Administrative Use Only
Agreement Date: _____

**PROFESSIONAL SERVICES AGREEMENT BETWEEN
HDR MICHIGAN, INC.
AND THE CITY OF ANN ARBOR
FOR BARTON RAW WATER MAIN CONDITION ASSESSMENT**

This agreement (“Agreement”) is between the City of Ann Arbor, a Michigan municipal corporation, having its offices at 301 E. Huron St. Ann Arbor, Michigan 48104 ("City"), and HDR Michigan, Inc. (“Contractor”), a Michigan Corporation, with its address at 5405 Data Court, Ann Arbor, Michigan 48108. City and Contractor are referred to collectively herein as the “Parties.” The Parties agree as follows:

I. DEFINITIONS

Administering Service Area/Unit means Public Services Area / Water Treatment Services Unit.

Contract Administrator means Glen Wiczorek, Senior Utilities Engineer, acting personally or through any assistants authorized by the Administrator/Manager of the Administering Service Area/Unit.

Deliverables means all Plans, Specifications, Reports, Recommendations, and other materials developed for and delivered to City by Contractor under this Agreement.

Project means Barton Raw Water Main Condition Assessment, RFP No. 21-02.

II. DURATION

Contractor shall commence performance on June 1, 2021 (“Commencement Date”). This Agreement shall remain in effect until satisfactory completion of the Services specified below unless terminated as provided for in Article XI. The terms and conditions of this Agreement shall apply to the earlier of the Effective Date or Commencement Date.

III. SERVICES

A. The Contractor agrees to provide Professional Engineering Services ("Services") in connection with the Project as described in Exhibit A. The City retains the right to make changes to the quantities of service within the general scope of the Agreement at any time by a written order. If the changes add to or deduct from the extent of the services, the compensation shall be adjusted accordingly. All such changes shall be executed under the conditions of the original Agreement.

B. Quality of Services under this Agreement shall be of the level of quality performed by persons regularly rendering this type of service. Determination of acceptable quality shall be made solely by the Contract Administrator.

C. The Contractor shall perform its Services for the Project in compliance with all statutory, regulatory, and contractual requirements now or hereafter in effect as may be applicable to the rights and obligations set forth in the Agreement. The Contractor shall also comply with and be subject to the City of Ann Arbor policies applicable to independent contractors.

D. The Contractor may rely upon the accuracy of reports and surveys provided to it by the City (if any) except when defects should have been apparent to a reasonably competent professional or when it has actual notice of any defects in the reports and surveys.

IV. INDEPENDENT CONTRACTOR

The Parties agree that at all times and for all purposes under the terms of this Agreement each Party's relationship to any other Party shall be that of an independent contractor. Each Party will be solely responsible for the acts of its own employees, agents, and servants. No liability, right, or benefit arising out of any employer/employee relationship, either express or implied, shall arise or accrue to any Party as a result of this Agreement.

Contractor does not have any authority to execute any contract or agreement on behalf of the City, and is not granted any authority to assume or create any obligation or liability on the City's behalf, or to bind the City in any way.

V. COMPENSATION OF CONTRACTOR

A. The Contractor shall be paid in the manner set forth in Exhibit B. Payment shall be made monthly, unless another payment term is specified in Exhibit B, following receipt of invoices submitted by the Contractor, and approved by the Contract Administrator.

B. The Contractor will be compensated for Services performed in addition to the Services described in Article III, only when the scope of and compensation for those additional Services have received prior written approval of the Contract Administrator.

C. The Contractor shall keep complete records of work performed (e.g. tasks performed, hours allocated, etc.) so that the City may verify invoices submitted by the Contractor. Such records shall be made available to the City upon request and submitted in summary form with each invoice.

VI. INSURANCE/INDEMNIFICATION

A. The Contractor shall procure and maintain from the Effective Date or Commencement Date of this Agreement (whichever is earlier) through the conclusion of this Agreement, such insurance policies, including those set forth in Exhibit C, as will protect itself and the City from all claims for bodily injuries, death or property damage that may arise under this Agreement; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor, or anyone employed by them directly or indirectly. Prior to commencement of work under this Agreement, Contractor shall provide to the City documentation satisfactory to the City, through City-approved means (currently myCOI), demonstrating it has obtained the policies and endorsements required by Exhibit C. Contractor shall add registration@mycoitracking.com to its safe sender's list so that it will receive necessary communication from myCOI. When requested, Contractor shall provide the same documentation for its subcontractor(s) (if any).

B. Any insurance provider of Contractor shall be authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-authorized insurance companies are not acceptable unless approved in writing by the City.

C. To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses, including attorney's fees, resulting or alleged to result, from any acts or omissions by Contractor or its employees and agents occurring in the performance of or breach in this Agreement, except to the extent that any suit, claim, judgment or expense are finally judicially determined to have resulted from the City's negligence or willful misconduct or its failure to comply with any of its material obligations set forth in this Agreement.

VII. COMPLIANCE REQUIREMENTS

A. Nondiscrimination. The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of the Ann Arbor City Code and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

B. Living Wage. If the Contractor is a "covered employer" as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Agreement a "living wage," as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Agreement are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

VIII. WARRANTIES BY THE CONTRACTOR

A. The Contractor warrants that the quality of its Services under this Agreement shall conform to the level of quality performed by persons regularly rendering this type of service.

B. The Contractor warrants that it has all the skills, experience, and professional licenses (if applicable) necessary to perform the Services pursuant to this Agreement.

C. The Contractor warrants that it has available, or will engage, at its own expense, sufficient trained employees to provide the Services pursuant to this Agreement.

D. The Contractor warrants that it has no personal or financial interest in the Project other than the fee it is to receive under this Agreement. The Contractor further certifies that it shall not acquire any such interest, direct or indirect, which would conflict in any manner with the performance of the Services it is to provide pursuant to this Agreement. Further Contractor agrees and certifies that it does not and will not employ or engage any person with a personal or financial interest in this Agreement.

E. The Contractor warrants that it is not, and shall not become overdue or in default to the City for any contract, debt, or any other obligation to the City including real and personal property taxes. Further Contractor agrees that the City shall have the right to set off any such debt against compensation awarded for Services under this Agreement.

F. The Contractor warrants that its proposal for services was made in good faith, it arrived at the costs of its proposal independently, without consultation, communication or agreement, for the purpose of restricting completion as to any matter relating to such fees with any competitor for these Services; and no attempt has been made or shall be made by the Contractor to induce any other person or firm to submit or not to submit a proposal for the purpose of restricting competition.

G. The person signing this Agreement on behalf of Contractor represents and warrants that she/he has express authority to sign this Agreement for Contractor and agrees to hold the City harmless for any costs or consequences of the absence of actual authority to sign.

IX. OBLIGATIONS OF THE CITY

A. The City agrees to give the Contractor access to the Project area and other City-owned properties as required to perform the necessary Services under this Agreement.

B. The City shall notify the Contractor of any defects in the Services of which the Contract Administrator has actual notice.

X. ASSIGNMENT

A. The Contractor shall not subcontract or assign any portion of any right or obligation under this Agreement without prior written consent from the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under the Agreement unless specifically released from the requirement, in writing, by the City.

B. The Contractor shall retain the right to pledge payment(s) due and payable under this Agreement to third parties.

XI. TERMINATION OF AGREEMENT

A. If either party is in breach of this Agreement for a period of fifteen (15) days following receipt of notice from the non-breaching party with respect to a breach, the non-breaching party may pursue any remedies available to it against the breaching party under applicable law, including but not limited to, the right to terminate this Agreement without further notice. The waiver of any breach by any party to this Agreement shall not waive any subsequent breach by any party.

