Item 5A.
BCWMC 6-18-20

resourceful. naturally.
engineering and environmental consultants

BARR

Memorandum

To: Bassett Creek Watershed Management Commission (BCWMC)
From: Barr Engineering Co. (Barr)
Subject: Item 5A: Irving Avenue Sanitary Sewer Replacement – Minneapolis, MN
BCWMC June 18, 2020 Meeting Agenda
Date: June 11, 2020
Project: 23270051 2020 2221

5A Irving Avenue Sanitary Sewer Replacement – Minneapolis, MN BCWMC 2020-16

Summary:

Proposed Work: Sanitary sewer replacement

Basis for Review at Commission Meeting: Work in floodplain; utility crossing that disturbs the bed or banks of the creek, variance request for installing new utility pipe crossing with less than 4 feet of cover.

Impervious Surface Area: N/A

Recommendations:

A. Approval of a variance to Section 8.3 of the BCWMC Requirements document for utility crossing requirement of a minimum depth of 4.0 feet below the channel invert.
B. Conditional approval of the entire project.
C. A separate BCWMC application shall be submitted for review of the diversion and dewatering plan and authorize Commission Engineer to review and approve application without bringing back to the BCWMC.

General Project Information

The proposed linear project is located in the Bassett Creek Main Stem subwatershed, within the Irving Avenue right of way, the Minneapolis impound lot, and Bryn Mawr Meadows Park in Minneapolis. The proposed linear project includes replacement of 2,300 linear feet of sanitary sewer, including 75 linear feet under Bassett Creek. Recent pipe inspections have revealed that at least a portion of the system is compromised. The proposed linear project results in 0.92 acres of grading (disturbance) and no change in impervious surfaces from the 2.04 acres of impervious within the project limits in existing conditions. A new 24-inch diameter ductile iron pipe will be installed across Bassett Creek in the location of the existing Irving Avenue Bridge. The existing 48-inch diameter and 52-inch equivalent diameter pipes will continue to convey wastewater until the new pipe is constructed. Due to unfavorable soils in the area, the new pipe must be installed on piles via open cut construction. Once the new pipe is in service, the existing pipe will be abandoned in place with high density controlled low strength material (CLSM). The BCWMC administrator and technical staff have been involved in several preliminary coordination meetings and communications regarding this project. Anticipated construction schedule is from September 2020

through September 2021. Construction for the Bassett Creek crossing will be during low-flow periods in the winter of 2020-2021. Attached is a copy of the City's May 27, 2020 letter to the Commission.

Floodplain

The proposed linear project includes work in the Bassett Creek floodplain. The October 2019 BCWMC Requirements for Improvements and Development Proposals (Requirements) document … *requires that projects within the floodplain must maintain no net loss in floodplain storage and no increase in flood level at any point along the trunk system* (managed to at least a precision of 0.00 feet). The floodplain elevation of Bassett Creek is 811.2 feet NAVD88 downstream of Irving Avenue, and 811.3 feet NAVD88 upstream of Irving Avenue.

The Irving Avenue wooden bridge and abutments are no longer maintained and will be removed as part of the project, in advance of the sanitary pipe installation. The Metropolitan Council WOMP station, including the flow meter operated by BCWMC, will be relocated and the stairs adjacent to the bridge will be removed.

Documentation was not provided to evaluate the impact to Bassett Creek of removing the Irving Avenue Bridge and abutments, but we generally expect this change to be an improvement on existing conditions.

Rate Control

The proposed linear project does not create one or more acres of net new impervious surfaces; therefore, BCWMC rate control review is not required.

Water Quality

The proposed linear project does not create one or more acres of net new impervious surfaces; therefore, BCWMC water quality review is not required.

Erosion and Sediment Control

The proposed linear project does not result in one or more acres of land disturbance; therefore, BCWMC erosion and sediment control is not required. However, proposed temporary erosion and sediment control features include rock construction entrances, sediment control logs, silt fence, and catch basin inlet protection. Proposed permanent erosion and sediment control features include stabilization with seeding, erosion control blanket, and other features within the creek as noted below.

