September 2, 2025

Lower Mississippi River WMO
c/o: Joe Barten, Administrator via Dakota County SWCD
Dakota County Soil & Water Conservation District
4100 220th St West, Suite 102
Farmington, MN 55024

Re: Watershed Modeling for LMRWMO Priority Watersheds

Dear Mr. Barten,

On behalf of WSB, thank you for this opportunity to submit our qualifications. LMRWMO is beginning the process of completing hydrologic and hydraulic (H&H) and water quality (WQ) models for a significant portion of their watershed. These models will be used to describe the current state of the water bodies, identify pollutant loading hotspots within their watersheds, and describe the future of these water bodies under development and climate change scenarios. These models will be valuable decision-making tools for years to come, and WSB is the best firm to help you complete them.

Experienced Team Delivering Actionable Solutions | WSB has years of experience building watershed-wide models for use in both H&H and water quality analysis. Our team's ability to identify and prioritize watershed issues and develop projects to solve them means that the projects our team recommend will deliver real results when it comes to protecting water quality and minimizing risks to member communities from flooding and climate change.

Efficient Workplan | LMRWMO is using two different grant funding sources to complete these modeling tasks. WSB's work plan includes efficiencies for modeling adjacent watersheds, coordination with ongoing modeling efforts in the City of Inver Grove Heights, and a detailed breakdown of how work will be invoiced so that workplans for both grants will be completed on time and under budget.

Local Knowledge of LMRWMO Member Cities | WSB's drainage team has a history of completing successful projects for LMRWMO and its member cities. Our team has successfully completed assessments for Interstate Valley Creek and the Mississippi Direct Drainage watersheds for the LMRWMO, both of which were completed on time and on budget. WSB has also completed recent work on Seidls Lake, Surface Water Management Plans in Mendota Heights and West St. Paul, and water quality and H&H modeling for the City of St. Paul.

Please contact Jake at 612.990.3576 or jnewhall@wsbeng.com or Laura at 612.772.4633 or lrescorla@wsbeng.com with any questions about our qualifications or availability. This proposal shall remain valid for 90 days from the submittal date.

Sincerely, WSB

Jake Newhall, PE, PMP
Director, Water Resources

Laura Rescorla, PE
Project Manager, Water Resources

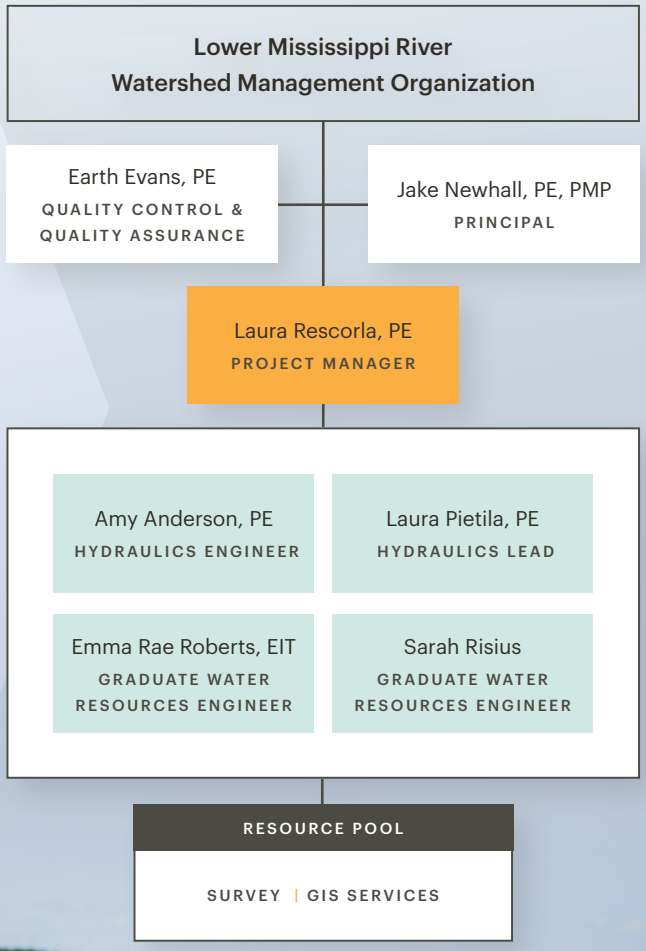
701 XENIA AVE S | SUITE 300 | MINNEAPOLIS, MN 55416 | TEL: 763.541.4800 | FAX: 763.541.1700 | WSBENG.COM

Project Team

The LMRWMO will be best served by our experienced, collaborative team that works together frequently to deliver high quality studies and projects.

Jake Newhall, **Amy Anderson**, and **Laura Rescorla** are a proven team on LMRWMO projects. Laura Rescorla manages a variety of water resources projects while continuing to contribute to the technical design and modeling aspects of them. She produces reports and plans for a variety of cities in the Metro area and understands what implementable projects look like. Using this experience, she will define the subtasks, establish an internal schedule, and coordinate the work of all team members to efficiently accomplish the project goals.

Laura Pietila specializes in H&H and water quality modeling – she has created numerous watershed wide H&H and water quality models as well as several City-wide SWMM models, frequently using them to identify problem areas or treatment opportunities and recommending potential improvements. **Emma Rae Roberts** and **Sarah Risus** work with both Laura Pietila and Laura Rescorla daily, ensuring that they will seamlessly fit into the project team.



Together, we will build the requested models – documenting the process for straightforward future updates – ensure their outputs are grounded in reality, identify potential projects and treatment opportunities, and produce actionable recommendations and reports to support LMRWMO's goal of effectively maximizing pollutant reductions.

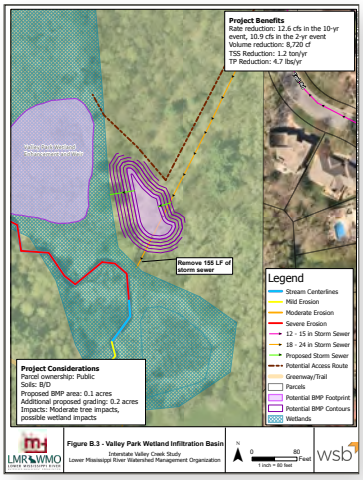
Qualifications and Experience

Interstate Valley Creek Stabilization and Volume Reduction Study

CLIENT: LOWER MISSISSIPPI RIVER WATERSHED MANAGEMENT ORGANIZATION (LMRWMO)
LOCATION: MENDOTA HEIGHTS, MN **DURATION:** APR 2022 - FEB 2023

LMRWMO selected WSB to provide engineering services for an erosion, discharge rate, and volume reduction study on Interstate Valley Creek (IVC) within the City of Mendota Heights. WSB determined locations for BMPs to reduce stormwater flows and pollutant loadings from the IVC tributary drainage area, provided preliminary designs, and estimated peak flow and pollutant reductions. WSB also conducted a field survey of the IVC main stem and two major tributaries and cataloged existing erosion issues. Using the survey results, WSB prioritized the most severe erosion issues based on criteria developed with the LMRWMO and provided feasibility-level stabilization designs and sediment loading estimates for the highest-priority sites.

