of Auburn Hills
Maplehurst Drain and Wetland Improvements Phase I and II



Client Contact Information
City of Auburn Hills
Michael Culpepper, City Manager
(248) 391-3777
1827 N. Squirrel Road
Auburn Hills, MI 48326

Project Cost and End Date
$2.57 million – December 2003

Oakland County's Maplehurst Drain, located in the City of Auburn Hills, Michigan, was undersized and unable to meet the growing needs of the 250-acre district. The residential lots and adjacent streets in this multiple-zoned area were subject to seasonal flooding due to the inadequate drain. Having worked closely with the MDEQ, OHM designed a drainage improvement plan that reconstructed a three-acre wetland for wetland preservation and designed a storm water detention system to protect the receiving waters of the Clinton River. The work also included construction of approximately 7,400 linear feet of 12-inch to 43-inch by 68-inch concrete storm sewer. Due to the location of the drain

arteries, a unique multiple outlet was designed that allowed for efficient drainage functions while protecting environmental concerns and providing a cost-effective use of portions of the existing drain. Residential street paving improvements added to the local quality of life improvements. In addition to full design services, OHM was also responsible for establishing easement requirements, permitting through governmental regulatory agencies and preparing contract specifications. OHM held public meetings in regards to the progress of the project and handled all resident concerns during the construction phase.

This project was expected to impact many residents in a well-established subdivision. Taking this into consideration, OHM reconfigured the original design layout to minimize the impact to the rear yards of approximately 15 residents. The storm system was shifted to the west to contain the easements to two residential side yards rather than disturbing multiple neighboring properties. The proposed detention basin used was designed on one piece of property. This eliminated five impacts to residents who would have been impacted by the outskirts of the basin, such as requiring the removal of a large number of established trees and natural features that in turn were protected. During construction of the pond, large deposits of waste were encountered requiring a redesign of the pond, which could not impact the residents or reduce the storage volume. This redesign required that OHM and Schleede-Hampton coordinate together to design a stable, constructible slope.

Of the six streets impacted in this subdivision, three were dead-end roads that required care and forethought on the part of OHM's field personnel and coordination with the contractor's forces. Multiple construction crews were present at the project site to install the proposed storm sewer and replace the existing gas main. This project was adjacent to the reconstruction project of Auburn and Squirrel roads. Given the location, the disturbance experienced by the residents was multiplied, requiring additional concern, pre-planning and coordination to minimize resident inconveniences.

Auburn Hills
Galloway Storm Water Management Plan

Client Contact Information
City of Auburn Hills
Shawn Keenan, Water Resources Coordinator
(313) 224-3620
1827 N. Squirrel Road
Auburn Hills, MI 48326

Project Cost and End Date
$62,000 – January 2007

The City of Auburn Hills selected OHM to prepare a State Revolving Fund (SRF) Project Plan with stormwater management recommendations for the Galloway Ditch within the Fieldstone Municipal Golf Club of Auburn Hills. OHM also helped the City obtain an S2 Grant of $55,800 to cover most of the costs of developing the project plan.

The Galloway Ditch receives high peak storm water flows as the result of large runoff volumes from highly developed areas upstream of the site. As a result, stream bank erosion, sedimentation, nutrient loading, and frequent flooding are some of the challenges faced by the community.

OHM has recommended several Best Management Practices that will improve storm water quality, and reduce the runoff volume and rate from the golf course. Recommended restoration activities included stream bank stabilization with bioengineering, vegetated buffers along stream banks, and the construction of additional floodplain storage/detention areas with diversion streams and native plantings.

OHM performed hydraulic modeling of the Galloway Ditch using the Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS 4.0) computer software. Results from model simulations helped to estimate the flood level that could be detained with the land area available for stormwater detention within the golf course.

The Galloway SRF Project Plan was adopted by the Auburn Hills City Council and has been submitted to the Michigan Department of Environmental Quality. OHM is excited to have the opportunity to continue to assist the City of Auburn Hills in its storm water improvement initiatives.

Orion Township
Reid and Branch Drain Study, Design and Construction

Client Contact Information
Orion Township
Gerald A. Dywasuk, Supervisor
(248) 391-0304
2525 Joslyn Road
Lake Orion, MI 48362

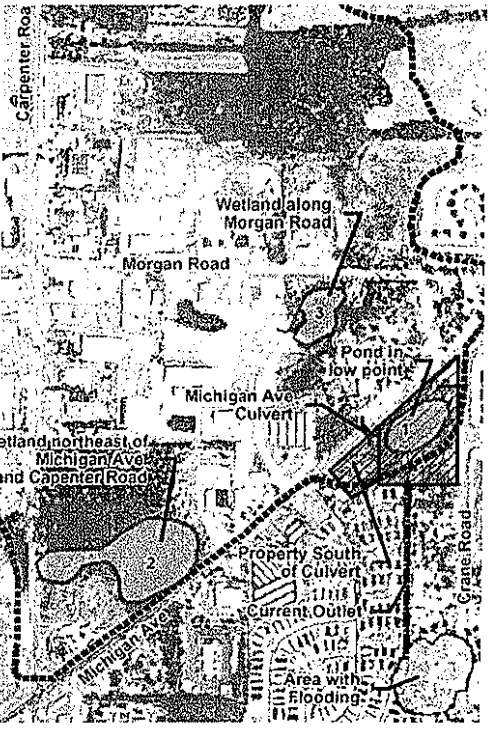
Cost and End Date
$20,000 – June 2001 (study)
$30,000 – April 2002 (design)
$310,000 – October 2002 (construction)

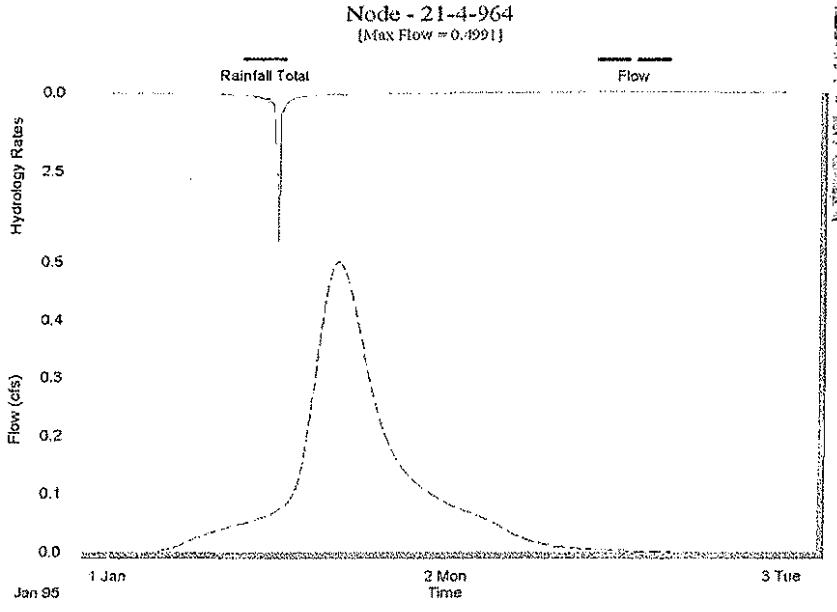
The purpose of the study was to determine the feasibility and functionality of a regional storm water detention basin and other drainage improvements to alleviate flooding in the northeast quadrant of Orion Township, within the Reid and Branch Drainage District, an Oakland County Drain. Extensive field investigation was conducted to document the drain's condition and capacity. The field investigation also included interviews with area residents to document and follow up with specific concerns and to establish flooding history and normal levels of the Reid and Branch Drain. The study also included identification of the watershed boundary through the use of existing maps and topography. Review of soil types and land uses within the drainage area was also performed and used for input into a Hydraflow model through which flow capacity of the drain was analyzed and alternatives for storm water detention were simulated. Recommendations for regional storm water storage were provided to the Township and affected residents

OHM was responsible for the design and oversight of construction that included reconstruction of existing ditches, installation of new storm sewer, replacement of undersized culverts, and the expansion of an existing detention basin. Extensive right-of-way acquisition was required as part of this project to construct the necessary improvements. This project was funded utilizing Tri-Party Funds, which are funded from the local community, Road Commission for Oakland County, and Oakland County. This project required coordination with the Road Commission for Oakland County and the Oakland County Drain Commissioner's Office.

Washtenaw County Drain Commissioner
Michigan Avenue East Central Drain

The Washtenaw County Drain Commissioner retained OHM for the study, alternative analysis, design, bidding and construction engineering services for the Michigan Avenue East Central Area Drain. The drainage district is located in the east-central portion of Pittsfield Township and drains to a low area located southwest of the intersection of Michigan Avenue and Crane Road. Flooding and high water in the low area made it necessary to create a drainage district and improvements to address the flooding. Pittsfield Township prepared a preliminary engineering study that recommends property acquisition of the low area parcel and the adjacent parcel in order to create a regional retention basin on these parcels. The Township filed a petition with the WCDC to create a Drainage District on April 14, 2004 to implement regional retention or another cost effective solution. The WCDC requested that multiple conceptual solutions be analyzed to determine the optimum solution to address the flooding issue. The initial study phase for the project included preparing a hydrologic model of the drainage district, developing conceptual alternatives, modeling each alternative, preparing preliminary cost estimates and recommending the optimum solution.





Client Contact Information
Washtenaw County Drain Commissioner
Gary Elling, PE, Deputy of Engineering Services
(734) 222-6881
P.O. Box 8645
Ann Arbor, MI 48107-8645

Project Cost and End Date
$245,000 – 2007

Combined Downriver Inter-Municipality Committee
Watershed Management Plan

Client Contact Information
Combined Downriver Inter-Municipality Committee
Craig Lyon, City Engineer
City of Taylor
(734) 374-1473

Project Cost and End Date
$218,250 – December 2006

The Combined Downriver Watershed Communities hired the team of OHM, Wade-Trim, and ASTI. This project involved coordinating 13 communities/entities in the development of the Combined Downriver Watershed Management Plan (WMP), in compliance with their Phase II Watershed Based Storm Water General Permit. The goal of the WMP was to identify and establish a plan for implementing actions to address water quality and water quantity concerns within the Watershed, by fostering cooperation among the various public and private entities in the Watershed.

The work for the WMP was divided into seven tasks. These tasks involved the development of the Public Participation Process (PPP), the Watershed Inventory, a field inventory, development of Best Management Practices (BMPs), methods for progress evaluation, the WMP for submission to MDEQ, and committee facilitation, staff support, and administration.

OHM acted as the prime consultant and was the lead facilitator in monthly watershed meetings and in the preparation of the WMP. In order to assess the Watershed, OHM performed fieldwork to collect information on the condition of the watershed. OHM also held workshops for the watershed communities in order to educate them on storm water best management practices and other watershed issues. These workshops were also used to brainstorm desired uses, goals, and best management practices for the Watershed.

ASTI's role in the project included reviewing and summarizing existing water quality studies and watershed condition information, conducting a field inventory of road crossings and collecting macroinvertebrate data, modeling existing and future pollutant loading, and assisting the project team with developing a list of impairments, existing and desired goals, and potential protection strategies/ BMPs to be implemented in the future.

Oakland County Drain Commissioner
Mainland Drain Study Phases II & III

Client Contact Information
Oakland County Drain Commissioner
Karen Warren, PE
(248) 452-8645
One Public Works Dr.
Waterford, MI 48328-1907

Cost and End Date
$38,800 – November 2006

The Oakland County Drain Commissioner (OCDC) selected the OHM/ASTI team to study and identify needed drainage improvements along the Mainland Drain – Phases II and III located at the Oakland County Campus. These drainage improvements are intended to eliminate flooding and reduce peak flows to minimize sedimentation and

erosion while improving instream habitat and water quality.

The project entails documenting existing drain and riparian corridor information, determining alternative drainage routes to minimize flooding, developing design flows, confirming drain capacities and development of concepts for drain and riparian corridor improvements.

Existing problem areas were field located through GPS survey and documented on a GIS map. This included documentation of existing flooding areas, stream bank erosion sites, areas of in-stream sediment accumulation and areas of invasive plant species in the riparian corridor. Drain capacities were evaluated in SWMM and potential alternatives that would reduce flooding were modeled to determine their ability to reduce flooding. Based on the alternative modeling, a conceptual design for proposed drain improvements and off-line detention facilities was prepared and recommendations provided to the OCDC. Proposed improvements investigated included spot removal of sediment deposition, bioengineering stream bank stabilization, flow diversion and wetland detention basin construction.

City of Westland
Storm Water Master Plan

Client Contact Information
City of Westland
William Wild, Mayor
(734) 467-3200
37137 Marquette Ave.
Westland, MI 48185

Project Cost and End Date
$650,000
June 2004

The City of Westland retained OHM to create a city-wide storm water management master plan. The project had several objectives, including quantifying storm water flow to the Rouge River within the City, open drain and outfall investigation, a detention basin inventory, detailed modeling of the Rouge River and a management program. The MDEQ approved the Quality Assurance Protection Plan that was prepared by OHM.

The project was funded partially by the Clean Michigan Initiative and the Rouge Program Office. OHM wrote both the CMI and RPO grant applications for the City. Coordination between the two funding offices and preparation of all reimbursement reports were performed by OHM.

A large portion of the study involved creating a GIS for the City. The GIS included the locations of all detention basins within the City, locations of county drains, partial verification of storm sewers, drainage district boundaries, land use, soils, wetlands, aerial photography and topography. The OHM GIS Group obtained digital information from City and County offices and created an inventory of the site development plans on file.

Two field investigations were completed as part of the project. The first investigation involved inventorying basins, outfalls, areas of erosion, log jams, culverts, wetlands, etc. along the open drains within the City. This information was used to prioritize the problems along the drains, as well as provide input for modeling the storm water runoff within the City. The second field investigation inventoried the balance of the basins, outfalls and wetlands outside of the drain corridors.

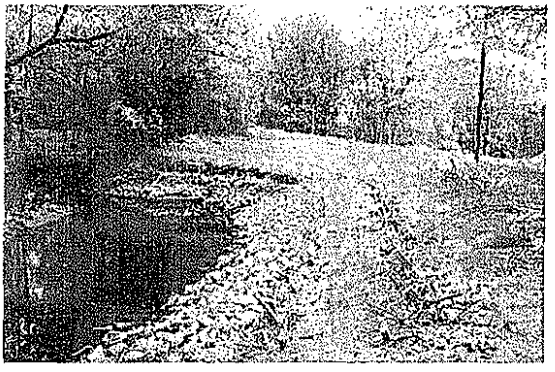
Modeling was performed using XPSWMM and Hydraflow to determine the quantity of flow through the City's

storm water management facilities and what impact the flow has on the Rouge River. Data used came from the field survey and existing digital data and plans. The modeling also determined where the system capacity was exceeded. Recommendations of discharge rates and volumes to the drains were made.

The Storm Water Management Plan was presented in a final report and was provided to the City, RPO and CMI. The Plan detailed the field findings, modeling results, storm water problem areas, project cost estimates and Best Management Practice recommendations (such as stream bank stabilization and protection, regional detention facilities and runoff rate recommendations for future development). The Plan will assist the City in the implementation of future storm water management programs.

NPDES Phase II Experience

Orchard, Hiltz & McCliment (OHM) has served numerous clients in a variety of tasks relating to the Phase 2 Federal Storm Water Permit. These clients include: Wayne County Department of Environment Rouge River National Wet Weather Demonstration Project, Cities of Westland, Farmington, Romulus, Ypsilanti, Northville, Sylvan Lake, Lincoln Park, Oak Park, Ypsilanti, the Charter Townships of Ypsilanti, Orion, Huron, Scio, Groveland and the Village of Dexter. These clients are located in various subwatersheds of the Rouge River, Clinton River, Flint River, Ecorse Creek, Combined Downriver, and Huron River Watersheds. Through this work, OHM has formed effective working relationships with Wayne County Department of Environment, the MDEQ regulatory staff, and numerous community officials.



OHM has been involved with many of its clients in the Southeast Michigan Watersheds through the preparation and implementation of the MDEQ General Storm Water Permit since its inception. As part of this work, OHM assists clients in developing illicit discharge elimination plans (IDEP) and public education plans (PEP). OHM staff also acts as community representatives at various watershed advisory groups (WAGs) and was involved in the development of the Ecorse Creek, Combined Downriver, Lower Huron watershed management plans and the Rouge subwatershed management plans. OHM also assists communities with storm water pollution prevention initiatives.

OHM continues to advise client communities with the implementation of their storm water activities. Tasks include facilitating community storm water programs, providing public education and outreach materials, providing technical advice and assistance, reviewing current programs and practices, and recommending additional activities. Consequently, OHM is well experienced in preparing annual reports required under the federal permit.

OHM Client References

Following are several references. We encourage you to contact these individuals to learn more about the quality services that OHM provides.

City of Auburn Hills
Shawn Keenan, Water Recourses Coordinator
(248) 364-6926

Oakland County Drain Commissioner
John McCulloch, Drain Commissioner
(248) 858-0968

Washtenaw County Drain Commission
Janis Bobrin, Drain Commissioner
(734) 994-2525

Dennis Wojcik, Drain Commissioner
(734) 994-2525



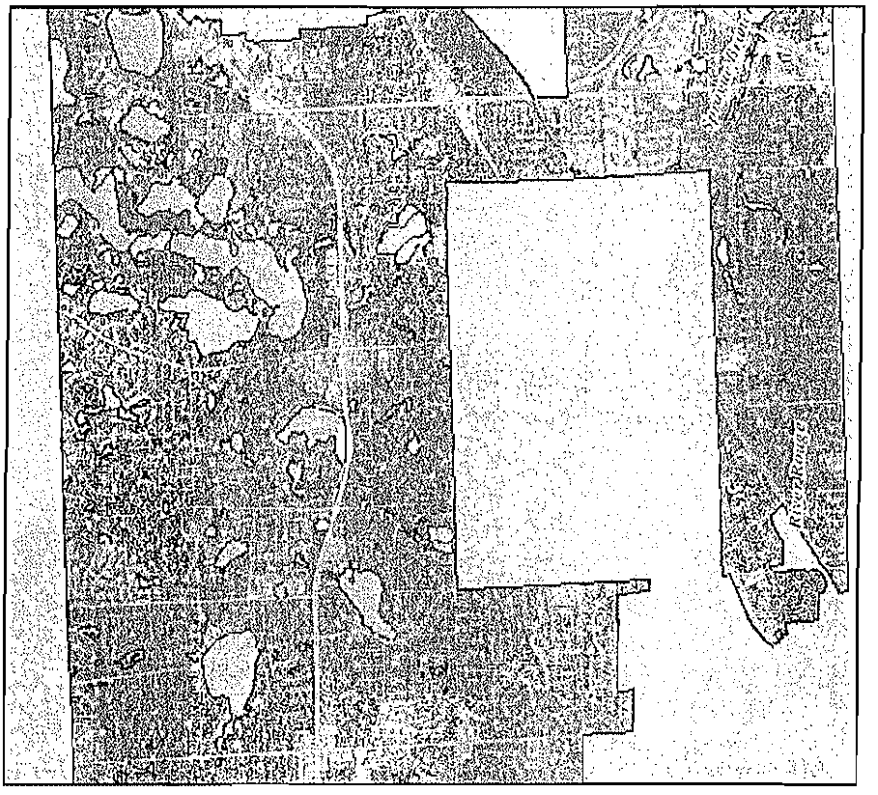

Bloomfield Township Wetland Inventory

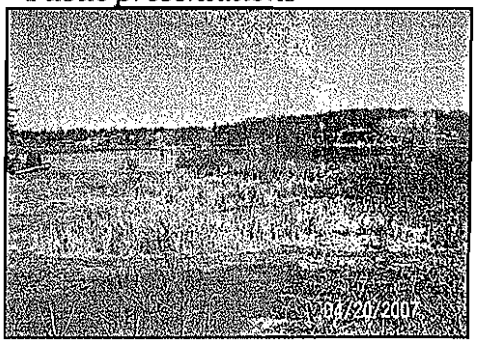
PROJECT EXPERTISE

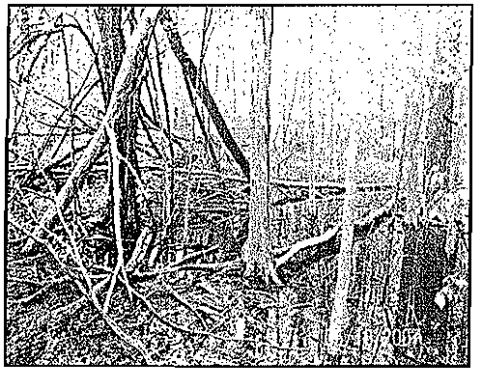
Wetland Services:
- *Wetland determinations*
- *Water quality analysis*
- *Functional assessments*
- *Stormwater analysis*

Geographic Information System Services:
- *Mapping*
- *Constraints analysis*
- *Natural features analysis and priority area ranking*

Municipal Services:
- *Ordinance and policy development and evaluation*
- *Site plan review*
- *Public presentations*







As part of a grant from the Rouge River National Wet Weather Demonstration Project, Niswander Environmental developed a comprehensive Wetland Inventory in April and May 2007 that identified, categorized, and assessed all wetlands and surface waters within Bloomfield Township. A Wetland Inventory was deemed critical for preserving the natural beauty and significant natural features of the community while maintaining its economic vitality. The goal of this inventory was not only to identify and characterize the Township's 1,460 acres of existing wetlands, lakes, ponds, and watercourses, but also to provide a baseline data-set to be used for future land use planning. The Wetland Inventory was designed as a GIS-based tool that can be used by Township planning, engineering, environmental, and building departments on a daily basis to evaluate projects and potential impacts to the Township's remaining wetlands and other natural resources.

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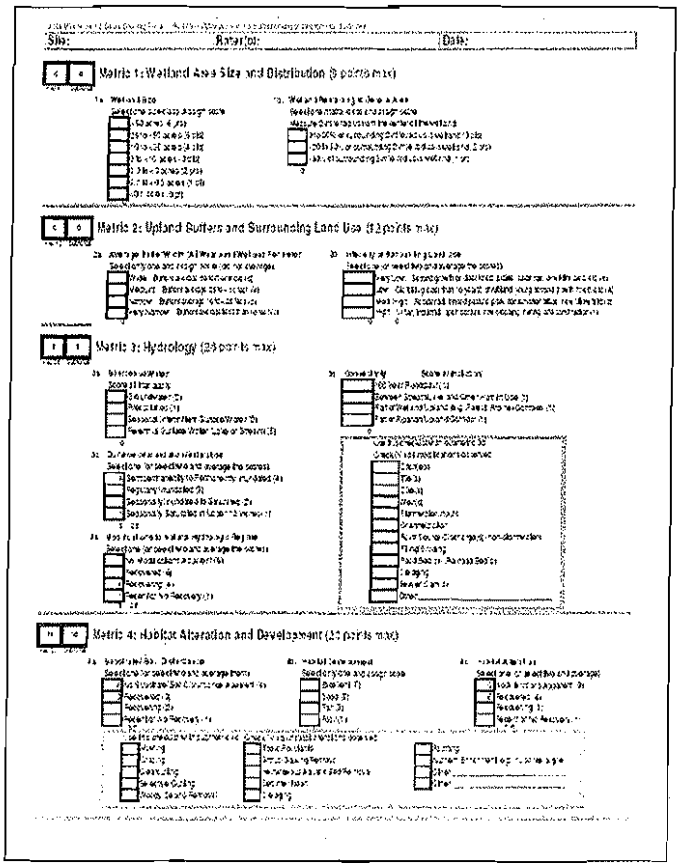
Bloomfield Township Wetland Inventory

Bloomfield Township is experiencing significant development around wetland features since they are considered desirable amenities by the residents. Therefore, detailed information on the Township's remaining wetlands is crucial to the protection of these wetland habitats. In addition, Bloomfield Township is at the headwaters of the Main 1-2 Subwatershed of the Rouge River; therefore, the wetlands in this area are critical for maintaining and improving the health of the watershed.

