MEMORANDUM

301 W. MAIN ▪ OWOSSO, MICHIGAN 48867-2958 ▪ WWW.CI.OWOSSO.MI.US

DATE: July 11, 2019

TO: City Council

FROM: Glenn M. Chinavare, Director of Public Services & Utilities

SUBJECT: Groundwater Resource Evaluation - OHM Advisors Addendum No. 11

RECOMMENDATION:

Approval to amend the professional service agreement with Orchard, Hiltz, and McClement (OHM) Advisors of Livonia, Michigan, for engineering services to expand the Hintz Road Wellfield and to develop the proposed Vandekarr Road Wellfield in the amount of $91,000.00.

BACKGROUND:

The N. Hintz Road Wellfield occupied one production well, which failed in 2017 after nearly 50 years of service, and recently replaced in 2019. The Hintz Road Wellfield has excellent water quality and room for a second production well. Staff met with MDEQ/EGLE to discuss a Hintz Well No. 2. MDEQ advised tht6a a second well will require a near identical groundwater resource evaluation as the recently installed Hintz production well No. 1.

Additionally, the city owns property south of the city, bordering Vandekarr Road, which hosts a 16-inch raw water transmission line extending from the Palmer Street Wellfield at Hopkins Lake to the Water Treatment Plant. Of the three Palmer Street wells, one was abandoned in 1975 for failing production and poor water quality. A second well has recently failed and is beyond repair, leaving a third well still in good operating condition, and is the only emergency raw water supply point of entry into the water distribution system. The long range intent is to abandon the Palmer Wellfield and develop a new wellfield on the Vandekarr Road property.

Staff has applied for a wellfield grant from the state of Michigan, which will cover 50% of the engineering and design costs for this OHM proposal for the proposed Vandekarr Road Wellfield.

FISCAL IMPACTS:

These services are budgeted for in the FY2019-2020 Water Fund Account 591-901-972.000.

Document originated by:

Glenn M. Chinavare, Director of Public Services & Utilities

Attachments: (1) Resolution
(2) OHM Proposal

RESOLUTION NO.

AUTHORIZING THE EXECUTION OF ADDENDUM NO. 11 TO AN AGREEMENT FOR PROFESSIONAL ENGINEERING SERVICES WITH ORCHARD, HILTZ & MCCLIMENT, INC. D/B/A OHM ADVISORS

WHEREAS, the city of Owosso, Shiawassee County, Michigan, entered into an agreement with Orchard, Hiltz & McCliment, Inc. d/b/a OHM Advisors by the adoption of Resolution 26-2015 on April 6, 2015; and

WHEREAS, the city and Director of Public Services & Utilities desires to expand the contract to include additional services for providing groundwater resource evaluations in accordance with state of Michigan regulatory requirements, for the Hintz Road Wellfield and proposed Vandekarr Road Wellfield sites.

NOW THEREFORE BE IT RESOLVED by the city council of the city of Owosso, Shiawassee County, Michigan that:

FIRST: The city of Owosso has heretofore determined that it is advisable, necessary and in the public interest to expand the contract approved by Resolution 26-2015 on April 6, 2015 with Orchard, Hiltz & McCliment, Inc. d/b/a OHM Advisors to include additional services in the amount of $91,000.00 for engineering services providing groundwater resource evaluations to expand the Hintz Road Wellfield and to develop the proposed Vandekarr Road Wellfield.

SECOND: The accounts payable department is authorized to submit payment to OHM Advisors, in the amount of $91,000.00 for services .

THIRD: The above expenses shall be paid from FY2019-2020 Water Funds Account 591-901-972.000.

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May 20, 2019

Mr. Glenn M. Chinavare
Director of Public Services
City of Owosso
301 West Main
Owosso, MI 48867

RE: Groundwater Resource Evaluation

Dear Mr. Chinavare,

OHM Advisors (OHM) is pleased to submit this proposal for the groundwater resource evaluations associated with the City's drinking source water. We have prepared our project understanding and scope of services based on information received from the City of Owosso (City) during the preparation of the Project Plan for the Drinking Water Revolving Fund (DWRF) program. This proposal addresses the planning and investigation work associated with the Hintz Wellfield and the proposed Vandekarr Wellfield.

PROJECT UNDERSTANDING

The Hintz Site consists of an older (failed) 16-inch production well that was constructed in 1968, and a newly permitted 12-inch replacement production well that was constructed in March 2018 (the older original production well is intended to be abandoned in the near future). There are two existing observation wells at the site, however, well construction logs for the observation wells are unavailable, and their condition is unknown. The aquifer test that was performed after the well construction provided an uncertain interpretation of the groundwater resource. Although the original intent of the test was to assess the ability of the aquifer to support two simultaneous operating wells on the same property, the information provided does not readily allow this evaluation. Nevertheless, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) re-analyzed the data and rated the well capacity at 730 gpm. The scope of work for the Hintz Site, therefore, is to perform a new aquifer test and provide more definitive answers to the original questions sought for the property. The Hintz site was not included in the recent DWRF Project Plan.