B. The City may terminate this Agreement, on at least thirty (30) days advance notice, for any reason, including convenience, without incurring any penalty, expense or liability to Contractor, except the obligation to pay for Services actually performed under the Agreement before the termination date.

C. Contractor acknowledges that, if this Agreement extends for several fiscal years, continuation of this Agreement is subject to appropriation of funds for this Project. If funds to enable the City to effect continued payment under this Agreement are not appropriated or otherwise made available, the City shall have the right to terminate this Agreement without penalty at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of termination to Contractor. The Contract Administrator shall give Contractor written notice of such non-appropriation within thirty (30) days after it receives

notice of such non-appropriation.

D. The provisions of Articles VI and VIII shall survive the expiration or earlier termination of this Agreement for any reason. The expiration or termination of this Agreement, for any reason, shall not release either party from any obligation or liability to the other party, including any payment obligation that has already accrued and Contractor's obligation to deliver all Deliverables due as of the date of termination of the Agreement.

XII. REMEDIES

A. This Agreement does not, and is not intended to, impair, divest, delegate or contravene any constitutional, statutory and/or other legal right, privilege, power, obligation, duty or immunity of the Parties.

B. All rights and remedies provided in this Agreement are cumulative and not exclusive, and the exercise by either party of any right or remedy does not preclude the exercise of any other rights or remedies that may now or subsequently be available at law, in equity, by statute, in any agreement between the parties or otherwise.

C. Absent a written waiver, no act, failure, or delay by a Party to pursue or enforce any rights or remedies under this Agreement shall constitute a waiver of those rights with regard to any existing or subsequent breach of this Agreement. No waiver of any term, condition, or provision of this Agreement, whether by conduct or otherwise, in one or more instances, shall be deemed or construed as a continuing waiver of any term, condition, or provision of this Agreement. No waiver by either Party shall subsequently effect its right to require strict performance of this Agreement.

XIII. NOTICE

All notices and submissions required under this Agreement shall be delivered to the respective party in the manner described herein to the address stated below or such other address as either party may designate by prior written notice to the other. Notices given under this Agreement shall be in writing and shall be personally delivered, sent by next day express delivery service, certified mail, or first class U.S. mail postage prepaid, and addressed to the person listed below. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; (2) the next business day when notice is sent next day express delivery service or personal delivery; or (3) three days after mailing first class or certified U.S. mail.

If Notice is sent to the CONTRACTOR, it shall be addressed and sent to:

HDR Michigan, Inc.
Attn: Khaled Soubra, PhD, PE
5405 Data Court
Ann Arbor, MI 48108

If Notice is sent to the CITY, it shall be addressed and sent to:

City of Ann Arbor
Craig Hupy, Public Services Area Administrator
301 E. Huron St.
Ann Arbor, Michigan 48104

With a copy to: The City of Ann Arbor
ATTN: Office of the City Attorney
301 East Huron Street, 3rd Floor
Ann Arbor, Michigan 48104

XIV. CHOICE OF LAW AND FORUM

This Agreement will be governed and controlled in all respects by the laws of the State of Michigan, including interpretation, enforceability, validity and construction, excepting the principles of conflicts of law. The parties submit to the jurisdiction and venue of the Circuit Court for Washtenaw County, State of Michigan, or, if original jurisdiction can be established, the United States District Court for the Eastern District of Michigan, Southern Division, with respect to any action arising, directly or indirectly, out of this Agreement or the performance or breach of this Agreement. The parties stipulate that the venues referenced in this Agreement are convenient and waive any claim of non-convenience.

XV. OWNERSHIP OF DOCUMENTS

Upon completion or termination of this Agreement, all documents (i.e., Deliverables) prepared by or obtained by the Contractor as provided under the terms of this Agreement shall be delivered to and become the property of the City. Original basic survey notes, sketches, charts, drawings, partially completed drawings, computations, quantities and other data shall remain inthe possession of the Contractor as instruments of service unless specifically incorporated in a deliverable, but shall be made available, upon request, to the City without restriction or limitation on their use. The City acknowledges that the documents are prepared only for the Project. Prior to completion of the contracted Services the City shall have a recognized proprietary interest in the work product of the Contractor.

XVI. CONFLICTS OF INTEREST OR REPRESENTATION

Contractor certifies it has no financial interest in the Services to be provided under this Agreement other than the compensation specified herein. Contractor further certifies that it presently has no personal or financial interest, and shall not acquire any such interest, direct or indirect, which would conflict in any manner with its performance of the Services under this Agreement.

Contractor agrees to advise the City if Contractor has been or is retained to handle any matter in which its representation is adverse to the City. The City's prospective consent to the Contractor's representation of a client in matters adverse to the City, as identified above, will not apply in any instance where, as the result of Contractor's representation, the Contractor has obtained sensitive, proprietary or otherwise confidential information of a non-public nature that, if known to another client of the Contractor, could be used in any such other matter by the other client to the

material disadvantage of the City. Each matter will be reviewed on a case by case basis.

XVII. SEVERABILITY OF PROVISIONS

Whenever possible, each provision of this Agreement will be interpreted in a manner as to be effective and valid under applicable law. However, if any provision of this Agreement or the application of any provision to any party or circumstance will be prohibited by or invalid under applicable law, that provision will be ineffective to the extent of the prohibition or invalidity without invalidating the remainder of the provisions of this Agreement or the application of the provision to other parties and circumstances.

XVIII. EXTENT OF AGREEMENT

This Agreement, together Exhibits A, B, and C, constitutes the entire understanding between the City and the Contractor with respect to the subject matter of the Agreement and it supersedes, unless otherwise incorporated by reference herein, all prior representations, negotiations, agreements or understandings whether written or oral. Neither party has relied on any prior representations, of any kind or nature, in entering into this Agreement. No terms or conditions of either party's invoice, purchase order or other administrative document shall modify the terms and conditions of this Agreement, regardless of the other party's failure to object to such form. This Agreement shall be binding on and shall inure to the benefit of the parties to this Agreement and their permitted successors and permitted assigns and nothing in this Agreement, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Agreement. This Agreement may only be altered, amended or modified by written amendment signed by the Contractor and the City. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall be deemed to be one and the same agreement.

XIX. ELECTRONIC TRANSACTION

The parties agree that signatures on this Agreement may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this Agreement. This Agreement may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

XX. EFFECTIVE DATE

This Agreement will become effective when all parties have signed it. The Effective Date of this Agreement will be the date this Agreement is signed by the last party to sign it.

[REMAINDER OF PAGE LEFT BLANK; SIGNATURE PAGE FOLLOWS]

FOR CONTRACTOR

By _____

Its _____

Date: _____

FOR THE CITY OF ANN ARBOR

By _____
Christopher Taylor, Mayor

By _____
Jacqueline Beaudry, City Clerk

Date: _____

Approved as to substance

_____
Craig Hupy
Public Services Area Administrator

_____
Tom Crawford, City Administrator

Approved as to form and content

_____
Stephen K. Postema, City Attorney

EXHIBIT A
SCOPE OF SERVICES

(Insert/Attach Scope of Work & Deliverables Schedule)

Introduction

The purpose of this document is to provide a work plan for Professional Services between HDR Michigan, Inc. (HDR) and the City of Ann Arbor (City), for condition assessment of two existing raw water transmission mains that convey water from the Barton Pump Station to the City's Water Treatment Plant. The raw water mains to be assessed consist of 5,000 LF of 24-inch Cast Iron Pipe (CIP) and Ductile Iron Pipe (DIP) installed in 1949 and 1965 and 5,900 LF of prestressed concrete cylinder pipe (PCCP), Lined Cylinder Pipe (LCP) installed in 1965. Industry studies (2007 ASCE Pipelines' Numbers Don't Lie – Higgins, et al) have shown that PCCP of this vintage has an approximate distress rate between 3%-3.5%. By taking this proactive approach to management, the City of Ann Arbor is working toward minimizing the risk of failure of the 42-inch raw water main, by reducing its likelihood of failure.

