



**CITY OF NOVI CITY COUNCIL**  
**FEBRUARY 28, 2022**

**SUBJECT:** Approval to award engineering services to OHM Advisors for a feasibility analysis and environmental assessment of the Middle Branch of the Rouge River between 10 Mile Road and Novi Road in the amount of \$52,900.

**SUBMITTING DEPARTMENT:** Department of Public Works, Engineering Division

<b>EXPENDITURE REQUIRED</b>	<b>\$ 52,900.00</b>
<b>AMOUNT BUDGETED</b>	<b>\$ 71,400.00</b>
<b>APPROPRIATION REQUIRED</b>	<b>\$ 0</b>
<b>LINE ITEM NUMBER</b>	<b>210-211.00-805.000</b>

**BACKGROUND INFORMATION:**

In 2013, the City commissioned Environmental Consulting & Technology (ECT) to perform a streambank assessment of the Middle Branch of the Rouge River downstream of Grand River to the south City Limits, along with two other streams in the City. ECT's report, which was included in the 2014 Stormwater Master Plan Update, identified four priority sites of concern in the Middle Branch of the Rouge River between 10 Mile Road and Novi Road. Priority sites were selected based on a Bank Erosion Hazard Index (BEHI), proximity to infrastructure or private property, and length. This section of the Middle Branch of the Rouge River is of particular concern because it runs parallel to and crosses under railroad track.

The City obtained a proposal from engineering consultant, OHM Advisors, for an in-depth environmental assessment of the project area. The environmental assessment consists of six primary tasks: data gathering, reference reach assessment, wetland delineation, threatened and endangered species survey, hydrologic and hydraulic study, and conceptual design, and basis report. The environmental assessment will satisfy the state's permitting requirements and provide OHM with data needed to complete construction documents for implementation. The attached engineering services proposal provides more details on the scope of services. The fee for this assessment will be \$52,900, which is based on the fee rate of \$115 per hour for general consulting. The assessment and

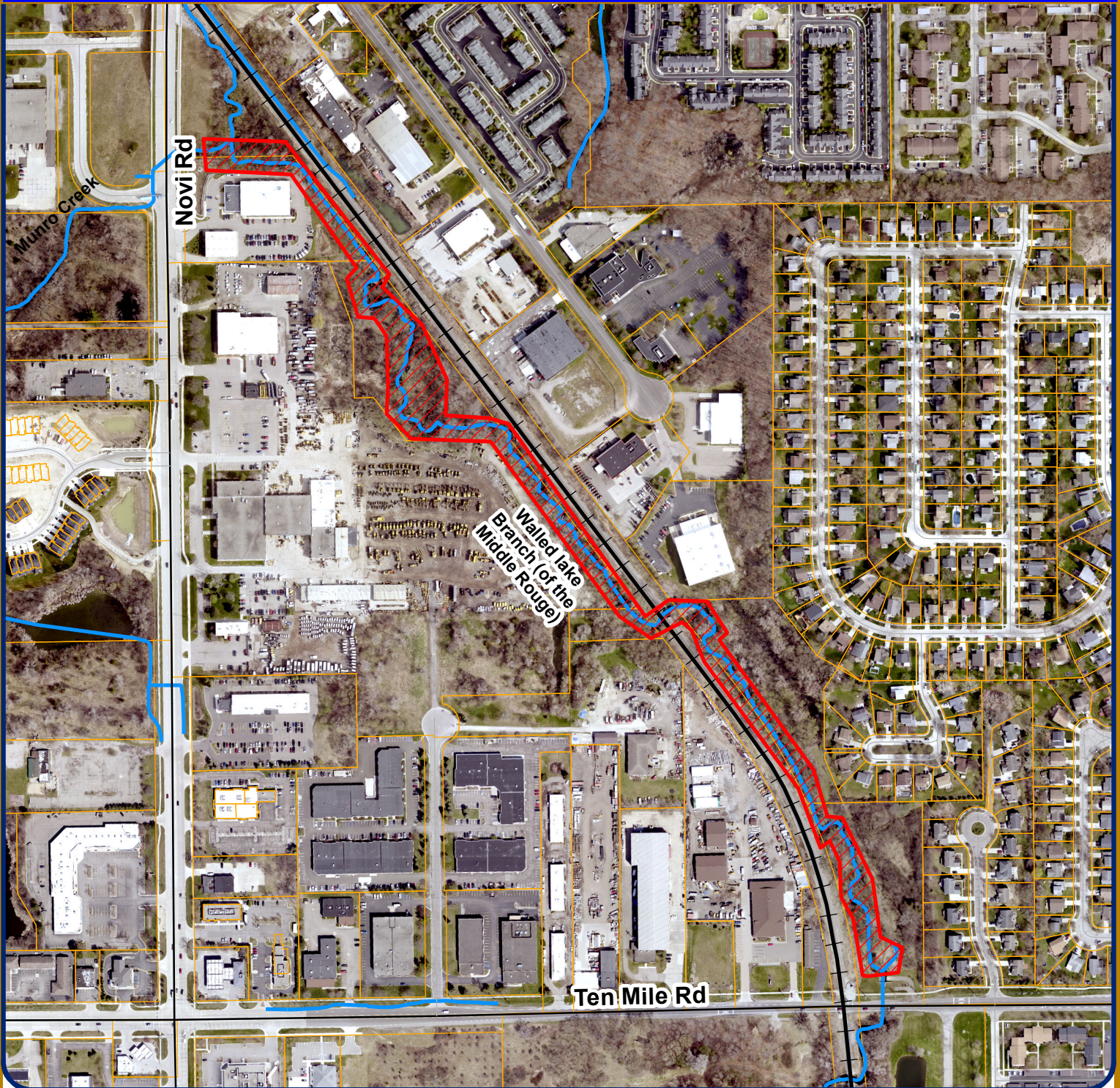
conceptual design are expected to take approximately three months to complete, April - June 2022.