The study developed feasibility-level designs for six stormwater BMPs and ten streambank erosion sites, along with a prioritization matrix to help LMRWMO and Mendota Heights staff identify high-priority projects and estimate potential pollutant load reductions.



KEY WSB STAFF: JAKE NEWHALL, LAURA RESCORLA, AMY ANDERSON
REFERENCE: JOE BARTEN | LMRWMO ADMINISTRATOR | 651.480.7784 | JOE.BARTEN@CO.DAKOTA.MN.US

Surface Water Management Plan and City-Wide Modeling

CLIENT/LOCATION: FARIBAULT, MN **DURATION:** JUN 2021 - SEP 2022

WSB partnered with the City of Faribault to update its Surface Water Management Plan and develop a city-wide XP-SWMM model. This framework identifies current stormwater issues and supports resilient infrastructure planning. Model development included verifying GIS data, refining subwatershed boundaries, setting hydrologic parameters, and mapping stormwater storage and flow. Using the SCS method, the model pinpointed problem areas and informed flood reduction and water quality BMP recommendations based on cost-benefit assessments.

KEY WSB STAFF: LAURA RESCORLA, JAKE NEWHALL, LAURA PIETILA
REFERENCE: MARK DUCHENE | DIRECTOR OF ENGINEERING | 507.333.0360 | MDUCHENE@CI.FARIBAULT.MN.US

St. Anthony Hill Watershed Modeling

CLIENT/LOCATION: SAINT PAUL, MN **DURATION:** MAY 2024 - MAR 2025

WSB overhauled an XP-SWMM model of the stormwater infrastructure throughout the 4.3-square-mile Saint Anthony Hill subwatershed in Saint Paul, MN. The original model, created in 2010, was not built to handle Atlas 14 rainfall events and did not include all trunkline storm sewer pipes. Using as-builts and HydroCAD modeling, WSB created a P8 model with over 50 BMPs to determine the Saint Anthony Hill watershed's pollutant loading to the Mississippi River. Using the Models, WSB identified locations for future BMPs and areas prone to flooding, which will inform future infrastructure design.

KEY WSB STAFF: LAURA PIETILA, EMMA RAE ROBERTS

REFERENCE: PATRICK MURPHY | CIVIL ENGINEER IV | 651.266.6254 | PATRICK.G.MURPHY@CI.STPAUL.MN.US

City-wide SWMM Modeling and Subwatershed Assessments

CLIENT/LOCATION: PRIOR LAKE, MN **DURATION:** JAN 2021 - APR 2022

WSB developed a citywide XP-SWMM model covering 19.6 square miles for the City of Prior Lake to identify flooding concerns and support stormwater management planning. The model was validated using MnDNR ordinary high water levels and past study results. Maps were created to show flood inundation areas and impacted structures. WSB also identified locations where stormwater surcharges from the storm sewer infrastructure into streets.

Following the citywide modeling, WSB conducted a desktop GIS analysis to identify potential BMP sites aimed at reducing pollutant loading to Prior Lake, an impaired waterbody. P8 water quality models were built to evaluate existing pollutant loads and BMP effectiveness in reducing TSS and TP. BMP designs included basin enhancements and new installations near roadways. A prioritization matrix and conceptual designs were developed for each proposed BMP

KEY WSB STAFF: JAKE NEWHALL, LAURA PIETILA

REFERENCE: NICK MONSERUD | P W DIRECTOR / CITY ENGINEER | 952.447.9834 | NMONSERUD@PRIORLAKEMN.GOV

Lower Mississippi River Direct Drainage Feasibility Study

CLIENT: LMRWMO **DURATION:** MAR 2024 - DEC 2024

LMRWMO selected WSB to complete a feasibility study to prioritize stormwater BMPs and ravine stabilization projects in the direct drainage watershed to the Mississippi River within the LMRWMO. From the entire watershed, WSB analyzed over thirty sites and completed over fifteen site visits to determine cost-effective BMP locations. WSB provided LMRWMO with nine concept designs along with cost estimates and a decision matrix to assist with project prioritization and future grant funding. Throughout the study, WSB also worked closely with six of LMRWMO's member cities to make sure the recommended BMPs met their specific priorities for stormwater management.

KEY WSB STAFF: JAKE NEWHALL, AMY ANDERESON, LAURA RESCORLA, SARAH RISIUS, EMMA RAE ROBERTS

REFERENCE: JOE BARTEN | LMRWMO ADMINISTRATOR |651.480.7784 | JOE.BARTEN@CO.DAKOTA.MN.US

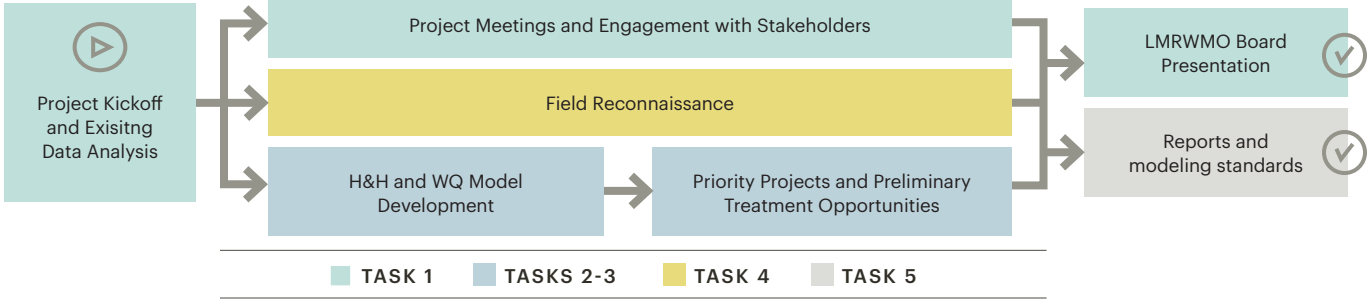
Work Plan for Scope of Services

PROJECT UNDERSTANDING

The LMRWMO and its member cities desire to implement impactful, cost-effective projects to significantly improve water quality and increase pollutant reductions across the watershed.