Lakes, Streams, and Wetlands

The proposed linear project includes bridge removal and pipe installation that will affect the Bassett Creek streambed and streambanks. As noted earlier, open cut construction is necessary to install the piles and pipe, which will result in disturbance of the creek bed and banks. The open cut construction will also require the temporary diversion of Bassett Creek. The applicant proposes to construct a temporary channel on the south side of Bassett Creek, approximately 225 feet long; its width and depth will be determined by the contractor based on their method of construction. The applicant will require that the contractor construct watertight embankment damsupstream and downstream of the work area. Once the work area in the creek is dry, the applicant anticipates supporting the open cut and pipe installation work area with sheeting and shoring. Should flows exceed the diversion channel's capacity, the excess flows would overtop the embankment and flow through the work area (i.e., in the creek channel).

The work is proposed to be completed during months with normally lower flows (i.e., in the winter) to reduce land use and environmental impacts. The applicant reviewed twenty years of Bassett Creek flow data collected by the BCWMC/MCES at Irving Avenue to gain a better understanding of the diversion requirements. The work within the creek is anticipated to take two to three months to complete. The contractor will be required to submit their diversion and dewatering design and plans to the City and BCWMC for review and approval prior to installation.

The cross-section of the creek will be restored to match the existing elevations and grades. The applicant used the City of Minneapolis/BCWMC CIP Bassett Creek Main Stem Stabilization Project as the basis for the proposed creek restoration. Proposed stream restoration measures include riprap on the stream bed and banks (toe protection), rock cross vanes, and seeding. As requested by the City, the Commission Engineer provided comments, in the recommendation section, suggesting a few changes to the in-stream structures to better tie into the Main Stem project upstream and downstream of the bridge.

The City of Minneapolis is the local government unit (LGU) responsible for administering the Wetland Conservation Act; therefore, BCWMC wetland review is not required. However, the applicant provided an exhibit identifying a 50-ft. buffer from the edge of the Bassett Creek wetland and indicated the areas within the buffer will be restored.

Water Resources

Soil contamination has been identified within the project area. Excavation, removal and disposal of contaminated soils will be managed in accordance with the Phase 2 Investigation Report and Response Action Plan (RAP). Soil excavated in the vicinity of Bassett Creek has chemical concentrations above MPCA industrial limits and will be disposed of at a landfill and replaced with clean fill. Barr Engineering Co. prepared the RAP for the City of Minneapolis.

Utility Crossings

As noted, a new 24-inch diameter ductile iron pipe will be installed across Bassett Creek in the location of the existing Irving Avenue bridge. Section 8.3 of the Requirements document includes a utility crossing requirement of a minimum depth of 4.0 feet below the channel invert. The city of Minneapolis has provided a variance request for providing less than 4.0 feet of cover over the top of the pipe.

Variance Request

The city of Minneapolis requested a variance to Section 8.3 of the BCWMC Requirements document for the utility crossing requirement of a minimum depth of 4.0 feet below the channel invert.

Section 3.3 of the BCWMC Requirements document indicates that in granting variances, the Commission shall make a finding showing that all of the following conditions exist. A memo from the city's consultant addressed these conditions, as follows.

1. There are special circumstances or conditions affecting the property such that the strict application of the provisions of these standards and criteria would deprive the applicant of the reasonable use of the applicant's land.

   ***Response**: The existing sanitary sewer was installed in 1905 and has less than 4 feet of cover. A new pipe will be installed with the same crown elevation and similar cover to the existing condition. The*

pipe cannot be lowered to accommodate the minimum cover requirement because it is a gravity sewer that has a controlled grade at the intersection of Irving Avenue and Currie Avenue.

Commission Engineer Response: *Follow-up discussion with the City's consultant indicates the crown of the new pipe will be installed approximately 1.5 feet higher than the existing pipe at the Bassett Creek crossing, thus decreasing the cover from about 3.5 ft. to about 2 ft.*

2. The variance is necessary for the preservation and enjoyment of a substantial property right of the applicant.

   Response*: The City of Minneapolis is committed to providing reliable and sustainable sanitary sewer service to its residents. As such, the City evaluated several options for the reconstruction of the sewer. Eight alternatives were developed in advance of the design development; four lift station options and four gravity options following different alignments in the area were considered. Through that evaluation, it was determined that the reconstruction of the sanitary in its current location was the most efficient and reliable way to provide service to the project area.*

3. The granting of the variance will not be detrimental to the public welfare or injurious to the other property in the territory in which the property is situated.