OHM is also currently working on construction plans for streambank stabilization of the Middle Branch of the Rouge River, north and south of Chattman Drive, and dredging of the inlets of Meadowbrook Lake. Originally this project also included bankfull shelf construction in the park area south of Meadowbrook Lake. However, after considering feedback from stakeholders, the City feels it is in the best interest to remove the park portion of the project and redirect design efforts to restoring the Middle Rouge north of 10 Mile Road.

**RECOMMENDED ACTION:** Approval to award engineering services to OHM Advisors for a feasibility analysis and environmental assessment of the Middle Branch of the Rouge River between 10 Mile Road and Novi Road in the amount of \$52,900.



# Middle Rouge River Streambank Stabilization and Restoration 10 Mile Road to Novi Road Location Map






Map Author: Rebecca Runkel  
Date: 2/16/22  
Project: Middle Rouge, 10 Mile to Novi Rd  
Version #: 1.0

**MAP INTERPRETATION NOTICE**

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.

**Legend**

-  Project Area
-  Railroad
-  Stream or Drain



**City of Novi**  
Engineering Division  
Department of Public Works  
26300 Lee BeGole Drive  
Novi, MI 48375  
cityofnovi.org



1 inch = 459 feet







February 9, 2022

Mr. Ben Croy, P.E.  
City Engineer  
City of Novi, Department of Public Works  
26300 Lee Begole Drive  
Novi, MI 48375

RE: Scope of Feasibility & Environmental Assessment Services  
Middle Rouge Streambank Restoration & Stabilization between 10 Mile Road and Novi Road

Dear Mr. Croy:

We are submitting this scope of services as a follow up to our prior discussions and the City's desire to prepare pre-design documents of the Middle Rouge streambank restoration project between 10 Mile Road and Novi Road. The following outlines our Project Understanding, Scope of Work, Schedule, and Fee for the pre-design phase of this project.

### **PROJECT UNDERSTANDING**

We understand this project to include a feasibility analysis for the engineering design of streambank and flow stabilization, along with floodplain creation, for an approximately 1,600-foot intermittent stretch between 10 Mile Road and Novi Road crossing. The stream in this location is approximately 21 feet wide and has a depth of approximately 4 feet at base flow.