To make progress towards that goal, the work included in this proposal will develop hydrologic and hydraulic (H&H) models for 3 priority watersheds and water quality (WQ) models for 9 priority watersheds.

PROJECT APPROACH



TASK 1

Project Kickoff and Communication

After the project is awarded and contracts are signed, WSB will facilitate a kickoff meeting with LMRWMO, member City staff, and other stakeholders as identified by LMRWMO. We will request and review relevant information from the Cities and LMRWMO including:

- Existing WQ and H&H models that include the study areas
- GIS data, including BMPs, storm sewer, land use, subwatersheds, tree cover, soils

EXISTING DATA AND GAPS

To develop the H&H and WQ models, the figure to the right summarizes the major data that we anticipate being readily available (have) and that which we need to populate and/or create (need).

MODEL	WATERSHED	HAVE	NEED
H&H	Seidels Lake	• Inver Grove Heights storm - all • South St. Paul storm - sizes	• South St. Paul storm - inverts • Drainage areas • Inver Grove Heights model boundary conditions
	Thompson Lake	• West St. Paul storm - sizes • North boundary condition - St. Paul Model	• West St. Paul storm - inverts • Drainage areas • South boundary conditions
	Rogers Lake	• Mendota Heights storm - all (some pipes) • Drainage areas	• Mendota Heights storm - sizes and inverts (some pipes • Boundary conditions
WQ	All watersheds	• Routing	• Drainage areas • BMP as-builts

PROJECT MEETINGS

WSB will lead monthly meetings with LMRWMO and City staff to share updates on progress and provide opportunities for feedback at any critical junctures. WSB will also lead 3 partner meetings which will focus on the potential projects within the modeled areas, one before and one after the WBIF site visits and one to discuss the preliminary AIG opportunity list. These partner meetings will provide opportunities for the stakeholders to weigh in on project location and type so that those that are ultimately proposed are realistic, actionable, and effective, based on any known site constraints, redevelopment plans, existing issues, etc.

WSB will present the highlights of the project and outline recommended next steps to the LMRWMO Board in the fall of 2026 before finalizing the project deliverables.

TASK 2

WBIF Project

The WBIF project task includes developing water quality and H&H models for three priority subwatersheds: Thompson Lake, Rogers Lake, and Seidls Lake including the HWY 110 & 494 drainage area. The water quality models will be developed in P8. Following the methodology of the current City of Inver Grove Heights H&H modeling effort, we will develop the H&H models in PCSWMM using the SCS (curve number) method.

H&H MODELS

Up to four storms – as determined with LMRWMO at project kickoff – will be run though the model, demonstrating that it can simulate multiple rainfall events. We anticipate that the model runs will include the 2-, 10-, 100-, and 500-year 24-hour rainfall events using NOAA Atlas 14 and MSE3 distributions. It is important to note that the 500-year event is included to ensure the model is built with the flexibility and capacity to handle rainfall events that the LMRWMO may want to run in the future - including increased rainfall intensities and durations - as newer data is made available. For this effort, the 500-year event will be considered the climate change scenario. Future planned land uses (provided by member cities) will be incorporated into the models to serve as the (re)development scenario. WSB will

ROGERS LAKE, MENDOTA HEIGHTS

delineate drainage areas using light detection and ranging (LiDAR) and available as-built plan information. We will include major stormwater BMPs in the models, determining basin storage via LiDAR. Only live storage will be included in the H&H models.

Storm sewer will be modeled to a minimum pipe size of 15 inches. Model detail will focus on the intersection level. Pervious depressions (less than two feet deep) will be excluded from the modeling.

The models will be validated qualitatively by comparing model results to LMRWMO and City staff flood observations and reported high water levels during 1-2 recent, large rainfall events. The models will be validated quantitatively by incorporating survey of critical information (Task 4). This scope does not include model calibration.

WQ MODELS

The watershed WQ models will be developed using industry approved modeling methodology. They will be developed using the same drainage areas as the H&H model for efficiency. Permanent pool storage will be added into the model as necessary for existing BMPs. Model detail will focus on identifying areas without treatment.

PRIORITY PROJECT LIST

Using the combined results of the WQ and H&H models, we will identify a minimum of two potential projects within each priority watershed area, for a total of up to 12 total projects. The projects will be developed and prioritized based on:

- Volume reduction
- Water quality improvement
- Flood reduction/ mitigation
- Erosion prevention
- Resiliency in the face of a changing climate and/or (re) development

When development or redevelopment occurs in the watershed, BMPs will need to be incorporated to meet rate, volume, and WQ requirements. As part of identifying potential project locations, we will consider those areas planned for (re)development to determine if there's potential for regional treatment and/or BMPs that would be a win-win to address existing issues and account for future development.

Potential project locations, types, and scopes will be presented at a Partner Meeting (Task 1). We will finalize the priority project list based on stakeholder feedback, narrowing it down to conduct site visits of up to 10 sites (Task 4). The site visits will further confirm the opportunities and challenges of each site and will inform the feasibility analyses that will be included in the final WBIF project report for the priority projects.

ASSUMPTIONS:

- GIS files of the storm sewer, BMPs, lakes, ponds, and land uses within the subwatersheds will be provided.
- If available, GIS files of drainage areas, soils, tree cover, depth to groundwater, etc. will be provided.
- Any WQ and H&H models available within the subwatersheds will be provided. PCSWMM models for the Seidls Lake and HWY 110 & 494 drainage areas are included in the Inver Grove Heights modeling effort and will be available by the end of 2025.

TASK 3

AIG Project

Water quality models will be developed in P8 for 6 additional priority watershed areas - Interstate Valley Creek, Ivy Falls Creek, Kaposia Creek, Lake Augusta, Hornbeam Lake, and Sunfish Lake. Drainage areas will be delineated using light detection and ranging (LIDAR) and available as-built plan information. Drainage areas will delineated to existing BMPs and strategic locations where future BMPs may be implemented. The average drainage area size will be between 10-20 acres and not to the intersection level as with the models in Task 2. Known, existing BMPs will be included in the models. The models will be validated quantitatively by incorporating survey of critical information (Task 4).

We will use all 9 WQ models to produce "heat maps" that visually show the estimated sediment and nutrient loadings throughout the watersheds and identify pollutant loading "hot spots." The WQ models will also be used to quantify the treatment achieved via existing BMPs. We will develop a semi-quantitative way to predict chloride loading across the modeled subwatersheds. We anticipate incorporating feedback from member cities regarding their salting vs. sanding practices on City streets in the modeled subwatersheds as well as assumptions regarding salt use for different land uses. We will incorporate the findings and recommendations of the MPCA's Twin Cities Metropolitan Area Chloride Management Plan and Chloride TMDL Study into this portion of the project work.