   Response*: As stated above, granting of the variance will allow the sewer to be constructed at elevations similar to existing conditions. Although temporary excavation is required in the creek, the new sewer will not alter any conditions within the stream. Grades will be restored to existing conditions once construction is complete.*

4. In applications relating to a use in the 1% (base flood elevation, 100-year flood) floodplain set forth in Table 2-9 of the Plan, the variance shall not allow a lower degree of flood protection than the current flood protection.

   Response*: As noted in the Utility Crossings section of this letter, a temporary diversion channel will be provided. Should an event occur which would cause the flows to increase beyond the designed channel diversion capacity, the flow will be allowed to overtop the temporary embankments and flow through the work site, i.e., the existing stream bed. Additionally, the construction of the new sewer will not permanently impact the floodplain as existing grades will be restored upon project completion.*

5. The granting of the variance will not be contrary to the intent of taking all reasonable and practical steps to improve water quality within the watershed.

   Response*: Although there may be temporary impacts, it is expected the long-term effects of the project will be favorable to the overall water quality in the watershed while considering two main contributing factors:*

   1. Contaminated soils excavated during construction will be removed and properly disposed of at a regulated landfill. New fill will be brought in.
   2. The new ductile iron pipe sewer will provide a more reliable watertight system, preventing infiltration or exfiltration.

Recommendation

A) Approval of the City of Minneapolis' variance to Section 8.3 of the BCWMC Requirements document for the utility crossing requirement of a minimum depth of 4.0 feet below the channel invert.

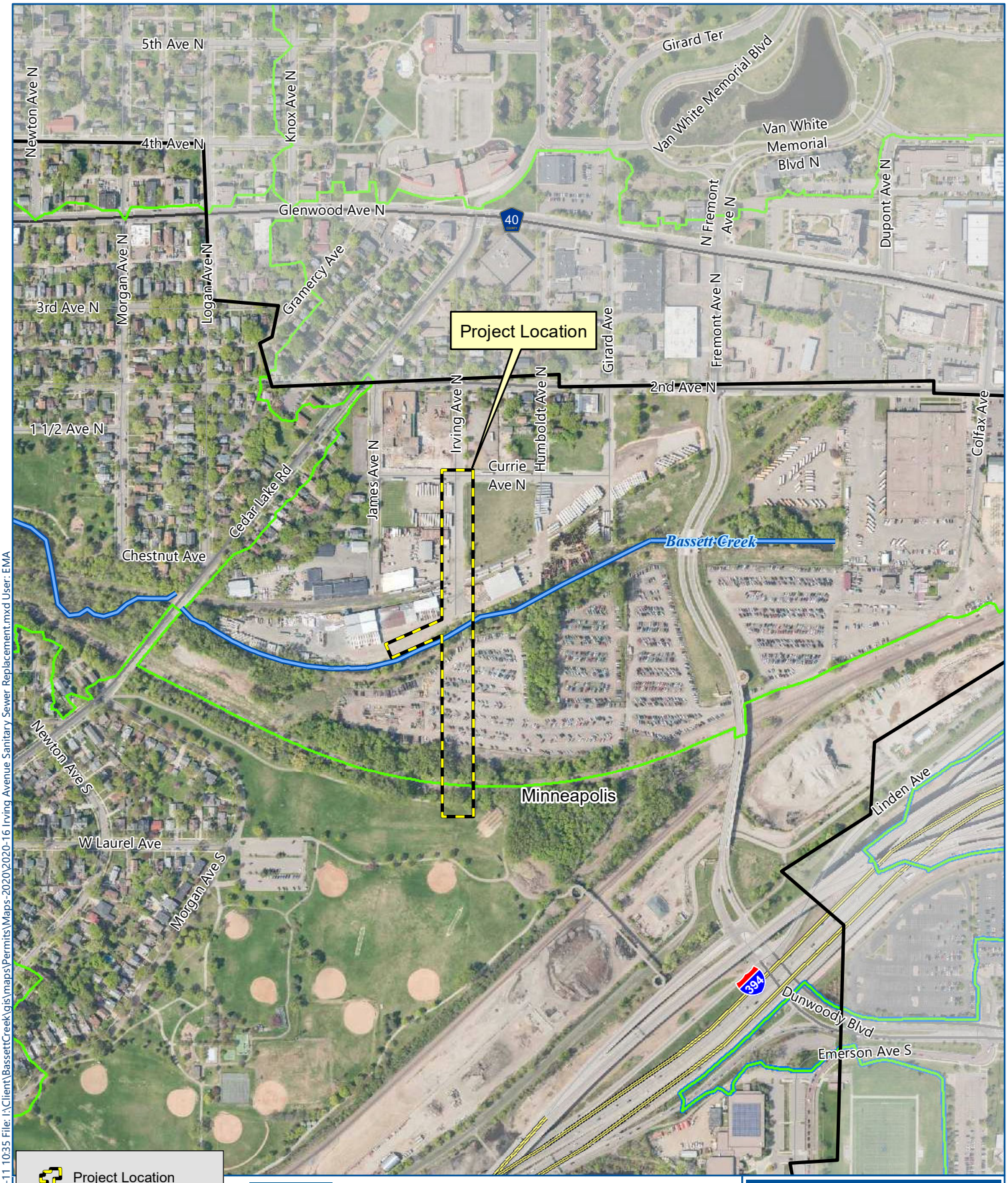
B) Conditional approval of the entire project based on the following comments:

