

# Marty E. Rye, PE, CFM

PRESIDENT / SENIOR WATER RESOURCES ENGINEER

## EXPERTISE

River Engineering/Stream Restoration Design / Geomorphic Assessments

Hydrologic / Hydraulic Analysis, Modeling, and Hydraulic Structure Design

Dam Design, Inspection, Failure Analysis, and Removal

Wetland / Pond Design / Fish Passage / Screening Design

Watershed Management

Construction & Project Mgmt

## PROFESSIONAL AFFILIATIONS and REGISTRATIONS

Professional Engineer (PE) in: Iowa, Massachusetts, Minnesota, Wisconsin

Certified Floodplain Manger (CFM)

American Society of Civil Engineers (ASCE) & Environmental and Water Resources Institute (EWRI)

Association of State Flood Plain Managers (ASFPM)

Association of State Dam Safety Officials (ASDSO)

American Institute of Biological Sciences (AIBS)

American Geophysical Union (AGU)

American Fisheries Society (AFS)

## EDUCATION

BS, Civil Engineering – Water Resources, University of Minnesota

BS, Agricultural Engineering – Soil and Water, University of Minnesota

Mr. Rye is the founder and president of Concord Ecological Engineering. He has over seventeen years of professional experience in the areas of river engineering, natural resource and watershed management, and related civil works projects as a hydrologist, design engineer, and project manager. Marty's project experience includes stream rehabilitation, geomorphic assessments, dam removals, hydraulic and hydrologic studies, design of hydraulic structures, flood routing, floodplain analysis, and storm water quality analysis and facility design. He is also skilled in community planning and project design, management, and construction engineering / implementation. Marty's broad experience and understanding of ecological and engineering principles gives him a unique perspective into issues that have a direct impact on water resources management.

## Selected Project Experience

*Pigeon Creek Restoration and Flood Mitigation–Thiensville, Wisconsin.* Historical development in the Village of Thiensville has included the placement of restrictive crossings, floodplain encroachment, and channel modifications. The design to reduce flooding losses includes improving the hydraulic conveyance capacity and restoring the channel to the Milwaukee River. Marty provided the preliminary stream assessment and concept design review needed to complete the environmental documentation to obtain final FEMA funding and permitting for the project. He has performed regulatory coordination with Wisconsin Department of Natural Resources in developing corridor management objectives, performed a field investigation that included the collection of geomorphic parameters needed for the final design of the reconstructed channel, and preliminary modeling of a proposed storage basin using XP-SWMM and HEC-HMS. The results were incorporated into the effective HEC-RAS model for developing the revised floodplain map. Additional low flow modeling including the evaluation of data from the United States Geological Society National Water Quality Assessment (NAWQA) site just upstream of the project is to be incorporated into the final design. The project is proposed to be constructed in the Fall of 2006 and 2007.



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## Other Significant Projects

**Mittal Mining Environmental Impact Statement – Mn/DNR.** Marty is a member of a project team to develop an Environmental Impact Statement (EIS) for the Minnesota Department of Natural Resources (Mn/DNR). The EIS is for the proposed expansion of the Mittal (Ispat Inland Steel) mine on the Iron Range of Minnesota. The project will involve the development of a new mine pit and the use of existing an existing processing facility. The mining operation will eliminate the natural drainage of the headwater of streams. The manner in which the operation dewateres the system to mimic the natural variability of a natural stream system and thereby minimize its ecological impact is a major focus of the environmental review. Marty is evaluating the impact of the proposed project on the surface water systems and is the technical lead on evaluating the geomorphic impact on tributary stream systems. He is performing a field assessment of the recipient dewatering streams, determining the potential environmental impact of the additional discharge, developing concepts to minimize impacts, and working with regulatory authorities to develop mitigation and monitoring strategies.

**Mining Dam Safety Inspections – Mn/DNR.** Marty lead a dam inspections team for eight tailings dam and power generation significant hazard dams in the 'Iron Range' of Minnesota for the Minnesota Department of Natural Resources Dam Safety Unit. The dams inspected included (owner):

- Sauntry Creek / Plant Site Settling / Minorca Basin (Mittal Steel – Ispat Inland Steel)
- Whitewater Reservoir (Minnesota Power)
- LTV-2E (Cleveland Cliffs / Polymet)
- McKinley (City of McKinley)

The inspections included client meetings regarding conditions, operation, and activities, on-site evaluations, and the development of a inspection report with recommendations.

**Deer Creek Bank Stabilization and Stream Restoration – Ashland County, Wisconsin** Marty is presently leading a team under contract with the Wisconsin Department of Transportation to provide preliminary and final design services stabilization of a failing embankment on Highway 13 south of Ashland. The existing embankment consists of 'red clay' and is over 100 ft high. Continued failure of the embankment threatens the creek and roadway. The project design includes slope stabilization and stream rehabilitation through the project reach. This is a continuation of a project Marty began before starting Concord Ecological Engineering. He is providing project management and is the lead hydraulic engineer for the project. The project is expected to be constructed in 2007.