In 2013, the City commissioned a streambank assessment of the Middle Rouge River (ECT, 2013). Results from the study concluded this section of the Middle Rouge River between 10 Mile Road and Novi Road to be exhibiting moderate to very high bank erosion which contributes to excessive sediment loads further downstream and continued stream corridor degradation (see Figure 1). Based on a field walk through of the site, conditions since the 2013 study have further deteriorated and the objective of this scope is to gather background information and prepare conceptual design documents of proposed streambank stabilization measures.

We understand the City desires for OHM Advisors to provide professional services consistent with our on-going Agreement for Civil Engineering Services.



*Figure 1 – 2013 Middle Rouge River Study Area Recommended for Improvements*

### SCOPE OF SERVICES

The scope of work for this project is split into two phases. The first phase will be a feasibility study where efforts will focus on data collection, natural channel design parameter quantification, and developing a concept plan. Phase two will produce construction documents for bid and contractor implementation. The work will be consistent with our Agreement for Civil Engineering Consulting Services between the City and OHM Advisors. This includes items related to the permitting and streambank design phase of work as outlined below:

#### **Phase 1 – Feasibility Study & Concept Plan**

- Data Gathering (Site Inventory, Assessment and Stream Survey)
- Hydrology and Hydraulics
- Design Basis Report & Concept Plan



## **Phase 2 – Design Engineering – (To Be Submitted under Separate Proposal)**

- Construction Plan and Specification Development
- Bidding and Award

The following outlines our work plan to accomplish the scope of services for the preliminary design phase of this project related to streambank restoration as noted above:

### **PHASE 1 TASKS – FEASIBILITY STUDY & CONCEPT PLAN**

#### **Task 1 – Data Gathering (Site Inventory, Assessment and Stream Survey)**

As the first major task, OHM will gather background information and perform a field inventory/survey of the stream corridor. The primary goal of this task is to document existing conditions and quantify stream channel parameters to develop a restoration concept design. Specific work efforts include:

- ▶ Meet with City staff for an initial kick-off meeting to discuss the project scope and schedule.
- ▶ Obtain information from the City including development plans, GIS data, area historical drainage information, wetland inventory maps, existing studies, property owner complaints and other available relevant information.
- ▶ Contact utility companies to be assured that conflicts do not exist.
- ▶ Perform a field inventory of the stream corridor, collecting data related to current channel conditions (degree of incision, bank-full depth, bank slope, percent of vegetative cover, existence of obstructions, man-made features, access potential, hydraulic controls, riffle/pool locations, substrate, etc.) and confirm initial recommended treatment. GPS coordinates and photos will be obtained at each identified location.
- ▶ Obtain sediment core samples from point bars. We have assumed two (2) core samples will be obtained for this project. A pebble count will be performed at the core sample locations.
- ▶ Obtain sediment core samples from riffles. We have assumed two (2) core samples will be obtained for this project. A pebble count will be performed at the core sample locations.
- ▶ Perform a sieve analysis and obtain the gradation parameters for each sample.
- ▶ The collected data will be organized into an inventory database that will serve as the foundation in the design basis report (delivered under Task 6). The sites will be prioritized based on their bank characteristics. We have found from past experience on similar urban streams that high and medium priority areas need to be treated, while other lower-priority areas can be left to allow natural restoration. This will be balanced with access constraints along this tight corridor.
- ▶ Create a preliminary access plan depicting area that can be used by contractor for access to the site and for storing of materials and equipment.
- ▶ Obtain horizontal and vertical survey control. We expect that control can be obtained in the “leaf off” condition and with GPS equipment.
- ▶ Obtain stream cross sections approximately every 100 feet or where significant changes in the cross-section occur. Cross-sections will include the stream centerline, toe of slope, top of bank, top of sediment, hard bottom, and ground point at a minimum of 25 feet from the top of bank. Locate and record the size and invert elevations of each road crossing. The size, length, material, inverts, and depth of sediment will be documented at each road crossing. We estimate that 16 cross-sections will be obtained.
- ▶ Tree survey work to identify potential bat habitat may be needed to supplement topographical survey data.