1. Applicant must provide documentation of any changes to flows and water surface elevations for Bassett Creek for the 2-year, 10-year, and 100-year 24-hour storm events based on the removal of the Irving Avenue Bridge and abutments.
2. Sheets 43-44: Restoration of the proposed diversion must be shown on the plans.
3. Applicant must evaluate lowering the crown of the sanitary pipe to maximize the cover at the Bassett Creek crossing.
4. Applicant must demonstrate the sanitary pipe is adequately protected from scour at the Bassett Creek crossing.
5. Sheet 16: Clarification must be provided for the proposed project's intent for the existing sheet pile weir that was installed as part of the Bassett Creek Flood Control Project approximately 20 feet downstream of the existing sanitary sewer. The existing sheet pile weir is shown on Sheet 16, but should also be included on the temporary erosion & sediment control plans (Sheet 27), the removals and abandonment plan & profile (Sheet 31), the sanitary sewer plan & profile (Sheet 37), the restoration plans (Sheets 43-44), as applicable.
6. The proposed restoration plan must be revised or clarified as follows:
    i. Consider shifting the rock cross vane that is directly upstream of the Irving Avenue Bridge removal approximately 10 feet further upstream to the edge of the existing riprap.
    ii. Consider shifting the rock cross vane that is directly downstream of the Irving Avenue Bridge removal approximately 10 feet further downstream to the edge of the existing riprap.
    iii. The proposed rock vanes further upstream and downstream of the Irving Avenue Bridge removal may not be necessary, but further coordination and discussion is needed with the BCWMC Engineer.
    iv. Clarification must be provided as to why the riprap toe protection is shown on the south bank but not the north bank.
    v. Class 3 riprap was used for the riprap toe protection for the Bassett Creek Main Stem stabilization project, therefore Class 3 riprap should also be used for this application.
    vi. Clarification must be provided as to how the proposed riprap at the Irving Avenue Bridge removal will tie into the existing riprap in the area.

vii. Clarification must be provided for why random riprap, class 2 is proposed for final restoration at the beginning and end of the proposed diversion.

7. Revised Drawings (paper and final electronic files) and supplemental documentation must be provided to the BCWMC Engineer for final review and approval.

C) A separate BCWMC application shall be submitted for review of the diversion and dewatering plan and authorize Commission Engineer to review and approve application without bringing back to the BCWMC. The plan must include adequate protection during potential overflow events.