The Vandekarr site is a proposed wellsite with no previously completed investigation work. Prior to proceeding with exploratory work, an additional desktop study is needed to determine the potential risk if groundwater development at the site will cause movement of known contaminants located east and presumably west (at the Palmer Wellsite) of the property toward the new proposed well(s). Although the desktop study was originally intended to explore the local drift aquifer, the area is underlain by an extensive bedrock aquifer formation that also has the potential to serve the City's water supply needs. Both aquifers have differing water qualities and both have limitations regarding withdrawals. The aquifer of choice to pursue for further exploration will depend largely on the up-front analysis described on the next page. Whether the bedrock or the drift aquifer is developed, the initial exploration drilling and testing will essentially be the same.

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SCOPE OF SERVICES

Task 1 – Hintz Aquifer Analysis
Detailed work items that are part of this task are listed below:

- Coordinate with the City's drilling contractor to re-develop both observation wells to a reasonably productive condition and clear up any screen fouling that may have occurred since they were constructed. This will be performed so both wells can be reliably used as observation wells during the aquifer test. The air-lifting method of development will be used for this task.
- Perform aquifer testing and analysis utilizing the new 12-inch production pump and well. The new production well will be set at a predetermined pumping rate and pumped for a minimum duration of 24 hours, and allowed to recover for a minimum duration of 24 hours. During pumping and recovery, the water levels within the pumping well, the two observation wells and the original 16-inch production well will be monitored using data logging equipment supplied by the engineer. The data will be used to calculate the hydraulic properties of the pumped aquifer.
- An aquifer analysis report will be prepared and submitted to the City prior to submittal to EGLE for their review and approval. The report will include the following:
  1. A full description of the local hydrogeology and the assumed hydraulic inter-relationships between local geological units and/or hydraulic boundaries. The results of previous studies may be incorporated into this report.
  2. Geologic cross-sections which depict the local geology. These will be based upon a well log database for the area, and the local wells at the site.
  3. A description of the aquifer test, and a full analysis of the aquifer test data using appropriate analytical techniques.
  4. The determination of the drawdown that would occur within the production well after pumping for 100 days without the benefit of recharge.
  5. An analysis of the long-term production capability of the aquifer.
  6. An analysis of the potential for additional wells on the property and their mutual interfering effects if run simultaneously. Recommendations for well spacing to be provided if aquifer can support multiple wells.
  7. Appendices which will include location and site mapping, aquifer test data, well logs, and any other pertinent data.

Task 2 – Vandekarr Desktop Study and WHP Grant Application
Perform a desktop study to evaluate risk of contamination associated with groundwater source development in both the drift and bedrock aquifers. This analysis is intended to provide a "go/no go" answer prior to moving forward with exploratory drilling. The work associated with this task is eligible for a Wellhead Protection Grant that would provide 50% funding match. The remainder of the funds would be provided through the DWRF loan.

- Research EGLE records to obtain site specific information regarding all sites of contamination located within 3,000 feet of the proposed wellsite.
- Utilize analytical element modeling packages to simulate proposed withdrawals and the effects these would have on local groundwater flow patterns.
- Prepare preliminary geologic cross-sections and groundwater flow maps to support the modeling effort.
- Prepare a preliminary report of results for review with the City and eventually EGLE.
- Prepare and Submit Wellhead Protection Grant Application

Task 3 – Vandecarr Exploratory Drilling Support

This step assumes the site has acceptable conditions and the project team has agreed upon a path forward utilizing either the drift aquifer or the bedrock aquifer. This task will proceed once EGLE provides preliminary approval based on the desktop study. The purpose of this task is to verify hydrogeologic suitability, water quality, and initial viability as a groundwater drinking water source.

- Perform a preliminary Adverse Resource Impact analysis (ARI) which will then be confirmed by the EGLE using their Water Withdrawal Assessment Tool (this registers an allowable capacity of the proposed well before proceeding further).
- Coordinate with the City's drilling contractor to perform a single boring to an assumed depth of 150 feet if within the drift or 340 feet if within the bedrock (both depths are assumed based on known conditions in this area). Oversee install of a single 5-inch well within this first boring using 5-inch PVC casing.
- Oversee the development and test pumping of the exploratory well to determine the quality of groundwater and the general yield characteristics of the aquifer.
- Collect and analyze test pumping data. Perform necessary laboratory analysis including Unit 37 chemical analyses and radionuclides gross alpha and radium 226/228.
- Review all data with the City and EGLE before proceeding with production well.

Task 4 – Vandekarr Test Production Well Design and Bidding Support

This task will proceed once EGLE provides preliminary approval based on exploratory drilling results. The test production well will be converted to a production well once it has been approved by MDEQ. The bidding documents to install the test production well are necessary because drilling costs will likely exceed $50,000 which is the cutoff for a minimal cost procurement contract in EGLEs DWRF eligibility guide.