Niswander Environmental is currently working to provide a Wetlands and Watercourses Map and GIS database to the Township that provides more detailed information on the wetlands that exist within the Township than was previously available. Data collected during the inventory included wetland type (based on Cowardin Classification System – PEM, PSS, PFO, etc.), dominant vegetation (including invasive species assessment), quality (high, medium, low), and functions (flood control, wildlife habitat, groundwater recharge, pollution filtering, erosion control, etc.). Other significant characteristics were also be noted (*i.e.*, disturbance, surrounding land use, unique features, restoration potential, buffers, etc.). Additionally, photographs were be taken at each survey location.



In order to qualitatively evaluate the functions and values of wetlands, Niswander Environmental used the Michigan Wetland Rapid Assessment Methodology (MiRAM) currently being developed by the MDEQ with input from a select group of wetland scientists, including Dr Niswander. The MiRAM is a way to rapidly assess a wetland by assigning a score and category. These categories will be utilized to determine which wetlands are of crucial importance to the Township.

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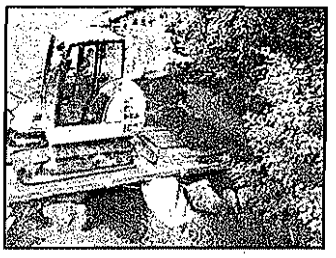
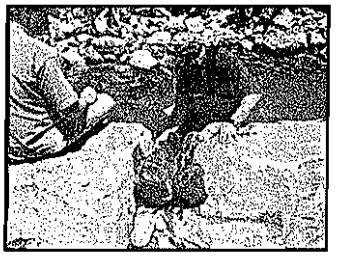


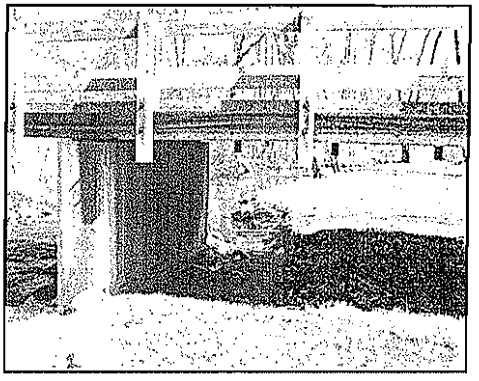


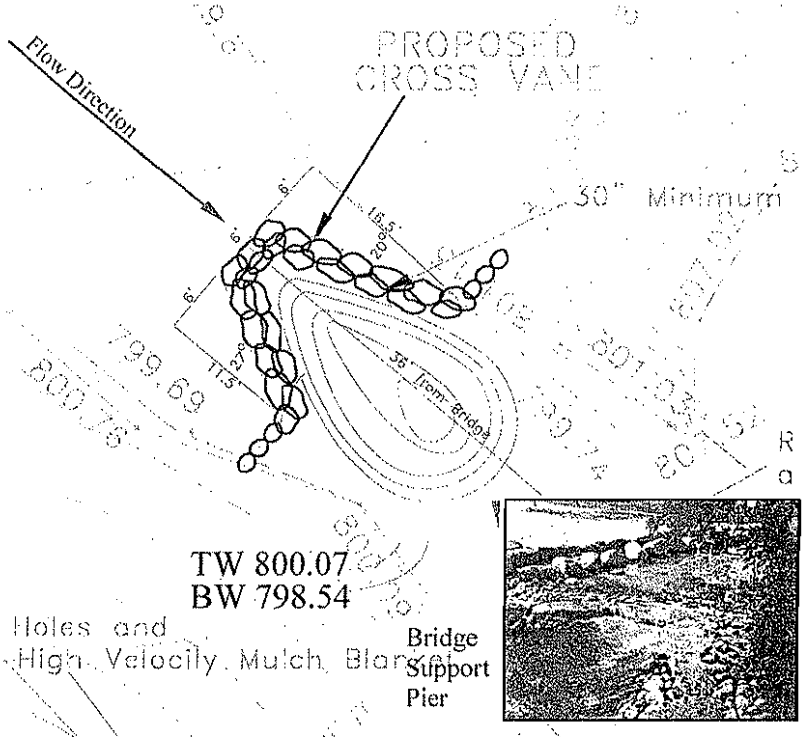
Bloomfield Hills Stream Restoration

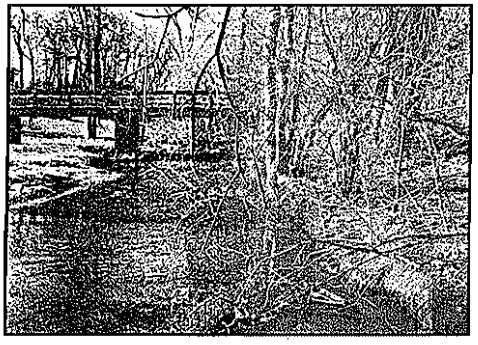
PROJECT EXPERTISE

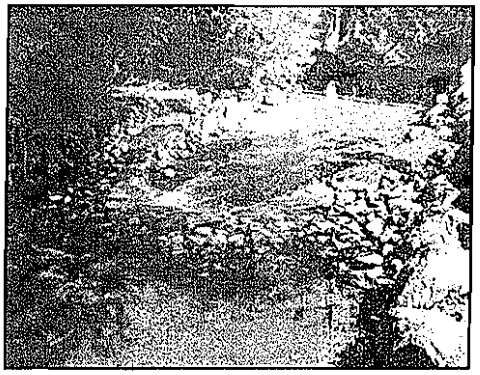
Ecological Services:

- *Stream restoration*
- *In-Stream structure design*
- *Structural installation*
- *MDEQ negotiations*









Niswander Environmental was contracted to design and oversee installation of in-stream structures to protect bridge abutments shared by two residential properties in Bloomfield Hills, MI. This section of the Rouge River had severely scoured an existing bridge to the point that its structural integrity was compromised. Prior to design, a site investigation was conducted to evaluate the existing conditions and severity of the erosion issues at hand.

An effective strategy to restore and manage this segment of river was designed in Summer 2007. Two in-stream habitat structures, known as cross-vanes, were installed to aid in dissipating energy and training stream flows into a defined thalweg that is directed away from the banks and existing bridge supports. Cross vanes not only direct stream flow away from the banks, they reduce erosion, prevent downcutting, and control streambed gradient. Additionally, these cross vanes provide increased fish and microinvertebrate habitat by creating scour pools at the overflow convergence. This project, was designed and managed by Niswander Environmental, and has received several accolades from the State as an innovative and successful stream restoration project.

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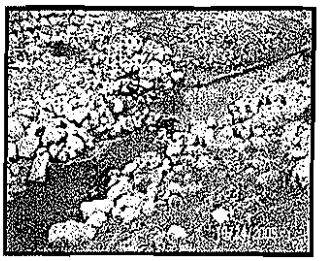
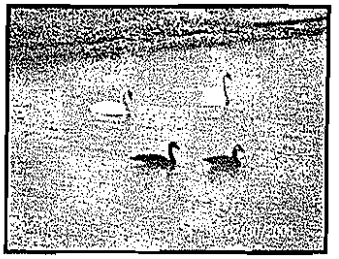
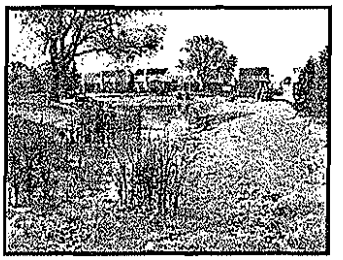
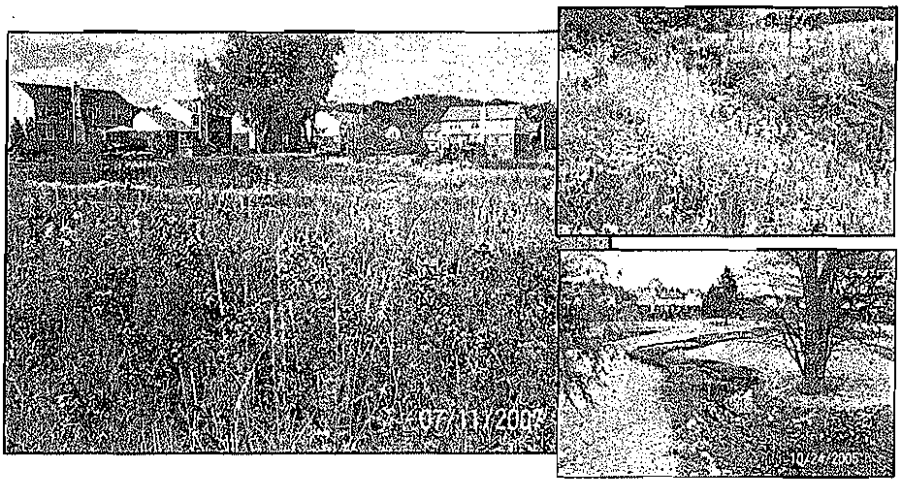





Country Club Village Open Space Development

PROJECT EXPERTISE

Wetland Services:
- *Treatment wetlands*
- *Stream restoration*
- *Water quality analysis*
- *Monitoring and Maintenance*



Green Infrastructure:
- *Site planning*
- *Open space design*
- *Stormwater management*
- *Prairie planting*

Restoration:
- *Landscape planning*
- *Prairie restoration*
- *Wetland restoration*
- *Invasive species control*

In 2003, a developer proposed a residential development on a 100-acre parcel of land in the City of Rochester Hills that was previously used as a golf course. The City's, MDEQ's, and developer's objective for the Country Club Village Residential Development (Project) was to develop a model open space residential development that would include one mile of stream relocation and restoration, stormwater detention basins, floodplain compensation, secondary treatment basins (wetlands), and 8 acres of prairie. A paved walking path winds throughout the open space, providing residents full access to the benefits of the constructed rain gardens, prairies, and wetlands.

In 2005, Niswander Environmental, whose staff had previously been involved in the design and approval of the Project, were asked to review the approved plans, evaluate the on-site conditions, document what activities had been completed, identify deviations from the approved plans, provide remediation suggestions, and develop a schedule and cost estimate for work yet to be completed.

Niswander Environmental oversaw the remediation activities, which included installation of in-stream structures, modifications and corrective actions for the wetland areas, and planting and seeding of the site, all completed in the fall of 2005.

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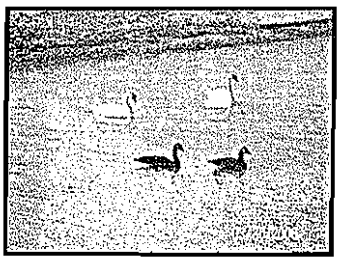
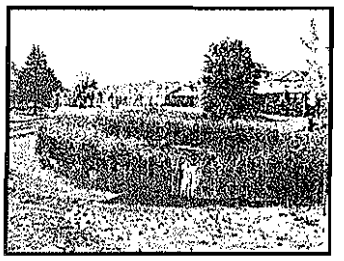
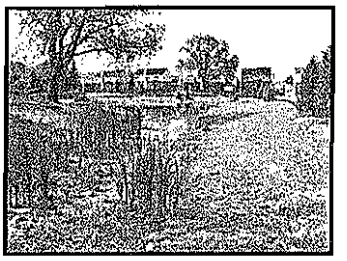
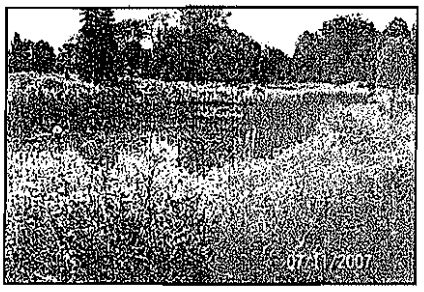
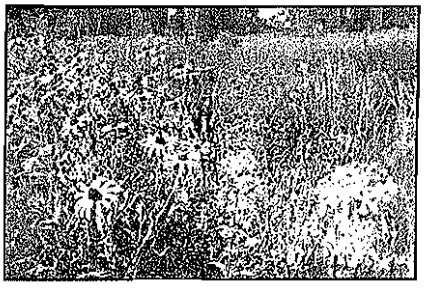




Country Club Village Open Space Development



Secondary treatment basins, were designed to function as an emergent wetland system, were constructed adjacent to the primary detention basins. The emergent and wet prairie seed mixes contain species that are efficient at sediment removal and are resilient to fluctuating water levels.

In-stream structures, such as this cross vane, will enhance the overall quality of the stream while providing an aesthetic feature along the walking path.

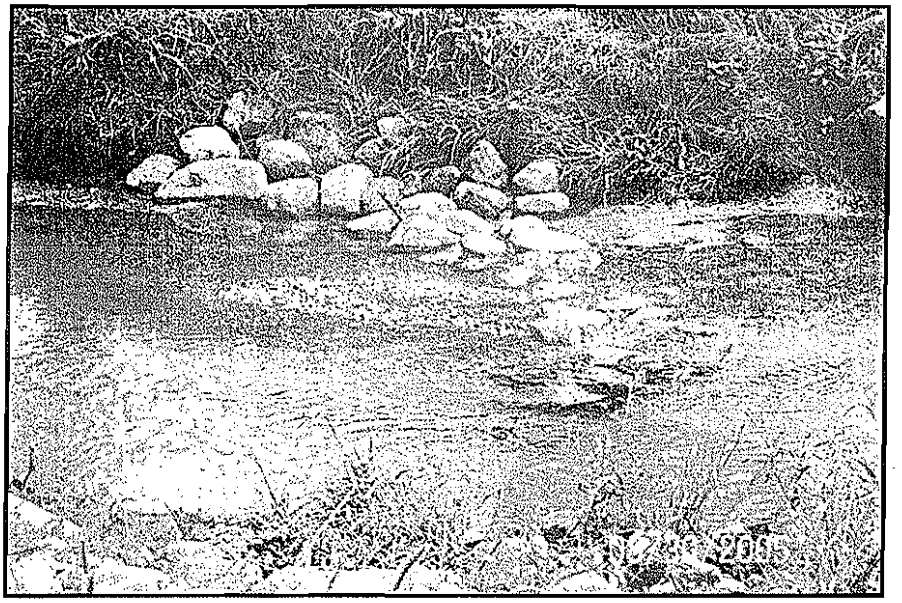


Rain gardens are a form of "Bioretention": consisting of permeable soils, native plants, and mulch that will allow for stormwater infiltration and prevent runoff into adjacent waterways.

A series of in-stream structures were installed in the existing and relocated streams. These structures are designed to improve stream stability, reduce stream bank erosion, and create aquatic habitat for wildlife. Native plant species established along the previously degraded stream bank enhance the quality and natural beauty of the stream.

Rain gardens were constructed to catch stormwater runoff from the clubhouse parking lot and adjacent tennis courts. The rain gardens serve as shallow, temporary catch basins where stormwater is quickly absorbed and filtered into the ground. The rain gardens are unique since they are created as landscaped features designed to fit within a formal garden setting utilizing native plants. Unlike typical open water detention basins, the rain gardens are designed to collect and quickly filter water, not store it, which prevents the potential for mosquito breeding.

Several treatment wetlands were redesigned to compensate for errors in construction, and seeded to establish native species within the basins. In addition, all upland areas in the open space were over-seeded with prairie species. Niswander Environmental will be managing the development of the site for the next three years and has generated a long term maintenance plan for use by the Homeowner's Association.



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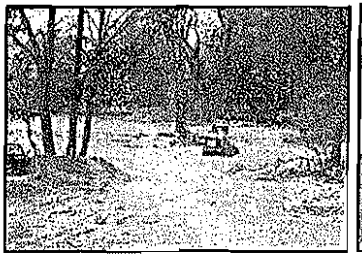



Macatawa Watershed Demonstration Wetland

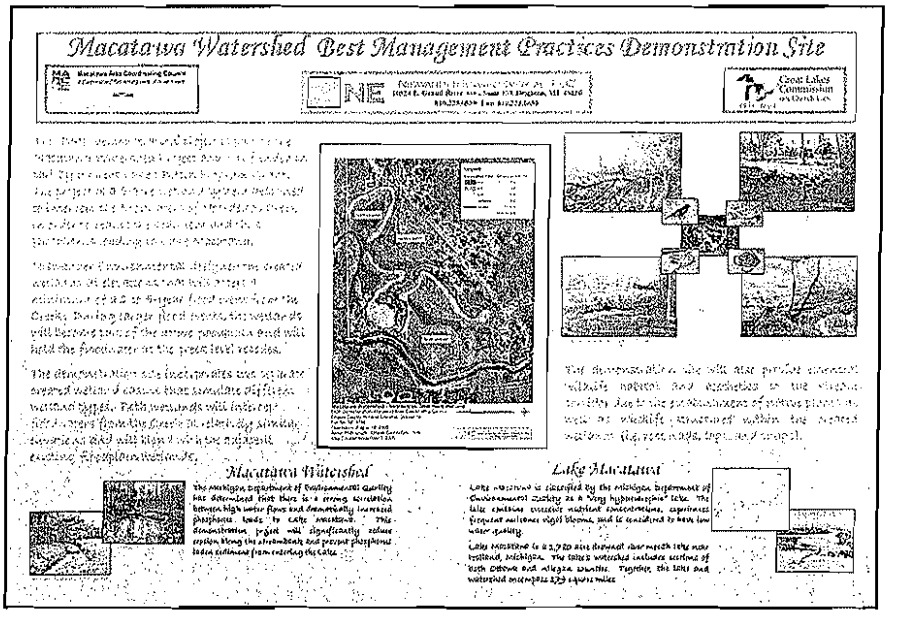
PROJECT EXPERTISE

Wetland Services:
- *Delineations*
- *Permitting*
- *Wetland mitigation*
- *Watershed management*
- *Treatment wetlands*
- *Construction oversight*
- *Water quality analysis*
- *Functional assessments*

Geographic Information System Services:
- *Mapping*
- *Optimum site selection*

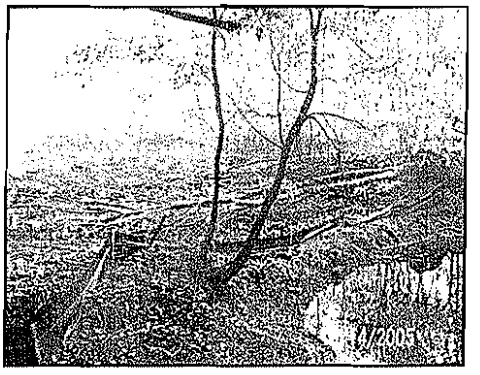
Green Infrastructure:
- *Open space design*
- *Stormwater management*

Municipal Services:
- *Grant/demonstration project application and administration*
- *Contractor bid selection*
- *Agency coordination*



The Macatawa Area Coordinating Council (MACC) constructed a Best Management Practices (BMP) demonstration site for water quality improvement in the Macatawa watershed. The project was funded by the Great Lakes Basin Program and generous private donors. Niswander Environmental designed this BMP demonstration site to aid in meeting TMDL requirements set by the Michigan Department of Environmental Quality (MDEQ) for Lake Macatawa. This site is also intended to provide outreach and educational opportunities regarding water quality for students and the general public.

The project is located on an 80-acre parcel in Holland Township and contains Noordeloos Creek and its floodplain. Noordeloos Creek is a tributary to Lake Macatawa. This portion of the watershed is a mix of residential and agricultural development and contributes large amounts of sediment to Lake Macatawa. Niswander Environmental designed five acres of treatment wetland to intercept the floodwaters of Noordeloos Creek in order to reduce sediment and thus phosphorous loading to the lake.



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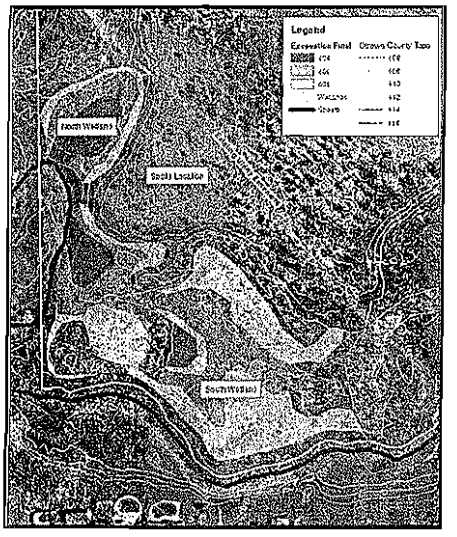
Macatawa Watershed Demonstration Wetland

Niswander Environmental delineated all wetlands in the project area. The existing wetlands were old oxbows within the creek's floodplain. Historical aerials were also obtained from Ottawa County that clearly revealed these oxbow areas and allowed them to be accurately digitized into GIS. This eliminated the need for a detailed survey since the County topography could be correlated with the existing wetland locations. FEMA maps were also incorporated to examine the creek's peak flows and to determine necessary elevations for the wetland basins.



Niswander Environmental designed the constructed wetlands at elevations that would accept a minimum of a 2 to 5 year flood event from the creek and that will blend with the existing wetlands. During larger flood events, the wetlands will become part of the active floodplain and will hold the floodwater as the river level recedes. Thus, the constructed wetlands will increase floodplain storage during storm events, which will reduce the peak stormwater flows in the creek, remove sediments, and reduce erosion further downstream. The demonstration site will also provide essential wildlife habitat and aesthetics to the property due to the establishment of native plants as well as habitat structures within the constructed wetlands (*i.e.,* root wads, logs, and snags).

Niswander Environmental coordinated environmental clearance of the site to keep the project on the schedule outlined in the GLBP grant. Niswander Environmental and the MACC met with MDEQ and Ottawa County staff on site prior to submitting permit applications to obtain agency opinions of the project in order to avoid delays in the permitting process. As a result MDEQ and Soil Erosion & Sedimentation Control permits were issued in one month. In addition, utility easement clearance from Marathon Gas Company was also obtained since it was necessary to cross the easement to access the site. Niswander Environmental selected a contractor and performed construction oversight, including wetland seeding. The innovative approach and cooperative efforts of all involved allowed for the project to be completed in record time.