#### *Deliverable:*

- ▶ Minutes from kickoff meeting
- ▶ Inventory and stream assessment portion of Design Basis (to be submitted as part of Task 6)
- ▶ Stream cross section details

#### **Task 2 – Reference Reach Assessment**

Based on recent project experience and discussions with EGLE staff, it is our understanding that upcoming (not permitted) stream projects will be required to identify a reference reach and gather natural channel parameters along



the reference reach. The natural channel parameters of the reference reach are then used as design criteria for the targeted restoration reach. Specific work activities would include the following:

- ▶ Identification of and concurrence from EGLE on an appropriate reference reach for the restoration reach.
- ▶ Perform a field inventory of the reference reach, collecting data related to the natural channel design parameters (degree of incision, bank-full depth, bank slope, percent of vegetative cover, existence of obstructions, man-made features, access potential, hydraulic controls, riffle/pool locations, substrate, etc.).

### **Task 3 – Wetland Delineation**

A wetland delineation will be required before permitting of stream restoration projects to ensure impacts to existing wetlands are mitigated. Additionally, the wetland delineation will determine design and site access constraints that could impact the restoration effort. Specific work activities would include the following:

- ▶ Desktop review of National Wetland Inventory (NWI) maps, Hydric soils mapped by the U.S. Department of Agriculture, Natural Resource Conservation Service (USDA NRCS), and National Cooperative Soil Survey data.
- ▶ Onsite wetland investigation to perform data collection and analysis of vegetation types, hydrology indicators, and soils. Flag and GPS flagged survey points of wetland boundaries using GPS equipment with sub-foot accuracy.
- ▶ Technical memorandum summarizing field findings including wetland delineation site map, field datasheets, USDA soil survey map and EGLE wetland inventory map, for submission as part of the JPA.

### **Task 4 – Threatened and Endangered Species Survey**

A threatened and endangered species survey (T&E) will be required before permitting of stream restoration projects to ensure impacts to Federal and State listed species are mitigated. For in water work a mussel survey will be required to determine presence or absence of Federal or State listed species. If mussel species are present, then additional relocation will be required. Specific work activities would include the following:

- ▶ Request and review of Federal (USFWS) and State (MNFI) listed species.
- ▶ T&E field survey to determine suitable habitat and species presence/absence.
- ▶ Mapping of suitable habitat and or species.
- ▶ Technical memorandum summarizing field findings.
- ▶ Regulatory agency communication and submission of required documents.
- ▶ **NOTE:** This does not include additional relocation of mussels if presence determined within the project area. Relocation costs can be in the range of \$20,000-\$30,000.

### **Task 5 – Hydrology and Hydraulics**

OHM Advisors will develop existing and proposed conditions HEC-RAS models based on data collected in Task 1. The existing conditions hydraulic model will be used to develop proposed design cross-sections. The proposed conditions hydraulic model will be used to confirm the size of a stable channel and protection measures developed during the concept design phase. Specific work efforts are as follows:

- ▶ Request flood flows from EGLE as the tributary drainage area is greater than 2 square miles. OHM will perform an independent calculation of peak flows to validate the flows provided from EGLE are appropriate and up-to-date.
- ▶ Develop a backwater analysis using HEC-RAS for the existing and proposed conditions to obtain open channel hydraulic parameters. The data will be tabulated in an open channel summary that identifies, in locations of significance, the channel cross section location, cross section area, channel grade along with hydraulic parameters at each cross section. The summary will be developed for the bank-full, 10-year and 100-year storm events.
- ▶ Perform bank-full dimensionless shear stress computations in HEC-RAS and check with hand computations using core sample and cross section data. These computations will aid in determination of the stable channel/bank condition. It should be noted that to maintain stability, a stream must be able to transport the largest size of sediment and have the capacity to transport the load on an annual basis. These





computations will be performed as per methods outlined in the NRCS NEH Part 64 Stream Restoration Guide.

- ▼ Perform scour computations to determine bury depth of proposed toe/in-stream stabilization measures.
- ▼ Optimize the design of stabilization measures based on weighting the costs associated with the wide disturbance area and tight corridor.
- ▼ Prepare the hydraulic portion of the design basis outlining hydraulic findings.