Project Location
Municipality
BCWMC Legal Boundary
Major Subwatershed
BCWMC Hydrologic Boundary
Bassett Creek

BARR

0 250 500 Feet

Bassett Creek Watershed Management Commission

BCWMC #2020-16
IRVING AVENUE SANITARY SEWER REPLACEMENT
Minneapolis, MN

LOCATION MAP

Barr Footer: ArcGIS 10.7.1, 2020-06-11 10:35 File: I:\Client\BassettCreek\gis\maps\Permits\Maps-2020\2020-16 Irving Avenue Sanitary Sewer Replacement.mxd User: EMA

Minneapolis
City of Lakes

Public Works
Surface Water & Sewers
309 2nd Ave S – Room 300
Minneapolis, MN 55401

www.minneapolismn.gov

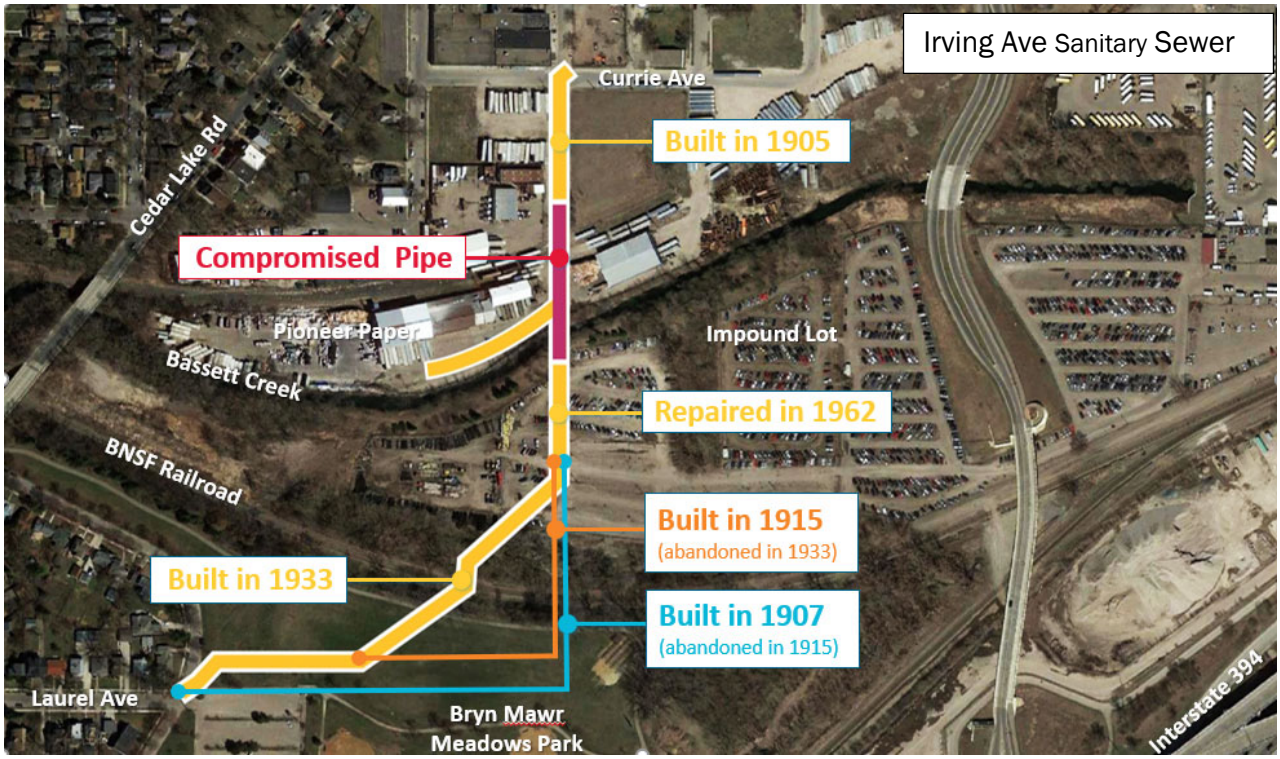
May 27, 2020

Bassett Creek Watershed Management Commission
c/o Barr Engineering Co.
Attn: Jim Herbert, P.E.
4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435-5422