PRELIMINARY TREATMENT OPPORTUNITIES LIST

Using the results of the WQ models, we will identify a minimum of two potential treatment opportunity areas within each priority watershed area, for a total of up to 25 total opportunities. We anticipate more than two potential treatment areas in the larger watersheds (Interstate Valley Creek, Ivy Falls Creek, Kaposia Creek). Note that some of the identified opportunities (up to 10) might overlap with those on the Project Priority List developed in Task 2. The opportunities will take into account:

- Sediment and nutrient loading
- Chloride loading

Similar to the consideration of (re)development in Task 2, as we identify treatment opportunities, we will consider those areas planned for (re)development to determine if there are locations that might lend themselves well to public-private partnerships to improve water quality.

WSB completed a Stabilization and Volume Reduction Study for the Interstate Valley Creek area in 2023, which recommended improvements in or adjacent to the Interstate Valley Creek Mainstem, Wentworth Creek, and Marie Creek. All of these projects proposed TP and TSS reductions. This work will not be duplicated and instead we'll focus on the chloride reduction within the Interstate Valley Creek subwatershed.

TASK 4

Field Reconnaissance

This task includes up to 24 hours of a one-person survey crew to gather any critical data that is missing for the creation and validation of the H&H and WQ models, such as a lake outlet.

This task also includes site visits of up to 10 sites for priority projects (as identified in Task 2) to validate desktop analysis and further confirm the opportunities and challenges of each site for the feasibility analysis. Findings based on the site visits will be presented at a project partner meeting prior to their inclusion in the final report (Task 1).

THOMPSON LAKE, WEST ST. PAUL

TASK 5

Final Deliverables

Upon project completion, LMRWMO will receive 3 H&H and 9 WQ models for priority watersheds, along with digital reports and documentation for the WBIF and AIG projects. These reports will confirm project objectives were met for funding reimbursement and guide next steps for design and feasibility of priority projects and treatment opportunities identified in Tasks 2 and 3.

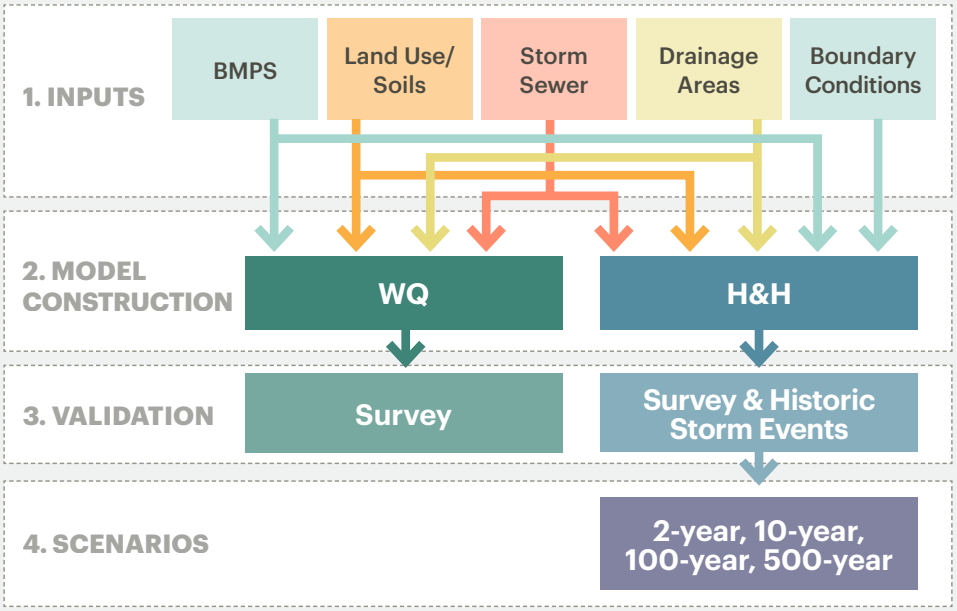
WSB will develop documents detailing H&H and WQ model standards, best practices, and maintenance processes to ensure long-term accuracy and usefulness for the LMRWMO and member Cities. The H&H standards will align with those being developed for Inver Grove Heights.

The final reports will be delivered to the LMRWMO before November 3, 2026. The models, documentation, and GIS data will be delivered to LMRWMO on or before December 13, 2026.

Efficiencies

By combining WBIF and AIG grant funds, the LMRWMO is set up for success with a holistic watershed health assessment.

Merging these efforts into one larger modeling initiative creates multiple efficiencies for our team. As shown on the right, input data overlaps between the H&H and WQ models.



Creating multiple models at once ensures consistency and efficiency, streamlining data review, input validation, and identifying key improvements. By addressing water quality, flood reduction, and resiliency across much of the LMRWMO area, WSB will prioritize complementary BMPs that meet multiple goals, creating a win-win for the LMRWMO.

Utilization of Grants

WSB will maximize efficiencies and assist the LMRWMO in receiving the most value for their grant dollars by having a strong understanding of eligible costs for each funding source. We will monitor our work – and accurate billing of it – so that each budget is maximized but costs kept within our proposed amount and ultimately the allocated grant budgets.

	SOURCE		
TASK | DESCRIPTION	AIG	WBIF	TOTALS
Task 1: Project Kickoff & Communication	$3,075	$17,423	$20,498
Task 2: WBIF Project		$55,581	$55,581
Task 3: AIG Project	$72,526		$72,526
Task 4: Field Reconnaissance	$2,090	$6,270	$8,360
Task 5: Final Deliverables	$12,190	$34,694	$46,884
Total Proposed Fee	**$89,881**	**$113,968**	**$203,849**
Total Grant Budget	**$90,000**	**$114,000**	**$204,000**

Conflict of Interest: WSB is not aware of any potential Conflicts of Interest that could arise when working with the LMRWMO. If you have any questions on this topic, please reach out to Jake Newhall.

