MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

Meeting: Board of Managers
Meeting date: 5/27/2021
Agenda Item #: 11.3
Item type: Action Item

Title:	Authorization to Execute a Contract for 54th Street Streambank Investigation
Resolution number:	21-035
Prepared by:	Name: Kate Moran Phone: 952-641-4520 kmoran@minnehahacreek.org
Reviewed by:	Name/Title: Becky Christopher, Policy Planning Manager; Laura Domyancich-Lee, Planner - Project Manager
Recommended action:	Authorization to execute a contract with Inter-Fluve, Inc. for the lump-sum amount of $38,600 to perform an investigation of the stream channel downstream of 54th Street in Edina, MN
Schedule:	May 2021 – August 2021: Inter-Fluve performs site review, analysis and hydraulic modeling, and develops technical memorandum
Budget considerations:	Fund name and code: Planning 2-2002 Fund budget: $1,178,645 ($75,000 for Responsive Planning) Expenditures to date: $303,537 ($4,908 from Responsive Planning) Requested amount of funding: $31,600 ($38,600 total with $7,000 to be reimbursed by the City of Edina)
Past Board action:	Res # 14-056 Authorization of Memorandum of Understanding with the City of Edina and District establishing coordination framework

Summary:
The City of Edina (City) has requested technical assistance from the Minnehaha Creek Watershed District (District) to investigate concerns with streambank stability and the formation of a sandbar within Minnehaha Creek located downstream of the West 54th Street bridge in Edina (refer to Attachment 1 – City of Edina Request for Assistance Letter).

Background

Over the last several years, rapid snowmelt in the spring at times followed by high precipitation during the spring and summer has led to high flows in Minnehaha Creek followed by prolonged flooding throughout the growing season. These high flows have destabilized the stream channel in areas and resulted in eroded and undercut banks. The resulting transport of suspended solids downstream has resulted in the formation of sandbars and areas of deposition, which has affected flow patterns and further increased bank erosion. Local homeowners along Minnehaha Creek reached out to the City of Edina regarding a sandbar that formed downstream of the West 54th St bridge and appears to be diverting flows toward the bank of the City's and homeowners' properties (refer to Attachment 2 for site area map).

MCWD has undertaken significant capital investment in the restoration of Minnehaha Creek through remeandering, installation of bioengineered stabilization techniques, reconnection of the creek to its floodplain, and restoration of upland areas along the creek. These successful efforts have been supported by thorough and comprehensive investigations including stream assessments and project feasibility studies in addition to synthesis of floodplain,

stormwater, and groundwater data. For these reasons, the City has requested the District's assistance in investigating this area of concern.

The District and City have a long history of effective partnerships, including collaboration on the Arden Park and Reach 14 Restoration Projects. In 2014, the City and District entered into a Memorandum of Understanding (MOU) that documented shared goals and established a cooperative framework to support the integration of work and alignment of resources to make wise investments in infrastructure and protect and improve natural systems in order to develop vibrant, healthy communities.

Evaluation

The District's 2017 Watershed Management Plan outlines its commitment to serving as a resource to its communities, and remaining responsive to opportunities created by land use change or partner initiatives, through early coordination and co-planning of land use and water resource matters. District staff are in the process of developing formal policy to guide the implementation of this "Responsive Model" for Board review in July. In the interim, staff have been operating this approach in a pilot phase and evaluating partnership requests using the following four criteria categories: resource need and priority, project benefits, cost effectiveness, and strength of the partner's coordination and commitment to working with the District.

Staff evaluated the City's request by applying the four criteria categories and vetting it through a cross-departmental staff team to inform the recommended response. As part of this evaluation, in February 2021, District staff conducted a site visit to observe channel conditions. Based on this evaluation process, District staff proposed that the District utilize its expertise and extensive knowledge of the area to lead an investigation to advise the City on potential solutions.

At the March 11, 2021 Operations and Programs Committee (OPC) Meeting, District staff provided a background, evaluation, and recommendations on four active responsive opportunities including the City of Edina's 54th Street Streambank Investigation. Staff noted that the scope of work for an investigation would be brought before the Board in spring 2021 to allow for the investigation to be completed with open water conditions in the creek and while the stream banks are visible and not fully inundated.