**Brookfield Dam Removal – Private Conservation Development in Brookfield, Wisconsin..** Marty is providing assistance in the preliminary design for the removal of a 11ft high dam in the City of Brookfield. The project is part of a conservation development and includes the rehabilitation of the upstream pool. Concord is providing assistance in the concept design, drawdown sequencing, construction methodologies, regulatory coordination, channel rehabilitation within the historical pool of the dam, and the development of sediment management strategies. It is anticipated the project will go to final design and construction in 2006.

**Nature's Preserve Conservation Development – Private Development, Anoka County Sandplain in Lino Lakes, Minnesota..** Marty is presently leading a team responsible for the ecohydraulic, flood analysis, and water quality treatment aspects of a 240-acre development north of Minneapolis. The site includes several threatened and endangered flora species in a large wetland complex as well as isolated wetlands, constructed stream, and woodlands. The goal of project is to protect and enhance the function of the wetland complex by maintaining its existing hydrologic setting and biochemistry while re-establishing its local disturbance ecology and accommodating residential development. The design is considering multiple innovative design alternatives and facilities to meet the challenging project criteria. It is a benchmark project in the northeastern metropolitan area that includes coordination with multiple resource agencies. Marty is providing sub-team project management, assistance in regulatory



coordination, and design expertise for the project. It is anticipated the project will go to construction in 2007.

***Root River Hydraulic Modeling – West Allis, Wisconsin*** Marty is providing assistance in the regional hydraulic modeling for the Root River as part of the reconstruction of National Avenue. Information from the HEC-RAS model developed by Marty is being used to determine the feasibility of proposed reconstruction scenarios to reduce flooding potential of this major transportation corridor.

***Sheboygan River at Lake Michigan – Sheboygan, Wisconsin*** Marty lead a team of subconsultants to Collins Engineering in the development of a sediment testing program for the U.S. Coast Guard. The project entails the excavation of potentially contaminated sediment within the Sheboygan River. Contaminants including PCB's, PAH's, and heavy metals from upstream industrial processes are expected constituents within the deposited sediment. Marty performed project coordination with the Wisconsin Department of Natural Resources and the US Army Corps of Engineers in the development of the testing protocol and performed field review of sediment collection and sampling procedures. Project excavation and sediment disposal is expected in the Fall of 2005.

***Prior to Concord Ecological Engineering***

***Lincoln Creek – Reach 6 River Restoration Design / Build Owner's Representative – Milwaukee, Wisconsin.*** Lincoln Creek Reach 6 is the last section of 10 sections that comprise the Lincoln Creek Flood Control Management Plan. Reach 6 involves the construction of an aesthetically pleasing and environmentally acceptable stream channel that meets flood control objectives through a very tight stream corridor. The project involved the removal of approximately 6,500 lineal feet of concrete lining and installing an immobile stone and quarry lined channel that incorporated a riffle-pool low flow channel design. Marty's role in the owner's representation included a review of the design/builder design analysis, plans and specifications, and material approvals to ensure consistency with project performance criteria. He provided sight visits, monitored construction activities, and facilitated regular project status meetings to ensure the clear communication to keep the owner informed regarding the project design performance, schedule, and budget.



***Stony Creek – Stearns County, Minnesota*** Marty lead a project team that performed a geomorphic and hydraulic investigation of Stony Creek for the Sauk River Watershed District. The project was also funded by the Township and the Minnesota Department of Natural Resources (Mn/DNR). Stony Creek has been identified as a potential brook trout stream and has been historically stocked by the MnDNR. Roadway flooding, concerns regarding agricultural practices, and stream stability prompted this study to develop an integrated management approach and design. The study included a HEC-RAS analysis performed by HDR, geomorphic assessment, and alternative analysis. Marty is providing project management and is the lead engineer for the project.

***Underwood Creek Restoration Concept Design - County Grounds Project, Milwaukee, Wisconsin*** The Milwaukee Metropolitan Sewerage District (MMSD) is presently sponsoring the design of an approximately \$70 million flood damage reduction project that includes the diversion of approximately 3,000 cfs of Underwood Creek to a proposed 400 ac-ft detention pond. As part of this project the existing concrete lining within Underwood Creek would be removed and replaced with a channel configuration that is consistent with the rehabilitation of the Underwood Creek corridor that increases the ecological function while protecting existing infrastructure. Marty led a team was retained by HNTB, Inc to provide coordination / development of project performance criteria with MMSD and the Wisconsin Department of Natural Resources (WDNR), develop a concept design of the rehabilitated stream corridor, and provide technical oversight of HEC-RAS modeling efforts. Marty was the lead hydraulic engineer, facilitated development of project performance criteria with MMSD and the WDNR, and was the project manager for the team.

***Tower Brook Fish Passage – West Chesterfield, Massachusetts*** Marty was a member of a team that performed the design for the modification of an existing 11.5 ft diameter culvert on a pristine trout stream in western Massachusetts for the Massachusetts River Group. The existing culvert was considered to be a physical and velocity barrier to fish migration. The design included raising the tailwater by the construction of a downstream riffle and the installation of baffles and a rock substrate within the existing culvert. The project included the design and development of final construction documents. Marty performed project design services and is the designer of record for the project.