It is our understanding that the 24-inch CIP failed in 2017 and a section of that pipe was replaced with a 24-inch DIP, using a line-stop installed by E.T. MacKenzie, a member of the HDR team for this project. While it is unknown whether the 24-inch main is lined, field notes kept by E.T. MacKenzie indicate that it is unclear whether the pipe has significant tuberculation or a buildup of debris that might be expected from the conveyance of raw water, which to our understanding, has a significant population of Zebra mussels. In order to confirm this, HDR has proposed a visual assessment and a, hydraulic analysis which should provide insight on the usable inside diameter. This information can be used to determine the level of risk associated with deploying different types of in-line assessment technologies.

The pipelines to be assessed are located within a highly used recreational area with challenging terrain. HDR is aware of the importance of minimizing disturbance to the recreational area and minimizing disturbance to the environment during field activities. Our teaming partner, E.T. MacKenzie, has worked with the City on this pipeline in the past and is aware of these unique challenges. We will work with E.T. MacKenzie to develop access plans that minimize disruptions to both the community and the environment.

The City provided a report dated July 16, 2018, prepared by Tetra Tech, that recommended internal and external condition assessment of both raw water transmission mains. This proposal assumes the accuracy of the information included in that report; however, it is HDR's intent to confirm critical details as part of the assessment planning process. Our Proposed Work Plan, outlined below, assumes the base scope of work will be completed, as detailed in the RFP. We have also included value-added services and suggested modifications to the scope of work in this section, following our Proposed Work Plan.

The HDR team includes Xylem (formerly Pure Technologies) to provide pipeline inspection services. Xylem brings decades of experience deploying high resolution condition assessment tools into critical transmission mains for clients across the world. They are the world leader in Electromagnetic assessment of PCCP.

For this project, Xylem will be deploying the following in-line assessment tools:

- **SmartBall** – This free-swimming acoustic tool will collect information on the location of leaks and gas pockets within both the PCCP and CIP/DIP
- **PipeDiver** – Electromagnetic information that can be used to determine wire wrap damage on the PCCP will be deployed on this free-swimming technology platform

1. Management of Work Plan

HDR will serve as the prime contractor and be responsible for managing all aspects of the work defined herein. HDR's Ann Arbor, Michigan office has industry leaders in the field aspects of condition assessment and will lead this effort. HDR will sub-contract the following services: pipe tapping, earth

work, geotechnical investigation and in-line assessment of the transmission mains. HDR will be the main point of contact for all work associated with this project. We have structured the following work plan to discuss each task in detail following the anticipated sequence of execution for the condition assessment of the two raw water transmission mains.

A. Proposed Work Plan

TASK 1 CONDITION ASSESSMENT PLANNING

Kick-off Meeting

HDR will facilitate a kick-off meeting to include all stakeholders. During this meeting, an updated schedule will be provided, that includes the key meetings and workshops, as outlined in the RFP.

Review Record Drawings & Perform Data Gap Analysis

The City has provided record drawings, design specifications, and lay sheets for the 42-inch PCCP as part of the RFP. These drawings also show the horizontal location of the 24-inch CIP, but it is our understanding that detailed record drawings for the 24-inch CIP are not available. The City will provide available photos of the CIP, taken during the 2017 repair. HDR will complete a data gap analysis and work with the City to attain any additional available information. We will then thoroughly review all of information to validate the proposed assessment methodologies and execution plan.

Perform Hydraulic Assessment

The internal assessments will require minimum flows of 1.5 – 3 feet per second (fps) to propel the SmartBall and PipeDiver through the water mains. HDR will confirm the flows needed to perform each of the pipeline inspections using flow meters, and determine the operations needed to attain such flows (e.g., valve and pump operations).

Community Outreach

The raw water mains are located within Bird Park, a heavily used recreational area. Given the sensitive nature of working within this area, alerting the community to the assessment activities is a critical component of this project.

HDR will support the City in communicating a message to the local community about the importance of maintaining a reliable raw water transmission main system. This outreach effort will include support in developing a message, as well as development of content that can be used on social media, in emails and in physical mailers to the local communities. Social media sites will be maintained and updated as the project progresses, to confirm that the messaging is up to date. Effective messaging and communication early in the process will be critical in maintaining positive outlook for this project within the community. This task is planned to be underway prior to the planned site walkover.

Ferrous Pipe Assessment Alternatives Workshop

To determine the most cost-effective means of assessing the CIP, HDR will prepare and host a two-hour workshop for the City staff, where options for high resolution assessment will be presented. The workshop will include a discussion of the potential advantages and limitations of Xylem's In-line Ultrasonic technologies (PipeDiver Ultra), which will allow for a more informed decision to be made for the type of assessment. Currently, the PipeDiver Ultra is not included in the base scope of work.

Present Preliminary Condition Assessment Plan to City

HDR will prepare a Preliminary Condition Assessment Plan, that includes a summary of planned field activities, assessment technologies, engineering/analytics, pipe access/system operations requirements, permits, timelines and responsibilities, needed to perform the proposed assessment. This document will be formally presented to the City and other identified stakeholders prior to commencing field activities. The intent is that the Plan will be updated, based upon the site walkover, discussions with the City's Operations staff and other key stakeholders. Discussions with the Water Treatment Plant operators will include reviewing the water delivery needs and field activities to assure proper coordination and contingency options are planned to maintain continuous service. Prior to the live inspection of the pipelines, HDR will present an updated Final Condition Assessment Plan to the City that accounts for lessons learned during the detailed planning stages.

Secure Required Permits

HDR will begin the permitting process early to minimize the likelihood of delays due to permitting. Given that this pipeline is located almost entirely within the Bird Recreational Park, the following permits are anticipated in order to complete this assessment:

- **Water System Permit** – this permit requires review and approval by the State Department of Environment, Great Lakes and Energy (EGLE). Because this work will be on the raw water pipe, this permit may not be required, so we will review this topic with the City to confirm the State permitting requirements. If needed, we will work with the City to arrange a pre-application meeting to confirm requirements.
- **Erosion & Sediment Control** – this permit will be reviewed and approved through the City of Ann Arbor.
- **Right of Way Permit** – this permit will be reviewed and approved through the City of Ann Arbor.

It is anticipated that, approximately 2-3 months of lead time may be required. For this reason, HDR intends to begin the permitting process upon NTP.

TASK 2 DETAILED SITE WALKOVER

Upon NTP, the HDR team will traverse the pipeline as part of the planning process. In order to create efficiencies in the schedule, HDR proposes to complete the following activities during the initial site visit, upon NTP:

- **Visual Assessment** – HDR will identify surface features that may cause or be evidence of pipeline deterioration or conditions that may adversely affect the condition of a pipeline (e.g., excessive backfill, pipeline crossings, wet spots, or ground subsidence).
- **Insertion and extraction points** – The field assessment involves the launching of tools into live water mains, at the newly installed access point (16-inch tap to be constructed under this contract) for the PCCP and through the existing fire hydrant for the CIP main, and to extract the tools at the Water Plant after the pipes manifold and transition to a 36-inch concrete pipe. Additional details regarding the preliminary plans for insertion and extraction of the condition assessment tools is included later in this work plan (Free-swimming leak and gas pocket detection, electromagnetic inspection & pipeline mapping).