Recommendation

Based on the recommendation to conduct a technical investigation, District staff developed a request for a proposal from Inter-Fluve that would ensure a thorough investigation and the development of data-driven solutions appropriate for the area. District staff, in coordination with City staff, determined Inter-Fluve was uniquely qualified to conduct the investigation based on its previous work including design for both the Arden Park Restoration and Reach 14 Streambank Improvement Projects, the District's 2012 Stream Assessment, and general understanding of the complexity present within the Minnehaha Creek system.

Inter-Fluve submitted a proposal to conduct a site review, perform an analysis and hydraulic modeling, and develop a technical memorandum based on these findings (refer to Attachment 3 – Inter-Fluve Proposal April 26, 2021). A final technical memorandum will be developed with City and District input and will include: methodology, analysis and modeling, alternatives, and recommendations (i.e., type, extent, estimated construction cost, and urgency of the proposed solution(s), if one is appropriate). City and District staff reviewed and determined that the Inter-Fluve proposal is complete and will provide the District, City, and private land owners with a clear understanding of the scale, urgency, and cost of work in this area. The cost for the investigation is $38,600, of which the City has agreed to contribute $7,000 to cover the cost of the topographic survey.

Following completion of the technical memorandum, the District and City will work together to determine the next steps based on the recommended solution(s). The District has framed expectations that the City would lead implementation planning of any solutions, pending the scope of recommended solution(s) and future discussions with the District. If the City does request additional technical and/or financial support for implementation, the District would evaluate the request based on the results of the Inter-Fluve investigation and the determined scale and scope of work needed.

Based on the submitted Inter-Fluve proposal, staff requests authorization to enter into a contract with Inter-Fluve for an amount not to exceed $38,600, of which the City will contribute $7,000, for the 54th Street Streambank Investigation.

Supporting documents:
Attachment 1: City of Edina – Request for Assistance Letter
Attachment 2: Site Area Map - 54th Street Streambank Investigation
Attachment 3: Inter-Fluve Proposal – April 26, 2021

MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

RESOLUTION

Resolution number: 21-035

Title: Authorization to Execute a Contract for 54th Street Streambank Investigation

WHEREAS, the City of Edina (City) has requested technical assistance from the Minnehaha Creek Watershed District (District) to investigate and address concerns with streambank stability and the formation of a sandbar within Minnehaha Creek located downstream of the West 54th Street Bridge;

WHEREAS, the District has completed two stream restoration projects adjacent to this study area, located directly upstream (Arden Park Restoration in 2020) and downstream (Reach 14 Streambank Improvement Project in 2013);

WHEREAS, during the 2014 flood event, the study area experienced significant bank erosion and sediment deposition;

WHEREAS, the District's 2017 Watershed Management Plan outlines its commitment to serving as a resource to its communities through early coordination and planning of land use and water resource matters, including technical assistance, regulatory process facilitation and shared efforts to secure funding, referred to as the Responsive Model;

WHEREAS**,** District staff are in the process of developing formal policy for Board adoption that will guide the implementation of the Responsive Model, and in the interim, staff have been operating this approach in a pilot phase;

WHEREAS**,** the District staff evaluated the City's request and is recommending that the District utilize its expertise and extensive knowledge of the area to provide support to the City by conducting an investigation to determine and advise the City on potential solutions;

WHEREAS, the District Governance Manual directs the Administrator that any professional service in excess of $25,000 be selected after obtaining written quotes or bids or utilizing a qualification based selection process;

WHEREAS, the District staff obtained a single proposal from Inter-Fluve, and recommends retaining Inter-Fluve without seeking competitive proposals, on the basis that Inter-Fluve is uniquely qualified to conduct the investigation based on its previous work including design for both Arden Park Restoration and Reach 14 Streambank Improvement Projects, its performance of the District's Stream Assessment, and its understanding of the complexity present within the Minnehaha Creek system;

WHEREAS, under the proposal, Inter-Fluve will conduct a site review, perform an analysis of the gathered data, and complete hydraulic modeling to develop a technical memorandum that will describe the analysis, alternatives, and recommendations;

WHEREAS, the 54th Street Streambank Investigation cost is $38,600 of which the City will pay $7,000 and provide this lump-sum to the District upon Board of Managers authorization to enter into a contract with Inter-Fluve; and

WHEREAS, the study will provide the District, City, and private land owners with a clear understanding of the channel conditions, potential work to address those conditions, and the cost to do so, at which time the District and City will work together to consider the next steps based on these data-driven recommended solutions.