Subject: Irving Avenue Sanitary Sewer Reconstruction Project

Dear Mr. Herbert:

The City of Minneapolis (City) Surface Water and Sewers (SWS) Division owns and operates an existing 48- and 52-inch equivalent diameter sanitary sewer located within the Irving Ave right-of-way, the Minneapolis Impound Lot and Bryn Mawr Meadows Park. Recent pipe inspections have revealed that at least a portion of the system is compromised (see figure below). Accordingly, the City needs to move forward with the replacement of the pipe. Overall, approximately 2,300 linear feet of sanitary sewer will be replaced, including a 75 linear foot section located under Bassett Creek at Irving Avenue.



A new 24-inch ductile iron pipe will be installed across Bassett Creek in the location of the existing Irving Avenue Bridge. The existing 48-inch diameter pipe will continue to convey wastewater until the new pipe is constructed. Soils in the area are unfavorable and will require the new pipe be installed on piles via open cut construction. Once the new pipe is in service, the existing pipe will be abandoned in place with high density controlled low strength material (CLSM). Below is a summary of each of the major components of construction.

As previously discussed, we are submitting the following information and Attachments for your review:

Application for Development Proposals

The Application for Development Proposals has been completed and is included as Attachment A.

Erosion and Sediment Control

Work in and around Bassett Creek will be performed in accordance with the Stormwater Pollution Prevention Plan (SWPPP) and best management practices (BMP) outlined in the contract documents (see Attachment B). The work site will be protected by redundant erosion control measures as shown in Sheets 27 and 28, using the details provided on Sheet 24. All erosion control will be completed per City of Minneapolis and/or MnDOT Specifications.

Contamination

Soil contamination has been identified within the Project area. Excavation, removal and disposal of contaminated soils will be managed in accordance with the Phase 2 Investigation Report and Response Action Plan (RAP) prepared by Barr Engineering for the site (see Attachment C).

Bridges: Removal of the Irving Avenue Bridge

An existing bridge was constructed across the Creek along Irving Avenue in the 1980's and is no longer maintained or inspected. With the installation of the new pipe within the bridge footprint, the City has elected to remove the bridge as part of this Project. Accordingly, the wooden bridge and abutments will be removed in advance of the pipe installation. Pictures of the existing bridge deck and abutment are provided below. The Metropolitan Council flow meter (operated by BCWMC) will be relocated and the stairs adjacent to the bridge will be removed.

Utility Crossings: Installation of new Sanitary Sewer Pipe

The bridge removal and pipe installation will require the temporary diversion of Bassett Creek. It is proposed a temporary channel be constructed on the south side of the Creek (see Sheet 16 in Attachment B). The proposed channel will be approximately 225 linear feet in length; its width and depth will be determined by the Contractor based on his/her method of construction. The Contractor will be required to construct watertight embankments both upstream and downstream of the work area. Once the creek area is dry, it is anticipated the work will be completed within sheeting and shoring. If the flows were to become greater than the diversion channel capacity, the flows would overtop the embankment and allowed through the work area.

It is proposed the work be completed during the normally lower flow, i.e. in the winter months, to reduce land use and environmental impacts. Overall, it is anticipated the work within the Creek will take two to three months to complete. To get a better understanding of the diversion requirements and provide information to the bidding contractors, a review of Bassett Creek flows was performed. Twenty years of data collected at Irving Avenue by BCWMC was reviewed. A summary is provided Attachment D and summarized in the table on Sheet 16. The Contractor will be required to submit his/her diversion channel design to the City and BCWMC for review and comments prior to installation.

Variance Request: Depth of Cover under Creek

A variance from BCWMC is being requested due to lack of available pipe cover. Below are responses to the conditions outlined in Section 3.3.3 of the BCWMC Requirements for Improvements and Development Proposals:

Condition #1: There are special circumstances or conditions affecting the property such that the strict application of the provisions of these standards and criteria would deprive the applicant of the reasonable use of the applicant's land.