Schedule

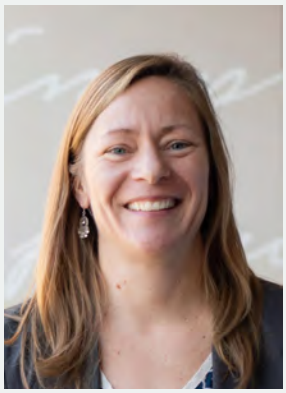
TASK | DESCRIPTION	2025				2026												'27
	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1 PROJECT SCHEDULES AND COMMUNICATION																	
Kickoff meeting	●																
Review existing info, identify data gaps		▬	▬														
Monthly project meetings			●	●	●	●	●	●	●	●	●	●	●				
Project partner meetings								●	●	●							
Board meeting presentation														●			
2 WBIF PROJECT																	
WQ & H&H models for 3 priority watersheds				▬	▬	▬	▬										
Project list & feasibility analysis for draft review								▬	▬								
Final project list & feasibility analysis										▬	▬						
3 AIG PROJECT																	
WQ models for 9 priority watersheds				▬	▬	▬	▬										
Prelim. evaluation of treatment opportunities								▬	▬	▬	▬						
4 FIELD RECONNAISSANCE																	
Field surveys				▬	▬	▬	▬	▬	▬	▬	▬						
Site assessments							▬	▬	▬								
5 FINAL DELIVERABLES																	
Final report for AIG project												▬	▬	▬			
Final report for WBIF project												▬	▬	▬			
Standards, Guidance, and Best Practices				▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬			
Final deliverables to LMRWMO																☑	
Final invoice provided to LMRWMO																	☑

Fee Proposal

PRODUCT | DESCRIPTION	PROJ. PRIN. J. NEWHALL	PROJ. MGR. L. RESCORLA	PROJ. ENG. L. PIETILA	QA/QC SPEC. E. EVANS	GRAD. ENG. E. ROBERTS	GRAD. ENG. S. RISIUS	HYDR. ENG. A. ANDERSON	SURVEY	ADMIN	TOTALS
1 PROJECT KICKOFF AND COMMUNICATION										
Kickoff meeting	2.0	3.0	3.0							$1,632
Review existing info & identify data gaps		8.0	8.0		16.0	16.0				$7,376
Monthly project meetings	2.0	12.0	12.0		6.0	6.0				$6,606
Project partner meetings	3.0	9.0	9.0							$4,104
Board meeting presentation		4.0								$780
TOTAL HOURS	**7.0**	**36.0**	**32.0**	**0.0**	**22.0**	**22.0**	**0.0**	**0.0**	**0.0**	
PRODUCT 1 SUBTOTAL SERVICES										**$20,498**
2 WBIF PROJECT										
WQ, H&H Model: Thompson Lake	1.0	16.0		1.0	60.0					$11,388
WQ, H&H Model: Seidls Lake	1.0		16.0	1.0		72.0				$13,952
WQ, H&H Model: Rogers Lake	1.0	16.0		1.0	60.0					$11,388
Project list and feasibility analysis for draft review by LMRWMO and communities	5.0	8.0	17.0	1.0		40.0	4.0			$12,785
Final Project List & Feasibility Analysis	1.0			1.0	20.0	20.0				$6,068
TOTAL HOURS	**9.0**	**40.0**	**33.0**	**5.0**	**140.0**	**132.0**	**4.0**	**0.0**	**0.0**	
PRODUCT 2 SUBTOTAL SERVICES										**$55,581**
3 AIG PROJECT										
WQ Model: Interstate Valley Creek		12.0		1.0	30.0					$6,474
WQ Model: Ivy Falls Creek			12.0	1.0		30.0				$6,780
WQ Model: Simon's Ravine		12.0		1.0	30.0					$6,474
WQ Model: Lake Augusta			12.0	1.0		30.0				$6,780
WQ Model: Hornbeam Lake		12.0		1.0	30.0					$6,474
WQ Model: Rogers Lake			12.0	1.0		24.0				$5,892
WQ Model: Seidls Lake, adjacent 494 System		12.0		1.0	24.0					$5,700
WQ Model: Sunfish Lake			12.0	1.0		30.0				$6,780
WQ Model: Thompson Lake		12.0		1.0	24.0					$5,700
Prelim. eval. of treatment opps. and recommended practices	8.0	14.0	14.0		24.0	24.0	8.0			$15,472
TOTAL HOURS	**8.0**	**74.0**	**62.0**	**9.0**	**162.0**	**138.0**	**8.0**	**0.0**	**0.0**	
PRODUCT 3 SUBTOTAL SERVICES										**$72,526**
4 FIELD RECONNAISSANCE										
Field Surveys								24.0		$4,680
Site Assessments		10.0	10.0							$3,680
TOTAL HOURS	**0.0**	**10.0**	**10.0**	**0.0**	**0.0**	**0.0**	**0.0**	**24.0**	**0.0**	
PRODUCT 4 SUBTOTAL SERVICES										**$8,360**
5 FINAL DELIVERABLES										
Final Report for AIG project	3.0	12.0	12.0		14.0	14.0	6.0		6.0	$10,790
Final Report for WBIF project	3.0	36.0	36.0		38.0	36.0	12.0		8.0	$27,322
Standards, guidance, & best practices	3.0	8.0	8.0		8.0	8.0	8.0		2.0	$7,690
Final deliverables to LMRWMO		2.0	4.0							$1,082
TOTAL HOURS	**9.0**	**58.0**	**60.0**	**0.0**	**60.0**	**58.0**	**26.0**	**0.0**	**16.0**	
PRODUCT 5 SUBTOTAL SERVICES										**$46,884**
Total Project Hours	**33.0**	**218.0**	**197.0**	**14.0**	**384.0**	**350.0**	**38.0**	**24.0**	**16.0**	
Hourly Billable Rate	$264	$195	$173	$264	$129	$148	$195	$195	$89	
Total Fee By Job Classification	**$8,712**	**$42,510**	**$34,081**	**$3,696**	**$49,536**	**$51,800**	**$7,410**	**$4,680**	**$1,424**	
TOTAL SERVICES										**$203,849**

Appendix

Key Personnel Resumes



Earth Evans, PE

DIRECTOR, WATER RESOURCES

As a project engineer and project manager for technically diverse projects in water resources for over 25 years, Earth takes projects from planning and preliminary engineering through design and construction. She is a technical resource in hydrologic and hydraulic modeling, flood damage reduction and floodplain modeling, water quality modeling and evaluation of best management practices, permitting, and hydraulic design.

REGISTRATION:
Professional Engineer:

CO #53515

IA #20597

MN #44235

MO #2021012867

ND #7058

TX #129722

WI #41660

FL #99575

EDUCATION:
Master of Civil Engineering, University of Minnesota, MN

BS in Civil Engineering, University of North Dakota, ND

CERTIFICATIONS:
TxDOT Precertification:

10.1.1 - Hydrologic Studies

10.2.1 - Roadway Hydraulic Design

10.3.1 - Bridge Hydraulic Design

10.5.1 - Bridge Scour Evaluation and Analysis

17.5.1 - Civil Engineering

Legends of Hutto Drainage Improvements | Hutto, TX

CLIENT: CITY OF HUTTO

PROJECT DURATION: 2023 - 2025

Earth provided quality control of the preliminary design evaluation of improvements to address drainage issues with several channels within the Legends of Hutto development. The analysis included development of a 2D model to evaluate flood risk and nuisance small storm drainage issues within the rear yard channels of the development. Additionally, tailwater conditions for the downstream Brushy Creek FEMA Zone AE floodplain were considered. Feasibility-level improvements and cost estimates were developed.