***Milwaukee County Stream Survey – Milwaukee County, Wisconsin.*** Marty led a team that performed a geomorphic assessment of 120 miles of streams in Milwaukee County. This effort included walking the streams with teams of engineers and geomorphologists, performing an assessment of the streams and collecting data including bed material data, cross-section data, photograph, inventory of structures, and the development and prioritization of projects within the stream system. The results of the investigation are loaded onto a GIS system for use by a multitude of various management agencies and personnel. The County will be using the information to develop a prioritized capital improvement plan for future implementation. Marty performed field work, data analysis and management and project management services for the project.



***Little Menomonee River Restoration – Kerr McGee – Milwaukee, Wisconsin.*** Marty led a team retained by Kerr-McGee to provide assistance in the design and implementation of the restoration of Reaches 2 and 3 of the Little Menomonee River. The design included the hydraulic and geomorphic design of a new channel as part of a river clean up. The project was constructed in the winter of 2003 / 2004. Marty provided construction observation expertise during the construction process. He was the project manager and lead the technical design team.

***Root River Flood Abatement Structure at National Avenue – West Allis, Wisconsin*** As a subcontractor to TNA for the hydraulic design and stream restoration portion of this project sponsored by the City of West Allis. Historic runoff events have damage 11 structures and caused local and regional traffic hazards. The project involves the final design of flood abatement measures including a proposed bridge replacement on the Root River. Marty provided project management and is the lead hydraulic engineer for the project.

***Milwaukee County Stream Survey – Milwaukee County, Wisconsin.*** Marty led a team that performed a geomorphic assessment of 120 miles of streams in Milwaukee County. This effort included walking the streams with teams of engineers and geomorphologists, performing an assessment of the streams and collecting data including bed material data, cross-section data, photograph, inventory of structures, and the development and prioritization of projects within the stream system. The results of the investigation are loaded onto a GIS system for use by a multitude of various management agencies and personnel. The County will be using the information to develop a prioritized capital improvement plan for future implementation. Marty performed field work, data analysis and management and project management services for the project.

***Kinnickinnic River Geomorphic and Hydraulic Assessment – Milwaukee, Wisconsin.*** The Kinnickinnic River runs through wooded riparian corridors in southern Milwaukee, and over the years the stream has suffered severe degradation due to changes in the watershed. Increased peak flows during storm events have caused severe bank erosion and channel incision, which in turn has resulted in degraded fish habitat and loss of riparian vegetation. Through geomorphic field investigation and hydraulic modeling, the project team examined the current state of channel incision and erosion, and recommended solutions for restoration of the stream channel. Marty performed field investigation and technical assistance to the project.

***Menomonee River Sediment Transport Study – Milwaukee, Wisconsin.*** Performed site evaluation of prioritized sites to determine suitability for various treatments. Provided recommendations in report and developed prioritization list of sites with in MMSD jurisdiction to consider for flood control, re-naturalization, and stabilization projects. Provided general recommendations for maintenance and monitoring of sites in transition or at risk.



***Indian Creek Flood Management Study – Milwaukee Metropolitan Sewerage District – Milwaukee, Wisconsin.*** As part of a flood control project that included the re-habilitation of a concrete-lined stream, Hey and Associates retained Inter-Fluve to perform a geomorphic investigation of the project area, including the evaluation of stream stability upstream and downstream of the channel reconstruction area. Work completed during this reconnaissance survey included qualitative geomorphic evaluation of relative channel stability, fish habitat assessment, riparian vegetation, identification of geologic and man-made controls, inventory of existing infrastructure and areas of potential risk that need to be incorporated into the low flow channel design criteria. Marty was the project manager for the Inter-Fluve team and provided the technical review and comments for the project.

***Tonawanda East-West Stream Stabilization – City of Des Moines, Iowa.*** A preliminary design was developed for a ravine through a historic part of Des Moines had incised several feet and was endangering existing infrastructure including a sanitary sewer crossing and roadway. The corridor is forested and an integral part of the neighborhood. The design included the restoration of the channel, stormwater management, and water quality treatment. Marty was the project manager and lead designer for the project that is scheduled for construction in 2004.

***Mosher Creek Stream Restoration – Village of North Fond du Lac, Wisconsin.*** Mosher Creek is presently lined with failing retaining walls and armored streambank protection within a highly encroached urbanized corridor. Robert E. Lee and Associates retained a team led by Marty to perform the design of a restored channel that provides many of the functions of a natural stream while protecting the existing infrastructure. The project is proposed to be constructed in 2004. Marty was the lead designer and project manager for Inter-Fluve for the project.

***Little Menomonee River Restoration – Wisconsin Department of Natural Resources – Milwaukee, Wisconsin.*** Marty led a team retained by the Wisconsin Department of Natural Resources to provide expert review of proposed river restoration work. This review included the close collaboration with WNDR personnel to discuss project objectives and offer responses to the designer's request for comments on design materials. This review consisted of field visits of Reach 1 construction and general comments on proposed Reach 2 and 3 design. Marty was the project manager and provided the technical review and comments for the project.