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers hereby authorizes the District Administrator, on the advice of counsel, to enter into an agreement with the City as necessary to formalize the City's $7,000 contribution to the study cost, and to enter into a contract with Inter-Fluve for the 54th Street Streambank Investigation for an amount not to exceed $38,600.

Resolution Number 21-035 was moved by Manager _____, seconded by Manager _____. Motion to adopt the resolution ___ ayes, ___ nays, ___abstentions. Date: 5/27/2021

_____ Date: _____
Secretary

May 7, 2021

Minnehaha Creek Watershed District
Kate Moran, Policy Planning Coordinator
15320 Minnetonka Boulevard
Minnetonka, MN 55345

RE: Request for Assistance - 54th Street Streambank Investigation

Dear Ms. Moran:

The City of Edina (City) is requesting assistance to investigate and address concerns with streambank stability and the formation of a sandbar within Minnehaha Creek located downstream of the 54th Street Bridge. The City understands the Minnehaha Creek Watershed District (District or MCWD) is committed to serving as a resource to its communities through early coordination and planning of land use and water resource matters, referred to as the District's Responsive Model. This letter is intended to request partnership with MCWD and highlight discussions to-date between the City and District staff.

In 2014, the City and District entered into a Memorandum of Understanding (MOU) that documented shared goals and established a cooperative framework to support the integration of work and alignment of resources to make wise investments in infrastructure and protect and improve natural systems in order to develop vibrant, healthy communities. Over the years, the City and District have a long track record of effective partnerships, including work with the Arden Park and Reach 14 Restoration Projects.

Most recently, City and District staff have discussed the need for a technical investigation downstream of 54th Street Bridge to determine the potential scope and scale of work to address concerns regarding the bank stability and influence from stream hydraulics. Based on these coordination discussions, the City recognizes and supports utilizing the District's expertise and extensive knowledge of the area to provide technical support by leading an investigation. The goal of this investigation would be to characterize the extent of streambank erosion and the condition of adjacent upland areas, and identify potential solutions

and costs to sustainably stabilize the area. The City is willing to use the information gathered to lead implementation planning, pending the outcome of this technical investigation and subsequent discussions with the District.