Niswander Environmental completed numerous outreach activities for the site and conducted a tour for local residents and resource agencies. Currently, Hope College is conducting research at the site to determine the amount of sediment being stored within the wetlands. This site will continue to be utilized in the future by both students and the general public as an educational tool.

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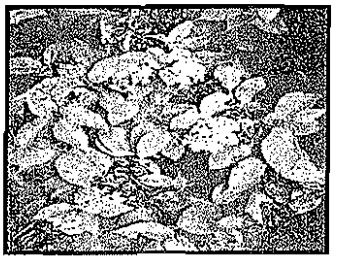


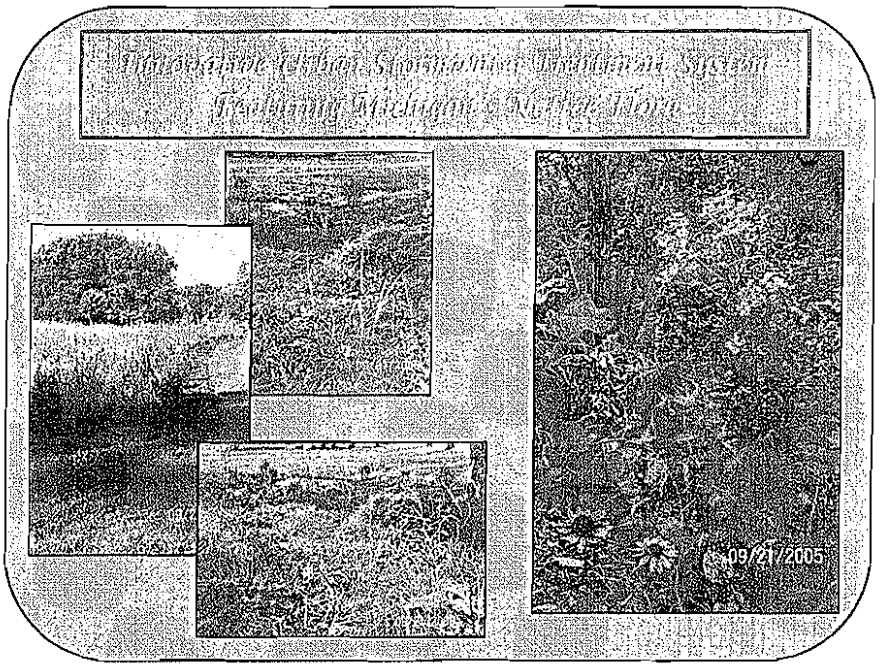
Meadowlake Farms Bioswale Project

PROJECT EXPERTISE

Wetland Services:
- *Delineations*
- *Permitting*
- *Watershed management*
- *Treatment wetlands*
- *Stream restoration*
- *Water quality analysis*
- *Functional assessments*
- *Construction oversight*

Municipal Services:
- *Mapping*
- *Grant/demonstration project*
- *Public coordination*
- *Public presentations*

Green Infrastructure:
- *Open space design*
- *Stormwater management*



Meadow Lake, a tributary of the Franklin Branch of the Rouge River, is a 50-acre residential lake located in Bloomfield Township, Oakland County, Michigan. A 30-inch storm sewer collects stormwater runoff from residential areas, commercial establishments, a golf course, and a school. Stormwater flow is directed through a roadside drainage ditch and discharges into Meadow Lake. This runoff has resulted in an increase in the amount of sediment, nutrients, and pollutants entering Meadow Lake, thus negatively impacting water quality and aquatic habitat. Bloomfield Township and the Meadowlake Farms Homeowner's Association received a grant as part of the Rouge River Project to improve water quality in the watershed. Hubbell, Roth and Clark (HRC) and Niswander Environmental were retained to design and construct a treatment system to achieve this goal. Niswander Environmental and HRC designed a bioswale that would improve water quality by not only trapping sediment, nutrients, and pollutants from the stormwater before entering the lake, but also by increasing the absorption of water through the ground surface within the swale.

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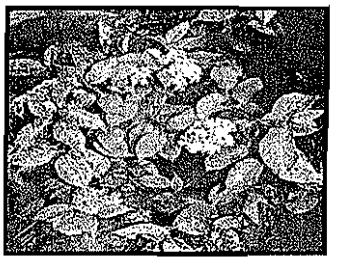
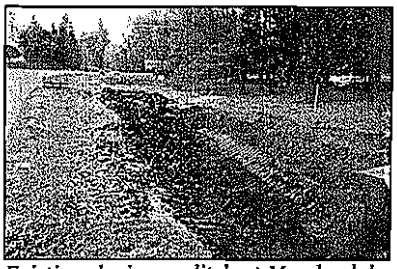
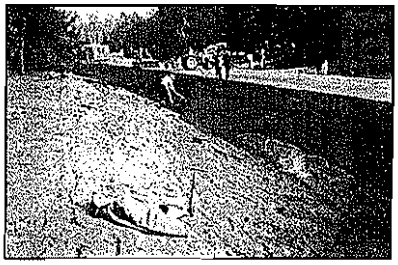


Meadowlake Farms Bioswale Project

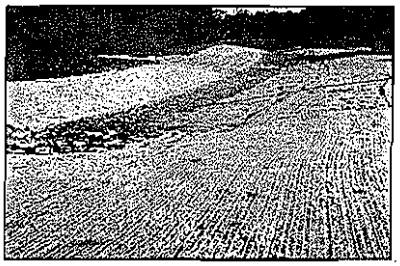
Bioswale Construction



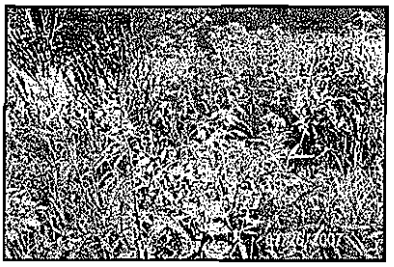
Existing drainage ditch at Meadowlake Farms prior to construction



Bed is leveled with topsoil and prepared for seeding and planting



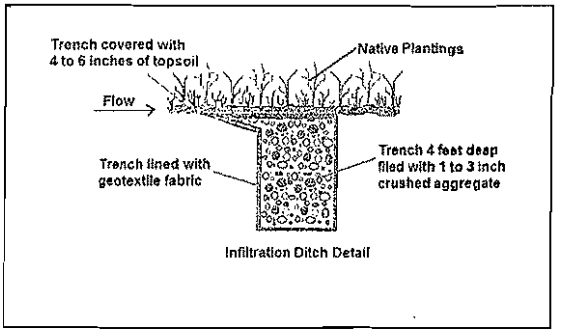
Mulch blankets used to reduce soil erosion and stabilize new plant material



Meadowlake Farms Bioswale – approximately 1 year later

To increase the surface area and slow the stormwater flow velocities, the bioswale was constructed by excavating the existing drainage ditch to create a 12-foot wide swale with a level channel bed. Subsurface infiltration ditches were placed at intervals along the base of the swale to increase water storage and absorption into the soil.

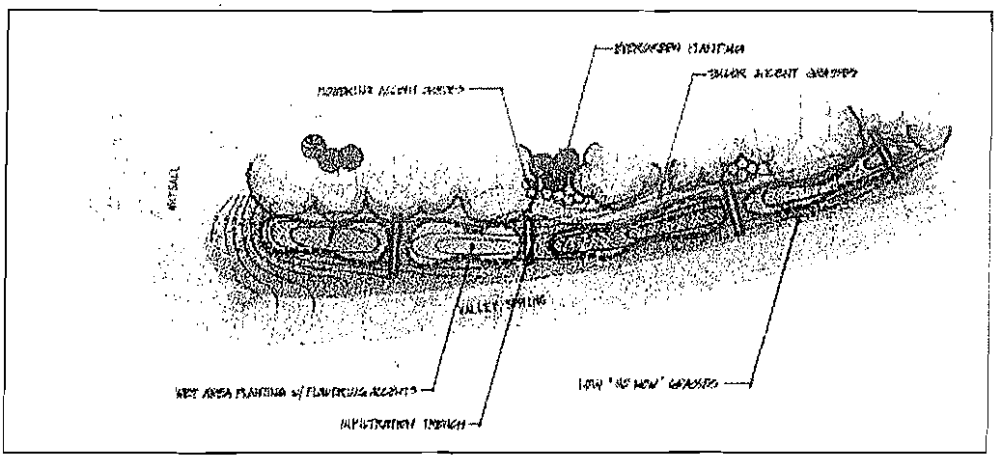
Prairie and wetland plant species native to Michigan were planted in landscaped "zones" along the bed and edges of the swale. The wetland zones are planted with a variety of wet tolerant species that are known for their ability to trap and filter sediments. A sedge mix creates an aesthetic transition zone between the swale base and the upland edge.



Cross Section of a Typical Infiltration Trench

Warm season prairie grasses planted amongst the existing vegetation provide a natural background to the bioswale feature. A low "no mow" turf grass was incorporated into the surrounding landscape to provide the appearance of a manicured garden without the maintenance and fertilizer requirements of typical turf grass.

The site was properly constructed in Fall 2005 with HRC and Niswander Environmental performing construction oversight. Niswander Environmental also conducted a public meeting to the Homeowner's Association and presented the bioswale project on behalf of the Township.



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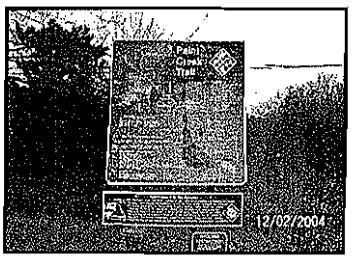


Rochester Hills Natural Features Inventory

PROJECT EXPERTISE

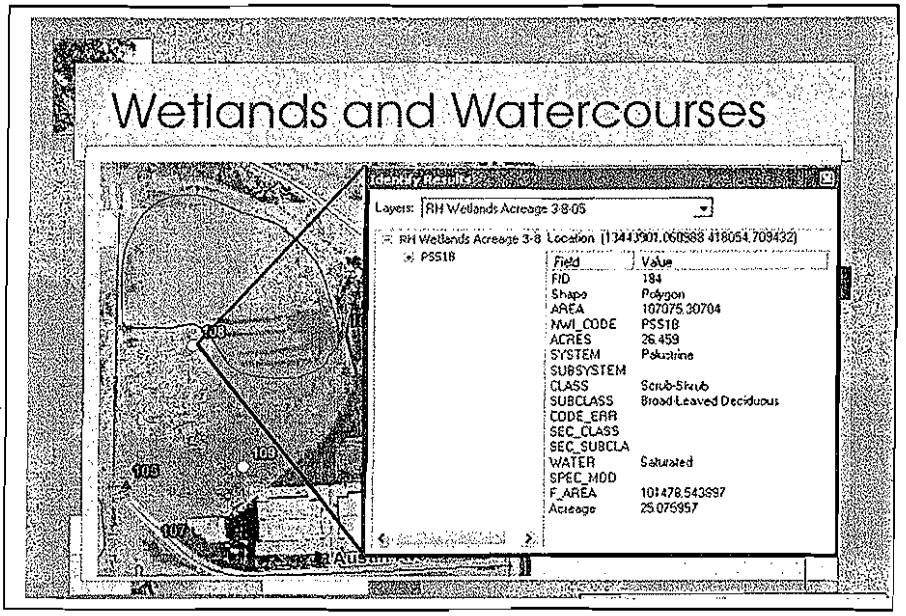
Wetland Services:
- *Wetland Mapping*
- *Stream Restoration*
- *Water Quality Analysis*
- *Functional Assessments*

Ecological Assessments:
- *Natural Features Inventories*
- *Woodland/Tree Surveys*

Geographic Information System Services:
- *Mapping*
- *Optimum Site Selection*
- *Constraints Analysis*
- *Site Planning*
- *Natural Features Analysis and Priority Area Ranking*

Green Infrastructure:
- *Open Space Design*
- *Trail System and Greenway Development*

Municipal Services:
- *Ordinance and Policy Development and Revision*
- *Master Land Use Planning*



A Natural Features Inventory (NFI) was conducted for the City of Rochester Hills by Niswander Environmental in 2004 and 2005. The NFI was completed as part of the Master Land Use Plan Update completed by McKenna Associates, Inc. The NFI identified steep slopes, floodplains, wetlands, watercourses, woodlands, and Priority Natural Areas within the City. GIS-based maps of the City's natural features were generated as part of this NFI. The NFI was undertaken with input from the Oakland Land Conservancy, Oakland County Planning, Clinton River Watershed Council, Rochester Hills Planning Commission/City Council, and the public.

Available GIS data were compiled from various sources to develop an initial base map of possible existing natural features. General natural resources information was obtained from Oakland County Planning, Oakland County Soil Survey, Clinton River Watershed Council, SE Michigan Greenways Initiative, Michigan Department of Environmental Quality Wetland Inventory, Michigan Department of Natural Resources, National Wetland Inventory, and aerial photo interpretation. In addition, City-specific information was obtained from the Rochester Hills GIS database, 1991 Rochester Hills Natural Features Report for the Master Planning Process, and the Rochester Hills Master Plan 2001-2005.

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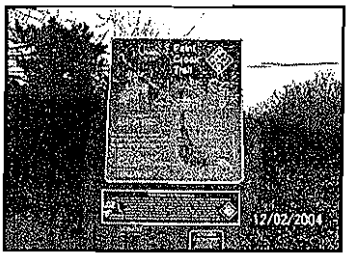
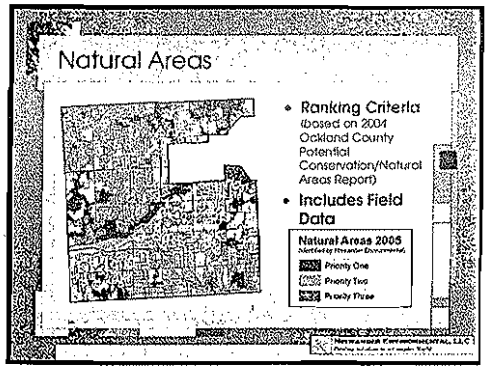



Rochester Hills Natural Features Inventory



A comprehensive field evaluation of all accessible natural features in the City was completed in the fall of 2004. Natural features assessment data were collected at 725 survey points and photographs were taken at 671 locations.

A preliminary NFI map was generated by integrating the field data into the GIS initial base map. Each survey and photo location was identified on the NFI map and the assessment data and digital photographs were then linked to each location. GIS coverages were then developed for each natural feature category. Attribute data, including feature type, size, quality, restorability, and other pertinent information, were linked to each individual natural feature category.

The natural features were then analyzed for significance to the City by developing qualitative criteria for site ranking. Determining significance to the City was based on evaluation of not only the quality of the natural resource, but also the site's need for protection, threat of destruction, and relationship to surrounding land use. The natural features were placed within a Priority Area based on the points obtained in its criteria ranking. Priority Area One contains the Natural Areas of most significance to the City.

The NFI created a baseline data set to that was used for the Master Land Use Plan Update. The NFI is designed to be a tool that can be used by City planning, engineering, and parks staff on a daily basis to evaluate projects and potential impacts to natural resources. Niswander Environmental evaluated the quality of the natural resources in order to provide guidance for the preservation, restoration, and management of the City's open space. In addition, the NFI is intended to be used for determining if and how effectively the natural resources of the City are protected by the City's existing ordinances and if changes or amendments to the ordinances would provide additional protection in the future.

The key of the NFI's success is its implementation towards protecting the remaining Priority Natural Areas through existing and newly developed ordinances. This process has begun with the drafting of a Steep Slopes Ordinance in 2005, in which Niswander Environmental helped develop. In addition in 2005 the City passed a 10-year Open Space Millage and the NFI is being used to direct the land acquisition efforts.

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Smallenburg Park Urban Stormwater Demonstration Project

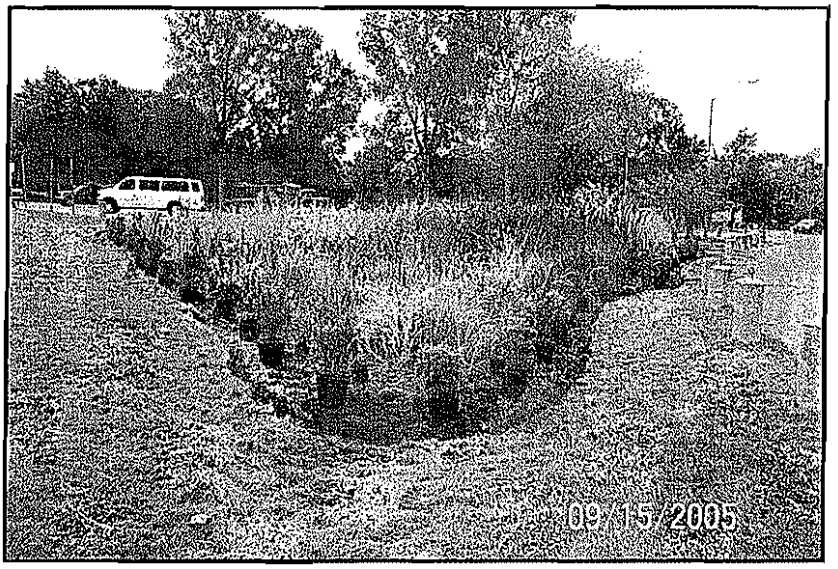
PROJECT EXPERTISE

Wetland Services:
- *Watershed management*
- *Treatment wetlands*
- *Functional assessments*

Municipal Services:
- *Grant/demonstration project*
- *Agency coordination*

Green Infrastructure:
- *Site planning*
- *Open space design*
- *Stormwater management*
- *Best Management Practices*
- *Rain Gardens*
- *Bioswales*
- *Natural Features Setback Protection*

Restoration:
- *Landscape Planning*
- *Plant Installation*
- *Prairie Seeding and Planting*
- *Wetland Seeding and Planting*
- *Invasive Species Control*



The Macatawa watershed, which covers approximately 110,000 acres, extends into Ottawa and Allegan Counties and includes Lake Macatawa, the Macatawa River, and numerous tributaries. Lake Macatawa, in southern Ottawa County, Michigan, is an 1800-acre drowned river mouth, which empties into Lake Michigan. According to the MDEQ, the water quality of Lake Macatawa is being impaired by large amounts of phosphorus loading from its tributaries. The Macatawa Area Coordination Council (MACC) is responsible for implementing stormwater management projects to improve water quality within the watershed. Smallenburg Park, located adjacent to Holland High School, was targeted to implement watershed restoration activities to improve water quality, specifically to lower phosphorus levels, as specified in the TMDL for phosphorus in the Macatawa watershed.

Previous consultants completed initial design and implementation of these activities. However, upon the fist year of site observation, the MACC determined that the overall effect of the site did not meet their expectations. Niswander Environmental was then contracted to offer recommendations to not only obtain a functional system, but also to create an

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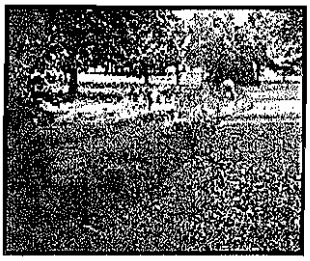
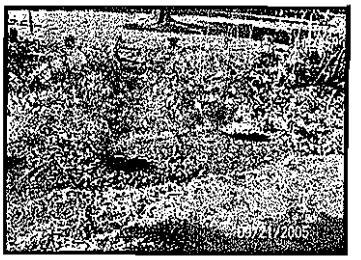
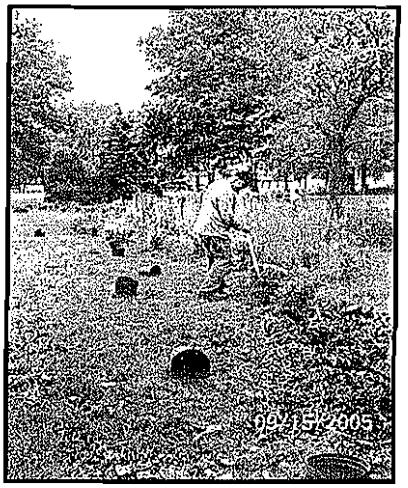
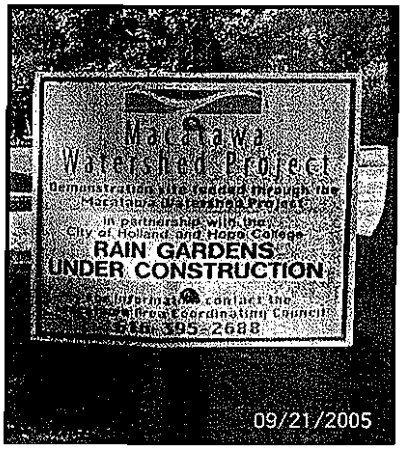


Smallenburg Park Urban Stormwater Demonstration Project





aesthetically pleasing environment. Niswander Environmental's task was to create rain gardens, which essentially transform low-quality, aesthetically unpleasant drainage swales into attractive landscaping features planted with perennial native grasses and wildflowers. Niswander Environmental designed and constructed four rain garden areas within Smallenburg Park. Each of these areas had previously been unsightly drainage swales, with weeds and non-native, undesirable species. Niswander Environmental first removed all invasive species, including purple loosestrife, Canada and bull thistle, and motherwort, within each basin. Once these species were eradicated, a mulched and planted perimeter was installed with a patterned combination of native shrubby cinquefoil and purple coneflower around each of the basins to provide a consistent, positive visual cue to the presence of a component of the demonstration site. One rain garden was planted with additional native prairie species, including Indian grass, big bluestem, little bluestem, tickseed, and butterfly weed. These rain gardens provide water storage, vegetation for nutrient uptake, and educational opportunities for the general public. Additional recommendations were given regarding basin design and operation to ensure proper functionality was achieved at the site.

Not only did Niswander Environmental's design provide the desired water quality improvement but also created an aesthetically pleasing desirable landscape feature within the Park. The establishment of a formal landscape edge identifies the limits of the natural features setback and will prevent future encroachment and mowing of the natural features.

Niswander Environmental coordinated this project with the MDEQ, the Macatawa Area Coordinating Council, Hope College, Allegan County Conservation District, other engineering firms and numerous landowners to ensure that the basins function well as stormwater conveyance and treatment systems to improve water quality within the watershed.