***Minnehaha Creek Geomorphic Assessment – Minnehaha Creek Watershed District – Minneapolis, Minnesota.*** Marty led a team retained by Wenck Associates to perform a geomorphic assessment for over 20 miles of stream. Minnehaha Creek flows through an urban corridor that has mixed land uses and corridor. The project included walking the entire reach and performing a stability assessment, sediment transport analysis, macroinvertebrate collection and identification, and extensive field reconnaissance. Marty was the project manager, performed the sediment transport and provided guidance for evaluation of the need for grade control for the stream.



***Minnehaha Creek Bank Stabilization Design Review – Minneapolis Park and Recreation Board – Minneapolis, Minnesota.*** The Minneapolis Park and Recreation Board (MPRB) commissioned the design of a trail reconstruction between Lake Harriett and Hiawatha Avenue. The proposed trail was adjacent to Minnehaha Creek and the project included bank stabilization and channel realignment construction as part of the trail project. The MPRB requested a review of the proposed design in reaction to review comments from local funding partners. Marty provided project management and technical oversight of the design review which included the conceptual evaluation of proposed bank treatments and channel realignment and comments regarding the cost effectiveness of the proposed work.

***Watercourse Maintenance Plan – Collins Engineering for Milwaukee Metropolitan Sewerage District.*** The Milwaukee Metropolitan Sewerage District is responsible for over 100 miles of watercourse for 28 streams in three counties. They manage the streams for a variety of interests including flood conveyance and ecological benefits to the community. Inter-Fluve developed the vegetation, channel, and floodplain portions of the maintenance plan for the watercourses within the MMSD jurisdiction. The plan provides comprehensive and pragmatic guidance to the District for watercourse maintenance and monitoring activities.

***Unnamed Creek – Galesburg, Michigan.*** The embankment of a constructed stormwater pond as part of an industrial development failed and impacted downstream wetlands, a brook trout stream and flooded downstream residences. The Michigan Department of Environmental Quality ordered the owner to address the ongoing problems and repair damages to the downstream resources. Marty performed the hydrologic / hydraulic analysis and developed a design modification to protect the downstream resources and residents. The project design included measures to successfully address water quality, temperature, and water quality impacts associated with the development.

***Cleveland Dam Restoration – Cleveland, Wisconsin.*** This project involves the restoration of Centerville Creek and its floodplain following the 1998 removal of the Cleveland Dam. Removal of the dam and subsequent incision of the channel into the former impoundment sediments has resulted in a deeply incised and highly eroding stream with little habitat or aesthetic value. Marty performed technical oversight for the preliminary design that integrated these data into floodplain and forest restoration, fish habitat design and wetland construction.

***Lake of the Isles – Minneapolis, Minnesota.*** High water levels in 1997 made the trail system around the lake unusable and damaged the shoreline. The Minneapolis Park and Recreation Board proposed to relocate and raise the trail around the lake. The proposed design included the creation of an additional island, bioengineered shoreline protection, and grading activities associated with the trail construction. Marty supplied project management services, design review, and performed hydrologic investigations for the primary consultant for the project.



## Dam Removals

***Sauk River Park Dam Removal on the Sauk River – Melrose, Minnesota.*** A small dam located within a City park was removed. The dam removal project needed to be coordinated with the bank stabilization project, multiple funding partners, regulatory agencies including the State Historical Preservation Office, and the project owner. Marty supplied project management, removal design, and construction oversight for the removal of the dam.

***Morehouse Dam Removal on the Straight River – Owatonna, Minnesota.*** Marty provided project management services and performed preliminary engineering for the proposed removal of the Morehouse Dam. The analysis included the development of post dam removal images used to discuss aesthetic impacts of dam removal, preliminary site investigation that include environmental analysis of surrounding properties and sediment behind the dam, coordination with the State Historical Preservation Office and estimation of post dam removal conditions that would meet ecological, permitting, fiscal, and local objectives.

***Little Cannon River Dam Removal – Cannon Falls, Minnesota.*** Marty was the project manager and performed the preliminary design of removal of a 17 ft high dam that included a relative cost comparison of dam repair and removal, hydraulic analysis of the impact of dam removal on the flood profile using HEC-RAS, review of impact of dam removal on upstream bridge scour potential, alternative analysis of providing bridge scour protection by increasing the opening capacity, and presentation of virtual reality imaging of dam removal aesthetics.

***Mill Pond Dam Removal and River Restoration, Pomme de Terre River – Appleton, Minnesota.*** Marty was the project manager and performed the preliminary design, final design, and construction engineering services for removal of a partially failed dam and upstream river restoration. Project included the inspection/survey of existing dam and upstream pool, sediment analysis, coordination with State Historical Preservation Office, preparation of Environmental Assessment Worksheet, and construction services for the dam removal, and construction of rock weirs to provide grade control, protect existing infrastructure, and provide fish passage through the river reaches.