Since we were unable to gain access to the Water Plant as part of the initial pre-proposal site visit, HDR, in collaboration with our technology partner Xylem, will evaluate the specific location of where the SmartBall and PipeDiver can be retrieved during our site walkover.

- **Appurtenance Assessment** – The HDR team will assess the condition of the fire hydrant that will be used to launch the SmartBall assessment tool into the CIP, as well as ARVs, valves and other appurtenances on the pipeline. As indicted above, it is anticipated that the acoustic technology to assess the CIP will be inserted into the existing hydrant, as part of a pressurized insertion. HDR will confirm that the condition of the hydrant will allow for these modifications.
- **Inventory** – HDR will collect photographs and GPS data of features and relevant observations in a GIS environment or integrated with GIS during the site walkover. Photographs will be georeferenced/linked to the GPS data.
- **Environmental Impact Analysis** – Minimizing the environmental impact to the recreational area is a critical component of this project. During the site walkover, HDR in conjunction with E.T. MacKenzie, will identify potential access challenges, in order to develop mitigation strategies for minimizing negative impacts to the recreational area during the field assessments.
- **Corrosion Survey and Soil Sampling** –In order to consolidate field activities and minimize disruption to the community, the corrosion survey will also be completed in the same timeframe as the site walkover and ARV repairs. The survey will include non-invasive techniques for collecting data that will be used to determine the presence of corrosive soils, which can adversely impact metallic components of the pipelines (including the prestressing wires and steel cylinder in the PCCP).

  HDR anticipates that neither the CIP nor PCCP are cathodically protected, which means that the pipes may be vulnerable to external corrosion due to corrosive soils. The activities outlined in this section, will allow the City to better understand the condition of the soils for the length of both pipelines. HDR will use the information to provide recommendations for how to protect the mains from further external corrosion sources using cathodic protection, thereby reducing the rate of corrosion and increasing their remaining useful life.

  The data collected during the EMAG walkover will identify areas of corrosive soils. The Wenner 4-pin will be used to confirm the corrosivity of the soils, prior to the geotechnical evaluation, which will then quantify the corrosivity of the soils. The data collected from the corrosion survey will be correlated with the data collected as part of the internal assessments in order to gain a more complete picture of the pipelines' risk off failure from both internal and external sources.
- **Close Interval Potential Survey** – HDR will determine the applicability of either a close interval potential survey (CIS) or cell-to-cell survey method for the pipelines. The most applicable means of over-the-line survey will be conducted.

- **Meet with Ann Arbor staff to discuss history of the pipelines** – During the site walkover, HDR will meet with City staff to collect information on the pipelines and operation of the system. Historic information and institutional knowledge from a utility's field operations staff

is often the most valuable information that can be collected, when it comes to planning for a field condition assessment. HDR will use the information to supplement the data already collected during the review of the available documents.

- **Collect high frequency pressure data** –Pressure monitoring is a low-cost way of collecting high-quality information on the operations of a water system. During the site walkover HDR will identify locations to deploy transient pressure monitors. This data will be used to make recommendations regarding operational efficiencies, to determine if surges may be adversely impacting pipe condition and to determine the exact loading the pipelines need to withstand. Deploying transient pressure monitors is part of HDR's standard protocol for the assessment of large diameter pressure pipelines, as it provides valuable information that can be used to determine the root cause of pipeline failures and when making critical pipeline operational management decisions. Pressure data loggers require an outlet to attach to the pipe (e.g. corporation valve) or can be adapted to fit onto a fire hydrant. As such, the data collection will be dependent upon access to each pipe.
- **Operational dry run –** A dry run of the in-line assessment is a key tool in reducing overall risk during the live assessment. During the dry run, the system will be operated in the same manner as what will be done during the live inspection, but without any tools in the pipeline. During the dry run, HDR will measure flow rates at the proposed insertion location and the extraction location. If feasible, a biodegradable ball may be inserted into one or both pipes, as part of this process, to confirm that there are no blockages that would prevent the SmartBall from passing. This dry run not only allows us to confirm the flow information, but it also will provide the City with an increased level of confidence as we move into the live inspection.

Risk Review / Contingency Plan – Given the inherent risk of using in-line condition assessment technologies in a live pressurized pipeline, a thorough risk analysis will prove to be invaluable when it comes to reducing the likelihood of challenges during the field assessment. HDR will work with our teaming partners to identify risks, then develop mitigation plans. We will present a risk register, that includes the identified risks, along with mitigation strategies, to the City and other stakeholders, as part of the Preliminary Condition Assessment Plan, in a workshop setting, which will allow each stakeholder to ask questions and gain confidence in the planned field assessment.

Finalize Condition Assessment Plan – HDR will finalize the Condition Assessment Plan and present the updated information to the City and other key stakeholders. The updated plan will include details for the day of the live inspection, including a timeline, communication protocols for the day of the field inspections, safety plan, and comprehensive risk mitigation strategies. If modifications are required following the presentation of the plan, updates will be made, and the revised plan will be provided to the City and other stakeholders prior to the live field assessment.

TASK 3 CONDITION ASSESSMENT DATA COLLECTION

Prepare Pipeline –It is anticipated that a minimum 16-inch outlet will be required on the PCCP in order to insert the condition assessment tools. The City has already identified a proposed location for this tap, as part of a 2018 study, by Tetra Tech. HDR will confirm the need for a tap to insert the condition assessment technologies, as part of the preliminary planning phase for this project. For the purpose of this proposal, it is assumed that the PCCP will be tapped in the location previously identified by the City. Given that the main structural component of PCCP is the prestressing wires, tapping PCCP requires a specialized approach and a contractor experienced in tapping this type of pipe. Water Tap, a member of

the HDR team, has extensive experience with tapping large diameter PCCP, particularly in the Southeast Michigan area.

Free-swimming leak and gas pocket detection, electromagnetic inspection & pipeline mapping – HDR intends to deploy Xylem's SmartBall to collect acoustic information regarding locations of leaks and gas pockets on both the PCCP and CIP/DIP, while the pipelines remain in service. The SmartBall will also collect geo-referenced data, which will allow HDR to provide the City with horizontal and vertical location information for both pipelines. The PCCP will also undergo an electromagnetic inspection using Xylem's PipeDiver platform. The tool will provide information regarding the location of broken prestressing wire wraps, which may put the PCCP at risk for structural failure.

In 2018, HDR team member Xylem visited the site of the raw water mains to conduct a site assessment and indicated that the best insertion point for the condition assessment tools on the PCCP would be at a location just outside the Pumping Station. For the purpose of this proposal, it is assumed that the PCCP will be tapped in the location indicated in the RFP, as previously identified by Xylem. Both the SmartBall and PipeDiver can be inserted at the planned 16-inch tap. As part of due diligence, HDR will evaluate alternatives for insertion of the tools, that do not require the PCCP to be tapped, during the initial data gathering phase. It may be possible to temporarily shut down the pumping station during low flow, remove several fittings inside the pumping station, then re-pressurize the main to complete the inline assessment. Due to access restrictions during the pre-proposal site visit, HDR was not able to enter the pumping station to identify potential insertion locations inside the station.