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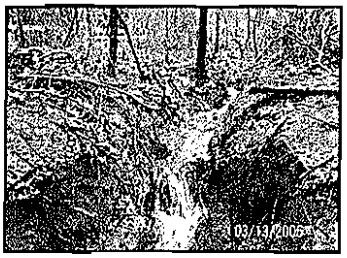
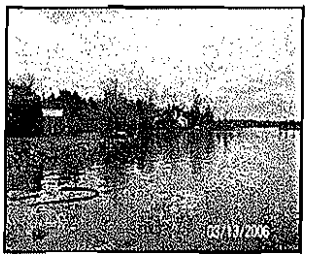


West Bloomfield Environmental Services

PROJECT EXPERTISE

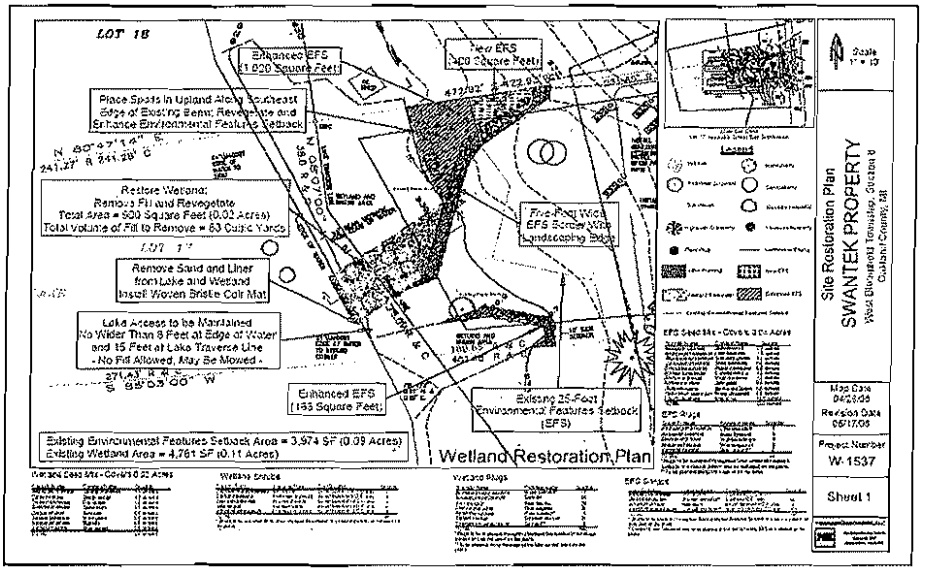
Wetland Services:
- *Delineations*
- *Permitting*
- *Wetland mitigation*
- *Bioengineering*
- *Watershed management*
- *Treatment wetlands*
- *Stream restoration*
- *Water quality analysis*
- *Functional assessments*
- *Expert Testimony*

Ecological Assessments:
- *Threatened and endangered Species Surveys*
- *Woodland/tree surveys*
- *Site plan development*

Geographic Information System Services:
- *Mapping*
- *Optimum site selection*
- *Site planning*

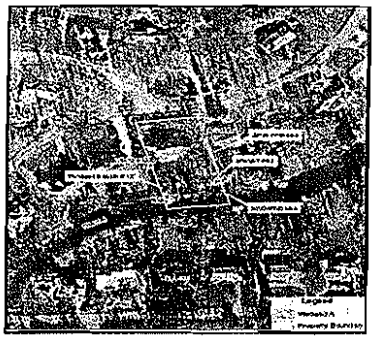
Green Infrastructure:
- *Site planning*
- *Open space design*
- *Stormwater management*
- *Landscape design*

Green Infrastructure:
- *Ordinance and policy administration*
- *Site planning and consultation*
- *Public meeting support*



Dr. Steven Niswander is the client manager for comprehensive environmental services provided to West Bloomfield Township. Niswander Environmental administers the Township's wetland woodland, floodplain, and stormwater ordinances, which require review of all new site plans and extensive coordination with the Environmental Director, the Wetland Review Board, the Planning Commission, and the Township Board. Per Township requirements, Niswander Environmental conducts wetland delineations, provides essential/non-essential wetland determinations, conducts stream and habitat assessments, threatened and endangered species surveys, site planning services, provides expert witness testimony, and designs successful wetland mitigation sites using the latest BMP's.

In addition to these services, Niswander Environmental provides resourceful ways to improve and protect the water quality of this lake community. In implementing the Township's stormwater ordinance, Niswander Environmental utilizes innovative green technology to naturally manage stormwater in an efficient and cost-effective manner.



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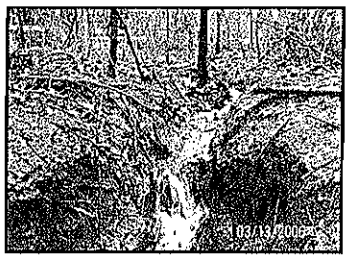
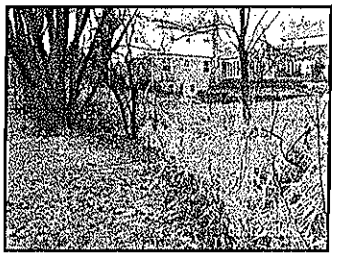
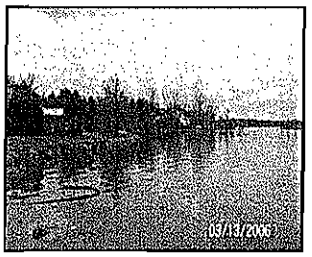
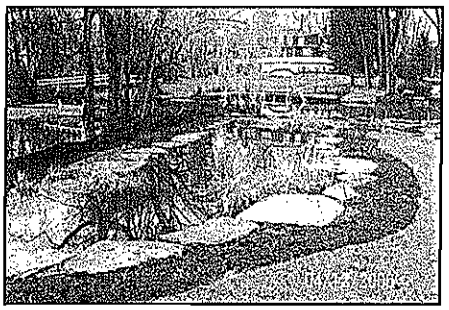


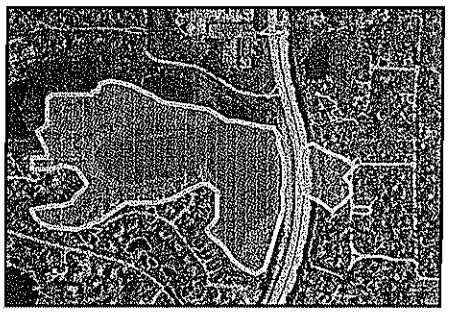



West Bloomfield Environmental Services

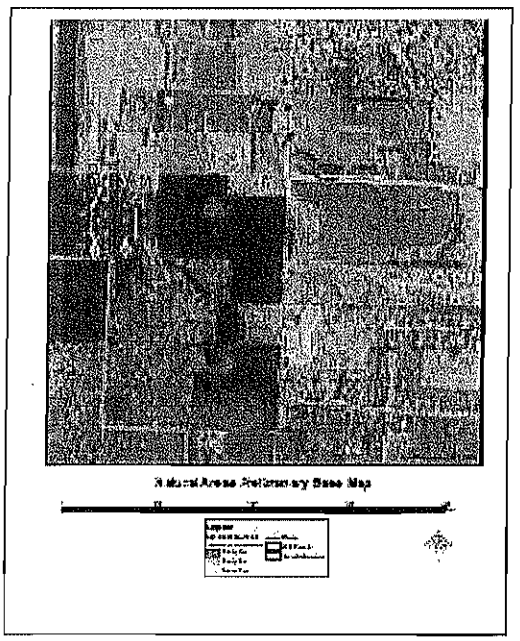


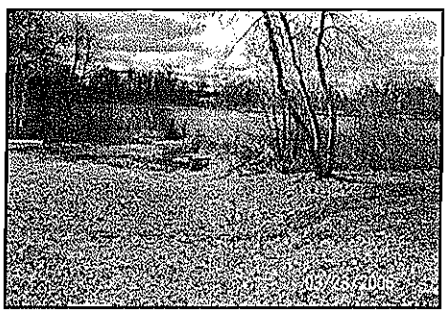
Niswander Environmental has designed and created numerous bioswales, raingardens, and treatment wetlands that have resulted in reducing runoff rates and nutrient loading into area waters, as well as providing an aesthetically pleasing natural feature when planted with native shrubs, grasses, and wildflowers.

A primary concern of West Bloomfield Township is environmental setback protection and open space planning. Because the Township's environmental feature setbacks are often encroached upon, Niswander Environmental is tasked with design and implementation of naturalized environmental features setback restoration plans, again primarily through formal landscaping using native plant material.



Niswander Environmental works with the Township on land preservation issues and open space planning, which is completed by integrating GIS with land selection variables. This allows the Township to prioritize remaining undeveloped land to achieve acquisition and preservation goals.





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Section 3 – **Project Team**

Team Introduction
Team Organizational Chart
Resumes

MDEQ Part 91 Certifications

Team Introduction

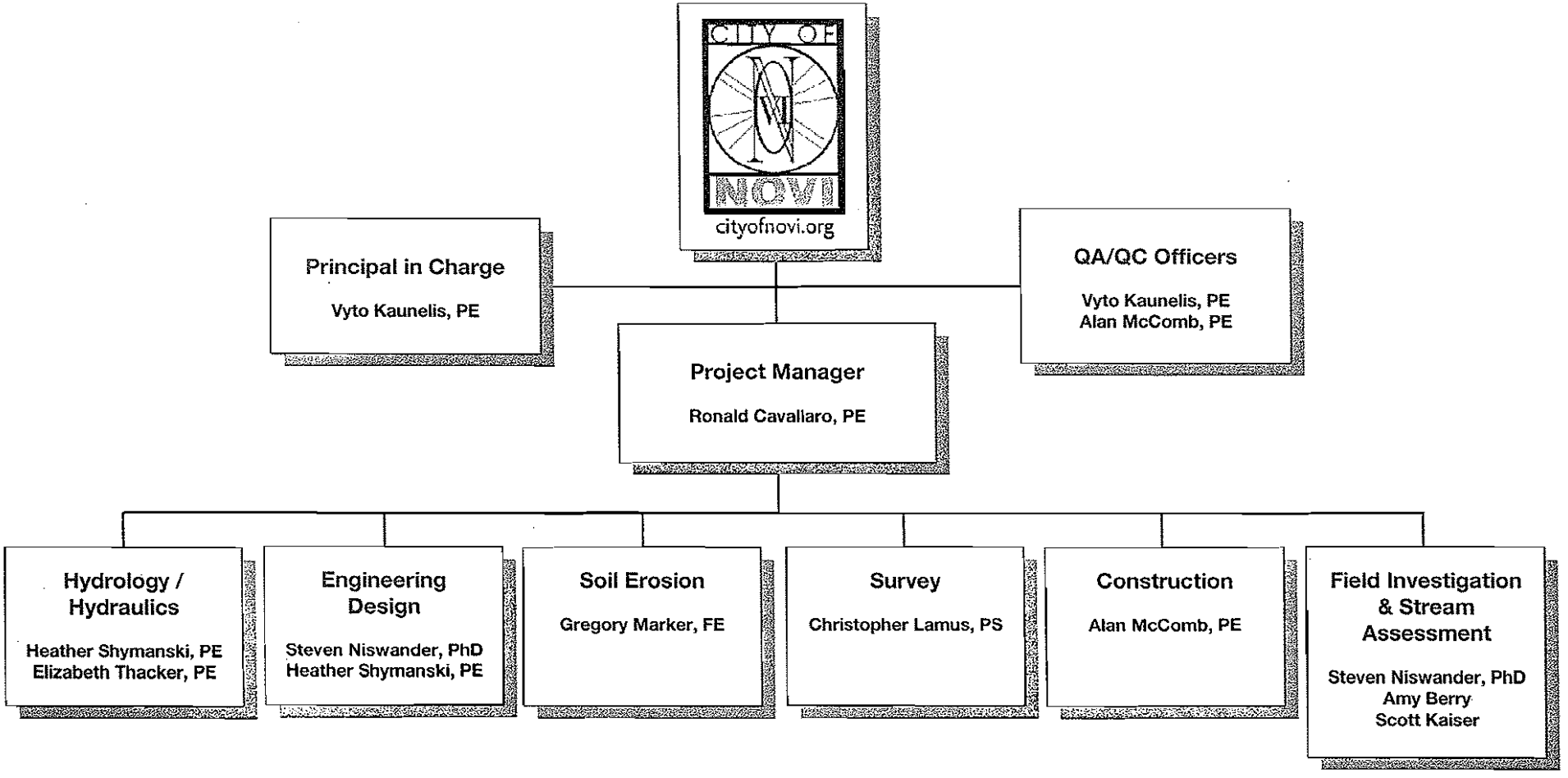
The team of OHM and Niswander Environmental will base the design of the Taft and Bishop Basins on ecological engineering principals, which is the design of sustainable ecosystems that integrate human society with its natural environment for the benefit of both. Utilizing this approach will insure that the basins will provide the necessary storm water storage while providing a self-sustaining ecological diverse ecosystem in each of the areas.

Our team has substantial depth of design and construction experience with in-line regional basins, off-line regional basins and streambank stabilization projects. Ron has been involved in the development of two of the City's storm water master plan updates and has been involved in the design and/or analysis of most of the City's regional on-line and off-line basins including the Leavenworth, Taft, Dunbarton, Cedar Springs, Civic Center and Lexington Green Basins. Ron has also been more recently involved in regional detention projects in West Bloomfield Township for the OCDC and in Augusta/Ypsilanti Townships for the WCDC. Both of those projects included geomorphologic evaluation of reaches of the receiving stream for stream bank erosion and other problem areas. Steve Niswander has been involved in numerous stream restoration and detention basin retrofit projects in Michigan and has extensive knowledge of the design and construction of in-stream habitat improvement structures. Both OHM and Niswander have an excellent working relationship with the MDEQ regulatory personnel that will be involved in the permitting of this project. We have discussed with the MDEQ how to most expeditiously permit the project along with developing the most viable, cost-effective solution.

The Request for Qualifications states a DBE requirement of 30%. OHM is committed to meeting or exceeding the requirements for DBE participation. OHM has worked with Niswander Environmental, the DBE participant, on numerous prior projects. Throughout the course of this project, OHM will monitor hours and charges by Niswander to assure that the requirement is met.

Team Organizational Chart

Engineering Services for
Regional Basin Retrofit for Water Quality Improvements –
Taft and Bishop Regional Detention Basins



Ronald A. Cavallaro, Jr., PE

Senior Project Manager

OHM

Education
Bachelor of Science in Civil Engineering, Michigan Technical University, 1988
Water Resource Option

Professional Registration
- Registered Professional Engineer, Michigan, License #39120
- Professional Hydrologist pending renewal

Professional Affiliations
- American Society of Civil Engineers (ASCE)
- American Water Resources Association (AWRA)
- American Institute of Hydrology (AIH)
- Association of State Dam Safety Officials (ASDSO)
- Michigan Water Environment Association (MWEA)
- Huron River Watershed Council

Experience

May 2006 – Current
OHM
Manager of Municipal Services
Livonia, Michigan

Nov 2005 – April 2006
Hitch, LLC
Senior Engineer
Houghton, Michigan

April 2003 – Nov 2005
Midwestern Consulting, LLC.
Associate
Ann Arbor, Michigan

Sept 1994 – April 2003
Ayres, Lewis, Norris & May, Inc.
Senior Associate
Ann Arbor, Michigan

Aug 1991 – Sept 1994
JCK & Associates, Inc.
Project Engineer

May 1988 – Aug 1991
Connecticut Dept. of Transportation
Hydraulics & Drainage Unit
Transportation Engineer I

Background

Mr. Cavallaro has more than 19 years experience in watershed management, general municipal engineering, grant writing, water and sewer system design, hydrologic and hydraulic investigations, streambank stabilization design, scour analysis, dam and bridge design/inspections, floodplain studies and ordinance writing. He has worked as an expert witness in storm water management and floodplain permitting issues including cases for Washtenaw County, the Charter Township of Northville, the Adrian & Blissfield Railroad and several insurance companies, municipalities and private developers. Mr. Cavallaro has also managed the implementation of over 30 RPO & CMI funded projects including projects for the Cities of Southfield, Wayne, and Novi, and Northville Township, OCDC and WCDC.

Relevant Experience

Recent Projects

LID Standards Assistance, Washtenaw County Drain Commissioner – Ongoing
Project manager for this project which entails assisting the WCDC with revising their storm water standards to require LID practices in proposed developments within the County.

Allens Creek Storm Water Project – Ongoing
Project manager for this storm water project which includes assisting the WCDC and City of Ann Arbor in identifying retrofit opportunities and developing alternatives to implement storm water management improvements in the Allens Creek watershed. The project will include preparation of a SRF project plan to obtain State funding for some of the proposed opportunities.

Storm Water Management Retrofits, City of Auburn Hills, MI – 2007
QA/QC Officer to improve storm water quality, increase on-site infiltration and strive to meet the goals set forth in the Clinton River Watershed's Management Plan including reducing storm water runoff to help restore the natural flow regime of the Clinton River. The City is interested in potentially retrofitting seven (7) sites owned by the City with storm water improvements that will reduce runoff quantity and improve quality through enhancing infiltration.

John Bird Drain, Washtenaw County Drain Commissioner – Ongoing
Project Manager to review storm water management plan in Augusta Township for a proposed residential development along both the West Branch Paint Creek John Bird Drain and Paint Creek.

Woods of Edenderry – Storm Water Management Basin Rehabilitation, Charter Township of Northville, MI – 2007
Project Manager to provide survey, alternatives analysis, design and construction services for rehabilitation of detention basins to meet modern storm water quality design techniques in the Woods of Edenderry subdivision.

Storm Water Study – Phase II, City of Novi, MI – 2006-2007
Project Manager for this project which was aimed at determining improvements necessary to increase existing regional detention basin effectiveness and provide

recommendations for improving the City's Soil Erosion Control Program. OHM coordinated with several of the City's departments to outline CIP projects for the next five years.

Additional Experience

Floodplain, Hydraulic Analysis and Streambank Stabilization Experience
Engineer responsible for local bridge design hydraulic analysis' and scour studies including Stark Road in the City of Midland, Decker and Wixom Roads in the City of Novi, Marshall Road and Kalamazoo Avenue in the City of Marshall, Canton Center Road in Canton Township plus many new residential bridge designs for private developers. Ron has worked with the NRCS and numerous agencies and municipalities in stream restoration and stabilization projects using innovative methods for over 15 years including a project installing step-pool structures along with native plantings for U of M in the Nichols Arboretum and a project for the Charter Township of Northville which included a 15 foot energy dissipation drop structure, step-pools and bioengineering to rehabilitate a stream on the Oakland/Wayne County line. The award winning Quail Ridge Drain project was both CMI and RPO funded.

Connecticut Department of Transportation
Project Engineer for many floodplain related studies including scour analysis', scour protection designs, scour studies, hydraulic analysis', hydrologic analysis' and revetment designs for small and large span bridges including the 11 span I-95 Baldwin Bridge over the Connecticut River.

Oakland County Drain Commissioner
Edwards Drain Stabilization; John Donahue Drain, Jacobs Drain Regional Detention, Quail Ridge Drain Bioengineering/Rehabilitation -RPO/EPA and CMI funded projects

City of Wayne, Michigan
City Hall Parking Lot BMP Design – Award winning CMI funded project

Washtenaw County Drain Commissioner
Over 10 studies and designs including the Northeast Area Park Storm Water Demonstration Project which was CMI funded

City of Southfield, Michigan
Section 34 Dry Swale Project – CMI funded

Village of Beverly Hills, Michigan
Parking Lot Redevelopment LID design CMI application

City of Wayne, Northville & Salem Townships, Michigan
Voluntary General Storm Water Permit Preparation & Implementation

Dam Design & Inspections
Over 30 dam inspections, designs and studies for various public and private entities.

OHM

Vytautas (Vyto) Kaunelis, PE

QA/QC Officer

Education

- Masters of Science in Civil Engineering, University of Michigan, 1984
- Bachelors of Science in Civil Engineering, University of Michigan, 1976

Professional Registration

Professional Engineer, State of Michigan, 1979
License Number: 27579

Professional Affiliations

- Water Environment Federation
- American Public Works Association

Experience

32 years of experience – 10 years with Wayne County Department of Environment, 18 years with another Southeastern Michigan-based consulting engineering firm, and 4 years with OHM

Background

Mr. Kaunelis is the director of the Environmental and Water Resources Group (EWRG) at OHM and is responsible for the overall EWRG Mission to provide innovative and quality solutions to the variety of environmental issues facing communities today.

In several positions with Wayne County, including several years as the appointed Drain Commissioner, he dealt with numerous projects. Initiation and completion of all projects achieved the desired results and generally resulted in a high level of satisfaction for the customer. This was particularly important for Wayne County due to a low level of trust from factors pre-dating the administration for which he worked. This experience has provided a public sector perspective on implementation of successful projects.

During his 10 years at Wayne County, Mr. Kaunelis had an opportunity to oversee the operation of four major sanitary collection / transportation systems (North Huron Valley / Rouge Valley, Northeast, Downriver, and South Huron Valley) and two wastewater treatment plants (Downriver and South Huron Valley). Each of the systems had to deal with a variety of major improvements, such as wet weather flow control facilities. Also, a unique set of flow metering and modeling techniques were developed for each of the systems to ensure that customer communities were receiving the appropriate level of service for which they had contracted and "fair and equitable" cost allocation.

In addition to his work in managing Wayne County systems, Mr. Kaunelis served as a representative on DWSD partnering initiatives such as the GDRSS modeling and metering programs, the combined sewer overflow (CSO) cost allocation, and rate issues identification and resolution. This afforded him the opportunity to develop an understanding of the other major regional sewer systems in southeast Michigan.

While employed with another Southeastern Michigan-based consulting engineering firm, Mr. Kaunelis held various positions ranging from Student Engineer in 1975 to Vice President in 1993. Mr. Kaunelis worked on, and eventually led, a team of 10 engineers and technicians in the successful completion of a variety of water, wastewater and infrastructure projects for a number of communities and industries in Michigan and the surrounding area. This included work on over 20 water system analyses.

Mr. Kaunelis also served on the State of Michigan Combined Sewer Overflow and Sanitary Sewer Overflow Policy Development Committees.

Relevant Experience

Mainland Drain Study Phases II and III, Oakland County Drain Commissioner, MI – 2006

Principal in Charge to assist the Oakland County Drain Commissioner in accomplishing their objectives in reducing peak flow, flooding, sedimentation and erosion while improving in-stream habitat and water quality along the Mainland Drain within the Phase II and Phase III project limits.

Bush Lake Feasibility Study, Oakland County Drain Commissioner, MI – 2005
Principal in Charge responsible for a lake level control study in Holly Township / Village of Holly. The most appropriate lake level was determined through analysis of the lake hydrology outlet channel hydraulics, property owners' opinions, wildlife habitat, aquatic vegetation, and existing wetlands. Recommendations for a new outlet structure was provided, as well as an assessment district and preliminary costs for a new structure.

Representative to DWSD Technical Advisory Committee, Wayne County DOE – Ongoing
The Detroit Water and Sewerage Department (DWSD) has initiated a partnering effort with the water system customers, called the Technical Advisory Committee (TAC). Mr. Kaunelis has been hired by Wayne County DOE to represent the interests of the Wayne County Communities on the TAC. He serves on the Contracts and Rates Committees and chaired a Sub-group to the Rates Committee dealing with Peak Hour rates.