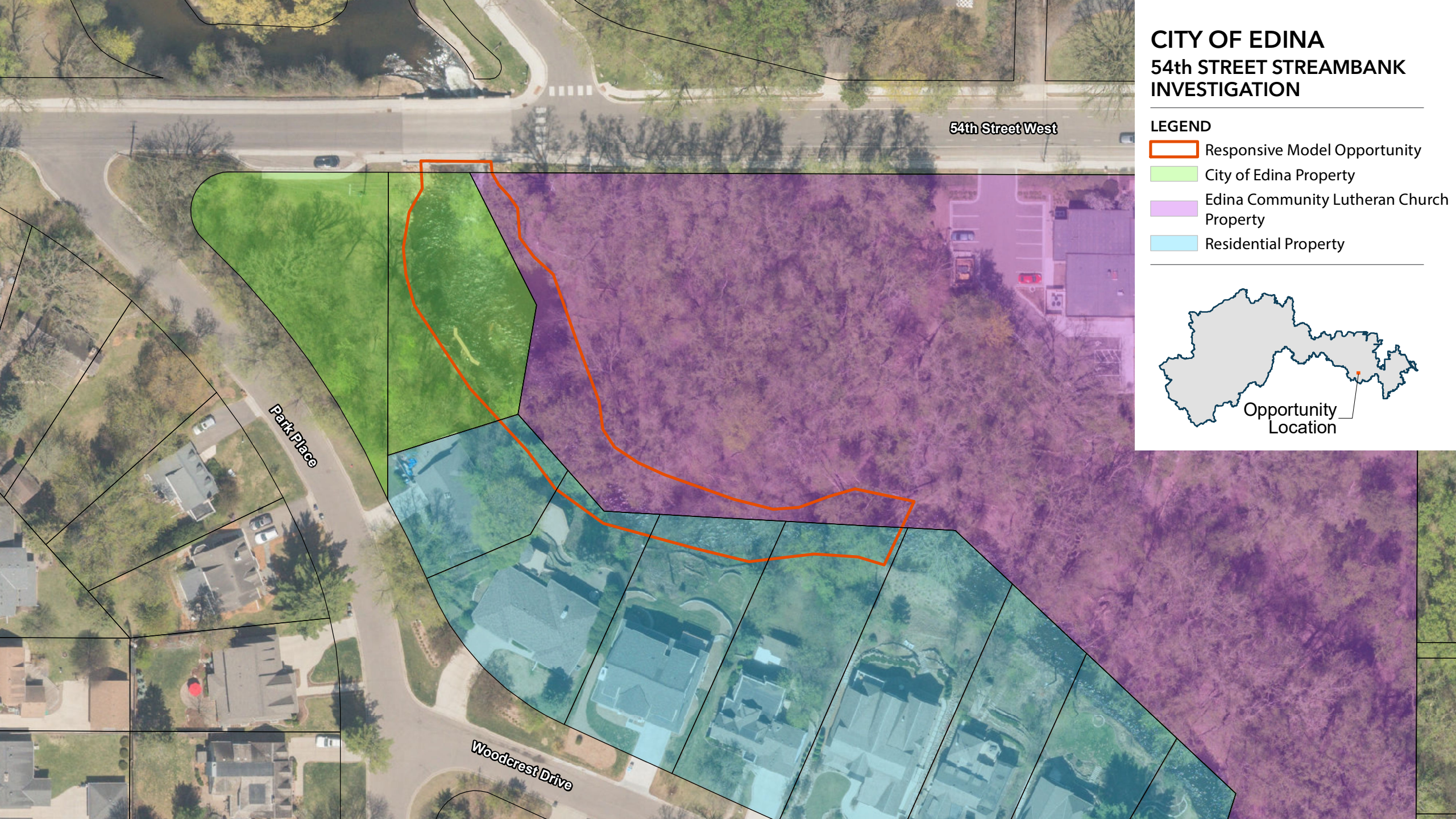
The City has reviewed and approves of the proposed scope of work for the investigation prepared by Inter-Fluve (April 26, 2021 Proposal) and agrees to contribute $7,000 to cover topographic survey costs of the total $38,600 investigation cost.

The City recognizes the value added through collaboration and partnership and appreciates the District's on-going coordination and consideration of this request. Thank you in advance for your consideration.

Sincerely,

Chad A. Millner

Chad Millner, PE Director of Engineering



CITY OF EDINA

54th STREET STREAMBANK INVESTIGATION

LEGEND

- Responsive Model Opportunity
- City of Edina Property
- Edina Community Lutheran Church Property
- Residential Property

April 26, 2021

INVESTIGATE

DESIGN

RESTORE

Minnehaha Creek Watershed District
Attn: Laura Domyancich-Lee, Planner – Project Manager
Kate Moran, Policy Planning Coordinator- Assistant Project Manager
15320 Minnetonka Blvd.
Minnetonka, MN 55345

Re: 54th Street, Edina Stream Bank Investigation

Dear Laura and Kate,

On behalf of the Inter-Fluve team, thank you for reaching out to us regarding this project effort. Per our discussion in the field and the Scope of Work Request document, we have developed the scope effort and associated fee outlined below. We have also included our geotechnical investigation partner, Haugo. We look forward to discussing the scope further and refining the approach as needed to meet the needs of MCWD and the City of Edina. As noted in the request, the purpose of this effort for the area noted in the request is as follows:

> This investigation aims to determine the extent of unstabilized stream banks, the condition of adjacent upland areas,the possible causes of destabilization, potential solutions to increase the long-term stability of the stream channel in this area, and the scope and estimated cost of potential stabilization andassociated work.

To achieve this goal, our broad recommendation is to analyze the hydraulics of the reach under low and high-flow conditions and to assess trajectory of the bank erosion in the context of the geomorphology and site ecology (specifically the floodplain vegetation growth on the east bank and the land-owner vegetation removal on the west bank). Concurrently, we recommend that geotechnical stability analysis be conducted by our subconsultant, Haugo, so that hydraulic and geotechnical findings together can answer the questions included in the request, and so that recommendations can be integrated into a cohesive design solution.