During the 2018 site visit, Xylem also recommended an extraction point within the limits of the Water Treatment Plant. Due to COVID restrictions, HDR was unable to enter the Water Treatment Plant during the pre-proposal site visit. Based upon the piping plans provided by the City, it appears that there are two potential tool extraction locations within the limits of the Plant. The Water Treatment Plant Piping Plan below identifies the potential extraction locations for the condition assessment tools, both of which appear to be outlets to open reservoirs, where the tools can easily be retrieved. HDR will confirm the extraction location during the initial site walkover. Critical data points to be considered are valve operability and ease of access. If neither of these locations are deemed the best option, HDR will work with the City to identify alternatives for extraction of the tools near or within the Water Treatment Plant limits.

Following conversations with HDR teaming partners E.T. MacKenzie and Water Tap, who were both on-site following the 2017 failure of the CIP, it is unclear whether the pipe is lined or if has debris build-up. It is possible that there is significant tuberculation and / or debris from the raw water source built up on the inside wall of the CIP. For the purpose of this proposal, it is assumed that the pipeline has enough of an inside diameter and smoothness to allow a SmartBall to be used. HDR has included a visual, as well as hydraulic assessments, which can help the City to better understand the actual usable inside diameter of the pipe. An alternative in-line inspection technique is outlined in the value-added section, if the CIP is found to be in a condition that is not ideal for the SmartBall inspection platform.

Xylem typically requires two runs of the SmartBall to confirm accuracy of the geo-referenced data that can be used for mapping. For the assessments of these pipelines, it is assumed that only one run will be conducted for each pipeline. HDR will supplement the collected geo-referenced data from the SmartBall with the information previously collected by Tetra Tech in 2017-2018, which included surface field locating activities, in order to provide the City with a GIS based mapping file for each pipeline.

TASK 4 ENGINEERING ANALYSIS & REPORTING

Evaluate Data & Engineering Analysis – The data collected as part of the field assessment of the two raw water mains will be interpreted to provide structural condition information for the 42-inch PCCP and locations of leaks and gas pockets for both the PCCP and CIP. The electromagnetic data will be used to complete a finite element analysis (FEA) for the PCCP. A structural curve for the PCCP will be developed that can be used to determine if a distressed pipe is reaching a structural limit, by comparing operating pressure and number of broken prestressing wire wraps.

Generate Preliminary C.A. Report

HDR will use the data collected during each phase of the process to develop recommendations for next steps. We will correlate the desktop analyses, soil corrosion data and the internal assessment data to gain an overall picture of the health of the pipelines. This will allow the City to better understand if specific segments of the pipeline may be at increased risk of failure, so that additional non-destructive testing (NDT) can be done to confirm the condition of the pipeline. The goal is for HDR to make informed recommendations for specific pipe segments to be renewed or replaced, based upon their overall risk of failure.

For the PCCP, the condition assessment report will include evaluations of following data sources:

- **Corrosivity of the soils** – EMAG, Wenner 4-pin and soil sample testing will provide data regarding the potential for external corrosion, which can compromise the structural integrity of the pipeline. The presence of external corrosion may indicate that there is damage to the metallic portions of the PCCP (wire wraps, steel cylinder, joint rings). This data will be used in conjunction with the other assessment techniques (internal acoustics and EM) to determine if direct assessment is warranted.
- **Locations of gas pockets and leaks** – The SmartBall will identify areas along the pipeline where the pipe is leaking or where there is trapped air / gas. The presence of a leak at a PCCP joint means that the joint ring, as well as the other metallic components of the pipeline are at risk for damage due to corrosion. Trapped air within a water transmission main reduces the operational efficiency of the pipeline and provides confirmation of the operability of existing ARVs or the lack of ARVs at locations where they may be needed. The information gathered during the acoustic evaluation, coupled with the data from the corrosion survey will allow HDR to make more informed recommendation on management of the main.
- **Prestressing wire wrap damage** – The main structural component of PCCP is the prestressing wire wraps, which keeps the concrete core in compression. The PipeDiver free-swimming tool from Xylem, will be equipped with electromagnetic sensors, which will provide information regarding the location and quantity of broken prestressing wires on individual pipe segments. As detailed previously, HDR will develop a structural risk curve for the 42-inch LCP PCCP, based upon the available pipe specification information. A finite element analysis will be conducted for pipes that are found to be in distress. This will allow a more informed decision to be made, as it will provide information regarding the condition of each pipe segment, based upon its actual condition (i.e. strength of the pipe with 25 broken wire wraps vs zero broken wire wraps).

The report will consolidate the above data and recommendations for additional NDT will be made, if deemed necessary. If it is determined that specific pipe segments are at risk for incipient failure, immediate repair recommendations will be made. Additional recommendations, including maintenance of ARVs, addition of ARVs and other operational efficiencies will also be included in the report.

For the CIP main, the condition assessment report will include results from both the corrosion and acoustic surveys, as detailed above. Based upon the corrosivity of the soils, locations of leaks and gas pockets, locations for direct assessment via test pitting, will be recommended. The direct assessment for the CIP may include wall thickness measurements using an external bracelet tool, which provides average wall thickness measurements over a defined area, and ultrasonic thickness (UT) testing which provides a discrete wall measurement at a specific point. HDR will provide recommendations for test pit locations as part of a Spot Excavation Plan, which will be discussed during a separate Corrosion workshop (to be held prior to development of the preliminary condition assessment report). The results of the direct wall measurements will be included in the preliminary condition assessment report.

HDR will provide the City with an electronic copy of the preliminary condition assessment plan and will present the results of the evaluation during a workshop. The recommendations for next steps for both the PCCP and CIP, will be discussed. In addition to the report, HDR will provide the City with an electronic CAD file that includes X-Y coordinates of the pipelines, which will be based upon the geodetic data collected during the SmartBall assessment.

- **Close Interval Potential Survey** – The results from the over-the-line survey will be used to support the results from the corrosion evaluation and in-line assessments.
- **Direct Assessment** – Direct assessment of a pipeline allows the City to validate the algorithms used to interpret the data collected as part of the corrosion and in-line assessments. Based upon the agreed upon next steps, HDR will support the City with direct assessment of the pipelines. For the CIP, this includes test pitting locations that have been identified as increased risk of failure and measuring remaining wall thickness using an external bracelet tool. The HDR team will secure necessary permits and support the City with additional Community Outreach necessary to complete the direct assessments. It is anticipated that no more than eight (8) test pits will be required, as identified by the RFP.

  Given the high-resolution information gathered as part of PCCP EM evaluation, direct assessment for that pipeline is not anticipated, unless pipe segments are found to be in distress and in need of immediate repair. Once the pipe segment has been excavated, a non-destructive, external verification tool will be used to confirm the correct pipe has been exposed. Additional continuity testing may also be completed during that time, prior to repairs, to confirm the pipe is in distress.

Final Condition Assessment Report
Following the direct assessment, HDR will provide an updated assessment report that identifies recommendations for management of the pipelines, including:

- **Renewal** – Typically these assessments find isolated locations of a pipeline that has an unacceptable level of deterioration. Targeted repairs focused at these pipe sections will restore pipeline reliability and eliminate a potential failure. HDR will provide the City with recommendations for renewal. There are several options that can be completed while keeping the pipe in service, such as: External Post-Tensioning, External Carbon Fiber Reinforce Polymer (CFRP) steel bands, repair clamps and replacement. HDR will provide recommendations for the most applicable type of repair, based upon the collected data.
- **Operational Efficiencies** – Trapped air inside of a pipeline can reduce the overall efficiency of a water pipeline and transient pressures can cause undue stress and incremental damage to the pipe wall. HDR will make recommendations to improve operational efficiencies by replacing inoperable ARVs, adding ARVs where they are needed and identifying the root cause of transients in the line.
- **Asset Management Approach** – Maintaining a reliable raw water system is the objective of this project. HDR will provide recommendations for improving the reliability of the City's raw water system, such as improving operational efficiencies, upsizing the existing mains or adding in redundant pipelines to allow for regular maintenance.
- **Cathodic Protection** – Implementing a hot-spot cathodic protection system will reduce the rate of corrosion on both pipelines. HDR will make recommendations for increasing the remaining useful life of the pipelines, if there is evidence of exposure to corrosive soils.