***Frazer Dam Removal – Minnesota Department of Natural Resources, Otter Tail River – Frazer, MN.*** Marty was the project manager and performed the preliminary design, final design, and construction engineering services for removal of a dam and upstream river restoration. Project included the inspection/survey of existing dam and upstream pool, sediment analysis, coordination with State Historical Preservation Office, preparation of Environmental Assessment Worksheet, and construction services for the dam removal, and construction of rock weirs at an upstream highway crossing to provide grade control and allow fish / canoe passage



## **Dam and Hydraulic Structure Design / Analysis**

***Reconstruction of Combined Locks Dam – Kaukauna Power and Electric – Fox River, Wisconsin.*** Marty designed the spillway and new gate configuration for a hydropower reconstruction in accordance with Wisconsin Department of Natural Resources and Federal Energy Regulatory Commission permitting and licensing requirements. Design included the determination of the Inflow Design Flood (IDF) by analyzing numerous dam failure scenarios generated using the DAMBRK model. The spillway was designed to operate under a variety of flow conditions with sufficient capacity to pass the IDF and construction phasing requirements. Marty also performed an HEC-2 analysis to determine the impacts on the water surface profile of potential construction fill activities on the Fox River flood profile.

***Hydraulic Analysis of Malt-O-Meal Dam, Malt-O-Meal Company, Cannon River – Northfield, MN.*** Marty performed a hydrologic hydraulic, and structural stability investigation of existing dam. Project included a flood frequency analysis of gaged data, development of a calibrated flood profile using HEC-RAS model, evaluation of dam capacity, and dam stability analysis.

***Dam Failure Analysis, Upper and Lower Wood County Park Dams, Yellow River – Wood County, Wisconsin.*** Marty evaluated impact of potential dam failure during sunny-day and 100 year flood events for existing and proposed spillway conditions. Analysis of failure of each dam was performed using DAMBRK program as required by Wisconsin Department of Natural Resources Dam Safety Unit. Results of analysis were used to secure state funding for spillway reconstruction.

***Dam Inspection and Evaluation, Cannon River, Malt-O-Meal Company – Northfield, Minnesota.*** Marty performed an evaluation of existing dam spillway and preliminary design of dam repair and potential removal alternatives for a historic milling dam on the Cannon River.

***Dam Reconstruction, Straight Lake, Minnesota Department of Natural Resources. – Osage, Minnesota.*** Marty performed a hydraulic investigation of dam outlet for repair / reconstruction of existing outlet structure.

***Hydraulic Structure Design for Split Flow Diversion Evaluation of the Red River at Grand Forks—U.S. Army Corps of Engineers, St. Paul District.*** Marty performed the hydraulic design of gated Red River control structure, diversion channel inlet structure, diversion channel return structure, and channel protection. Project involved the proposed diversion of 50,500 cfs of the Red River of the North in a constructed channel to minimize flood damage in East Grand Forks and Grand Forks. Hydraulic structures were designed to operate under highly submerged conditions to minimize energy loss at the upstream diversion channel inlet. Diversion channel return structure was designed to maximize energy dissipation under greatest head differential condition.



***Detailed Hydraulic Modeling of Minnesota River for the Burnsville Amphitheater – Burnsville, Minnesota.*** Marty performed a detailed hydraulic analysis of a proposed amphitheater on the Minnesota River using HEC-RAS. Previous analysis had indicated no stage increase was associated with the concept design. However, the detailed analysis indicated an unacceptable stage increase would occur. A revised design that accommodated the floodplain grading activity and the amphitheater design requirements was developed based upon the revised modeling effort.

***Bridge Hydraulics Analysis, Short Street over the Chippewa River – Eau Claire, Wisconsin.*** Prior to joining Inter-Fluve, Marty performed the hydraulic analysis for the design of Short Street Bridge crossing over the Chippewa River using the HEC-2 model.

***7th Street and Cedar Avenue Sewer Separation – St. Paul, Minnesota.*** Prior to joining Inter-Fluve Marty performed the design of two vortex drop structures located in downtown St. Paul to vertically drop storm water approximately 80 feet to a storm tunnel. Project included the design of the vortex inlet structures, drop shafts, transition structures, air vents, storm tunnel hydraulics, and energy dissipation to deliver storm water runoff to the Mississippi River.

## **Flood Insurance Investigations**

***Flood Insurance Study Revision, Cannon River – Northfield, Minnesota.*** Marty was the project manager and performed hydraulic analysis of Cannon River using HEC-RAS. Analysis based upon revised hydrology evaluation using Bulletin 17B methodology and revised aerial contour information. Regulatory floodway developed with City's direction. Revised analysis and flooding limits map was submitted to the Federal Emergency Management Agency for review and approval. State grant was obtained for the project.

***Flood Insurance Study – River Falls, Wisconsin.*** Marty performed hydraulic analysis using HEC-2 for Kinnickinnic River, Rocky Branch, Mann Valley, and Unnamed Tributary. Analysis included combining existing electronic contour information and survey information obtained using global positioning survey data. Analysis and new map outlining regulatory flood limits submitted to Federal Emergency Management Agency for approval.

***Letter of Map Revision, Coon Creek – Coon Rapids, Minnesota.*** Marty performed the hydraulic design of new crossing of Coon Creek consisting of three 12' X 8' box culverts. Hydraulic analysis was performed using HEC-2 program. Results of analysis were summarized and submitted to Federal Emergency Management Agency for Conditional Letter of map Revision (LOMR) on behalf of the City of Coon Rapids.