Proposed Scope of Work:

Site Review

Inter-Fluve will leverage our existing knowledge of the site gleaned from the recent Arden Park Improvements project to efficiently assess the conditions of the bank instability. Our tasks will primarily fall into the following efforts:

1. Conduct visual geomorphic review of the stream reach. Review will include investigation and classification of the stream bed and side slope aggregate size (which will provide field indicators of shear

stress and natural bank armoring), and vegetation. Execute on-site review of higher flow conditions during storm events that occur over the next month.

2. Haugo will complete up to eight (8) hand auger borings, using a 4-inch auger head, at the top and toe of the slope and Dynamic Core Penetrometer tests which will extend to refusal or maximum depths of 10 feet. The hand auger locations will be located with GPS coordinates and elevations. A visual classification of the soil borings will be completed. The geotechnical team will completed slope stability analyses of up to four (4) cross sections along the stream bank. The geotechnical team will require access to private properties for the site investigation.

3. Topographic survey of the stream reach. The sections noted in Figure 1, which were developed based on 2017 survey data in support the Arden Park HEC-RAS model will be updated with 2021 survey data collected as part of this effort. We will limit out survey to the eight lower cross sections noted in Figure 1. The survey will include bathymetric survey either wading or using our hydrone equipment.

4. Historical review of the bank and floodplain conditions in the project reach. This task will provide context to the current erosion. We will utilize geomorphic data gathered during the 2003 and 2012 geomorphic analysis and well as publicly available historic aerial imagery. We will also conduct a brief image search for historical documentation of the slope conditions.

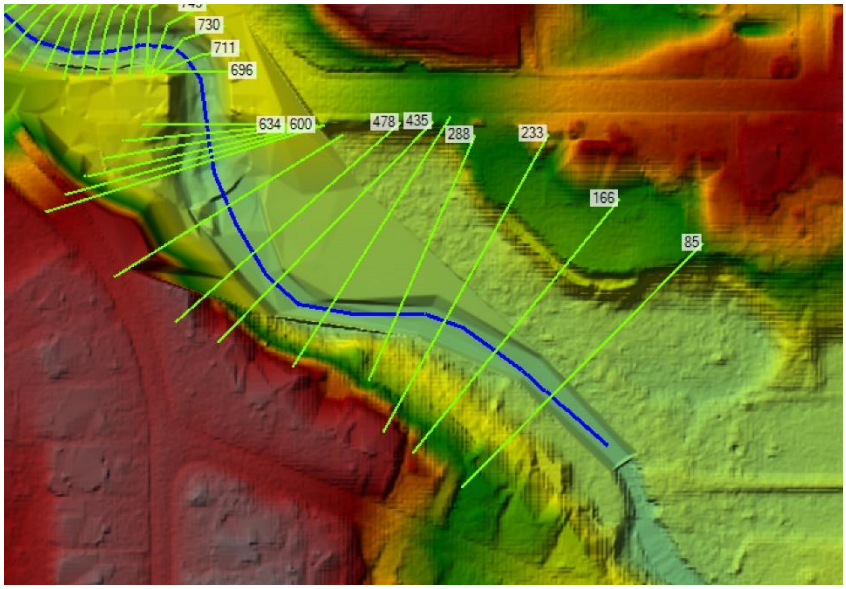


Figure 1: Existing Conditions HEC-RAS Section Locations

Hydraulic Modeling

Inter-Fluve will update the Arden Park as-built HEC-RAS model with the 2021 survey data and compare the models to understand the last 4 years of change on the site. This hydraulic model and associated analysis will provide quantitative estimates of the shear stresses located within this bend of the stream system as well as a quantitative evaluation of the sand bar located downstream of the 54th Street Bridge. The team will review the two primary flood flow conditions, 300cfs and 100-year flow, as well as higher and lower frequency storms to understand potential bank impacts. Inter-Fluve will then develop up to four proposed model conditions to reflect potential solutions to the project site to reduce hydraulic erosion along the toe of the right slope. The anticipated solutions may include floodplain lowering (left bank), bank hardening (right bank), vegetation stabilization (right bank), and some combination of the concepts.