I-494 First Project Oversight | Richfield, Edina, and Bloomington, MN

CLIENT: MNDOT CENTRAL OFFICE

PROJECT DURATION: 2023 - CURRENT

Earth is the drainage oversight lead for the I-494 First Project, which extends from East Bush Lake Road to 12th Avenue. In this role, Earth reviews deliverables to confirm conformance with the contract and MnDOT design standards. A key priority of the project is to develop solutions to decades-long flooding along the I-494 corridor. She is working closely with the Design team to model the corridor in XPSWMM (taking inflows from City PCSWMM models) and develop large-diameter conveyance, flood storage (below ground and surface), and add cost-effective resiliency to the chronically under-capacity system in a densely developed urban area. Her role also involves extensive coordination with the Watershed District permitting agencies, multi-discipline team, and City Staff.

Ongoing Water Resources Support | Woodbury, MN

CLIENT: CITY OF WOODBURY

PROJECT DURATION: 2000 - CURRENT

Earth has assisted the City of Woodbury with ongoing water resources support services for nearly 25 years. This role has included development review for compliance with local regulations, stormwater management planning, asset management, risk analysis, floodplain review, hydrologic/hydraulic modeling, water quality analysis, ravine restoration, ordinance and design guide updates, master planning, design of drainage infrastructure and permitting for street reconstruction projects and public infrastructure for developments, BMP retrofit design, and structural and non-structural flood proofing evaluation.

Jake Newhall, PE, PMP

DIRECTOR, WATER RESOURCES

Jake has 19 years of engineering experience and has managed and designed many types of water resources projects, including H&H modeling, planning, design, maintenance programs, and construction. He has worked with numerous watersheds, municipalities, counties, and state agencies. Jake's well-rounded water resources skills and experience allow him to collaborate and be innovative while solving challenging water quality and quantity problems. Jake is extremely familiar with the LMRWMO and its member cities as a result of his involvement in watershed and City projects and studies over the past 18 years.

REGISTRATION:
Professional Engineer:

MN #49170

NC #057682

CO #0064526

WI #100948-6

GA #052008

FL #99037

EDUCATION:
BS in Civil Engineering, University of Minnesota, MN

CERTIFICATIONS:
Certified PMP #1989038

TxDOT Precertification:

17.5.1 - Civil Engineering

Prior Lake Subwatershed Assessment | Prior Lake, MN

CLIENT: CITY OF PRIOR LAKE

PROJECT DURATION: NOV 2021 - JUN 2022

WSB's water resources team completed a subwatershed assessment for all areas draining to Upper and Lower Prior Lake. The goal of the study was to identify untreated and undertreated subwatersheds to help target potential water quality improvements. City-wide model H&H was utilized and a P8 model was developed to help estimate existing conditions and loadings. Stormwater infrastructure and open space were reviewed to help identify optimal locations to implement stormwater management BMPs. Existing stormwater BMPs were reviewed and evaluated to determine if retrofit opportunities would be available to enhance water quality.

Stormwater Direct Drainage Prioritization and Stormwater Management Preliminary Design | Farmington, MN

CLIENT: CITY OF FARMINGTON

PROJECT DURATION: SEPT 2021 - MAR 2023

Jake was the project manager responsible for completing a subwatershed assessment for the Vermillion River in Farmington, MN. This included analyzing the tributary drainage area to the Vermillion River and outlining Best Management Practice (BMP) recommendations to reduce phosphorus loading to the river. Various levels of treatment upstream of the river were analyzed: no treatment, local BMPs, regional BMPs, and treatment trains. Modeling was completed to determine the most feasible size for each BMP. A cost-benefit and constructability matrix was created to help rank and prioritize the best stormwater improvements for consideration. Preliminary design was completed for the two highest priority improvements.

Lower Mississippi River Direct Drainage Feasibility Study | Dakota County, MN

CLIENT: LOWER MISSISSIPPI RIVER WATERSHED MANAGEMENT ORGANIZATION (LMRWMO)

PROJECT DURATION: MAR 2024 - DEC 2024

LMRWMO chose WSB for a feasibility study to prioritize stormwater BMPs and ravine stabilization projects in the Mississippi River's direct drainage watershed. WSB analyzed the watershed, considering topography, geology, land ownership, infrastructure, and land use. They examined over 30 sites, visited 15+, and identified cost-effective BMP locations. WSB provided LMRWMO with nine concept designs, cost estimates, and a decision matrix for project prioritization and future grant funding. Throughout the study, WSB collaborated closely with six LMRWMO member cities to ensure the recommended BMPs aligned with their specific stormwater management priorities.

Laura Rescorla, PE

PROJECT MANAGER, WATER RESOURCES

Laura is a Project Manager in WSB's Water Resources Group. She has nine years of engineering experience collaborating across technical groups to deliver quality products to clients in a variety of water resource project areas. Her areas of expertise include planning, hydraulic and hydrologic modeling, storm sewer and BMP design, permitting, and construction management. Laura has experience with a variety of H&H and water quality modeling programs.

REGISTRATION:
Professional Engineer:

MN #58716

EDUCATION:
BS in Engineering, Calvin University, MI

ASSOCIATION/ ORGANIZATION:
ASCE

Interstate Valley Creek Stabilization and Volume Reduction Study | Mendota Heights, MN

CLIENT: LOWER MISSISSIPPI RIVER WATERSHED MANAGEMENT ORGANIZATION (LMRWMO)

PROJECT DURATION: APR 2022 - FEB 2023

Laura led the study of the Interstate Valley Creek (IVC) subwatershed to identify potential locations for BMPs to reduce stormwater peak discharge rates, volumes, and pollutant loadings. GIS data, HydroCAD, and P8 were used to identify sites with the highest potential impacts. Laura conducted site visits to verify the desktop analysis and determine the opportunities and challenges of each site. In collaboration with the LMRWMO and City of Mendota Heights, a prioritization matrix was developed. The study included feasibility level designs, cost estimates, and discharge rate, volume, and pollutant reductions for the 6 highest priority BMPs, giving the LMRWMO an actionable plan from which to secure funding and move into final design.