## Hydrologic Investigations / Pond Designs

***Drainage Study, Annexation Area – Oakdale, Minnesota.*** Marty was the project manager and performed hydraulic, hydrologic, water quality analysis of a 760-acre urbanizing watershed. A series of proposed and existing ponding systems were analyzed for water quantity and water quality characteristics using P8 and HydroCAD™ models. The project included the annexation of approximately 440-acre agricultural area by the City of Oakdale and conversion into a golf course / housing development. Project included the design of outlets for a series of golf course ponds, wetland mitigation ponds, an existing wetland complex, and a new outlet for Armstrong Lake.

***Long Lake Water Resources Management Plan – Long Lake, Minnesota.*** Marty was the project manager and performed hydrologic and hydraulic analysis of the drainage system for Long Lake. A new freeway segment (US Highway 12) is being constructed through the community that includes the construction of a roadway over 30 ft below existing grade that significantly alters the drainage patterns of the City. The Water Resources Management Plan included the analysis of the existing drainage system, the proposed drainage system, development of a capital improvement program for the drainage system, which incorporated community development and facility maintenance components of the drainage system. The Minnesota Department of Transportation incorporated the plan components that including significant stormwater treatment and diversion to protect existing water resources.

***Drainage Design of East Bridge Over the Chippewa River, Chippewa Falls, Wisconsin – Wisconsin Department of Transportation.*** Marty performed preliminary drainage design of approach roadway including design of open ditch, culverts, and water quality pond to treat bridge deck drainage.

***Drainage Study, SE Quadrant Business District – Vadnais Heights, Minnesota.*** Marty performed a hydrologic analysis and hydraulic design of pond / drainage system for a 77-acre urbanizing drainage basin. Analysis updated original comprehensive drainage study with development specific data using P8 and HydroCAD™ models.

***Drainage Analysis for Arlington Business Park, St. Paul Port Authority – St Paul, Minnesota.*** Marty designed rate control and water quality ponds using P8 and HydroCAD™ models. Pond design was for the redevelopment of a salvage yard complex to an industrial park at Interstate 35E and Arlington Avenue in St. Paul. System design included the use of an existing wetland complex with discharge to existing city storm sewer main trunk line and creation of a new pond which discharges to MN/DOT I-35E drainage system.

***North Prison Pond Outlet Study, Middle St. Croix Watershed District – Bayport, Minnesota.*** Preliminary design of outlet and storm sewer pipe from Prison Pond to the St. Croix River to alleviate winter flooding problems. Marty performed the preliminary design for the project which included incorporation of internal drainage from Bayport Prison Facility, Washington County, MN/DOT roadways, and Andersen Corporation industrial facilities. Results of preliminary design submitted to State of Minnesota for final project funding.

***Drainage Analysis for CR 18 Reconstruction in Inver Grove Heights – Dakota County, Minnesota.*** Marty designed the storm sewer system for reconstruction of local and county roadway systems. Project included design of storm sewer system and design of water quality treatment ponds that also alleviated existing flooding problems. Proposed development and future land use considerations were incorporated into final design. Analysis was performed using Rational Equation Spreadsheets, P8, and HydroCAD™ models.

***Drainage Analysis, Flood Control/Retaining Wall on St. Croix River, US Army Corps of Engineers, St. Paul District. – Stillwater, MN.*** Marty performed interior drainage analysis of flood control/retaining



wall including the analysis of internal drainage characteristics and design of emergency pumping activities when high river levels necessitate the closure of gravity outlets to the St. Croix River.

***Storm Sewer Design for Truth Hardware/Florence Avenue – Owatonna, Minnesota.*** Marty designed a storm sewer system for expansion of industrial parking facility and roadway reconstruction. Included the use of HydroCAD™ model to alleviate local parking lot and roadway intersection flooding problems.

***Storm Water Treatment Pond Design, St. Croix River Bridge Crossing, East Approach, St. Croix County Minnesota Department of Transportation.*** Marty designed water quality treatment ponds and erosion control using P8 and HydroCAD™ models for east approach to Hwy 36 bridge crossing over the St. Croix River, Design included discharge storm water through an existing steep ravine with highly erodible soils to the St. Croix River.

***Drainage Analysis, Business Park – Rosemount, Minnesota.*** Development of a drainage system for the development of a business park. Marty performed an analysis of this potentially landlocked system. The project included a water quality analysis, pollutant removal efficiency evaluation, and preliminary storm sewer layout.

***Storm Water Treatment Pond Design, 12th Street and Heron Avenue Roadway Project – Oakdale, Minnesota.*** Marty designed a water quality treatment pond system for the construction of a new school and library complex. Design included the incorporation of off-site drainage patterns to construct a regional treatment system that will facilitate future development of the area. Analysis of system was performed using P8 and HydroCAD™ models.

***Storm Water Treatment Pond, 7th Street Reconstruction – Oakdale, Minnesota.*** Design of storm water treatment basin located at the inlet to Tanner's Lake to treat roadway and residential runoff. Analysis included the use of P8 and HydroCAD™ models.