Develop Field Marking Strategy
The City has requested a strategy for field marking the pipelines, to allow for easier locating during maintenance, that is non-obtrusive to the recreational park. HDR will provide recommendations for a cost-effective means of field marking the pipeline using above ground markers at inconspicuous locations along the alignment.

Assumptions

- The City will provide dewatering and pumping out of access MHs, as required.
- Pre-excavation to determine appropriate saddle size for 42-inch will not be needed.
- Standard park restoration is included; however, full restoration of the park paths will be done by others (wood chips, etc.).
- The City will remove and replace chain link fencing, as needed, to facilitate access to the site.
- Operation of in-line valves will not be necessary.
- The fire hydrant can be used for the insertion of in-line acoustic tools for the CIP.
- Access to the WTP and PS will be made available as part of the initial site walkover.
- If meetings and workshops cannot be held in person, they will be held virtually using a Web-based video conferencing platform.

Project Management

Planning and managing the work is a key step to project success. HDR will work directly with the City's project manager and manage all work. Specific staff involvement requirements are outlined in our Work Plan and will be adjusted as needed to deliver work and meet the City's needs throughout the project. The project and HDR will benefit from City staff's active involvement throughout the project; including participation in project meetings; review of project deliverables; and active communications assuring that work stays and on schedule and needs are met.

HDR will use a collaborative approach which will integrate the City's personnel in engineering, operations, maintenance, and City finance staff as necessary. Together, the City and HDR will plan and deliver the field investigations, engineering evaluations, and prepare solutions to protect the long-term reliability of raw water delivery from the Huron River. In order to accomplish these goals, the City and HDR will meet routinely throughout the project, as proposed in our initial Project Schedule. Progress Reports will be provided monthly to support delivery and provide backup for invoicing.

To assist with assuring project success, our Project Management approach will include the review and assessment of potential project challenges to understand risks and provide planned mitigation activities. Our initial summary of these challenges with proposed mitigation activities is provided in the Barton Challenge Mitigation Strategies Table included on the following page. Because the field investigations will occur in Bird Park, which has limited access and a highly wooded/hilly landscape, gaining access and completing proposed excavations with soil borings will be disruptive. In addition, the trenching required to install the access tap could disrupt the exposed pipes, which are very close to each other. Finally, the installation of tools to inspect the pipe interiors will require planning with operations to assure safe and reliable insertion and removal of the equipment. We work in a coordinated manner to assess, understand and proactively manage these challenges as part of our Project Management Approach.

Initial Project Schedule

Our initial Project Schedule is provided on the following pages. Following the review and confirmation of this schedule with the City, a Final Project Schedule will be prepared and distributed to the Project Team for project delivery. HDR will monitor and manage the project schedule identified below in coordination with the City of Ann Arbor.

HDR will manage the project schedule identified below and on the following pages for the City of Ann Arbor in RFP #21-02 Barton Raw Water Main Condition Assessment. Planned deliverable issue dates are contingent upon receipt of City of Ann Arbor comments within 14 calendar days of receipt for review.

Preliminary Project Schedule	
Notice to Proceed (NTP)	Estimated June 1, 2021 per RFP
Project Kickoff Meeting	Estimated June 1, 2021
Receive and Review Available Documentation	1 week after NTP
Preliminary Condition Assessment Plan	9 weeks after kickoff meeting
Pre-Inspection Workshop	1 week after Preliminary Plan
Detailed Site Walkover	1 week after Pre-Inspection Workshop
Final Condition Assessment Plan	4 weeks after Pre-Inspection Workshop

Corrosion Survey and Soil Sampling	14 weeks from NTP
Electromagnetic Inspection	16 weeks from NTP
Acoustic Leak and Gas Pocket Inspection	16 weeks from NTP
Corrosion Study Technical Memorandum	4 weeks after Corrosion Study
Spot Excavation Plan	5 weeks after Corrosion Study
Corrosion Survey Workshop	6 weeks after Corrosion Study
Water Main Marking Recommendations	5 weeks after Acoustic Inspection
Electromagnetic Inspection Memorandum	6 weeks after Electromagnetic Inspection
Electromagnetic Inspection Memorandum	6 weeks after Acoustic Inspection
Spot Excavation for Direct Assessment	21 weeks from NTP
Raw Water Main Inspection Workshop	7 weeks after Electromagnetic Inspection
Overall Risk Workshop	30 weeks from NTP
Final Report	35 weeks from NTP

Data Delivery

HDR will provide electronic file transfer of all deliverables, unless otherwise noted in the Work Plan, to the City for their review. Documents will be sent via email or uploaded to a file sharing site (Microsoft SharePoint). Deliverables will be sent for review on or before the dates shown in the schedule above. At project conclusion, HDR will provide the project files, including a copy of final deliverables, to the City of Ann Arbor on a portable flash drive.

Communication and Coordination

HDR will coordinate monthly progress meetings with the City to provide an update on project status. If the progress of the schedule dictates more frequent meetings, HDR will adjust the frequency of the progress meeting schedule; however, they well be no less than monthly. HDR will provide updates on progress to date and discuss upcoming work plans. New issues will be discussed in these meetings as well as information needs and resolution of open items. These discussions can happen via conference call.

This project is located in a recreational park that is highly utilized. As discussed in detail in Section A of the Work Plan, Public Outreach is a critical component in the success of this project. HDR will support the City by developing messaging and content to be used in several media formats, such as physical mailers and email. HDR will also help to maintain updates to social media sites, as the project progresses. Effective messaging and communication early on and throughout the project lifecycle will be critical.

All meetings will be documented with meeting minutes recorded by HDR. All design decisions will be documented via email correspondence.

1. Working Relationship Between Consultant and City Staff

HDR will work collaboratively with the City of Ann Arbor and its project stakeholders. HDR will listen to understand the City's goals and objectives for the Raw Water Main Condition Assessment. The City's

goals will be our goals. We will bring the needed expertise to the table, including well-known industry experts in pipeline condition assessments, to make the City's vision a reality. Our project manager and team will work hand in hand with the City's project team to ensure smooth transfer of information and to obtain consensus on all aspects of the work and final project deliverables.

2. Compatibility with City Standards

An important element of our Project Management Plan will involve the review and application of City Standards as they apply to this project. This will include assuring compliance with our Contract terms. In addition, we will review and follow City Standards for site investigations, safety procedures, access restrictions, permits, approvals, design, water system operations coordination, and environmental compliance.

As an existing City Consultant and business located in Ann Arbor, using sub Contractors with offices and Contract experience with the City, we have a record of experience to understand what is expected by the City. We will build on that knowledge and experience to proactively engage our team for full alignment and use of City Standards.

3. HDR's Philosophy on Services

Understanding client needs to fully assess and deliver the right solutions with sustainable and reliable results is a foundational element of our approach to water projects like the Barton Raw Water Main Condition Assessment. Although this project is an investigation and study to evaluate needs and recommend next steps for system improvements, our approach will evaluate alternatives and provide recommendations to assure long term reliability and service.