*Deliverable:*

- ▼ Hydraulic portion of Design Basis (to be submitted as part of Task 6)

**Task 6 – Conceptual Design and Basis Report**

Under this task, OHM Advisors will compile data from the previous tasks and develop conceptual alternatives and preliminary cost estimates into a design basis report. Specific work efforts include:

- ▼ Based on the proposed conditions hydraulic results, prepare conceptual sketches for restoration measures at the site. Conceptual plan views will be developed with GIS aerial backgrounds to provide a preliminary indication of access area and associated impacts.
- ▼ Prepare an EGLE pre-application meeting request and meet with EGLE on-site to determine permitting requirements and obtain EGLE input. We have assumed that the City will pay the pre-application fee as a reimbursable expense.
- ▼ Quantify sedimentation prevention benefit (load). Bank Erosion Hazard ratings and Near Bank Stress ratings will be used to estimate streambank erosion load in tons per year for both the existing and proposed (stable) conditions. The difference between the existing and proposed condition sediment loads will be used to quantify the sediment prevention benefit.
- ▼ Compile stream data into EGLE's stream quantification tool.
- ▼ Prepare planning level cost estimates for anticipated restoration measures.
- ▼ Compile information into a design basis report and submit to the City of Novi for review and modify the Design Basis based on City comments.
- ▼ Assist with 1 public meeting.
- ▼ Meet with the City of Novi and modify the Design Basis based on feedback received during the public meeting. This report will be used for the EGLE Joint Permit Application submittal. Once the recommendations in the report are agreed upon, we will initiate detailed design.

*Deliverable:*

- ▼ EGLE pre-application meeting request and meeting notes
- ▼ Conceptual design alternatives
- ▼ Design basis report
- ▼ Conceptual cost estimate
- ▼ Public meeting presentation materials

**ASSUMPTIONS/SERVICES NOT INCLUDED**

The following services are not anticipated to be required for this project and have not been included at this time:

- ▼ Permit or application fees that are necessary – to be paid by the City or as an additional reimbursable expense to OHM Advisors.
- ▼ Coordination or design for private utility relocations or repairs.
- ▼ Right-of-way and/or easement acquisitions – to be acquired by the City. Title work or easement descriptions and sketches can be prepared by OHM Advisors for an additional fee if requested.
- ▼ Remediation or removal of contaminated or hazardous soils or materials.
- ▼ Sediment transport analysis is not included.
- ▼ Design of erosion mitigation measures along tributary to the Middle Rouge behind the Caterpillar industrial complex.





In the event any of these services are required by OHM Advisors, an addendum to the supplemental engineering agreement will be submitted for your approval prior to performing said services.

**SCHEDULE**

Based upon an authorization to proceed given by March 1, 2022, the following outlines our anticipated schedule milestones of main tasks related to this work:

- Data collection/survey – April 2022
- Conceptual plans – June 2022
- Tentative Design Start – July 2022
- Tentative Construction Start – March 2023

\* The tentative design and construction schedule assumes that easement/permit coordination with CSX railroad company will not cause delays. Historically, railroad companies can be slow to respond and coordinate with on easement/permitting needs. If an easement/permit is needed from CSX, the project schedule will most likely need to be delayed.

**FEE SCHEDULE**

Based on the fee schedule in the Civil Engineering Consulting Services Agreement between the City and OHM Advisors, the proposed fee for this project is established as follows:

Phase I – Feasibility Study & Concept Plan \$52,900

<b>Task</b>	<b>Budget</b>
Task 1 – Data Gathering (Site Inventory, Assessment, and Stream Survey)	\$15,600
Task 2 – Reference Reach Assessment	\$5,000
Task 3 – Wetland Delineation	\$2,500
Task 4 – Threatened & Endangered Species Survey	\$6,500
Task 5 – Hydrologic & Hydraulics	\$10,500
Task 6 – Conceptual Design and Basis Report	\$12,800
<b>Total Cost</b>	<b>\$52,900</b>

Thank you for the opportunity to be of service. If you have any questions or require additional information, please contact me at 248-751-3111. We look forward to working with you on this project.

Sincerely,  
 OHM Advisors

Authorization to Proceed

\_\_\_\_\_  
 Steve Siklich, P.E.  
 Project Manager

\_\_\_\_\_  
 Signature Date

\_\_\_\_\_  
 Printed Name Title

cc: Rebecca Runkel, Project Engineer  
 Tim Juidici, P.E., OHM Advisors  
 Valerie Novaes, P.E., OHM Advisors