***Storm Water Treatment Pond Design, Minnetonka Drive Reconstruction – Minnetonka, Minnesota.*** Marty performed the design of a water quality and rate control pond from existing depression to treat roadway and residential runoff from an established neighborhood prior to discharge to Minnehaha Creek. Analysis included the use of P8 and HydroCAD™ models.

***Storm Water Treatment Pond and Mitigation Wetland Design – Burnsville, Minnesota.*** Marty designed water quality and wetland mitigation ponds within proposed Kraemer Nature Center using a combination of HydroCAD™, XPSWMM, and P8 models. Design included the use of dynamic tailwater levels in new pond to control diversion of flows from existing storm sewer trunk line to treat small runoff and first flush events.

***Storm Water Pond Design – Burnsville, Minnesota.*** Marty performed hydrologic investigation of existing pond system and installation of geosynthetic clay liner to limit seepage losses.

***Pond Investigation, Wood Park Pond – Burnsville, Minnesota.*** Marty performed an evaluation of easement and water quality improvement options using P8 and HydroCAD™ models. The project included meeting the individual residents around the pond and negotiating the purchase of easements. The selected water quality treatment option was a batch alum treatment to reduce internal nutrient cycling and provide a short-term reduction in algal blooms.

***Lake Level Investigation, Keller Lake – Burnsville, Minnesota.*** Marty performed a hydrologic and hydraulic investigation and modeling of lake flooding including the design of a secondary outlet from Keller Lake to Crystal Lake. Analysis used XPSWMM and HydroCAD™ models. The analysis found the upper watershed drainage system and existing lake outlet were modeled incorrectly by others which



provided significantly different results. The connection between Keller Lake and Crystal Lake a long flat culvert that required a more sophisticated hydraulic modeling approach.

***Long Lake Outlet Study – Stillwater, Minnesota.*** Marty performed a hydrologic and hydraulic investigation of Long Lake outlet using HydroCAD™ model. He performed hydraulic analysis of existing drainage system through downtown Stillwater which includes natural channel, lined channel, concrete pipe, corrugated metal pipe, and a very old brick lined tunnel.



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**In addition to the above project-related experience, Marty was a Hydrologist for the Minnesota Department of Natural Resources – Division of Waters. His experience with the Department included responsibilities as a:**

***Staff Hydrologist:***

Marty in the Metro Field office and focused on reviewing applications for Mn/DNR Protected Waters and Appropriations permit applications as well as Utility License applications. These were reviewed for compliance with state policies and regulations. The review included the development of final permit documents, observation of constructed conditions, and resolution of violations. The permit review process required the resolution of multiple stakeholder interests to develop final permitting conditions.

Marty performed numerous field investigations to delineate wetland boundaries and determine Mn/DNR jurisdiction. In addition, Marty reviewed and offered comments on U.S. Army Corps of Engineers permits, watershed district plans, and environmental assessments. These were reviewed for consistency and with state policies and regulations.

***Acting Area Hydrologist:***

In addition to the duties as a Staff Hydrologist Marty was the Acting Area Hydrologist for over a year. The area of responsibility included urban, aggressively urbanizing, and rural portions of the Twin City metropolitan area. Marty assisted communities in adopting and administering shoreland and floodplain zoning ordinances. Marty worked with multiple communities that faced varied resource issues and administrative capacity.

***Surface Water Hydrologist:***

As a member of the Surface Water Unit of the Mn/DNR Central office, Marty performed hydrologic and hydraulic analyses on floodplain analysis, Stockton dam removal on the Straight River, Welch dam removal on the Cannon River, and lake outlet studies for the Heron Lake Diversion and Little Stone Lake Outlet modification. He also coordinated the lake level data collection and monitoring program for the State of Minnesota.

***Dam Safety Engineer:***

As a member of the Dam Safety Unit, Marty performed dam safety inspections throughout the state. He observed dam conditions, developed inspection reports, and provided owner notification with required action items. He witnessed construction a new major earthen dam construction project in southwest Minnesota. He also witnessed the installation of a major seepage control project for state-owned earthen dam in northwest Minnesota.



## **Additional Education**

### *Sediment Transport / Geomorphology / Stream Rehabilitation:*

Self-Sustaining Solutions for Streams, Wetlands, and Watersheds, ASAE National Conference, September 2004, St. Paul, MN.

Geomorphic and Numerical Analysis of Unstable Channels and Streambank Processes Workshop, ASAE National Conference, September 2004, St. Paul, MN.

Ecological Engineering and Ecological Restoration Workshop, ASAE National Conference, September 2004, St. Paul, MN.

River Restoration from the Perspective of Ecohydrology and Ecohydraulics Workshop, ASAE National Conference, September 2004, St. Paul, MN.

Sediment Transport Aspects of River Restoration Planning and Design Short Course. 2000. ASCE / EWRI Joint Conference on Water Resources Management and Water Resources Planning and Management

Evaluating Streambank Stability and the Effectiveness of Environmentally-Sensitive Bank-Stabilization Measures. 2001. ASCE Reno, NV.