HDR's local predecessor firm, Cummins & Barnard, maintained offices in Ann Arbor since 1932. With the acquisition by HDR in 2008, our local Ann Arbor office became part of a large firm while maintaining a strong local presence that is flexible and responsive. HDR has now been in business for over 100 years and has achieved this tenure of success. We pride ourselves on being active members of our community. We maintain a goal to provide engineering services to local clients that benefit the client. We work collaboratively with our clients to ensure that the client's goals are understood and become the primary objective. We bring experienced staff to the table to then drive the process, so that the project exceeds its goals and serves as community improvement.

Workshops

The overall approach for workshops will include a preparation phase, to confirm the content, attendance, and schedule details for each workshop. A delivery phase for assuring attendance, engaging participation, and facilitating actions resulting in the complete coverage of each topic. Followed by a documentation phase for the review and endorsement of results by City Staff as appropriate.

The planning and delivery of workshops as required for the Raw Water Main Condition Assessment will include each of the Workshop Topics identified in the RFP. The overall approach workshop will include a preparation phase, to confirm the content, attendance, and schedule details for each workshop. A delivery phase for assuring attendance, engaging participation, and facilitating actions resulting in the complete coverage of each topic. Followed by a documentation phase for the review and endorsement of results by City Staff as appropriate.

Our Project Schedule as provided and described in this Section provides the proposed sequence and timing for holding each Workshop. The four Workshop Topics and key components are as follows:

Pre-inspection Workshop

- Overall Work Plan – Content of the Base Scope and decisions regarding allowances, added value tasks, or investigation alternatives will be used to prepare presentation content.
- Contingency Plans – The project challenges and mitigation actions as discussed in the Project Management Section of our proposal will be used to provide initial content for Contingency Planning.
- Safety Procedures – All field activities will require the development and application of project specific Safety Plans in compliance with HDR, and City Standards.
- Access Restrictions – Access requirements will be defined and reviewed with the City to confirm that proper coordination, location, permitting and delivery of access restrictions is accomplished.

Raw Water Main Inspection Workshop

- PCCP Internal Inspection Data Review – Details for this technical work are provided in the Work Plan Section C of our proposal.
- Cast Iron Internal Inspection Data Review - Details for this technical work are provided in the Work Plan Section C of our proposal.

Corrosion Survey Workshop

- Corrosion Data Review - Details for this technical work are provided in the Work Plan Section C of our proposal.
- Spot Excavation Plan - Details for this technical work are provided in the Work Plan Section C of our proposal.

Risk Assessment Workshop

- Risk Analysis – The challenges and mitigation actions as provided in the Barton Challenge Mitigation Strategies Table included in this section and discussed in the Project Management Section of our proposal, will be used to prepare a Risk Analysis Matrix for review and development during this workshop.
- Recommendations for Corrosion Management, Repair and/or Rehabilitation – Results contained in the project Final Report will develop and provide plans with implementation recommendations for the City to address the corrosion, repair, rehabilitation or replacement needs to provide reliable and redundant capacity raw water supply.

DELIVERABLES

HDR will prepare all project deliverables as identified in the RFP following the Work Plan detailed approach as described in our proposal. To confirm and consolidate the list of project deliverables is as follows:

- Inspection Work Plans
- Contingency Plans
- Safety Plan
- Electromagnetic Inspection Data and Technical Memorandum
- Acoustic Leak and Gas Pocket Inspection Data and Technical Memorandum

- Corrosion Study Technical Memorandum with Recommendations
- Final Report to compile the various Technical Memoranda and to present the Overall Risk Analysis, Life Expectancy and Repair/Rehabilitation or Replacement Recommendations with cost estimates for budgeting.
- AutoCAD file with the location of the 42-inch and 24-inch water mains based on the internal inspection data. Coordinates shall be in the City's standard coordinate system.
- Recommendations for a water main marking system on the 24-inch and 42-inch mains at a minimum interval of every 500 feet and at alignment changes between the Barton Pump Station and the Water Treatment Plant, including within the Bird Hills Nature Area.

ALTERNATIVE ASSESSMENT SCOPE

The City has done a thorough job identifying the scope of work for the assessment of the two raw water mains. Given the inherent risk of putting assessment tools inside of active water mains, HDR is offering the following suggested scope additions and value-added services to consider. The costs for these services have not included in our base cost; however, we have included estimated costs for each item, as part of our cost proposal.

Following are suggested scope additions that will add value to the existing scope of work:

- **Alternative Assessment of CIP**
  An internal assessment of the 24-inch CIP using a free-swimming tool requires that the pipe be free of debris, as the proposed SmartBall technology will roll along the bottom of the pipeline. The SmartBall is encased in a foam casing, that can get caught on debris buildup. To limit the likelihood of an in-line assessment tool getting stuck in the pipeline, it is important that the City better understand the amount of debris inside of the CIP. HDR offers a suggested added-value service to determine if and how much debris is likely built up on the inside wall of the CIP.
    - **Hydraulic Assessment** – HDR will perform a desktop hydraulic analysis based on data provided by the City. Once the applicable data (flow rates, pressure data, etc) has been collected, HDR will develop a methodology, which will be presented to the City for approval. Once approved, HDR will move forward with conducting the hydraulic analysis.
    - **Visual Assessment of CIP** – It is unknown whether the CIP main is lined or has significant tuberculation or debris build-up. If the pipeline does have a significantly reduced diameter, using the SmartBall platform, which rolls along the bottom of the pipeline, could pose a risk, as the tool may get stuck on the build-up on the invert of the pipeline. In order to minimize the risk of having the SmartBall get stuck, HDR proposes a limited visual assessment of the CIP. Based upon what is encountered during this assessment, HDR will recommend either proceeding with the planned SmartBall assessment or using an alternative means of acoustically inspecting the pipeline, as outlined later in this section. The limited visual assessment will be completed by inserting a camera at the existing fire hydrant. HDR will temporarily remove the mechanical components of the fire hydrant to facilitate a limited visual assessment of the pipe near the Pumping Station.

- **PICA's Recon+ Acoustic Platform** – This technology is neutrally buoyant and can traverse the pipeline by remaining in the center of the pipeline, thereby reducing the likelihood of the tool getting stuck on tuberculation or debris built up inside of the pipe. The technology used is like that of Xylem's SmartBall. As such, this tool can be used in place of the SmartBall to collect acoustic information on leaks and gas pockets, if it is found that the CIP has significant debris buildup.