City of Northville, City of Auburn Hills and Orion Township Rate / Flow Issues with DWSD – 2004-2007
Provided expertise to several communities in dealing with DWSD water system rate issues. The process typically involves review of flow data, peaking factors, and local distribution system to understand the community's water usage patterns, determination of unusual conditions or erroneous data, and negotiations with DWSD to establish a rate consistent with the community's usage of the regional system.

Capacity, Management, Operation and Maintenance Plan, City of Novi, MI – 2005
QA/QC Officer to develop a comprehensive Capacity Management, Operation, and Maintenance plan for the City of Novi. This project is planned to extend over several years. Tasks include the analysis of the existing system, development of a flow monitoring program with a subsequent analysis of field data, a capacity analysis of the sanitary sewer system, performing of a sanitary sewer evaluation study, assisting the City staff in preparation of reports to the regulating agencies, e.g. the MDEQ, and review of current staffing and training programs in the City along with maintenance and management procedures, historic maintenance records and procedures, and the development of a customer compliant tracking method.

OHM

Alan McComb, PE

QA/QC Officer & Construction Engineer

Education
Bachelors of Science in Civil Engineering, University of Michigan, 1971

Professional Registration
Professional Engineer, State of Michigan, 1976

Professional Affiliations
- American Society of Civil Engineers
- Michigan Infrastructure & Transportation Association (MITA)

Professional Development
- Project Innovations, LeaderEase Training, 2004
- Project 2000 Project Scheduling Software Seminar
- Construction Contracting for Public Entities in Michigan, 1999
- Outlook '98 Computer Software Seminar, 1999
- American Consulting Engineers Council/MI Management Training Classes, 1996
- MDOT Construction Project Record Keeping CPRKS Seminar, 1996
- MDOT Office Technician Seminar, 1987

Experience
36 years of experience; 31 years with OHM. 5 years with the City of Ann Arbor. Mr. McComb also served as a member of the City of Ann Arbor Building Board of Appeals from 1980 to 1994, and currently serves on the Ypsilanti Township Construction Board of Appeals since 1993.

Background

Mr. McComb, a partner in the firm, directs construction engineering and management operations and supervises a staff of more than 55 engineers and technicians. He monitors project budgets for construction engineering costs to ensure that expenses are kept within budget. Under his management, engineers and technicians supervise and document all aspects of project construction – including material and workmanship quality, construction estimates, progress reports, and compliance with federal and state requirements for municipal clients in Wayne, Oakland, Macomb, and Washtenaw counties, as well as for MDOT projects.

Mr. McComb's experience includes 30 years of construction administration and documentation of MDOT-funded projects for local governments and MDOT. He and his staff are responsible for resolving contractor claims, working with MDOT and local government officials to resolve project issues promptly before they become major issues, and meeting with the affected parties to discuss and address these issues before they have a negative impact on a project. These projects include bridge and major road reconstruction along with utility infrastructure improvements. Administration of these projects involved EEO documentation, along with substantiation of material and workmanship quality for federal aid funding and MDOT compliance.

Mr. McComb's civil engineering experience has also included design and construction engineering for water and sanitary/storm sewer systems as well as major roads for municipal clients. He has been directly involved with the project administration and construction engineering of many major sewer projects including trunk sanitary and storm sewers routed directly through major residential and commercial areas. This work included construction engineering to foresee problems and promptly resolve them to minimize their impact to a project, from both cost and time perspectives. Also included are contract administration, processing pay estimates, change orders, client contact for progress status, and the adherence to all project specifications and schedules.

Prior to employment with OHM Mr. McComb was employed by the City of Ann Arbor Engineering Division where he was assigned various design tasks relating to roadway, sanitary, and storm sewer improvements as well as implementation of the design and construction of the City's bike path and handicapped ramp systems to allow for non-motorized and handicapped access to public buildings and the downtown area of the city.

Relevant Experience

Water System Improvements, City of Auburn Hills, MI – Ongoing
Construction Group Manager for this project to update the Auburn Hills water system with strategic installations of pressure reducing valves and electrical controlled valves in order to prepare for the addition of an elevated water storage tank.

Lowell Street Paving and Water Main Improvements, Ypsilanti Community Utilities Authority, MI – 2007
Construction Group Manager for this project, which includes replacement of approximately 2,100 lineal feet with 8-inch ductile iron water main within Lowell

Street. The water main will be paid for through use of a Drinking Water Revolving Fund (DWRF). The roads portion will utilize the MDOT Local Agency Program (LAP) funding mechanism and will be covered under a separate contract through the City of Ypsilanti. The project will include field engineering to mitigate water main/utility conflicts due to unknown or mis-marked utilities. OHM will be responsible for administering the contract through MDOT, performing full time construction observation and creating as-built drawings for YCUA and the City. The Lowell Street project will use both DWRF and MDOT LAP funds.

US-23/Lee Road Interchange Construction Engineering, Livingston County Road Commission, MI – 2006
Construction Group Manager for this project. OHM was responsible for overseeing the Permit Inspection for the construction of 3 multi-lane roundabouts and associated ramps lighting, and traffic signal work on the east and west side of the US-23/Lee Road interchange.

Bradley/Snow/I-94 WM Improvements, Ypsilanti Community Utilities Authority, MI – 2006
Construction Group Manager for this project. OHM worked with YCUA to determine a hybrid method of open cut and pipe bursting undersized cast iron water main. This project is part of a group of three projects that are identical in nature and will be funded with DWRF monies. This particular project consisted of approximately 18,000 ft of water main replacement (8" DIP).

North Shore Bridge Reconstruction, Village of Lake Orion, MI – 2003
Construction Group Manager for this project. OHM had provided complete design engineering, surveying and construction engineering.

Sylvan Lake 2002 Utility Improvements, City of Sylvan Lake, MI – 2003
Construction Group Manager responsible for contract compliance and construction engineering, the purpose for which was to install the utility improvements in conjunction with the City's paving program. Portions of the existing storm sewer, sanitary sewer and water main were installed in the 1940's. The project rehabilitated 5,400 linear feet of sewer pipe and 40 manholes. Due to poor rear yard drainage, 1,000 feet of storm sewer was rebuilt or rehabilitated using pipe bursting techniques. Also replaced were 1,200 linear feet of water main including 23 leaking gate valves and 34 leaking or damaged hydrants. Pipe lining and pipe bursting saved the City approximately $500,000 and decreased the required work within the existing pavement area and also minimized disruption to resident lawn areas.

This project presented a unique opportunity to protect Sylvan Lake which is a recreational attraction for this lakefront community. OHM worked with Sylvan Lake to identify opportunities to include several storm water quality improvements into this project. Thus, with little additional cost, Sylvan Lake was able to work toward compliance with MDEQ/NPDES Phase II Storm water quality in this approximately two-square-mile community. Maintaining public health standards for the water main installation and controlling by-pass pumping for the sanitary sewer work was also a primary emphasis.

Heather Shymanski, PE

Project Engineer

OHM

Education

- Masters of Science in Civil and Environmental Engineering, Wayne State University, 1996
- Bachelors of Science in Civil and Environmental Engineering, University of Michigan, 1992

Professional Registration

Professional Engineer, State of Michigan, 1997

Professional Development

- New Horizons, Microsoft Project 2000 Training, 2000
- Southeastern Michigan Council of Governments, Clean Michigan Initiative Seminar, 1999
- American Public Works Association, Stormwater Phase II: Designing and Implementing an Effective Stormwater Management Program, 1999
- Project Innovations, Facilitation Skills Training, 1999
- Water Distribution Network Modeling Seminar, Cybernet v.3.1, 1998
- Rouge Program Office/Michigan Department of Environmental Quality, Workshops I-IV on the MDEQ Voluntary General Stormwater Permit, 1998

Presentations

- Michigan's Phase II Stormwater Regulations: What's in Store for Michigan Communities? June 2001, Orion Township Hall, Scio Township Hall
- Michigan Phase II Stormwater Regulations: What's in Store for OHM Clients? April 2001, OHM, Inc. Livonia Office

Experience

15 years experience, 10 with OHM

Background

Modeling/Design

Ms. Shymanski has managed and coordinated the water system improvements for a community involving more than 30,000 feet of water main, two elevated storage tanks, and a well field site. Ms. Shymanski has done water modeling and prepared the reports for water reliability studies, water master plans, and private water systems using Cybernet water modeling software. She has also conducted Cybernet model runs of various water system improvements in several developing communities.

In addition, Ms. Shymanski directs the preparation of reports, cost estimates, impact studies and designs of various hydraulic related projects. She has a working knowledge of several hydraulic modeling programs, including Cybernet, SWMM/EXTRAN, HEC-2, HEC-RAS and TR-55.

Prior to joining OHM, Ms. Shymanski was involved in numerous hydraulic projects. Sample projects included a proposed sewer separation design for the City of Wayne that consisted of analyzing flow metering data and conducting a simulation of the design using the EXTRAN model. In addition, Ms. Shymanski was a team member of the Phase II Greater Detroit Regional Sewer System (GDRSS) EXTRAN modeling project which involved calibration and validation of the GDRSS model to compare model results to actual flow data collected throughout the system. Ms. Shymanski also evaluated weekly flow data and dry weather flow patterns for 27 flow meters in the down river community and established weekly rating curves. She also worked as a resident field engineer for the rehabilitation of the high lift transmission piping at the City of Detroit's Waterworks Park water treatment and distribution facility.

Storm Water/Environmental

Ms. Shymanski is a member of OHM's Environmental and Water Resources Group. Her responsibilities include QA/QC and design and coordination of stormwater and hydraulic projects for OHM's municipal clients. Ms. Shymanski is OHM's key contact person for gathering stormwater information relating to the Federal Stormwater Permit and is responsible for the knowledge of funding opportunities through the Rouge Program Office (RPO) and the MDEQ. She has prepared several stormwater grant applications and reimbursement packages for Rounds I-VIII of the Rouge Program Office grants as well as for the Clean Michigan Initiative (CMI) through the MDEQ. These grants have secured thousands of dollars for communities such as Farmington Hills, West Bloomfield Township, Northville, Novi, Westland, and Livonia. Ms. Shymanski currently assists the City of Northville, Lincoln Park, Orion Township, and the Village of Dexter with aspects of their Federal Stormwater permits. This assistance entails advising clients on stormwater funding opportunities, representing the communities at subwatershed meetings, preparing grant applications and reimbursement packages, giving stormwater presentations to City Councils and Township Boards, and facilitating community stormwater programs.

Heather Shymanski, PE

Project Engineer

OHM

Relevant Experience

Novi Stormwater Master Plan Update – Sediment Structure Evaluation, City of Novi, MI – 2006-2007
Engineer responsible for preparing the sediment structure evaluation which entailed field visits to five (5) sites throughout Novi with Aqua-Swirl, Vortechnics and Stormceptor structures installed. Field evaluations were done during dry weather and wet weather to determine the effectiveness of the structures. A summary report was prepared and included with the Master Plan Update.

Cogswell Drain Study, City of Romulus, MI – 2006
Engineer responsible for the field work and report preparation for the Cogswell Drain study. The study analyzed existing and proposed drainage conditions for Superior Estates subdivision in Romulus. The study involved determining the tributary area to the subdivision in order to evaluate the current drainage condition. The study proposed drain improvements to alleviate the flooding in the subdivision.

Stormwater Management Study, Joint Venture between OHM and Hubbell, Roth & Clark, City of Livonia, MI – 1999 to 2000
Project engineer on the joint venture team involved in reviewing the City of Livonia's stormwater management plan, assessing the existing conditions of Livonia's stormwater conveyances, generating a final current situation report to serve as the basis for a new Livonia stormwater management plan. As a part of the joint venture team, Ms. Shymanski also reviewed current stormwater and drainage concerns within the City of Livonia.

US-12 Drainage Study Phase I, Canton Township, MI – 1999
Project engineer responsible for the hydraulic analysis associated with this road reconstruction project. Analysis involved development of hydraulic profiles using HEC-RAS to determine the impact of proposed culvert extension and drain enclosure associated with road reconstruction.

Deer Creek Drain Flooding Study, City of Westland, MI – 1998 to 1999
Project engineer assisting in a study to determine the causes, extent, and possible solutions to alleviate flooding where the drain crosses Hix Road in Westland following storm events. The project involved field investigation and research of municipal records as well as preparing the report presenting the results of the study and recommended actions.

Fleming's Roseland Gardens Storm Flooding Analysis, City of Farmington Hills, MI – 1997
Project engineer for the investigation into the flooding of the Roseland Gardens subdivision. This work involved conducting a field survey and inspection, studying the surrounding contributing drainage areas, and calculating the existing storm sewer capacity. This information was compiled in a report with recommendations and costs and presented in a public meeting.

OHM

Elizabeth A. Thacker

Project Engineer

Education
- Masters Degree of Science in Environmental Engineering, University of Michigan, 2001
- Bachelors Degree of Science in Civil and Environmental Engineering, University of Michigan, 2000

Professional Registration
Passed Michigan Professional Engineers Examination

Papers and Presentations
"Reducing Excessive Storm Water Flows in Urban Community," Michigan Municipal Review, July 2003

Experience
5 years of experience with OHM

Background

Ms. Thacker is a project engineer in the Environmental and Water Resource Group. Her duties involve performing water studies, inflow & infiltration studies (I&I), hydraulic stream analyses, as well as providing various communities with Phase II NPDES stormwater assistance.

Her previous research involved work on the SEAR (surfactant-enhanced aquifer remediation) project, where she performed column experiments to determine the effects of binary non-aqueous phase liquid (NAPL) mixtures on SEAR.

Relevant Experience

Rain Garden Design, Livonia, MI – Ongoing
Design Engineer responsible for the design of two bioretention areas, or rain gardens, to be retrofit at an already developed site. These bioretention areas will receive runoff from the existing parking lot and will treat the first 0.5 inches of storm water runoff. The bioretention design features native vegetation, an underdrain, and an overflow.

Storm Water Retrofits for City Properties SRF Project Plan, Auburn Hills, MI – 2007
Engineer responsible for the selection of retrofit storm water best management practices that could be constructed on City-owned properties. Selected projects include a rain harvesting cistern, bioretention, bioswales, a level spreader, and naturalization. A report was developed that met State Revolving Fund (SRF) project plan requirements.

Mainland Drain Study Phases II and III, Oakland County Drain Commissioner, MI – 2006
Design Engineer to assist the Oakland County Drain Commissioner in accomplishing their objectives in reducing peak flow, flooding, sedimentation and erosion while improving in-stream habitat and water quality along the Mainland Drain within the Phase II and Phase III project limits.

Inflow and Infiltration Study (I&I), Romulus, MI – 2005
Project Engineer responsible for sanitary flow analysis. Duties include flow data organization and analysis to determine the extent of inflow and infiltration in to the sanitary sewer system. Also to be included are recommendations to reduce the amount of I&I.

Hydraulic Analysis, Wayne County, MI – 2005
The overall purpose of this project is to develop an antecedent moisture model for the NHV/RV System to assist in determination of required facilities to meet MDEQ's Sanitary Sewer Overflow Policy using the frequency exceedance criteria. Project Engineer responsible for performing a hydraulic analysis by routing the hydrologic antecedent moisture model through the County's sewer system model for comparison to observed meter data.

Bush Lake Feasibility Study, Oakland County Drain Commission – 2005
Project engineer responsible for the hydrologic and hydraulic analyses need for a

study that will determine the feasibility of establishing and maintaining a normal lake level on Bush Lake, as well as evaluate design alternatives for controlling the recommended level. The hydrology of the watershed, including the watershed boundary, soil types, land use and topography will be analyzed using Hydraflow Hydrographs 2002. Runoff rates for a 50 year and 100 year storm event will be determined. Hydraulics of the outlet structure and downstream channel will also be analyzed and improvements will be recommended as necessary. A simplistic HEC-RAS study of the channel will be conducted to determine if the channel is capable of handling any proposed additional flow, or determine what improvements are necessary.

Combined Downriver Watershed Management Plan, Combined Downriver Inter-Municipality Committee – 2004-2005
Project engineer to identify and establish a plan to address water quality and water quantity concerns within the Watershed. Specific project elements were divided into seven tasks, including the development of the Public Participation Process (PPP), Watershed and field inventories, BMPs, progress evaluations, the WMP for submission to MDEQ, and committee facilitation, staff support and administration.

Ecorse Creek Watershed Management Plan, Ecorse Creek Inter-Municipality Committee – 2004-2005
Project engineer responsible for performing a field assessment of the watershed. In addition, facilitation was provided to the committee in determining appropriate Best Management Practices to help meet the goals of the Watershed Management Plan.

Marion Township Rain Garden, Marion Township, MI – 2004
Project engineer for the design of a rain garden located at the Township Hall. Project included sizing of rain garden, drainage patterns and native plantings.

Hydraulic Analysis, Romulus, MI – 2003
Project engineer responsible for the hydraulic analysis associated with a culvert replacement project. Analysis involved development of hydraulic profiles using HEC-RAS to determine the impact of the proposed culvert replacement.

Hydrologic Analysis and Wetland Impact Study, Charter Township of Orion, MI – 2003
Engineer responsible for determining the impacts of a potential development on the natural features in the Township. A field visit was made to determine the extent and quality of the wetland area on the site, including its ability to retain stormwater and provide habitat for animals. In addition, the modeling software Hydraflow was used to analyze the existing and potential peak flows and total volume of runoff from the site. This analysis was used to help identify impacts to the stream in which the site discharges.

Hydraulic Weir Design, Hayes Land Development, MI – 2002
Project engineer responsible for gathering background information to define watershed boundaries for two lakes. Using the hydrologic modeling software, Hydraflow, the amount of runoff was calculated and a weir was sized to an allowable discharge rate, which was determined by the capacity of the downstream channel.

Professional Development
- National Low Impact Development Conference, 2007
- Sustainable Stormwater Management Seminar, 2007
- SWPPI Development Training Workshop, 2005
- Phase II Stormwater Public Education Tools & Techniques, 2005
- Sustainable Stormwater Management Seminar, 2004
- Army Corps of Engineers Wetland Delineation and Management Training, 2003
- Introduction to Wetland Values and Functions Workshop, 2002
- HEC-RAS 3.0 Training, 2002
- Source Water Protection Seminar, 2002
- Phase II Storm Water Workshop for Southeast Michigan, 2002
- Groundwater Utilization and Well Field Management Seminar, 2002
- Watershed Concepts and Management for Local Officials, Public Administrators and Practitioners Online Course, 2002

OHM

Gregory J. Marker, FE

Senior Construction Technician

Education
- B.S. Civil Engineering. Lawrence Technological University, 2004
- B.S. Biology. Michigan State University. Lymann Briggs School, 2000

Professional Registration
Fundamentals in Engineering, State of Michigan, 2004

Professional Certifications
- Soil Erosion and Sediment Control Act Administrator, 2006
- Office Technician Training, Michigan Department of Transportation, 2006
- Confined Space Entry, 2006
- Waterworks System Operator Class S-3, 2006
- Waterworks System Operator Class S-4, 2006

Professional Affiliations
- American Society of Civil Engineers – Student Chapter
- Chi Epsilon Engineering Honor Society – Student Chapter, Editor
- Laborers Union 1191 – Three Years

Experience
5 years of experience with OHM

Background

As an engineering technician with OHM's Construction Engineering Department, Greg is responsible for maintaining project scopes, budgets, and quality of work while fostering positive relations with the business owners and residents affected by the ongoing work. He was also responsible for correctly interpreting engineering drawings, preparing clear detailed reports, and performing surveying operations.

Greg is familiar with reviewing construction materials in the field for acceptance and is qualified to ensure compliance with plans and specifications. He has recorded and reported quantities used on projects; ensured that daily inspection reports relay clear and concise information to others associated with the project; prepared daily inspection reports with detailed sketches, descriptions and records of quantities used in relationship to the project and filing these records daily with the project engineer. He has been involved in overall budget tracking, change order and quantity disputes, along with negotiations with construction company representatives on behalf of the project engineer.

Prior to working with OHM, Greg worked for Di Ponio and Morelli Construction. He also has a Bachelor of Science degree in Biology from Michigan State University through the Lyman Briggs Program. He spent two summers focused on environmental and ecological concerns in recreational land use areas.

Relevant Experience

River Street Water Main and Paving Improvements, City of Ypsilanti, MI – July 2006 to November 2006
Abandonment and replacement of 2600 lft of water main, replacement of 12 Orangeburg sanitary leads, 2600 lft of new storm installation, sanitary sewer repairs, and addition of 2700 lft of curb and gutter road. Eight sidewalk intersections and 3 main line locations were brought into compliance with MDOT R-28e on a project with widely changing elevations. Acted as Field Client Representative, and project engineer under Jason Fisher for an MDOT local agency project.

Seaver Farms Development project, Ypsilanti Township, MI – August 2006 to August 2007
Project engineer/field client representative. Development of a 50 acre parcel that included 100,000 cyd of imported embankment, 2600 lft of new storm, water, and road construction, three detention ponds, 8 acres of wetland mitigation and plantings, and 30 acres of parcels ready for future commercial development. The project was in collaboration with Bosal Internationals construction of a new manufacturing facility, of which the township was providing access by developing the 50-acre parcel of land.

Tuttle Hill and Textile Water Main and Derbyshire Drain Improvements – May 2006 to September 2006
Field Client Representative and Project engineer for abandonment and replacement of 3000 lft of 16" water main, relocation of 4 hydrants, enclosure of 4000 feet of ditch with 36"and 30" storm sewer, and 2000 lft of open ditch improvements. The project was performed with collaboration of road and signal improvements from the

Washtenaw County Road commission as part of an MDOT local agency project. The project included utility pole, gas main, phone, and cable relocation.

Westland RPO Footing Drain Disconnect Program – June 2006 to September 2006
Acted as the Field Client Representative and Project Engineer for the installation of collector pipes and 20 sump pumps in various subdivisions in the City of Westland. Permanent meters were installed so that total flow removed from the homes could be monitored for the community's future information

Bloomfield Orchards Flow Metering Study (RPO Grant), Auburn Hills, MI – 2005
Field Engineer having installed, maintained, and collected data for 2 Isco Sanitary area-velocity flow meters, and one Isco rain gauge to prove the effectiveness of the Bloomfield Orchards footing drain disconnection program.

Footing Drain Disconnections (RPO VI-A Grant Project), City of Farmington, MI – 2005
Field Client Representative, Project Engineer, and inspector for the installation of collector pipes and 70 footing drain disconnections and sump pump installations in the Chatham Hills subdivision.

City of Westland Storm Water Management Plan, City of Westland - Department of Public Services, MI – 2004
Field Engineer having helped delineate the watershed boundaries with the city limits. The City of Westland retained OHM to create a city-wide storm water management master plan. The project had several objectives, including quantifying storm water flow to the Rouge River within the City, open drain and outfall investigation and a detention basin inventory and management program.