Surface Water Management Plan, City-Wide Modeling, and MS4 Updates | Faribault, MN

CLIENT: CITY OF FARIBAULT, MN

PROJECT DURATION: FEB 2021 - JUN 2022

Laura led the update of the City's Surface Water Management Plan (SWMP). Using the results of the city-wide model that was developed for this project, Laura collaboratively identified existing stormwater issues and recommended corrective actions/projects so that the City can plan for and build resilient infrastructure that will serve generations to come. Water quality BMPs were reviewed to meet the City's Waste Load Allocations (WLAs) and subwatershed assessments, to identify the optimal cost-benefit stormwater solutions, were incorporated into the SWMP.

Volume Reduction and Water Quality Study | Blaine, MN

CLIENT: CITY OF BLAINE, MN

PROJECT DURATION: MAY 2020 - AUG 2021

This project entailed developing a city-wide approach for volume reduction and water quality improvements. Laura identified future opportunities for stormwater management on city or publicly owned property to offset the impacts of future linear reconstruction projects, provide flood reduction, and work toward addressing TMDLs within the City. Sites with high potential for either volume reduction or water quality improvements were analyzed further to develop recommended options. The recommendations include the type of stormwater improvement, its associated treatment capacity, load reduction, anticipated cost, and potential funding sources.

Amy Anderson, PE, CFM

HYDRAULIC ENGINEER

Amy has over 14 years of professional experience in water resources engineering, specializing in hydraulic analysis of natural and constructed systems. Amy's experience in water resources spans the project cycle, from surveying and design through construction observation and post-project monitoring. Amy is experienced in using many types of software for hydrologic and hydraulic modeling, including XP-SWMM, HEC-RAS (both 1D and 2D), HEC-HMS, and RiverMorph. Amy has experience with bridge hydraulic analysis and crossing design, and is a certified floodplain manager (CFM).

REGISTRATION:
Professional Engineer:

MN #50820

ND #40598

EDUCATION:
MS in Aquatic Science, University of Michigan, MI

MSE in Civil Engineering, University of Michigan, MI

BS in Civil Engineering, Marquette University, WI

CERTIFICATIONS:
Certified Floodplain Manager

Interstate Valley Creek Erosion Study | Mendota Heights, MN

CLIENT: LOWER MISSISSIPPI RIVER WATERSHED MANAGEMENT ORGANIZATION (LMRWMO)

PROJECT DURATION: APR 2022 - FEB 2023

LMRWMO selected WSB to provide engineering services for an erosion and volume reduction study on Interstate Valley Creek (IVC) within the City of Mendota Heights. WSB was tasked with determining locations for BMPs to reduce stormwater flows within the IVC main stem and providing preliminary designs and estimating peak flow reductions. WSB also conducted a field survey of the IVC main stem and two major tributaries and cataloged existing erosion issues. The survey results prioritized the most severe erosion issues based on criteria provided by LMRWMO and provided feasibility-level stabilization designs and sediment loading estimates for the highest-priority sites. The results of the study produced feasibility-level designs for six volume-reduction BMPs and ten bank erosion sites. WSB also created a prioritization matrix that assists LMRWMO and City of Mendota Heights staff in determining which sites should be completed first and the pollutant load reductions that could result from completing these projects.

Seidls Lake Trail and Shoreline Improvements | Inver Grove Heights and South St. Paul, MN

CLIENT: CITY OF SOUTH ST. PAUL, MN

PROJECT DURATION: APR 2020 - JUN 2024

WSB worked with the City of South St. Paul on a multi- phase project to improve habitat, shoreline, vegetation and public access on Lake Seidls. The first phase, constructed in 2021, was to design and construct a lift station to stabilize water levels. The next phase was coordination between South St Paul, Inver Grove Heights, and Dakota County to reconstruct the existing trail and add new trail access to residents and visitors to the area. In addition, WSB's natural and water resources team designed shoreline restoration and native vegetation establishment for areas that were destroyed from the historically fluctuating water levels. The improvements include construction of in-lake habitat, fishing accessibility for anglers, and invasive species management. Construction of the trail and restoration improvements is scheduled for winter 2023/2024. Additionally, WSB assisted with writing several grant applications that were successful and a major financial support for each of the project components: lift station, trail, and shoreline/habitat improvements.

Laura Pietila, PE

HYDRAULIC LEAD

Laura has extensive hydrologic and hydraulic modeling experience utilizing various software including HydroCAD, HEC-RAS, HEC-HMS, SMS SRH-2D, XPSWMM, and EPA SWMM. She also performs water quality modeling computations with P8 and MIDS. Laura is passionate about providing clients with comprehensive and accurate modeling tools to provide valuable insights for planning for and mitigating stormwater issues.

REGISTRATION:
Professional Engineer:

MN #61877

EDUCATION:
BS in Environmental Engineering, University of Minnesota, MN

CERTIFICATIONS:
Certified Floodplain Manager

Surface Water Management Plan and City-Wide Modeling | Faribault, MN

CLIENT: CITY OF FARIBAULT

PROJECT DURATION: FEB 2021 - JUN 2022

WSB worked collaboratively with the City of Faribault to update the City's Surface Water Management Plan (SWMP) and develop a city-wide XP-SWMM model. The city-wide model, along with the SWMP update, provides a framework not only to identify and address existing stormwater issues, but also to plan for and build resilient infrastructure that will serve generations to come. Developing the model included verifying GIS storm sewer data and determining data gaps, incorporating existing subwatershed delineations and refining them to the intersection level, determining hydrologic input parameters, and defining areas of stormwater storage and overland flow. The model was built using the SCS method. The model results were used to identify existing storm sewer problem areas, then evaluate and recommend solutions. In conjunction with flood reduction recommendations, subwatershed assessments were completed to identify the optimal cost-benefit water quality BMPs for consideration by the City.

Jordan Interchange | Jordan, MN

CLIENT: SCOTT COUNTY

PROJECT DURATION: AUG 2022 - 2024

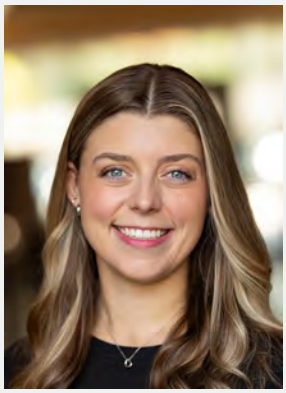
Laura worked on the hydraulic and floodplain analysis for the reconstruction of an interchange along Highway 169 in Jordan, Minnesota. The project is located within a FEMA Zone AE floodplain, requiring extensive coordination with the MnDNR floodplain office during preliminary and final design. A Letter of Map Revision will be completed post-construction, requiring coordination with FEMA. An effective unsteady HEC-RAS model was utilized to model the proposed project conditions.

