



City of Norman, OK

Municipal Building
Council Chambers
201 West Gray
Norman, OK 73069

Master

File Number: K-1617-94

File ID: K-1617-94 **Type:** Contract **Status:** Consent Item

Version: 1 **Reference:** Item 22 **In Control:** City Council

Department: Utilities Department **Cost:** \$74,804.00 **File Created:** 01/12/2017

File Name: Horizontal Well Feasibility Study **Final Action:**

Title: CONTRACT K-1617-94: A CONTRACT BY AND BETWEEN THE NORMAN UTILITIES AUTHORITY AND GARVER, L.L.C., IN THE AMOUNT OF \$74,800 TO PROVIDE A HORIZONTAL WELL FEASIBILITY ANALYSIS AND FIELD ASSESSMENT IN ASSOCIATION WITH THE FYE15 WATER WELLS AND SUPPLY LINES PROJECT.

Notes: ACTION NEEDED: Acting as the Norman Utilities Authority, motion to approve or reject Contract K-1617-94 with Garver Engineers, Inc., in the amount of \$74,804; and, if approved, authorize the execution thereof.

ACTION TAKEN: _____

Agenda Date: 02/14/2017

Agenda Number: 22

Attachments: Horizontal Well Concept Drawing, Garver Contract Executed

Project Manager: Chris Mattingly, Capital Projects Engineer

Entered by: chris.mattingly@normanok.gov

Effective Date:

History of Legislative File

Version:	Acting Body:	Date:	Action:	Sent To:	Due Date:	Return Date:	Result:

Text of Legislative File K-1617-94

Body

BACKGROUND: In March 2012, the Norman Utilities Authority (NUA) approved Contract K-1112-114 with Carollo Engineers, Inc. for preparation of the 2060 Strategic Water Supply Plan (the 2060 SWSP). The plan update was needed because the NUA was unable to supply sufficient potable water to meet peak demands during summer months and was concerned about probable regulatory changes affecting both our surface water and groundwater supplies.

The goal of the 2060 SWSP is to strengthen our knowledge of potential short and long-term water supply source(s) for our community and begin implementation of a robust, water supply solution acceptable to the citizens of Norman. The 2060 SWSP Ad-Hoc Committee was appointed to ensure open and two-way dialogue with the community, to ensure the suggestions of the public are addressed, and to be able to communicate the objectives and conclusions of the 2060 SWSP to the public.

Eight meetings were held with the 2060 SWSP Ad-hoc Committee and six public meetings were held for public

participation and input. Fourteen different portfolios were developed, investigated and evaluated at these meetings. Each portfolio was developed to provide an annual average supply of 29 million gallons per day (MGD) in 2060 and a peak daily supply of 55.4 MGD in 2060. Ultimately, Resolution R-1314-146 was approved by the NUA on June 24, 2014 recommending Portfolio 14 for implementation; this portfolio included the following recommendations:

1. Continued use of Lake Thunderbird as a raw water supply source with treatment at an improved Water Treatment Facility at the existing site (but with the current allocation reduced from 8.4 to an estimated 6.1 MGD based on a pending Bureau of Reclamation yield study);
2. Expanded water conservation practices ultimately resulting in additional water availability of 1 MGD in 2060 through reduced water consumption;
3. Additional non-potable water reuse ultimately resulting in additional potable water supply of 0.8 MGD in 2060 (and reduced peak summertime demand of about 4.6 MGD by 2060);
4. Continued use of our current groundwater supply system of 36 wells and expanding our groundwater supply system by 2 MGD in the short term, for a total of 8 MGD;
5. The addition of treatment for arsenic and chromium 6 at a centralized facility, increasing the groundwater capacity from 8.0 to 10.1 MGD by bringing 12 inactive wells back on-line; and
6. Implementation of indirect potable reuse (IPR) over time by adding additional treatment at the Water Reclamation Facility (WRF) and discharging the highly treated effluent into Lake Thunderbird; raw water conveyance systems and water treatment expansions would be required.