Derbyshire Drainage Engineering Study, Washtenaw County Drain Commissioner, MI – 2002
Field engineer having helped with calculation of existing versusm proposed storm water elevations for use in modeling the proposed improvements in Heasted methods StormCAD.

DEQ

Michigan Department of Environmental Quality
Water Bureau

CERTIFICATE OF TRAINING

presented to

Greg Marker

for successfully completing the training requirements
for administering Part 91, Soil Erosion and Sedimentation Control,
of the Natural Resources and Environmental Protection Act
(1994 PA 451, as amended)

Water Bureau Representative

Certificate Number: 05-0574

Date Issued: December 14, 2005

Expiration Date: December 14, 2010

Scott M. Kaiser
Senior Analyst

Education
- Pending Completion of Master of Science, GIS and Planning, Eastern Michigan University, Present
- Bachelor of Science in Resource Planning, University of Michigan, 2003

Professional Affiliation
Improving Michigan's Access to Geographic Information Networks (IMAGIN) - Member, 2004-Present

Professional Development
- Improving Michigan's Access to Geographic Information Networks, Annual GIS User Conference, 2005 & 2006
- Environmental Systems Research Institute, International User Conference, 2005, 2006 & 2007

Papers and Presentations
"Planning a City - An infrastructure Approach", IMAGIN, Annual GIS User Conference, Dearborn, MI, 2005

Awards
Mapping Gallery winner for analytical presentation, IMAGIN, MI, 2005

Experience
6 years of experience, 2 year with OHM

Background

Mr. Kaiser specializes in the areas of Geographic Information Systems (GIS), environmental planning and assessment, and hydrology. With more than six years experience in GIS and planning, his development concentrations range from utility and parcel mapping and database design to analysis for water resources. The spatial significance of GIS allows for drainage and basin analysis, riparian management, BMP establishment and/or enhancement as well as wetland delineation and/or mitigation.

Due to the increased demand for data accuracy and integrity his focus has also been on the integration and usage of several leaders in GPS solutions, more specifically Trimble, Leica, and Sokkia. Along with data platform design and development, Mr. Kaiser has also added his expertise to numerous professional and publishable award winning cartographic designs.

Relevant Experience

GIS Updates & CMMS Implementation, City of Westland, MI – 2005-Present
In 2005 the City chose City Works as their CMMS for workflow management and tracking. The GIS centric functionality of City Works made for a seamless integration with the existing utilities geodatabase. Following the CMMS install was the desire to increase the spatial accuracy of the GIS layers. The City employed the use of a Trimble Geo XH sub-foot accuracy GPS unit to collect all the utility features from hydrants and valves to street lights and signs. By integrating the new spatial location with the existing GIS feature locations gave the base layers a +/- one foot positional accuracy.

GIS Updates & CMMS Implementation, Charter Township of Orion, MI – 2007
Base layers were built for the Township by OHM several years back. However they desired to increase the functionality of the GIS by migrating to a geodatabase and implementing a CMMS. The course of action went through each user and department that uses or may use the GIS or CMMS for a review of there processes. The data was then compiled on the existing workflow and then presented to the departments on their options to move forward with GIS updates and CMMS implementation. Having the ideas presented to the Township empowered them to make the decisions about their system and the direction they wanted to go.

GIS Updates & CMMS Implementation, Superior Township, MI – 2005-Present
Since the inception of the original GIS base layers the Township has known the benefit the updating and keeping spatially accurate datasets. As new developments come into the municipality OHM acquires a digital submittal of the site plans and integrates it into the GIS. Quarterly deliveries are taken to the Township for staff use at the DPW and planning offices. To further empower the utilities workers they sought a CMMS package for increased workflow efficiency and process tracking.

GIS/CMMS Implementation, City of Auburn Hills, MI – 2005-Present
The City took on the task of streamlining their Department of Public Services via the usage of a GIS and a CMMS. The products from ESRI and CarteGraph were implemented to allow staff members' better access to geographic data, infrastructure and asset information 'as well as work order processing.

Water Main Study, Lincoln Park, MI – 2005
Responsibilities included the creation of a geodatabase for the City's water main pipes, valves, and hydrants. The data was collected via a GPS field survey and then integrated into the database. To further assist with the pipe placement a set of the City's water utilities atlas maps were scanned, georeferenced, and rectified to the parcels layer. Once all the point features were input into the database they were then connected and attributed with the help of the scanned atlas maps and orthophoto and prepared for the water model.

GIS & GPS utilities implementation plan & procedures, City of Pontiac, MI – 2005
The City of Pontiac desired a more efficient and accurate form of asset management for their underground utilities, therefore they chose the use of GIS. Responsibilities included preparing a client GIS/GPS needs assessment for the water, storm, and sanitary utilities, designing the data schema per the Cities requirements for the infrastructure geodatabase, overseeing a pilot study, and implementing the finalized database and field collection procedures. Following the database roll out was continued support for the Cities field and office staff.

Basin Retrofits Project, University of Michigan, Ann Arbor, MI – 2005
The university needed to assess their decaying and undersized storm retention and detention basins campus wide. With the utilization of field GPS surveying, GIS, and spreadsheets the drainage area for each basin was defined then a standard set of calculations was implemented to define the runoff and required holding capacity per the Washtenaw County Drain Standard. With the known conditions and the calculated requirements defined a recommendations report with accompanying maps were prepared to address areas of concern on the campus.

Utility and Parcel GIS Implementation, City of Monroe, MI – 2004
Mr. Kaiser acted as the technical liaison responsible for the development and implementation of the City of Monroe's GIS parcel and utilities databases. The obligations of the project were to design and implement a paper to GIS utilities digital conversion and a CAD to GIS parcel conversion as well as coordinate and lead bi-monthly roundtable discussions with the City regarding the progress of the project.

Utility and Parcel GIS Implementation, Charter Township of Northville, MI – 2004
For the Township's parcel and utilities GIS Mr. Kaiser was responsible for the development and implementation of the databases. The obligations of the project were to design and implement a CAD to GIS parcel and utilities conversions, compile field utility map books, and maintain yearly base layer updates.

County-wide Geodatabase Hydro Network Development, Washtenaw County Drain Commissioner – 2004
Responsibilities included the development and maintenance of the Washtenaw County Drainage network over an Arc SDE Oracle database. The features included in the network were the open and enclosed systems under the jurisdiction of the Drain Commissioner as well as any connecting water ways. Frequent maintenance was also focused on right-of-way mapping and as-built updates. To help with the data updates and integrity a series of Trimble GEO-XT GPS units running Arc Pad were integrated into the inspectors and engineers field assessments.

Christopher Lamus, PS

Survey Group Manager

OHM

Education
Bachelors of Science in Surveying Engineering, Ferris State University, 1993

Professional Registration
Professional Surveyor, State of Michigan, 1995
License Number: 41914

Professional Affiliations
- Michigan Society of Professional Surveyors
- American Congress on Surveying and Mapping

Professional Development
Mr. Lamus has completed several seminars that included topics of practical surveying with GPS, establishing control for projects and surveying in Michigan (laws and retracement procedures).

Experience
20 years of experience, 8 years with OHM

Background

As OHM's Survey Group Manager Mr. Lamus is responsible for setting up projects, scheduling, and establishing and monitoring project budgets. He also oversees and facilitates communication and coordination between his survey crews and technicians and the firm's engineers and CAD operators to ensure quality products.

Relevant Experience

North Terminal Redevelopment, Wayne County Airport Authority, City of Romulus, MI – Ongoing
Served as Lead Surveyor for multiple clients performing control verification, earthwork calculations, and layout services for new airport terminal. Various locations. $75,000.

Jackson Road Phase III, Scio Township, Washtenaw County, MI – 2004-Present
Project Surveyor responsible for planning, organizing, and directing survey to establish aerial targets, locating existing section corners, establishing control points (horizontal and vertical), road cross-sections, and hydraulic survey.

Northwestern Highway Connector, Orchard Lake Road to Haggerty, Road Commission for Oakland County, Farmington Hills, MI – Ongoing
As Project Survey Manager, Mr. Lamus is responsible for overall project responsibility including billings and monitoring of the budget. Mr. Lamus also provides QA/QC of the establishment of the horizontal and vertical control and existing right-of-way for aerial mapping and topographic design of nine traffic circles including mitigating wetland areas.

De-icing Fluid Force Main, Wayne County Airport Authority, City of Romulus, MI – Ongoing
Survey Group Manager for the project management and design of approximately 6.5 miles of force main and a lift station from the intersection of Middlebelt and Goddard to the intersection Ecorse and Cogswell. The route of the force main will cross several county drains, two railroads, MDOT highway (I-94), wetlands, City of Romulus right-of-way, and the Detroit Metropolitan Wayne County Airport. This involves coordination with numerous jurisdictional elements. OHM services will also include pre- and post-design topographical survey and construction management of the project.

Westland RPO Grant Project (Rear Yard Catch Basin Disconnect Program), City of Westland – Department of Public Services, MI – 2006
Senior Project Manager for this project. The City of Westland has conducted phases of manhole inspections of over 480 sanitary manholes structures to identify repairs necessary for eliminating inflow and infiltration of storm water into the sanitary sewer system. 21 of these locations were found to have sanitary manhole covers replaced with storm water covers allowing storm water to directly enter Westland's sanitary sewer system. A grant has been awarded the City for the repair of these locations and build storm sewers for drainage. The manhole rehabilitation efforts have been an integral part of Westland's storm water program because, not only did Westland identify locations where sanitary manholes were allowing storm water infiltration due to leaks in the structure, but they were able to identify known points where storm

water covers were allowing storm water to flow directly into the sanitary sewer system. By replacing these covers and constructing new storm sewer, storm water flow will be removed from Westland's sanitary sewer system and collected in its own storm sewer. The scope of services includes project administration, construction administration, and inspection. Also included is the writing and acquisition of easement documents.

Cogswell Area Drainage Study, City of Romulus, MI – 2006
Survey Group Manager for the complete drainage study of approximately 1 square mile residential area with a history of flooding and poor drainage. A report with recommendations will be submitted to the City.

Farmington RPO VI-A Grant Project, City of Farmington, MI – 2005
Survey Group Director for this project. The City of Farmington footing drain disconnection project involved the design and construction of 71 footing drain disconnections to the sanitary sewer within the Chatham Hills Subdivision to help control sanitary sewer overflows (SSOs) within the Rouge River Watershed. The scope of services for this project include project management, development of design drawings and contract documents, preparation of opinions of probable cost, permitting, construction observation, construction administration, and evaluation of the success of the project through metering.

Orion Storm Sewer GIS Phase 2, Orion Township, MI – 2004
Survey Manager to assist Township in seeking location of storm structures within Township by locating approximately 1100 structures and several detention basins using GPS to add this layer to the Township's GIS system. The Township will use this system to help with treatment of Storm Structures to help prevent the spread of the West Nile virus.

Main Street, East Shore Road to Nine Mile Road on-ramp to US-23, WCRC, Whitmore Lake, MI – 2002
As Project Manager, Mr. Lamus was responsible for overall management of the project, including project scoping, budget, schedule and QA/QC procedures. Project scope required collecting of topographic survey for the design of two miles of three-lane road, reconstruction with new traffic signals, establishing horizontal and vertical control, existing right-of-way, and generating a digital terrain model.

Grand River Avenue, Wixom Road to Beck Road, City of Novi, RCOC – 2002
Survey group manager for this project. Provided construction layout for approximately 1.5 miles of boulevard road, including storm sewer and utility relocations. This work also included preservation of a Public Land Survey corner as required by Act 803 of PA 2000. This act required that property controlling corners, such as a section corner, be replaced after construction. This process required that the Oakland County Remonumentation Board be advised that the corner was going to be disturbed during construction. The corner then needed to be witnessed prior to construction then replaced with an Oakland County Remonumentation monument after construction. State Plane Coordinates values were established. Final step was to witness the corner and provide a Land Corner Recordation Certificate to be recorded at the Oakland County Register of Deeds and a copy forwarded to Oakland County Remonumentation Board. OHM provided the design survey for approximately 1.5 miles of boulevard road including horizontal control in State Plane coordinates, by Global Positioning System and leveling using the Leica Digital Level.

STEVEN F. NISWANDER, Ph.D.

Principal - Niswander Environmental, LLC

10524 E. Grand River, Suite 103 ♦ Brighton, MI 48116

810.225.0539 ♦ Fax: 810.225.0653 ♦ Email: sniswan@niswander-env.com

Education:

Ph.D. 1997 Bioresource Engineering, Oregon State University, Corvallis, Oregon
Major: Bioresource Engineering; Minors: Soil Science, Water Resources
M.S. 1994 Natural Resources, The Ohio State University, Columbus, Ohio
B.S. 1991 Zoology, The Ohio State University, Columbus, Ohio

Certifications:

Professional Wetland Scientist #1276, Society of Wetland Scientists, 1993-present

General Experience and Qualifications:

Dr. Niswander is co-founder of Niswander Environmental and has over 15 years of wetlands and environmental management experience. His areas of research included wetlands for wastewater treatment, water quality, and ecological modeling as well as mitigation wetland functions. Dr. Niswander's research on the functions of mitigation wetlands was published in the Society of Wetland Scientists Journal 15(3):212-225. At the Iowa DOT, Dr. Niswander completed hundreds of wetland delineations and 404 permits, located and designed wetland mitigation sites, provided construction oversight, and developed the Iowa DOT Mitigation Monitoring Protocol. As a consultant, Dr. Niswander provides comprehensive ecological services to developers, road commissions, municipalities, and non-profit agencies and has managed all aspects of numerous wetland, stream, and floodplain projects. He has extensive experience with site planning and design and large-scale project management. Dr. Niswander is an expert on GIS-based Natural Features Inventories, specifically with application to Master Land Use Plans and open space management. Dr. Niswander has also completed numerous stream restoration and innovative stormwater treatment projects. Dr. Niswander's work also includes biomonitoring, reclamation plans, ecological inventories, threatened and endangered species surveys, in-depth GIS services, green building, and expert testimony.

Project Experience:

Black River Watershed Wetland Mitigation Bank Design - MDOT (2007-ongoing)
Project and Client Manager of wetland mitigation bank design contract as wetland assessment subcontractor to HRC.

Michigamme Watershed Wetland Mitigation Search and Design - MDOT (2007-ongoing)
Project and Client Manager of Michigamme Watershed mitigation search and design to fulfill current MDOT mitigation needs. Served as subcontractor to URS Corporation.

Westminster Wetland Mitigation Design/Build – Confidential Client (2007)
Project and Client Manager of design/build contract to construct 10 acres of wetland mitigation using surface water impoundment to fulfill mitigation needs of a large development company. Coordinated all aspects of project planning and implementation.

Lyon Oaks County Park Wetland Mitigation Design/Build – RCOC, OCP (2007)
Project and Client Manager of design/build contract to construct 13 acres of wetland mitigation and 7 acres of prairie on Oakland County Parks property to fulfill mitigation needs of the Road Commission of Oakland County. Coordinated all aspects of project planning and implementation.

Project Experience (cont.):

Biofiltration System Design – Livingston County Road Commission (2006-2007)
Project and Client Manager for biofiltration system design utilizing rain gardens and bioswales to intercept road runoff as part of Grand River Avenue improvements between Pleasant Valley and US-23. Design plans included Biofiltration Special Provision and Construction Quantities, and were incorporated into Engineers Construction Bid Package.

Stream Restoration Design – Nurenberg & Spiro (2007)
Project Manager for stream restoration project on the Rouge River intended to protect a shared residential bridge from erosive flows utilizing in-stream structures. At the request of Michigan Department of Environmental Quality, designed and oversaw installation of two cross vanes, one upstream and one downstream of the bridge. Site has become a demonstration site for MDEQ on best management practices.

Wetland Expert – Charter Township of West Bloomfield (2006-ongoing)
Client manager for comprehensive environmental services provided to the Township. Administers City's wetland, floodplain, environmental features setback, and stormwater ordinances. Guides planning issues regarding infrastructure projects, and performs site plan reviews of commercial, industrial, and residential site developments. Offers innovative solutions to lake restoration and stormwater management issues as part of the site plan review process in this lake community. Provides expert testimony.

Stream Restoration Demonstration Sites - MACC (2006 - ongoing)
Project Manager for two stream restoration demonstration sites within the Macatawa Watershed in Ottawa County as part of a Great Lakes Basin Program Grant. Assisted in obtaining grant, designed site, selected contractor, and oversaw installation of bioengineering techniques. Sites will be utilized as educational tools for watershed quality improvement.

Comprehensive Natural Features Inventory – Long Lake Township (2005-2007)
Project Manager for completion of NFI encompassing the entire Township. Mapped and field assessed all natural features including wetlands and watercourses, lakes, floodplains, woodlands, prairies, and threatened and endangered species. Developed a comprehensive GIS database that included ranking of Priority Natural Areas that will be utilized to establish local ordinances. Coordinated public hearings for NFI.

Stream Restoration - Real Estate Interests Group (2006)
Redesigned stream restoration corridor as part of a residential development in Taylor, including replacement of failing j-hooks, cross vanes, and other bioengineering techniques to meet MDEQ standards. Oversaw installation of new structures.

Threatened & Endangered Species Survey - Livingston Engineering (2006)
Conducted habitat assessment for the state endangered southern redbelly dace and white gentian and the state threatened ledberg's panic grass along the Huron River for a HDPE stormwater installation. Submitted determination of effects report to the MDNR.

Wetland and Stormwater Management Services - Grand Sakwa (2005-ongoing)
Project Manager for wetland and stormwater management aspects of large-scale commercial development in Rochester Hills. Site planning included incorporating the stormwater management system into an existing deteriorated peat wetland that will restore the wetland's hydrology. The site will be monitored for a period of five years.

Project Experience (cont.):

Maple River Watershed Mitigation Design - MDOT (2005-2006)
Project Manager for 39 acre wetland mitigation design including justification report, water budget, special provisions and cost estimates for an MDOT mitigation bank site in Mount Pleasant.

Smallenburg Park Urban Stormwater Demonstration Project - MACC (2005-2006)
Transformed low-quality, aesthetically unpleasant urban drainage swales into pleasing rain gardens for public education within Smallenburg Park in Holland, MI. Removed invasive species, planted native species within the basin, and incorporated a formal edge that identifies the limits of the natural features setback and prevents future encroachment. Recommendations were also given regarding basin design and operation to ensure proper functionality was achieved at the site.

Noordeloos Creek BMP Demonstration Site - MACC (2005)
Project Manager for design and construction of a wetland designed to intercept floodwaters to reduce sediment and phosphorous loads in the Macatawa Watershed. Conducted tour of the site to local agencies that was filmed and aired on local broadcasting networks.

M59/Howell Airport Mitigation Design - MDOT (2005)
Project Manager for design of 37 acres of wetland mitigation including water budget and special provisions in less than 2 months to meet tight bid letting deadline.

Wetland Services, Card Road - Road Commission of Macomb County (2005-ongoing)
Project Manager for wetland delineation and permitting and mitigation site location and design within road improvement project corridor. Conducted MDEQ negotiations for expedited permit issuance, including final mitigation plan acceptance.

Country Club Village Open Space Development - Centex Homes (2005-ongoing)
Designed and obtained approval for a model open space development plan for this large-scale residential development, which included rain gardens, treatment wetlands, stormwater detention basins, one mile of stream restoration, and 8 acres of prairie establishment. After initial implementation of the open space development plan, reviewed plans and evaluated on-site conditions to determine deviations from approved plans and provided remediation suggestions. Oversaw implementation of recommended corrective actions, which included in-stream structures, modifications to constructed wetlands, and planting and seeding of the entire site (prairie and wetland). Completed long-term maintenance plan for the homeowner's association.

Wetland, Site Planning, and Expert Testimony Services - Miller, Canfield, Paddock and Stone, PLC (2005-ongoing)
Project Manager for wetland permitting, mitigation site location, and site planning for a commercial development in Westland. MDEQ wetland permit was denied due to large amount of impact and is currently a contested case. Under retainer to provide expert testimony regarding wetlands takings issues.

Project Experience (cont.):

Bioswale Design - HRC and Bloomfield Township (2005)
Designed bioswale used as a demonstration of Best Management Practices for stormwater management and water quality improvement. Design included innovative water quality treatment system incorporating infiltration trenches and native plantings that will reduce sediment and nutrient loading into Meadow Lake. Presented at the homeowners association public meeting to review completion of the project.

Comprehensive Natural Features Inventory - City of Rochester Hills (2004-2005)
Project Manager for completion of NFI encompassing the entire City. Mapped and field assessed all natural features including wetlands and watercourses, woodlands, steep slopes, and floodplains. Developed a comprehensive GIS database that included ranking of Priority Natural Areas. NFI was utilized in the development of the City's Master Land Use Plan and is currently being incorporated into a new Open Space ordinance. Also assisted in development of Steep Slope ordinance that resulted from the NFI completion.

Wetland and Site Planning Services - Ypsilanti Township (2004-ongoing)
Project and Agency Manager for wetland and planning services on Ypsilanti Township property slated for large-scale commercial development that included complicated wetland, floodplain, and stormwater management issues. Conducted wetland delineation on 170 acres, identified mitigation area, developed alternative site master plans for the property, and obtained MDEQ wetland and floodplain permits. Construction oversight will be completed in fall 2006 and mitigation will be monitored for a period of five years.

Wetland Mitigation Search - Road Commission for Oakland County (2004)
A county wide GIS search was conducted to locate potential mitigation sites. Sixty potential sites were identified and ranked, and the top 10 were field evaluated. The RCOC is utilizing the study to meet their existing and future mitigation needs.

Hartland Road Mitigation Design - Livingston County Road Commission (2003)
Completed wetland delineation, wetland permit, mitigation site location, mitigation design, and construction in record time assuring the opening of Hartland High School.

Wetland Delineation and Woodland Assessment - 415-acre parcel, Real Estate Interests Group (2003-2004)
Project Manager for delineation on 415-acre site in Northville Township for private development. Conducted pre-application meeting with MDEQ to obtain concurrence. Oversaw assessment of woodlands on site including a quality rating utilizing historical aerial photos to confirm age class.

Environmental Planner - City of Rochester Hills, MI (2001-2004)
Client manager for comprehensive environmental services provided to the City. Administered City's wetland and watercourse ordinances, which required review of all new site plans. Guided the city in infrastructure planning including wetland permitting, threatened and endangered species survey, drain relocation, and water and sewer extensions.

Wetland Mitigation Monitoring Hamlin Road - City of Rochester Hills (2000-2004)
Conducted annual monitoring of flora and fauna at seven wetland mitigation areas totaling 7.5 acres. Evaluated development of mitigation area with special emphasis on changes in floral composition and wildlife usage.