- The existing sanitary sewer was installed in 1905 and has less than 4-feet of cover. A new pipe will be installed with the same crown elevation and similar cover to the existing condition. The pipe cannot be lowered to accommodate the minimum cover requirement because it is a gravity sewer that has a controlled grade at the intersection of Irving Avenue and Currie Avenue.

Condition #2: The variance is necessary for the preservation and enjoyment of a substantial property right of the applicant.

- The City of Minneapolis is committed to providing reliable and sustainable sanitary sewer service to its residents. As such, the City evaluated several options for the reconstruction of the sewer. Eight alternatives were developed in advance of the design development; four lift station options and four gravity options following different alignments in the area were considered. Through that evaluation, it was determined that the reconstruction of the sanitary in its current location was that the most efficient and reliable way to provide service to the project area.

Condition #3: The granting of the variance will not be detrimental to the public welfare or injurious to the other property in the territory in which the property is situated.

- As stated above, granting of the variance will allow the sewer to be constructed at elevations similar to existing conditions. Although temporary excavation is required in the Creek, the new sewer will not alter any conditions with the stream. Grades will be restored to existing conditions once construction is complete.

Condition #4: In applications relating to a use in the 1% (base flood elevation, 100-year flood) floodplain set forth in Table 2-9 of the Watershed Management Plan, the variance shall not allow a lower degree of flood protection that the current flood protection.

- As noted in the Utility Crossings section of this letter, a temporary diversion channel will be provided. Should an event occur which would cause the flows to increase beyond the designed channel diversion capacity, the flow will be allowed to overtop the temporary embankments and flow through the work site, i.e. the existing stream bed. Additionally, the construction of new sewer will not permanently impact the floodplain as existing grades will be restored upon project completion.

Condition #5: The granting of the variance will not be contrary to the intent of taking all reasonable and practical steps to improve water quality within the watershed.

- Although there may be temporary impacts, it is expected the long-term effects of the project will be favorable to the overall water quality in the watershed while considering two main contributing factors:
    1. Contaminated soils excavated during construction will be removed and properly disposed of at a regulated landfill. New fill will be brought in.
    2. The new ductile iron pipe sewer will provide a more reliable watertight system, preventing infiltration or exfiltration.

Wetland Buffer Requirements

The 50-feet buffer from the edge of the Bassett Creek wetland boundary has been identified in the Wetland Buffer Exhibit (Attachment E). Areas within the buffer will be restored per MnDOT and BCWMC Requirements.

Restoration

The cross-section of the creek will be restored to match the existing elevations and grades. Details from the Bassett Creek Main Stem Stabilization Project will be used for restoration of the Creek. See Sheet 43 for proposed restoration. The City would greatly appreciate if Barr could review the proposed restoration and provide input as necessary.

Construction Schedule

Anticipated construction schedule is from September 2020 through September 2021. Construction for the Bassett Creek crossing will be during low-flow periods in the winter of 2020-2021.

Please note that the City will separately be submitting the following permit applications to the Minnesota Department of Natural Resources (DNR) for work within the Creek:

- Public Water permit for removal of the bridge & appurtenances
- Water appropriation for the temporary dewatering
- License to Cross

We appreciate your time reviewing the attached information and are available to review with you at your earliest convenience. Please do not hesitate to contact me if you have questions or comments. I can be reached at 612-919-4243 or Kelly.MacIntyre@minneapolismn.gov.

Sincerely,

DocuSigned by:
Kelly MacIntyre
Kelly MacIntyre, Project Manager
Professional Engineer – Public Works, Surface Water & Sewers

cc: Laura Jester, BCWMC Administrator
Julie E Benadum, Brown and Caldwell Elizabeth Stout City, of Minneapolis

Attachments (5)

1. Attachment A: Bassett Creek Watershed Management Commission Permit Application
2. Attachment B: Preliminary Contract Drawings
3. Attachment C: Investigation Report and Response Action Plan (RAP
4. Attachment D: Bassett Creek Flow Summary
5. Attachment E: Wetland Buffer Exhibit