EXHIBIT B
COMPENSATION

General

Contractor shall be paid for those Services performed pursuant to this Agreement inclusive of all reimbursable expenses (if applicable), in accordance with the terms and conditions herein. The Compensation Schedule below/attached states nature and amount of compensation the Contractor may charge the City:

(insert/Attach Negotiated Fee Arrangement)

Fee Proposal

Barton Raw Water Main Condition Assessment

Description	Susan Donnally Project Manager	Michael Higgins Technical Advisor	Jim Scholl QA/QC	Colleen Howard Condition Assessment Engineer	Scott Jauch Condition Assessment Engineer	Lara Syrocki Environmental Engineer	Scott Williams Hydraulic Evaluation Engineer	Tina Whitfield Hydraulic Evaluation Engineer	Glenn Edgemon Corrosion Engineer	James Keegan Corrosion Engineer	Jeff Giddings Corrosion Engineer	Steven Pierce Corrosion EIT	Alex Palmatier Data Management Engineer	Michael Gossett Pipeline Engineer	Khaled Soubra Principal-in-Charge	Office/Admin Support	Total Hours	Total Task Labor Costs	E.T. MacKenzie Company	Xylem, Inc. (PCCP: SmartBall & PipeDiver)	Alternatives (One Option to be used)*		G2 Consulting Group	Task Expense Costs	Total Task Costs
																					Xylem, Inc. (CIP: SmartBall)	PICA Corp. (CIP: Recon +)			
Project Management	18	6	2	0	28	2	0	0	2	0	0	0	0	0	2	16	76	$ 14,550	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,550
Project Management and Administration	4				4										2	6	16	$ 3,040							$ 3,040
Kick-off Meeting	2		2		4	2										2	12	$ 2,190							$ 2,190
Ferrous Pipe Assessment Alternatives Workshop	4	4			4												12	$ 2,960							$ 2,960
Pre-Inspection Workshop	2				4											2	8	$ 1,290							$ 1,290
Corrosion Survey Workshop	2				4				2							2	10	$ 1,790							$ 1,790
Raw Water Main Inspection Workshop	2				4											2	8	$ 1,290							$ 1,290
Overall Risk Assessment Workshop	2	2			4											2	10	$ 1,990							$ 1,990
Condition Assessment Planning and Pipeline Preparation	28	2	4	12	70	32	4	4	0	2	0	12	4	2	0	2	178	$ 31,320	$ -	$ 82,688	$ 27,668	$ 8,990	$ -	$ 1,345	$ 143,020
Review Record Drawings and Data Gap Analysis	2			4	14							4					24	$ 3,160							$ 3,160
Community Outreach	4		4		8	16											32	$ 6,220							$ 6,220
Secure Required Permits	4				8	16											28	$ 5,220							$ 5,220
Perform Hydraulic Assessment							2	2									4	$ 950							$ 950
Condition Assessment Plan	6	2		8	14					2		8				2	42	$ 6,740		$ 82,688	$ 27,668	$ 8,990			$ 117,095
Detailed Site Walkover	8				18								4	2			32	$ 6,060						$ 1,345	$ 7,405
Operational Dry Run	4				8		2	2									16	$ 2,970							$ 2,970
Condition Assessment Implementation	20	4	4	24	96	8	0	0	2	6	2	48	10	6	0	0	230	$ 36,330	$ 95,025	$ 110,487	$ 25,765	$ 9,326	$ 5,854	$ 5,430	$ 278,830
Corrosion Survey / Geoprobe	2				16	2				4		24	2				50	$ 6,860					$ 5,854	$ 2,834	$ 15,548
Pipeline Preparation (Live Tap)	4	2			16									6			28	$ 5,710	$ 89,775						$ 95,485
Acoustic Leak and Gas Pocket Inspection	4				16								2				22	$ 3,490	$ 5,250	$ 23,665	$ 25,765	$ 9,326			$ 58,170
Electromagnetic Inspection	4				8								2				14	$ 2,570		$ 86,822					$ 89,392
Pipeline Mapping			2		8								2				12	$ 1,970							$ 1,970
Pipeline Marking	2		2		8	2							2				16	$ 2,920							$ 2,920
Direct Assessment	4	2		24	24	4			2	2	2	24					88	$ 12,810						$ 2,596	$ 15,406
Condition Assessment Data Evaluation and Reporting	10	4	0	4	58	0	0	0	4	2	4	28	2	0	0	2	118	$ 17,570	$ -	$ 26,749	$ 11,025	$ 8,326	$ -	$ -	$ 53,344
Electromagnetic Inspection Data and Technical Memorandum	2	1			2												5	$ 1,130		$ 15,724					$ 16,854
Acoustic Leak and Gas Pocket Inspection Data and Technical Memorandum	2	1			2												5	$ 1,130		$ 11,025	$ 11,025	$ 8,326			$ 23,180
Corrosion Study Technical Memorandum with Recommendations									2	2	2	24					30	$ 3,970							$ 3,970
Water Main Location and Marking Recommendations	2				8								2				12	$ 2,020							$ 2,020
Evaluate Data & Engineering Analysis	2	1		4	30												37	$ 4,930							$ 4,930
Final Report	2	1			16				2		2	4				2	29	$ 4,390							$ 4,390
TOTAL EMPLOYEE HOURS	76	16	10	40	252	42	4	4	8	10	6	88	16	8	2	20	602	$ 99,770	$ 95,025	$ 219,924	$ 64,457	$ 26,643	$ 5,854	$ 6,775	$ 491,805
HOURLY RATE	$ 275.00	$ 350.00	$ 250.00	$ 145.00	$ 115.00	$ 200.00	$ 275.00	$ 200.00	$ 250.00	$ 250.00	$ 225.00	$ 105.00	$ 275.00	$ 345.00	$ 320.00	$ 140.00								**BASE TOTAL****	$ 491,805
TOTAL EMPLOYEE LABOR DOLLARS	$ 20,900	$ 5,600	$ 2,500	$ 5,800	$ 28,980	$ 8,400	$ 1,100	$ 800	$ 2,000	$ 2,500	$ 1,350	$ 9,240	$ 4,400	$ 2,760	$ 640	$ 2,800									

Notes:

***Only one option of acoustic assessment of the CIP will be used (SmartBall, Sahara or Recon+), which depends upon the results of the visual assessment of the CIP**

****Base cost total includes acoustic assessment using SmartBall**

PIPE ASSESSMENT ALLOWANCES	Unit Price	Quantity	
Pipe Excavation per Location for Corrosion Study	$ 16,325	8	$ 130,600
BEM Assessment of 24" Raw Water Main	$ 5,422	8	$ 43,373
Miscellaneous Pipe Assessment	$ 15,000	1	$ 15,000
PIPE ASSESSMENT ALLOWANCE TOTAL			**$ 188,973**

ADDED VALUE ALLOWANCES	Unit Price	Quantity	
Hydraulic Assessment / C-Factor Testing	$ 7,500	1	$ 7,500
Visual Assessment of CIP	$ 2,025	1	$ 2,025
ADDED VALUE ALLOWANCES TOTAL			**$ 9,525**

GRAND TOTAL (BASE + PIPE ASSESSMENT ALLOWANCE) $ 690,303

EXHIBIT C
INSURANCE REQUIREMENTS

From the earlier of the Effective Date or the Commencement Date of this Agreement, and continuing without interruption during the term of this Agreement, Contractor shall have, at a minimum, the following insurance, including all endorsements necessary for Contractor to have or provide the required coverage.

A. The Contractor shall have insurance that meets the following minimum requirements:

1. Professional Liability Insurance or Errors and Omissions Insurance protecting the Contractor and its employees in an amount not less than $1,000,000.

2. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

   Bodily Injury by Accident - $500,000 each accident
   Bodily Injury by Disease - $500,000 each employee
   Bodily Injury by Disease - $500,000 each policy limit

3. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 04 13 or current equivalent. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the following minimum limits of liability are required:

$1,000,000	Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined
$2,000,000	Per Project General Aggregate
$1,000,000	Personal and Advertising Injury

4. Motor Vehicle Liability Insurance equivalent to, as a minimum, Insurance Services Office form CA 00 01 10 13 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be $1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

5. Umbrella/Excess Liability Insurance shall be provided to apply in excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of $1,000,000.

B. Insurance required under A.3 and A.4 above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City for any insurance listed herein.

C. Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional and unqualified 30-day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number(s); name of insurance company; name(s), email address(es), and address(es) of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions, which may be approved by the City in its sole discretion; (c) that the policy conforms to the requirements specified. Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. If any of the above coverages expire by their terms during the term of this Agreement, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.