Project Experience (cont.):

Environmental Assessment, 5-lane widening - City of Novi (2000-2002)
Project manager for the completion of an Environmental Assessment for the widening of Novi Road from two lanes to five lanes. Significant historical, wetland, access, noise, and contamination issues were addressed. Managed all aspects of EA including public involvement, alternatives analysis, and coordination with MDOT, MDEQ, and FHWA.

Clinton River Forced Main Crossing - City of Rochester Hills (2002)
Surveyed project area for state threatened Spotted Turtle and species of special concern Leadplant. Obtained MDNR clearance for proposed project.

Wetland Inventory – City of Auburn Hills (2001)
Mapped all wetlands in a 2,000-acre watershed. Conducted a functional assessment of 218 acres of wetland. Created a GIS wetlands coverage with a functional assessment attribute for use with the city's GIS. Inventory used for site planning, wetland protection, and stormwater management.

Project Planning/EIS, US 61 Bypass - Iowa DOT, Fort Madison, Iowa (1999)
Wetland and woodlands mapping and inventory on 0.25 mile wide by 6 mile long corridor. Developed preferred alternative and wrote biological assessment for inclusion in EIS. Located 150 acres of woodland mitigation and wetland preservation.

US 71 Bypass - Iowa DOT, Spencer, Iowa (1997-2000)
Conducted wetland alternatives analysis for 6 miles of new alignment using GIS, CAD, aerial photograph interpretation, and field investigations. Wrote wetland, threatened and endangered species, land use, and 4(f) evaluations portions of the EA. Delineated 23 wetlands totaling over 30 acres. Located mitigation sites and developed mitigation plan for creation of 50 acres of wetland.

Recent Training and Workshops:

Stream Restoration Design Principles, North Carolina Stream Restoration Program, April 2007
LEED for New Construction and Major Renovations, U.S. Green Building Council, 2006
Asters and Goldenrods, Institute for Wetlands and Coastal Training and Research, September 2000
Practical Highway Hydrology, National Highway Institute, October 1999
Functional Assessment of Wetlands, National Highway Institute, August 1999
Hydric Soils for Wetland Delineation, USDA NRCS, July 1999
Wetlands: Function, Assessment, and Management - SWS 20th Annual Meeting, June 1999
Army Corps of Engineers Regulatory IV Training (Wetland Delineation using the 1987 Manual), Des Moines, IA, September 1998
Wetland Plant Identification Course, Missouri DOT and Dr. Robert Mohlenbrock, Oct 1998
Riparian Management Systems Design and Installation Workshop, Agroecology Issue Team and Trees Forever, Ames, IA, November 1997
Assessing Wetland Functions: An In-Depth and Practical Look at Today's Methods, Society of Wetland Scientist North Central Chapter, Minneapolis, MN, September

Presentations:

Niswander S.F. (Invited Speaker) 2007. Natural Features Inventory. Michigan Association of Planners Annual Conference, Acme, MI

Niswander S.F. (Invited Speaker) 2006. Wetland Mitigation: Finding and Developing a Good Site. 2006. Michigan Department of Environmental Quality Conference: "Transportation and the Environment", Higgins Lake, MI

Niswander S.F. (Invited Speaker) 2006. Long Lake Township Natural Features Inventory – A Township Perspective. Natural Features Inventory Workshop, Northwest Council of Governments, Traverse City, MI

Niswander S.F. (Invited Speaker) 2006. Value of Natural Features Inventories in Master Land Use Plans. Natural Features Inventory Workshops, Livingston County Natural Features Inventory Coalition, Howell, MI

Niswander, S.F. 2006. Natural Features Inventories and Local Ordinances for Wetland Protection – a Michigan Perspective. 2006 Association of State Wetland Managers International Symposium, Traverse City, MI

Niswander, S.F. 2005. Value of Natural Features Inventories in Master Land Use Plans. Oakland County Planners Conference, Oakland County, MI

Niswander, S.F., and J.A. Moore. 1996. The Importance of a Water Budget When Evaluating a Constructed Wetland, Oregon State University Graduate Student Conference, Corvallis, OR

Niswander, S.F., J.A. Moore, M.J. Gamroth, and S.M. Skarda. 1995. Constructed Wetland Treatment of Pulp Mill Effluent and Dairy Wastewater, James A Vomocil Water Quality Conference: Wetlands, Best Management Practices, and Riparian Zones, Corvallis, OR

Research Publications and Technical Papers

Niswander, S.F. 1997. Treatment of Dairy Wastewater in a Constructed Wetland System: Evapotranspiration, Hydrology, Hydraulics, Treatment Performance, and Nitrogen Cycling Processes. Ph.D. dissertation, Oregon State University

Niswander, S.F., and W.J. Mitsch. 1995. Functional analysis of a two-year-old created in-stream wetland: hydrology, phosphorus retention, and vegetation survival and growth, *Wetlands* 15(3):212-225.

Niswander, S.F., and J.A. Moore. 1995. Treatment of pulp mill effluent with a constructed wetland. In: *Proceedings of James A Vomocil Water Quality Conference, Wetlands Best Management Practices and Riparian Zones*, Corvallis Oregon, pp. 2-23.

Niswander, S.F., J.A. Moore, M.J. Gamroth, and S.M. Skarda. 1995. Treating dairy flushwater in a constructed wetland. In: *Proceedings of James A Vomocil Water Quality Conference, Wetlands Best Management Practices and Riparian Zones,* Corvallis Oregon. pp. 24-39.

Skarda, S.M., J.A. Moore, S.F. Niswander, and M.J. Gamroth. 1994. Preliminary results of wetland for treatment of dairy farm wastewater. In: P.J. DuBowy and R.P. Reaves (Editors). *Constructed Wetlands for Animal Waste Management*, Lafayette, Indiana. pp. 34-42.

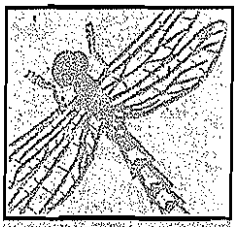
Niswander, S.F. 1994. Functional Analysis and Modeling of a Newly Created Wetland.

Honors:

1995	Jefferson B. Rodgers Agricultural Engineering Scholarship
1993	Society of Wetland Scientist - Student Travel Scholarship to Annual Meeting
1993-1997	Bioresource Engineering Departmental Graduate Research Assistantship

Professional Societies:

Association of State Wetland Managers 2006-present
Society of Wetland Scientists (Professional Wetland Scientist #1276) 1993-present
Oregon Society of Soil Scientist 1994 - 1997



AMY A. BERRY

Project Manager - Niswander Environmental, LLC

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810.225.0539 ♦ Fax: 810.225.0653 ♦ Email: aberry@niswander-env.com

Education:

B.S. 1998 Lyman Briggs School - Environmental Science & Management, Michigan State University

Certifications:

Professional Wetland Scientist #1777, Society of Wetland Scientists, 2007-present
Certified Stormwater Operator #C-13862, MDEQ, 2007-present
Certified Associate Ecologist #114741, Ecological Society of America, 2003-present

General Experience and Qualifications:

Ms. Berry has 9 years experience in wetland and ecosystem management, including work with local, state, and federal government, private consulting firms, non-profit agencies, and private conservation groups. Her work has focused on wetland delineation, permitting, and mitigation services (including site location, design, hydrology analysis, justification reports, bid documents, construction oversight, and project monitoring). Her work also includes ecological inventories, wetland inventories, tree surveys, threatened and endangered species surveys, wildlife habitat management, and GIS and CAD services.

Project Experience Highlights (2007):

Black River Watershed Wetland Mitigation Bank Design - MDOT (2007-ongoing)
Designed 40 acres of wetland mitigation using surface water impoundment for an MDOT mitigation bank site including detailed Design Justification Report and Special Provisions.

Michigamme Watershed Wetland Mitigation Search and Design - MDOT (2007-ongoing)
Conducted GIS search to determine availability of suitable land within the Michigamme Watershed to fulfill current MDOT mitigation needs. Completed search report indicating no suitable land available in the watershed. Subsequently designed 6.6 acres of wetland mitigation outside the watershed using the shared water source model including detailed justification report and special provisions.

City of Zeeland Water Quality BMP Design and Construction - MACC (2006-ongoing)
Project Manager for design, permitting, and construction of MDEQ Clean Water Initiative grant projects in the City of Zeeland. This grant included two projects: the Paw Paw Park bioswale and the City Street Maintenance Facility rain garden. These projects were designed to reduce sediment and phosphorous loads in the Macatawa Watershed. Projects are to be implemented in 2008. Also completed the Paw Paw Park Master Plan for the City that outlined future water quality feature projects.

Westminster Wetland Mitigation Design/Build – Confidential Client (2007)
Designed, obtained permits, and acted as contractor to construct 10 acres of wetland mitigation using surface water impoundment to fulfill mitigation needs of a large development company. The design included a Design Justification Report, including Pierce Water Modeling. Also served as Stormwater Operator during construction.

Mastis Restoration Plan – West Bloomfield Twp (2007)
Designed Wetland, Woodland, and Natural Features Setback Restoration Plan as part of West Bloomfield Township's fill violation requirements and included planting plan for restoring the disturbed regulated features.

Project Experience Highlights (2006-2007):

Lyon Oaks County Park Wetland Mitigation Design/Build – RCOC, OCP (2007)
Designed, obtained permits, and acted as contractor to construct 13 acres of wetland mitigation and 7 acres of prairie on Oakland County Parks property to fulfill mitigation needs of the Road Commission of Oakland County. The project included a Design Justification Report, including Pierce Water Modeling, and a Maintenance and Monitoring Report.

Water Quality BMP Demonstration Sites - MACC (2006-2007)
Project Manager of design, permitting, and construction of Great Lakes Basin Program grant bioswale projects designed to reduce sediment and phosphorous loads in the Macatawa Watershed. Projects located on lands owned and jointly funded by the Road Commission of Ottawa County and MDOT. Completed fact sheets as an educational tool for the watershed program. Conducted project tour the Macatawa Technical Committee, which was aired on local public stations.

Biofiltration System Design – Livingston County Road Commission (2006-2007)
Designed biofiltration system utilizing rain gardens and bioswales to intercept road runoff as part of Grand River Avenue improvements between Pleasant Valley and US-23. Design plans included Biofiltration Special Provision and Construction Quantities, and were incorporated into Engineers Construction Bid Package.

Wetland Inventory – Bloomfield Township (2006-2007)
Project and Client Manager of comprehensive Wetland Inventory of Bloomfield Township as part of Rouge River Wet Weather Demonstration Grant. Inventory included functional assessment of all wetlands using the Michigan Rapid Assessment Methodology being tested by the MDEQ. Bloomfield Township was the first community to use this method as part of a large-scale wetland inventory. Wetlands were ranked based on their MiRAM score and assessed for importance to the Township. Public Hearing held for map adoption into their local Wetland Ordinance.

Stream Restoration Design – Nurenberg & Spiro (2007)
Assisted with design of stream restoration project on the Rouge River. Design intended to protect a shared residential bridge from erosive flows utilizing in-stream structures. At the request of MDEQ, two cross vanes were installed, one upstream and one downstream of the bridge. MDEQ has lauded this site as extremely successful.

Maple River Watershed Wetland Mitigation Bank Design - MDOT (2006)
Designed 39 acres of wetland mitigation using surface water impoundment for an MDOT mitigation bank site including detailed justification report and special provisions.

M59/Howell Airport Mitigation Design - MDOT (2005)
Designed 37 acres of wetland mitigation incorporating complicated groundwater regime and prepared special provisions in less than 2 months to meet tight bid letting deadline.

Landscape/Wetland Restoration Plan - Swantek (2006)
Designed restoration plan as part of West Bloomfield Township wetland fill violation requirements and included planting plan for wetland and Natural Features Setback.

Project Experience Highlights (2004-2006):

Richfield Landfill Wetland Mitigation Design – Dragun Corporation (2006)
Designed wetland mitigation for landfill expansion site utilizing the shared water source model and completed detailed water budget, justification report, special provisions, and cost estimates. Mitigation construction oversight will be completed in fall of 2006 with subsequent monitoring for a period of 5 years.

Seaver Farms Property Wetland Mitigation Design – Ypsilanti Township (2005-2007)
Designed wetland mitigation for Township Property development utilizing the shared water source model and completed detailed justification report, special provisions, and cost estimates to meet MDEQ guidelines. Oversaw construction of mitigation site and adjacent drain infiltration trench in 2007.

Noordeloos Creek BMP Demonstration Site - MACC (2005)
Designed, obtained permits, selected contractors, and oversaw construction of a wetland designed to intercept floodwaters to reduce sediment and phosphorous loads in the Macatawa Watershed. Site is utilized as an educational tool for the watershed program.

Threatened & Endangered Species Surveys - Rd Comm. of Macomb County, (2005)
Conducted habitat evaluation for the federally-endangered Indiana bat and the State-threatened wavey-rayed lamp mussel along a proposed road improvement corridor. Completed Biological Assessment report for submission to the USFWS and MDNR to obtain environmental clearance. Clearance was obtained in less than one month.

Wetland Services, Card Road - Road Commission of Macomb County (2005-ongoing)
Completed delineation and mitigation site location within road improvement project corridor. Obtained MDEQ Part 301, 303 and 31 permit. Completed detailed final mitigation plans including special provisions and cost estimates. Reviewed draft permit and negotiated changes with MDEQ; obtained permit months prior to bid letting date.

Bioswale Construction Oversight – HRC & Bloomfield Township (2005)
Completed construction oversight for redesigned roadside drainage ditch that discharges to Meadow Lake. Design included innovative water quality treatment system incorporating infiltration trenches and native plantings that will reduce sediment and nutrient loading into the lake. Designed presentation for the homeowners association public meeting to review completion of the project.

Smallenburg Park Urban Stormwater Demonstration Project - MACC (2005)
Transformed low-quality, aesthetically unpleasant urban drainage swales into pleasing rain gardens for public education within Smallenburg Park in Holland, MI. Removed invasive species, planted native species within the basin, and incorporated a formal edge that identifies the limits of the natural features setback and prevents future encroachment. Recommendations were also given regarding basin design and operation to ensure proper functionality was achieved at the site.

Comprehensive Natural Features Inventory - City of Rochester Hills (2004-2005)
All natural features including wetlands, woodlands, prairies, and watercourses were mapped and field assessed. A comprehensive GIS database was developed and utilized for the development of the City's Master Land Use Plan.

Project Experience Highlights (1998-2004):

Wetland Mitigation Search - Road Commission for Oakland County (2004)
Conducted a county wide search to locate potential mitigation sites. Sixty potential sites were identified and ranked using GIS. These sites were further ranked through base map interpretation. Field verification confirmed final selection.

Ecological Inventory - Landfill Expansion Site, MI (2004)
Conducted assessment of streams, wetlands, and woodland on 55 acres for future landfill expansion site. Mapped all natural features including existing and past vegetation types and hydrology. Conducted analysis of Emerald Ash Borer damage.

Large Scale Road Improvement Project Environmental Clearance – Road Commission for Oakland County (2003-2004)
Project Manager for Environmental Clearance aspect of a large road improvement project. Conducted wetland delineation and tree survey for entire project corridor. Began mitigation site design including groundwater well installation, well monitoring, and preliminary mitigation site plans. Coordinated with local government on permitting issues and managed project schedule.

Hartland Road Mitigation Design - Livingston County Road Commission (2002-2004)
Delineated wetlands, obtained MDEQ wetland permit, designed mitigation, and wrote special provisions. Conducted initial year of monitoring for the mitigation site including evaluation of success of establishing hydrology and wetland vegetation as well as wildlife use of the site.

Ecological Inventory - City of Detroit Property (2002)
Conducted assessment of streams, floodplains, wetlands, woodlands and threatened and endangered species on 900 acres. Mapped natural features in GIS and determined development constraints for the property based on local, state, and federal regulations in order to aid in establishing property value.

Wetland Inventory - City of East Lansing, MI (2002)
Conducted citywide wetland inventory including GIS wetlands coverage with a functional assessment attribute data. Presented the wetland inventory at the City public hearing. Inventory used for wetland protection and City land use planning.

West Michigan Habitat Restoration Program - Timberland Resource Conservation and Development Area Council, Inc. (1999-2002)
Project Manager for private landowner wetland and grassland restoration program in an 8 county area of West Michigan in partnership with the U.S. Fish & Wildlife Service, the Wetlands Foundation of West Michigan, Ducks Unlimited, Conservation Districts, and local wildlife groups. Program resulted in the restoration of over 400 acres wetland and 130 acres prairie and the creation of numerous Habitat Management Plans.

Landowner's Guide to Wildlife Management – MDNR Private Lands Office (1998)
Wrote excerpts, provided editing services, and completed natural science artwork for comprehensive habitat management guide for private landowners as part of a term work program at the MDNR.

Recent Training and Workshops:

Vegetation Establishment for Constructed Wetlands, Wetland Training Institute, 2007
Planning Hydrology for Constructed Wetlands, Wetland Training Institute, 2006
Grasses, University of Michigan Matthaei Botanical Gardens, 2002
Wetland Identification and Delineation, Wetland Coastal Resources, 2002
Prescribed Fire on Private Lands, U.S. Forest Service, 2001
Threatened and Endangered Species: Their Ecosystems and State and Federal Legislation Processes, Michigan Natural Features Inventory, 2000
Fens, Michigan Natural Features Inventory, 2000
Grassland, Forest, and Wetland Ecosystems and Management Techniques, Michigan Department of Natural Resources, 1999

Professional Presentations and Technical Papers

Numerous Wetland Mitigation Justification Reports. Various Clients and Locales. 2005-present.
Macatawa Watershed Technical Committee: Great Lakes Commission Grant BMP Projects – Tour and Discussion. Zeeland, MI, 2007.
City of East Lansing Wetland Inventory Report. Presented at the City of East Lansing public hearing, East Lansing, MI, 2003.
Wetland Management Workshop: Restoring and enhancing wetlands on private lands. Presented at the Kent County and Montcalm County Conservation Districts, 2001 and 2000.
Pre- and Post- Wetland Restoration Guides. Submitted for public distribution to several local Conservation Districts in West Michigan, 2001.
Shallow Water Management for Wildlife. Submitted for public distribution to several local Conservation Districts in West Michigan, 2001.
Grassland Management and Restoration. Submitted for public distribution to several local Conservation Districts in West Michigan, 2000.
Managing Michigan's Wildlife: A landowner's guide. Published by the Michigan Department of Natural Resources, East Lansing, 1998.

Honors:

Honors graduate of Michigan State University, 1998
College of Natural Science Dean's List, 1996-1998
Michigan Competitive Scholarship, MSU High Achiever Grant, 1994-1998
Student Environmental Action Coalition volunteer, 1997-1998
Friends of the Shiawassee River volunteer, 1997
Holmes Hall Director of Recycling, 1996
Environmental Conservation Organization representative, 1995

Professional Societies & Certifications:

Society of Wetland Scientists (Professional Wetland Scientist #1777)
Ecological Society of America (Certified Associate Ecologist #114741)
Association of State Wetland Managers

Section 4 – Understanding of the Scope of Services Proposed Schedule

Statement of Understanding

The following Project Purpose and Objectives was developed by the City and OHM in preparing the grant application. We believe that it accurately portrays the project purpose and objectives. A key component for this project is expected to be the schedule, which is addressed after the grant application information.

PROJECT PURPOSE AND OBJECTIVES

The Middle One Subwatershed Management Plan identifies excessive storm water flows leading to significant erosion, sedimentation and loss of habitat as key concerns of the subwatershed. The goals of the proposed project are to reduce the frequency of bank full events downstream of the Taft and Bishop regional detention basins. The City of Novi identifies an action item in their SWPPI that discusses retrofitting existing detention basins to reduce storm water quantity and improve storm water quality. By performing the proposed project, Novi will be addressing the following goals of the Middle One Subwatershed Management Plan:

- *Reduction of excessive storm water flows that cause bank erosion, sedimentation and loss of habitat for fish and macroinvertebrates.*
- *Reduction of high sediment levels that contribute to a degradation of aesthetics, can limit light to aquatic plants that carry urban pollutants.*

Proposed Project Description

The proposed project consists of retrofitting two (2) regional detention basins. The Taft Basin is located along the Walled Lake Branch of the Middle Rouge River, and the Bishop Basin is located along Bishop Creek. These two basins are identified in the City of Novi's Storm Water Master Plan Update as providing inadequate attenuation. The lack of attenuation is causing stream bank erosion from excessive bank full flows in the vicinity of the Taft and Bishop Basins. The lack of attenuation varies based on the storm event and is also specific to each basin. It should also be noted that from our field investigations over the years, we have observed an increase in what appears to be unnatural stream bank erosion. This is a sign of an increase in the number of bank full events that occur as compared to a pre-developed condition.

The basin control structures will be redesigned to provide attenuation at high frequency events (i.e. 1, 2 and 10-year. Currently it appears that most of the regional basins were designed to attenuate larger events above the 10-year.

The City of Novi is, therefore, applying for a Round VIII, Part B RPO grant to retrofit the two existing regional detention basins. This will be accomplished by retrofitting the outlet control structures, installing in-line sediment traps, retrofitting wet pond areas, and stream restoration and native plantings in the wet pond areas. By reducing the frequency of bank full events, the stream banks downstream of each basin will naturally reestablish vegetation. As vegetation is reestablished, stream banks will repair more quickly after larger storm events. Water quality will be improved for both basins and their associated streams due to a decrease in unnatural sedimentation.

A. Anticipated Impact/Benefits of the Project to the River/Subwatershed/Watershed
The anticipated benefit of this project is to reduce the excessive storm water flows in order to reduce erosion, sedimentation and increase habitat for fish and macroinvertebrates. This project should also reduce the high sediment levels that contribute to the degradation of aesthetics and limit the light to aquatic plants.

B. Project's Consistency with the Goals and Objectives of the Subwatershed
This project addresses the following two goals of the Middle One Subwatershed Management Plan:

- *Reduction of excessive storm water flows that cause bank erosion, sedimentation and loss of habitat for fish and macroinvertebrates; and*
- *Reduction of high sediment levels that contribute to a degradation of aesthetics, can limit light to aquatic plants that carry urban pollutants.*

Implementation of the retrofits for each basin will reduce the bank full events which will allow the banks to naturally reestablish vegetation. This will decrease erosion and sedimentation in downstream reaches of each stream. By encouraging retrofit applications to existing detention basins, this project will be a showcase for other regional detention basins that are not performing as originally designed.

C. Cooperative, Innovative, or Demonstrative Nature of the Project
It is planned that the City of Novi will provide a narrative of their experience on this project with before and after photos as an aid to other communities considering detention basin retrofits. The stream bank inventory will be performed before and for two (2) years after the project to assess benefits. The assessment will extend past the duration of the RPO grant.

Schedule

The critical time component for this project is the vegetation that should be planted in the early fall. Given the expected duration of the MDEQ permit review process, the permit application will need to be submitted expeditiously.