Citywide XPSWMM Model | Prior Lake, MN

CLIENT: CITY OF PRIOR LAKE

PROJECT DURATION: JAN 2021 - OCT 2021

Laura developed a citywide XPSWMM model spanning 19.6 square miles for the City of Prior Lake to use as a tool to identify flooding concerns and to provide a basis of understanding for future stormwater management needs. The model was validated using MnDNR ordinary high water levels as well as modeling results from past studies of the area. The modeling effort produced high water levels of ponding areas and indicated locations where stormwater surcharges from the storm sewer infrastructure into streets. Visual maps were created to identify the locations of flood inundation as well as existing structures impacted by floodwaters.



Emma Rae Roberts, EIT

GRADUATE WATER RESOURCES ENGINEER

Emma Rae is a Graduate Engineer in WSB's Water Resources Group. She has experience in the engineering consulting field as well as working within multiple municipalities. Her experience includes hydraulic and hydrologic modeling, storm sewer design, storm sewer replacement prioritization, stormwater pond improvements, construction management, and erosion & sediment control inspections. She's experienced in ArcGIS Pro, HydroCAD, and XP-SWMM.

REGISTRATION:
Engineer in Training

EDUCATION:
BS in Civil Engineering, University of St. Thomas, MN,

CERTIFICATIONS:
Construction Site Management

ASSOCIATION/ ORGANIZATION:
American Society of Civil Engineers (ASCE)

American Public Works Association (APWA)

Minnesota Surveyors and Engineers Society (MSES)

Lower Mississippi River Direct Drainage Feasibility Study | Dakota County, MN

CLIENT: LOWER MISSISSIPPI RIVER WATERSHED MANAGEMENT ORGANIZATION (LMRWMO)

PROJECT DURATION: MAR 2024 - DEC 2024

LMRWMO chose WSB for a feasibility study to prioritize stormwater BMPs and ravine stabilization projects in the Mississippi River's direct drainage watershed. WSB analyzed the watershed, considering topography, geology, land ownership, infrastructure, and land use. They examined over 30 sites, visited 15+, and identified cost-effective BMP locations. WSB provided LMRWMO with nine concept designs, cost estimates, and a decision matrix for project prioritization and future grant funding. Throughout the study, WSB collaborated closely with six LMRWMO member cities to ensure the recommended BMPs aligned with their specific stormwater management priorities.

St. Anthony Hill XP-SWMM Model | St. Paul, MN

CLIENT: CITY OF ST. PAUL

PROJECT DURATION: APR 2024 - MAR 2025

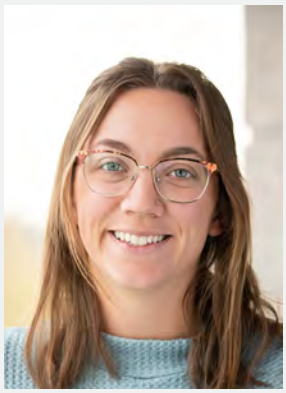
The City of St. Paul hired WSB to re-build a XPSWMM model of the stormwater infrastructure throughout the Saint Anthony Hill subwatershed in Saint Paul, Minnesota. The model was developed to identify areas prone to flooding and to inform future infrastructure design. A model was originally built for the subwatershed in 2010; however, the aging model was not built to handle the Atlas 14 rainfall event and did not include all trunkline storm sewer pipes. The model was rebuilt in 2024-2025 to address these issues to provide a relevant tool for the city.

Storm Sewer Capacity and Growth Analysis | Osseo, MN

CLIENT: CITY OF OSSEO

PROJECT DURATION: JAN 2024 - JUN 2024

WSB completed a comprehensive analysis of the City's storm sewer system and planned redevelopment to provide guidance for future road and utility improvement projects. This included recommendations for pipe upsizing and storm sewer extensions to improve drainage throughout the City. We also investigated known drainage issues and provided potential solutions to address them. Cost estimates were provided for all recommended improvements to inform City budget planning.



Sarah Risius

GRADUATE WATER RESOURCES ENGINEER

Sarah has four years of experience in the engineering consulting field. As a senior graduate engineer in WSB's Water Resources group, Sarah has experience in the creation of project plan sets, hydrologic and hydraulic modeling, water quality modeling, and permitting. She has used AutoCAD Civil 3D to design storm sewers, stormwater BMPs, and restoration projects ranging from feasibility to plan production to construction management. Sarah has used HydroCAD, MIDS, and P8 to evaluate project impacts and meet permit and project requirements for project design. Sarah is skilled in a variety of software including AutoCAD Civil 3D, HydroCAD, GIS, P8, MIDS, and all Microsoft Office programs to help meet clients' needs.

EDUCATION:

BS in Bioproducts and Biosystems Engineering, University of Minnesota - Twin Cities, MN

CERTIFICATIONS:

SWE

OSHA 40-hour

Erosion and Stormwater Management

HAZWOPER

Four Seasons Water Quality Improvements | Plymouth, MN

CLIENT: CITY OF PLYMOUTH

PROJECT DURATION: NOV 2022 - JUL 2025

WSB worked with the City and watershed district to take preliminary plans for a water quality improvement project through detailed design, permitting, and construction. The goal of the project was to remove 100 pounds of TP above and beyond any requirements. The improvements included construction of a stormwater pond and restoration of a large wetland. To design the improvements, Sarah developed H&H and P8 models of the site and surrounding watershed area. Permitting included a US Army Corps of Engineers Section 404 Individual Permit, MPCA Section 401 Water Quality Certification, and Wetland Conservation Act decision. The watershed district was a funding partner, so collaboration with the District was required. Sarah performed construction inspection of the project installation.

Lower Mississippi River Direct Drainage Feasibility Study

CLIENT: LOWER MISSISSIPPI RIVER WATERSHED MANAGEMENT ORGANIZATION (LMRWMO)

PROJECT DURATION: MAR 2024 - DEC 2024

LMRWMO chose WSB for a feasibility study to prioritize stormwater BMPs and ravine stabilization projects in the Mississippi River's direct drainage watershed. WSB analyzed the watershed, considering topography, geology, land ownership, infrastructure, and land use. They examined over 30 sites, visited 15+, and identified cost-effective BMP locations. WSB provided LMRWMO with nine concept designs, cost estimates, and a decision matrix for project prioritization and future grant funding. Throughout the study, WSB collaborated closely with six LMRWMO member cities to ensure the recommended BMPs aligned with their specific stormwater management priorities.