The Fiscal Year Ending 2016 (FYE16) budget included a capital improvement project (WA0212) known as the FYE15 Water Wells and Supply Lines. As noted in Item 4 above, this project was recommended as a part of the NUA approved 2060 Strategic Water Supply Plan and water rate funding was approved by Norman voters in 2015 as the first phase of system capacity improvements to increase the City of Norman water supply. Staff distributed Request for Proposal (RFP) 1516-6 on August 8, 2015 and fourteen (14) proposals were received on September 14, 2015.

The scope of RFP 1516-6 was generally to:

1. Study geologic conditions within the Garber Wellington aquifer, evaluate and propose the most cost-effective well field development plan for Norman;
2. Recommend, permit and acquire sites and water rights for test wells and production wells;
3. Recommend test well drilling and testing procedures to maximize water quantity and enhance water quality;
4. Consider the implications of pending (and potentially new) EPA rules concerning drinking water quality and evaluate and recommend the optimum location of a future ground water treatment facility (or facilities), including blending of water from wells with contaminant levels above acceptable levels with water from wells below contaminant limits to increase the total supply of water within acceptable limits;
5. Provide design documents and construction assistance for the installation of test wells, production wells, well houses and transmission system improvements to convey potable water to customers.

In October 2015, the following consultants were selected to perform the tasks identified below:

1. Carollo Engineers, Inc. of Oklahoma City, Oklahoma: Study geologic conditions within the Garber Wellington aquifer; recommend a well field development plan considering the likely location of a future groundwater treatment facility (or facilities) while optimizing future water transmission and distribution lines; acquire necessary water rights; design test well and production wells with associated construction administration.
2. Cowan Group Engineering, LLC (Cowan) of Oklahoma City, Oklahoma: Coordinate water rights permitting through the OWRB.
3. Alan Plummer Associates, Inc. (APAI) of Oklahoma City, Oklahoma: Update our system-wide water distribution model originally prepared in 2003 to include all waterlines; model calibration and recommendations for future improvements to enhance water distribution performance.
4. APAI, Garver and Cardinal were tentatively selected to perform work associated with water transmission improvements once water well locations have been finalized.

Discussion: Proposed Contract K-1617-94 with Garver, LLC will remove a portion of Task 1 work assigned to Carollo and assign it to Garver, LLC. Generally, Garver will analyze the feasibility for installing horizontal wells in the Garber-Wellington (Central Oklahoma) aquifer for the purposes of public water supply. Results of the desktop feasibility analysis, field assessment, and recommendations will be summarized in technical memoranda and reported to the NUA.

Normally, water wells are drilled vertically down through various sand layers as shown in attachment. Screens are placed at each sand layer to allow the water in the sand layer to enter the well and be removed by pumping. Horizontal wells are directed down to the sand layer and then steered horizontally within the sand layer. This will significantly increase the ability for water to enter the well since water quantity is dependent on the amount of screen surface area against the sand layer. Several consultants have approached NUA staff asking to investigate this concept further as it is unproven in this aquifer, but has a potential to yield much more water per well. Garver is partnering with Pumps of Oklahoma and their hydrogeology team; they will research how much more water can be expected when utilizing this more expensive style of drilling. They will also review the operation and maintenance tasks that the NUA could expect with a completed horizontal well. The oil and natural gas industry has utilized horizontal wells and found great success with increased yields. To date, the water industry has applied this concept only for river alluvium wells, but not for sand layers deeper into aquifer formations such as the Garber-Wellington.

The proposed contract amount of \$74,800 was negotiated with the consultant by staff. The contract time shall be in accordance with Attachment A of the contract (Phase I). Project scope is detailed under Attachment B of the contract (Phase I) and the corresponding task pricing is shown in Attachment C. Additional phases, including final design and construction, are anticipated but may or may not be acted upon depending on the findings of Phase I. Staff estimates Phase 1 to be complete in June 2017.

The Fiscal Year Ending 2017 (FYE17) budget includes unencumbered funding of \$1,056,715 in FYE15 Water Wells and Supply Lines, Design (account 031-9345-462.62-01; project WA0212) which is adequate to fund the contract.

RECOMMENDATION: Staff recommends approval of Contract K-1617-94 with Garver, LLC of Norman, Oklahoma, in the amount of \$74,800.