Scope of Services

Task 1: Obtain Information

Under this task, OHM will obtain existing information required to complete the analysis and design. It should be noted that has most of the information needed in-house. Additional and/or updated information required to be obtain is as follows:

1. Obtain flow rates from the MDEQ for the 1, 2, 10, 50 and 100-year recurrence interval events. This information will be used for the channel design in the Taft Basin and to use in the hydraulic analysis.

2. Obtain updated GIS information from the City, if available.

3. Obtain any additional easement documents for each basin, if not previously supplied for Phase 2 of the Storm Water Master Plan update.

Task 1 Deliverables:
MDEQ flow rates, GIS information and easement documents not previously obtained

Task 2: Topographic Survey

Under this task, OHM will supplement existing survey data to utilize for the hydraulic analysis and design of the retrofits. It should be noted that the existing topographic data at the Taft Basin is sufficient for analysis and design. Additional data at the Bishop Basin will be beneficial in determining depths in the "wet pond" area, since this information could not be obtained previously. Specific work efforts include:

1. Utilizing horizontal and vertical control previously obtained by OHM at the Bishop Basin, obtain additional topographic (hydrographic) information in the "wet pond" area of the Bishop Basin. This will be performed by cutting holes in the ice to obtain pond bottom elevations. An attempt will also

be made to obtain probes to determine the depth of sediment. If the depth is found to be excessive, then the sediment may need to be removed as part of the retrofit project.

2. Obtain two channel cross sections approximately 100 and 500 feet downstream of each basin. Also, obtain Grand River Avenue culvert information just downstream of the Bishop Basin. The cross section information will be used to verify the FEMA cross section information and will be used to compute the tailwater for the hydraulic analysis at each of the basins.

3. Obtain one channel cross section upstream of the Taft Basin to use for design of the channel geometry in the rehabilitation of the channel/floodplain. This information was requested by the MDEQ.

Task 2 Deliverables:
Hydrographic Survey of Bishop Basin and cross sections at both Taft and Bishop Basins

Task 3: Hydrologic and Hydraulic Analysis

A steady state hydrologic model exists for the two basins with backwater analyses for recurrence intervals up to the 100-year storm event. Using this information along with the stream cross section information obtained in Task 2, a stage-discharge relationship will be developed for each existing structure for the 1, 2, 10, 50 and 100-year storm events. We have discussed performing the hydraulics in this manner with the MDEQ and they have provided preliminary approval of these methods for justification of "no harmful interference". Specific work efforts include:

1. Using the City's GIS topographic data and topographic data from the Phase 2 Storm Water Master Plan, standard hydraulic equations and the FHWA program HY-8, (culverts) compute the existing stage-storage-discharge relationship for each of the basins. This information will be used as a check to the data in the hydrologic analysis on file at the City.

2. Using an iterative procedure, develop stage-storage-discharge relationships for the proposed retrofit structures. The iterative process involves picking smaller low level outlet sizes and computing the hydraulics. Based on the increase in headwater for a given flow rate, an upper level retrofit configuration will be chosen and the hydraulics recomputed. This process will continue until the configuration that attains the most attenuation for the largest range in events while matching the water surface elevation at the 100-year event is determined.

3. Prepare technical memorandum and submit to the City.

Task 3 Deliverables:
Technical memorandum showing hydraulic calculations for the 1, 2, 10, 50 and 100-year storm events and resulting retrofit configurations.

Task 4: Preliminary Design

The project team will prepare preliminary plans for the Taft and Bishop Basin pond retrofits and meet with the City of Novi and MDEQ to obtain input. From field observations during Phase 2 of the Stormwater Master Plan Update, OHM envisions the following ideas for each basin:

Taft Basin
Along with reworking the outlet structure and correction of the structural deficiencies listed in the 2007 Storm Water Master Plan Phase II (outlet erosion, missing slide gate, raising sanitary manhole, filling animal burrow), we envision re-creating a meandering stream with floodplain shelves in the "open" area of the basin. The re-created channel will allow for enhanced fish passage and provide valuable in-stream habitat.

Placing an in-line sediment trap upstream of the basin will help to minimize passage of upland sediment (from construction sites) that has entered the upstream reaches of the stream. Restoration of the floodplain shelf and stream corridor surrounding the basin area with native plantings will create a basin that will not only provide the necessary storm water storage but will also provide valuable wildlife habitat and water quality improvements.

Bishop Basin

Rehabilitation of the outlet structure will potentially include replacement of the standpipe with a structure that not only increases attenuation but also is relatively maintenance free. Also, the structural deficiencies listed in the 2007 Storm Water Master Plan Phase II will be corrected (failed pipe, sediment accumulation near outlet, west bank erosion). We envision habitat improvements to include waterfowl nesting islands, small sediment traps at the point source storm water outfall into the basin, and enhancement of the basin's riparian areas.

At the time of this proposal, OHM has been in contact with Pat Durak of the MDEQ and Pat has recommended that we set-up a "Pre-application" meeting with the MDEQ as soon as possible. The MDEQ has established a fee schedule for pre-application activities. The project team understands the importance of input from the MDEQ and the importance of timing to obtain permits prior to construction. A Pre-application meeting will be scheduled with the MDEQ and the City immediately upon project award in January 2008 to obtain input on conceptual designs at the Taft and Bishop Basins. The team will incorporate the comments from the Pre-application meeting prior to permit application. This approach will expedite the MDEQ review and help to eliminate potential problems and rework associated with permit review. The MDEQ permitting time will be accounted for in the project schedule. Specific work efforts include:

1. Meet with the City to "kick-off" the project. We envision holding this meeting in early January on the same day as the Pre-application meeting with the MDEQ.

2. Meet with the City and MDEQ in a MDEQ Pre-application meeting to discuss our ideas for rehabilitation and the conceptual plans prepared as part of the Storm Water Master Plan Phase II.

3. After meeting with Novi and the MDEQ, OHM will revise the conceptual plans and submit the preliminary plans (50 percent complete) to the City for input. A preliminary construction cost estimate will be prepared for each basin at this time.

4. Based on the City's input on the preliminary plans, the plans will be revised and a MDEQ permit application along with the required supporting material (fill/cut computations, riprap volumes, hydrologic computations, hydraulic computations, preliminary plans) will be prepared and submitted. Our fee does not include permit application fees. It is imperative that the plans be submitted early in the process in order to obtain a MDEQ permit in time for the 2008 construction season. The plans will include plan views (grading) of the basin areas, typical cross sections and outlet structure modification details. A conceptual plan of the proposed habitat restoration activities will also be prepared at this time.

5. Contact franchised utility companies to obtain location of utilities.

6. Forward the plans to MDOT for input on construction access requirements (for the Bishop Basin).

Task 4 Deliverables:

MDEQ Pre-application meeting, preliminary plans, revised plans based on initial comments, cost estimates, MDEQ Joint Permit Application and accompanying materials

Task 5: Final Engineering Design and Preparation of Contract Documents

OHM will prepare construction plans and contract documents based on City and MDEQ input on the preliminary plans. The project team will contact the MDEQ District Office for initial comments to expedite the process. The plans will be revised based on City and MDEQ comments. Specific work efforts are as follows:

1. Revise preliminary plans and submit 90 percent complete plans and contract documents to the City and RPO for review and input. The 90 percent complete plans will include plan views of the basin areas (grading, SESC items), typical cross sections, outlet structure details, native planting plans, SESC details, riprap details and other standard details.

2. Prepare construction access plan which will include existing permanent easements, property lines and ROWs. We have assumed that no new permanent or temporary easements will be required and that the improvements will take place within existing City easements/property. Also, prepare a MDOT ROW Use Permit (permit fee has not been included in fee).

3. Prepare a final Engineer's Opinion of Probable Construction Cost.

4. Submit plans to the City, meet with the City and RPO to discuss final comments, and revise the plans and contract documents for bidding.

5. Once the City has advertised the project, OHM will provide plans and contract documents to the prospective contractors and answer/document contractor's questions during the bidding process.

6. Attend the bid opening, provide bid tabulation review bidders qualifications and make a recommendation of award to the City. Assist the City in preparation of executed contracts.

Task 5 Deliverables:
Final contract documents, final project cost estimate, bid tabulation, executed contracts

Task 6: Field Investigation & Obtain Baseline Data

OHM previously conducted site evaluations of the Taft and Bishop Basins during Phase 2 of the Stormwater Master Plan Update. Therefore, we have sufficient information to initiate and complete the design for each basin. Under this task, a habitat and stream channel assessment will be completed approximately 1000 feet downstream of each of the basins. This data will serve as base line data for assisting with determination of each retrofit's impact on the downstream reach of each stream. Specific work efforts include:

1. Walk each creek to assess general types of vegetation along the stream corridor. Also, assess the creek bed and bank conditions utilizing a procedure similar to what the Natural Resource Conservation Service (NRCS) and many of the trout stream restoration groups are utilizing. Existing conditions will be documented including degree of erosion, habitat conditions (flora and in-stream), soil types (bed and banks) and channel conditions (incision, full bank depth, percent of vegetative cover, bank slope, etc). A GPS coordinate and photograph will be obtained at each problem area and/or channel reach.

2. Compile the data obtained in the field assessment into a site-specific numeric rating system. This data can then be used as a baseline comparison in future assessments.

3. Organize the data, photographs and GPS data and prepare a summary report to document existing conditions. Submit the data to the City and RPO for their files.

Task 6 Deliverables:
Habitat assessment report (site numeric ranking spreadsheet, digital photographs, GIS map which includes photograph locations and reach/problem locations)

Task 7: Construction Engineering

Under this task, the City will advertise the project and the project team will provide site observation and administer construction including coordination with City staff. Specific work efforts include:

1. Once a construction contractor has been secured, the project team will assist the City with conducting a pre-construction meeting and provide attendees meeting minutes.

2. Prepare and provide the contractor with a list of required submittals and review shop drawings, construction schedules, materials certifications and other submittals.

3. Provide construction staking.

4. Provide construction observation for both retrofit projects. We have assumed that the majority of construction activities requiring observation will take place in one month and require 80 hours of observation including observation for SESC compliance.

5. Provide construction administration including processing contractor pay requests, issuing change orders and providing the contractor direction on construction activities.

6. Perform a final walk-through with the City and construction contractor. Issue a letter of substantial completion to the contractor. We have assumed that one additional walk-through will need to take place one year after substantial completion.

7. Assist the City in closing the construction contract by obtaining release of surety and other close-out documents.

8. As an optional item we propose to perform a native planting walk-through 6 months, one year and approximately 2 years after substantial completion. These additional site visits have proved to be beneficial on previous projects in giving the contractor additional input (while he is under the Maintenance and Guarantee Bond) so that he can address native planting issues during the proper planting season. The cost of this work has been included in our fee. It can be eliminated if the City chooses not to have this work performed.

Task 7 Deliverables:
Bid tabulation, executed contracts, pre-construction meeting minutes, submittal list, daily field observation reports, processed pay requests, substantial completion letter, one-year completion letter and appropriate construction close-out documents

Task 8: Final RPO Project Report

Since the RPO project must be completed by December 2008 for grant reimbursement, additional stream monitoring information (beyond the Task 6 information) will not be included in the close-out report. The final report will include all design, analysis and baseline information gathered in the above tasks and information during construction.

Task 8 Deliverables:
Final RPO Project Report

Optional Task 9: RPO Reporting

We have placed this task as an optional task in case the City prefers to perform this work themselves. If the City requests OHM to perform this task, OHM will assist the City with preparation of RPO grant administration reporting documents. Specific work efforts include:

1. Prepare the quarterly reimbursement reports for submittal to the RPO. This involves obtaining City employee timesheets with reimbursable time and subconsultant invoices for the quarter. A spreadsheet will be prepared which totals the costs to date and amount reimbursed through the grant for the quarter. We have assumed that four quarterly reimbursement reports would be required.

2. Prepare an Activity Report which details work efforts that have been completed for that duration of the project and submit with each quarterly submittal to the RPO.

Optional Task 9 Deliverables:
Four quarterly RPO reimbursement packages for submittal to Wayne County RPO

Optional Task 10: Ongoing Stream Bank Monitoring

As an optional item, an ongoing habitat and stream channel assessment will be completed approximately 1000 feet downstream of each of the basins to compare to data that was obtained in Task 6. The stream banks will be assessed in Spring '09, Fall '09, Spring '10, and Fall '10. Specific work efforts include:

1. Walk each creek to provide an updated inventory to determine any changes to the general types of vegetation along the stream corridor. Also, conduct a geomorphic assessment of the creek bed and bank conditions utilizing the modified procedure as used in Task 6. Each site identified in the spring 2008 baseline assessment will be revisited to compare to the current conditions.

2. Compile the data obtained in the field assessment and compare this data to the baseline data previously obtained.

3. Organize the data, photographs and GPS data and prepare an updated summary report to document current conditions. The report will also include recommendations for future work along with cost estimates. Submit the report to the City, MDEQ and RPO for their files.

Optional Task 10 Deliverables:
Updated habitat assessment report (site numeric ranking spreadsheet, digital photographs, GIS map which includes photograph locations and reach/problem locations)

Engineering Services for
Regional Basin Retrofit for Water Quality Improvements –
Taft and Bishop Regional Detention Basins

Time Schedule

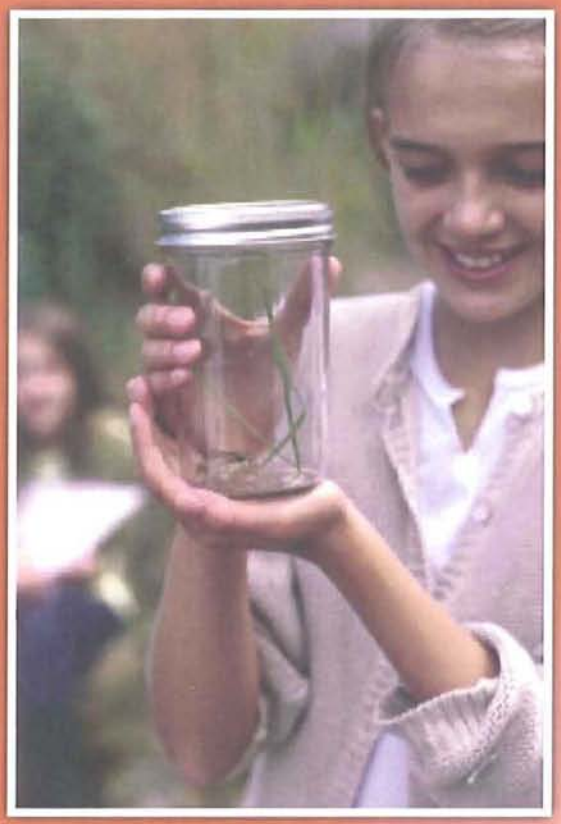
Task		Jan '08	Feb '08	Mar '08	Apr '08	May '08	June '08	July '08	Aug '08	Sept '08	Oct '08	Nov '08	Dec '08
Task 1:	Obtain Information												
Task 2:	Topographic Survey												
Task 3:	Hydrologic & Hydraulic Analysis												
Task 4:	Preliminary Design												
MDEQ Permit Review													
Task 5:	Final Engineering Design & Preparation of Contract Documents												
Task 6:	Field Investigation & Obtain Baseline Data												
Task 7:	Construction Engineering												
Task 8:	Final RPO Project Report												
Optional Task 9:	RPO Reporting												
Optional Task 10:	Ongoing Stream Bank Monitoring	Spring 2009 – Fall 2010											

Section 5 – **Fee Proposal**
(separately sealed)

Fee Proposal for

Engineering Services for Regional Basin Retrofit for Water Quality Improvements – Taft and Bishop Regional Detention Basins

December 20, 2007



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

OHM, with our division, Hitch, is an award winning consulting engineering firm focused on serving government agencies on infrastructure issues. Every day, our staff of more than 180 engineers, architects and specialized technicians strives to fulfill the company's mission, Helping Build Better Communities for Tomorrow.

- A dedicated project manager who understands the City's needs
- Experts in the field of hydrology, hydraulics, and regional basin design
- Extensive knowledge of MDEQ permitting requirements for this project
- Unmatched historical knowledge and understanding of the City's storm water system

OHM
Advancing Communities™

In association with: Niswander Environmental, LLC

CITY OF NOVI

FEE PROPOSAL

REGIONAL BASIN RETROFIT
FOR WATER QUALITY IMPROVEMENTS
TAFT AND BISHOP REGIONAL DETENTION BASINS

We the undersigned propose to furnish to the City of Novi services consistent with the Request for Qualifications dated November 30, 2007. Further, we are separately providing a separate estimate of hours and detail of cost. 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.

THIS FEE PROPOSAL MUST BE SUBMITTED IN A SEPARATE SEALED AND APPROPRIATELY LABELED ENVELOPE. PLEASE DO NOT INCLUDE FEES WITH THE STATEMENT OF QUALIFICATIONS.

Phase	**Amount**
Design Phase (including bidding)	$ 76,232
Construction Phase	$ 36,617
Total Fee	$ 112,849

PLEASE TYPE:

Company Name: Orchard, Hiltz & McCliment, Inc.

Address: 34000 Plymouth Road, Livonia, MI 48150

Agent's Name: John J. Hiltz, P.E.

Agent's Title: Vice President

Agent's Signature: _____

Telephone Number: 734-522-6711 Fax Number: 734-522-6427

E-mail Address: john.hiltz@ohm-advisors.com

Date: December 19, 2007

City of Novi
Regional Basin Retrofit for Water Quality Improvements - Taft and Bishop Detention Basins
Cost and Hours Estimate

	Principal	Project Manager	PE II - Project Engr	Niswander - Principal	Niswander - PM	Prof Surveyor	Surveyor III	Surveyor I	Field Engineer	Constr Admin	CAD Operator	Admin Support	BUDGET TOTALS
Tasks	$224	$146	$101	$115	$90	$102	$87	$62	$89	$69	$69	$60	
TASK 1 - Obtain Information													
TOTAL HOURS	0	0	10	0	0	0	0	0	0	0	0	0	10
TOTAL COSTS	$0	$0	$1,010	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,010
TASK 2 - Topographic Survey													
TOTAL HOURS	0	2	6	0	0	16	16	16	0	0	20	0	76
TOTAL COSTS	$0	$292	$606	$0	$0	$1,632	$1,392	$992	$0	$0	$1,380	$0	$6,294
TASK 3 - Hydrologic and Hydraulic Analysis													
TOTAL HOURS	2	12	48	4	4	0	0	0	0	0	16	8	94
TOTAL COSTS	$448	$1,752	$4,848	$460	$360	$0	$0	$0	$0	$0	$1,104	$480	$9,452
TASK 4 - Preliminary Design													
TOTAL HOURS	2	20	70	16	34	0	0	0	0	0	40	9	191
TOTAL COSTS	$448	$2,920	$7,070	$1,840	$3,060	$0	$0	$0	$0	$0	$2,760	$540	$18,638
TASK 5 - Final Engineering Design & Preparation of Contract Documents													
TOTAL HOURS	2	18	86	8	40	8	0	0	0	4	64	27	257
TOTAL COSTS	$448	$2,628	$8,686	$920	$3,600	$816	$0	$0	$0	$276	$4,416	$1,620	$23,410
TASK 6 - Field Investigation & Obtain Baseline Data													
TOTAL HOURS	0	12	56	12	38	0	0	0	0	0	0	20	138
TOTAL COSTS	$0	$1,752	$5,656	$1,380	$3,420	$0	$0	$0	$0	$0	$0	$1,200	$13,408
TASK 7 - Construction Engineering													
TOTAL HOURS	0	27	73	5	41	16	40	40	91	74	0	4	411
TOTAL COSTS	$0	$3,942	$7,373	$575	$3,690	$1,632	$3,480	$2,480	$8,099	$5,106	$0	$240	$36,617
TASK 8 - Final RPO Project Report													
TOTAL HOURS	2	5	24	0	0	0	0	0	2	0	0	4	37
TOTAL COSTS	$448	$730	$2,424	$0	$0	$0	$0	$0	$178	$0	$0	$240	$4,020
OPTIONAL TASK 9 - RPO Reporting													
TOTAL HOURS	0	4	24	0	0	0	0	0	0	0	0	0	28
TOTAL COSTS	$0	$584	$2,424	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,008
OPTIONAL TASK 10 - Ongoing Stream Bank Monitoring													
TOTAL HOURS	0	16	56	22	64	0	0	0	0	0	0	4	162
TOTAL COSTS	$0	$2,336	$5,656	$2,530	$5,760	$0	$0	$0	$0	$0	$0	$240	$16,522

BASE PRICE: Cost for Tasks 1-6 & 8	$76,232
Optional Task 9 =	$3,008
Optional Task 10	16,522
TOTAL DESIGN COST WITH OPTIONS	95,762
Construction Engineering	$36,617
Total Cost Including Optional Tasks & Construction Engineering =	$132,379

Livonia, Pontiac, Auburn Hills, Lansing

34000 Plymouth Road
Livonia, MI 48150

2008 RATE SCHEDULE *

Principal	$ 145.00
Senior Associate	$ 140.00
Associate	$ 135.00
Manager	$ 135.00
Professional Engineer IV	$ 131.00
Professional Engineer III	$ 110.00
Professional Engineer II	$ 104.00
Professional Engineer I	$ 95.00
Graduate Engineer III	$ 100.00
Graduate Engineer II	$ 90.00
Graduate Engineer I	$ 85.00
Technician IV	$ 98.00
Technician III	$ 87.00
Technician II	$ 74.00
Technician I	$ 60.00
Engineering Aide	$ 45.00
Professional Surveyor	$ 108.00
Graduate Surveyor	$ 85.00
Surveyor III	$ 84.00
Surveyor II	$ 80.00
Surveyor I	$ 65.00
Surveyor Aide	$ 45.00
GIS Analyst III	$ 120.00
GIS Analyst II	$ 100.00
GIS Analyst I	$ 85.00
DB/AD Developer	$ 155.00
IT Technician III	$ 150.00
IT Technician II	$ 125.00
IT Technician I	$ 85.00
Administrative Support	$ 48.00
Clerical Aide	$ 38.00

Note:

1. Above rates reflect 2008 Rate Schedule
2. Rates may vary when new RPO rates are obtained
3. 2007 RPO approved rates can be provided when obtained from the RPO

* This Rate Schedule is all inclusive. OHM bears the overhead costs (i.e. mileage, equipment, communications, faxing, copying, etc.) for providing the services proposed herein.

Niswander Environmental charges on a time and materials basis.

Niswander Environmental Labor Costs

Personnel	Level	Hourly Rate (dollars/hour)
Steve Niswander	Principal	$115
Angela Niswander	Principal	$115
Cindy Holzer	Project Manager	$115
Amy Berry	Project Manager	$90
Jeff Bridgland	Project Manager	$90

Niswander Environmental Reimbursable Expenses

Expense	Rate
Mileage	$0.485 per mile