Reporting and Meetings

Inter-Fluve will develop a draft technical memorandum which describes the data collected, analysis, alternatives, and recommendation(s). The memorandum will include a specific evaluation of the sandbar located downstream of 54th Street and its impacts to flow and erosion at the project site. The sandbar study will include hydraulic modeling of the area (as described above), historic photo review, and a qualitative discussion of sediment transport upstream pre- and post-dam removal and how it impacts sandbar formation. Finally, the Inter-Fluve team will provide a recommendation relative to whether any alteration to the sandbar is warranted. The sandbar recommendations will be included as a part of our overall bank stability recommendation that integrate the analysis outcome of the hydraulic and geotechnical investigation. The memorandum will include type, extent, estimated opinion of probable construction cost, and urgency of the proposed solution, if one is appropriate. The proposed solution is anticipated to integrate resolution to the hydraulic induced impacts as well as any needed upper slope stability measures.
Inter-Fluve and Haugo propose one design meeting (in person or via video conference) with the City and MCWD staff to discuss the Draft memorandum and the findings. Inter-Fluve will update and finalize the memorandum based on the meeting.

The following questions were posed within the Scope of Work Request. We have included brief answers (in red text) to each below to describe our scoped plans for this proposed effort.

1. What is the necessary extent of on-site assessment of the stream bank and channel withinthis section of Minnehaha Creek? Which observations are expected to deliver the desiredproduct, e.g. stream flows, stream morphology, stream bank condition, floodplain condition?
   Inter-Fluve will propose project extents based on the field review and hydraulic modeling results to stabilize the right (west) bank at the four

properties noted. Based on initial site review, it appears that the growth of vegetation in the floodplain on river left coupled with the removal of vegetation by owners on river right have increased water flow in the channel and associated shear stresses. The hydraulic modeling will clarify if this assessment is correct.

2. What is the necessary extent of geotechnical evaluation of the stream bank to determinestream bank stability and shear stress?
   Inter-Fluve and Haugo will characterize the material type based on exposed soil and hand auger investigations. The hydraulic impacts to the bank will be evaluated with HEC-RAS software and industry standard computations for shear with natural channel systems. Haugo, the geotechnical engineer will evaluate upper slope stability from a geotechnical engineering perspective using hand augers for the four private properties noted.
3. How will the project team assess the condition of the upland slopes above the stream banksrelative to overall bank stability? What level of access is needed?
   Upper slope geotechnical stability analysis and review will be completed by Haugo. Site access for geotechnical stability analysis will not require equipment access.
4. Is intervention needed to prevent slope failure and risk to homes? If so, to what degree orextent?
   Inter-Fluve will be able to provide a recommendation relative to hydraulicly induced erosion, but overall slope stability will also be a function of the geotechnical engineer's investigation and assessment.
5. What is the needed length and method of bank stabilization? Can stabilization be limited toCity property?
   Inter-Fluve will be able to provide a recommendation and guidance relative to the extent and type of solution to the hydraulic issues. The geotechnical engineer, Haugo, will provide guidance on any upper slope stability issues. We plan to meet internally to ascertain how the two evaluations and the associated solutions intersect. The blended design solution proposed by our joint team will determine the scale and extent of the recommendation.
6. Should the existing sand bar be removed? Should the stream channel be narrowed in thissection?
   The answers to these questions will part of the hydraulic modeling recommendation. Based on our site knowledge, removal of the sand bar will likely not resolve the situation long-term, as it has been a persistent deposition location for at least the last 10 years.
7. How will the project team assess adjacent floodplain, floodplain connectivity, and the floodplain's capacity to provide storage in high-flow conditions? Is there a need to connectthe stream to the eastern floodplain?
   The hydraulic modeling and site investigation will address these questions. We will investigate if there is site evidence of flows engaging the floodplain. We will look to the model to assess if making

the floodplain more assessable would relieve shear stress on the right bank and, if so, that w ould be a long-term solution given likely re-growth of vegetation in the floodplain.

8. What is the urgency of the recommended work?
   Inter-Fluve and Haugo will provide our engineering judgement based on the site evidence and analysis of the urgency of the stabilization effort.

We have assumed that the City or MCWD will complete homeowner notification and obtain access for the investigation team to access the properties. As noted above, we do not plan on any equipment access for the site investigation.

Inter-Fluve and Haugo are available to deliver the DRAFT Memorandum within 6 weeks of notice to proceed. Our proposed lump sum fee for the project is $38,600.

We look forward to assisting the City and MCWD with this effort.

Thank you,

Jonathon Kusa, PE, LEED AP
President & CEO
(541) 490-8230
jkusa@interfluve.com