- Prepare observation well and test production well installation and testing specifications which will include the drilling of one additional observation well (to be used for aquifer testing purposes), and the drilling and pump testing of a larger diameter test production well.
- Preparation of complete bidding documents for the installation and testing of the test production and monitoring well.
- Evaluation of Bids

Task 5 – Vandekarr Test Production Well – Drilling Field Support, Aquifer Testing, and Analysis

- Field inspection during installation of an additional 5-inch observation well for use during aquifer testing.
- Field inspection and design during installation of the test production well dependent on field conditions. Plumbness and alignment tests to be completed ton well. Engineering assistance provided to driller during drilling and well development.
- Monitoring during 24-hour pump test and analysis. Data will be analyzed to calculate the hydraulic properties of the pumped aquifer, and groundwater samples will be collected and analyzed for Unit 37 parameters including the radiological analyses. Equipment for pumping to be provided and operated by driller; water level monitoring equipment to be provided by Engineer.
- Provide a report of the investigations for EGLE review and approval of the well.

FURTHER CLARIFICATIONS AND ASSUMPTIONS

The fee schedule is based on the following assumptions:

- The new production pump and well at the Hintz site will be used for the analysis. The City will operate the pump as required for the testing.
- The drilling contractor used for Tasks 1 and 3 will be contracted by the City.
- Task 1 is not included in the DWRF Project Plan and will not be reimbursable under the DWRF loan. Task 1 at the Hintz site will be invoiced separately from Tasks 2, 3, and 4 at the Vandekarr site.
- Tree clearing and temporary access road from Vandekarr Road to the well location will be provided by the City.

SERVICES NOT INCLUDED

The following are services that are not included with this proposal:

- Boundary or topographical surveying.
- Site civil such as tree clearing or temporary road design
- Fees associated with the agency permit application and review process.
- Attendance at pre-bid meeting and Bid Opening
- Drilling services. Estimated drilling costs are listed below
    - Task 1 $3,000. Not reimbursable under DWRF, but potentially covered under a WHP Grant.
    - Task 3 $11,500 to $15,500 depending on drift versus bedrock drilling. These exploratory drilling costs are reimbursable *design* expenses under the DWRF project plan. As a design expense, this work does not need to be competitively bid.
    - Task 5 $75,000 to $85,000 depending on drift versus bedrock drilling. The test production well drilling costs associated with this task need to be competitively bid and are reimbursable expenses under the DWRF project plan.

DELIVERABLES

OHM will provide:

- A complete aquifer analysis for the Hintz site.
- A wellhead protection grant application for the Vandekarr investigation.
- A preliminary report of the Vandekarr site to use in obtaining EGLE preliminary site approval.
- A Vandekarr exploratory well report and test results.
- A complete set of bidding documents (project manual and drawing) for the Vandekarr test production well.
- Vandekarr Aquifer Test and Test Production Well Analysis
- Documents will be provided in both electronic and paper versions.

SCHEDULE

OHM intends to start within two weeks of approval of this proposal.

Project Schedule	
Task 1 – Hintz Aquifer Analysis	6/2019 – 9/2019
Task 2 – Vandekarr Desktop Study and WHP Grant Application	6/2019 – 9/2019
Obtain approvals from EGLE for Vandekarr Exploratory Drilling	8/2019 –10/2019
Task 3 – Vandekarr Exploratory Drilling Support	10/2019
Task 4 – Vandekarr Test Production Well Design	10/2019 – 12/2019
Vandekarr Test Production Well - Bid Process	Winter 2020
Vandekarr Test Production Well – Installation	Spring 2020
Task 5 – Vandekarr Test Production Well: Drilling Field Support, Aquifer Testing, and Analysis	Spring 2020
Part 399 Well Permit Approval from EGLE	Fall 2020
Future Work (not included in this proposal)	
Well House Design	Summer 2020
Well House Bid Process	Fall 2020
DWRF – 2nd Quarter Loan Closing	Spring 2021
Well House Install and System Commissioning	Spring/Summer 2021

FEE SCHEDULE

OHM proposes to provide the above outlined professional services in accordance with the following fee schedule. Services for Tasks 1, 2, 3 and 4 will be performed on a lump sum basis. The following budgets are presented for consideration:

Task 1 – Hintz Aquifer Analysis	$ 20,500
Task 2 – Vandekarr Desktop Study And WHP Grant Application	$ 21,000
Task 3 – Vandekarr Exploratory Drilling Field Engineering and Analysis	$ 11,200
Task 4 – Vandekarr Production Well Design	$ 17,400
Task 5 – Vandekarr Production Well Drilling Field Engineering and Analysis	$ 20,900
Total Investigation and Design Services	**$ 91,000**

ADDITIONAL SERVICES

Should the client require services beyond the scope of work outlined above, additional fees may apply and will be addressed on an as-needed basis. Major portions of work associated with additional services may require a separate future agreement.

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ACCEPTANCE

If this proposal is acceptable to you, a signature on the enclosed copy of this letter will serve as our authorization to proceed under previously agreed upon terms and conditions. Thank you for giving us the opportunity to be of service. We look forward to working with you on this project. This proposal is valid for 60 days from the date of this letter.

Sincerely,
OHM Advisors

Jennifer Drinan, P.E.

Matt Kennedy, P.E.

Orchard, Hiltz, & McCliment, Inc. CONSULTANT		**City of Owosso** CLIENT
_____	(Signature)	_____
_____	(Name)	_____
_____	(Title)	_____
_____	(Date)	_____

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