U.S. – Chinese Joint Workshop on Sediment Transportation and Environmental Studies. 2002. National Science Foundation / National Natural Science Foundation of China – Marquette, WI.

Rapid River Reconnaissance for River Restoration Design and Appraisal Short Course, 2004 Northwest Stream Restoration Design Symposium, Feb 2, 2004. Skamania Lodge – Stevenson, WA.

Hydraulic Design of Stable Channels Using the SAM Hydraulic Design Package, 2000. Ron Copeland, Milwaukee, WI.

Inter-Fluve, Process-Based Channel Design, 2000. Seattle, WA

Wildland Hydrology, Fluvial Geomorphology for Engineers, 1998, Pagosa Springs, CO.

### *Fisheries / Ecological:*

American Fisheries Society Joint 2005 Midwest Fish and Wildlife Conference, Grand Rapids, MI, December 11-14, 2005.

From Local to Global: Discussing the Forces Shaping Fish Communities in North Temperate Systems and What Managers Can Do About It. Dr. John Magnuson, American Fisheries Society Continuing Education, Duluth, MN, January 12-13, 2006.

1<sup>st</sup> MN Natural Resources Conference – Sustainable Natural Resources Management Defining Our Legacy, Minnesota Chapter American Fisheries Society, Brainerd, MN March 1 & 2, 2006.

Participated in Volunteer Monitoring Activities Including Odonata, Small Mammals, Carnivores, etc.



## **Additional Education (Continued)**

### Hydrology / Hydraulics / Floodplain:

Association of State Floodplain Managers 29<sup>th</sup> Annual Conference - No Adverse Impact: Partnering for Sustainable Floodplain Management, Madison, WI., June 16, 2005.

NRCS Site Evaluation Software (SITES) Training – ASCE Training, 1998 (Greg Hanson, et al)

1998 and 1999 Annual Conferences of the State Dam Safety Officials

USCOE Workshops (HEC-1, Advanced HEC-1, Advanced HEC-2), 1991-1993

SCS, Introduction to TR-20 Workshop, 1993

### Watershed / Water Quality:

National Symposium on Assessing the Cumulative Impacts of Watershed Development on Aquatic Ecosystems and Water Quality, 1996. Chicago, IL.

Using Source Loading and Management Model (SLAMM) and DETPOND for Stormwater Management, UW Extension, 1994

On-Site Sewage Treatment System Design / Certification – U of Mn Extension / MPCA, 1995

North American Lake Management Society, Short Course Phosphorus Inactivation and Interception, Minneapolis, MN

### Other:

Served seven years on the Arden Hills Minnesota Planning Commission

40 Hour HAZWOPER Certified



Concord Ecological Engineering, Inc.

## **Selected Presentations**

“Dam Removals – A Discussion of Issues and Impacts”, ASCE / EWRI 2000 Joint Conference on Water Resources Management and Water Resources Planning and Management, Minneapolis, MN.

“Sediment Management for Dam Removals”, A Hands on Workshop on the Latest Techniques for Dam Modification and Removal, Purdue University Calumet, IN, April 18, 2002.

“Bioengineering Bank Stabilization in Riverine Environment”, presentation at Minnesota Department of Natural Resources Water School, Brainerd, MN, October 30, 2002.

“Sediment Management for Dam Removals”, Marquette University Environmental Engineering Seminar, Milwaukee, WI November 20, 2003.

“Bioengineering Design within the Context of Natural and Engineering Demands”, Transportation Research Board 84<sup>th</sup> Annual Meeting, Washington D.C. January 5, 2005.

“Ecological Principles and Practices in a Riverine Environment”, Federation of Environmental Technologists - Environment '05 Conference, Milwaukee, WI March 9, 2005.

“Challenges in Managing and Rehabilitation of Functional Riverine Systems”, Association of State Floodplain Managers 29<sup>th</sup> Annual Conference - No Adverse Impact: Partnering for Sustainable Floodplain Management, Madison, WI June 16, 2005.

“Incorporating Ecological Engineering Perspectives in Sustainable Environmental Management”, 1<sup>st</sup> MN Natural Resources Conference – Sustainable Natural Resources Management Defining Our Legacy, Minnesota Chapter American Fisheries Society, Brainerd, MN March 1 & 2, 2006.

## **Selected Publications**

“Dam Removals – A Discussion of Issues and Impacts”, Proceedings for ASCE / EWRI 2000 Joint Conference on Water Resources Management and Water Resources Planning and Management, Minneapolis, MN.

Contributor to “Models and Modeling Section of Minnesota Pollution Control Agency’s Protecting Water Quality in Urban Areas – Best Management Practices for Dealing with Storm Water Runoff from Urban, Suburban and Developing Areas of Minnesota”, Minnesota Pollution Control Agency, 2000.

“Challenges in Managing and Rehabilitation of Functional Riverine Systems”, Proceedings for Association of State Floodplain Managers 29<sup>th</sup> Annual Conference - No Adverse Impact: Partnering for Sustainable Floodplain Management, Madison, WI June 16, 2005.

