

**PUBLIC UTILITIES BOARD AGENDA INFORMATION SHEET**

**AGENDA DATE:** March 14, 2016

**DEPARTMENT:** Utility Administration

**ACM:** Howard Martin, 349-8232



**SUBJECT**

Consider recommending approval of amending the Pecan Creek Water Reclamation Plant process model contract with Hazen and Sawyer engineers for additional testing and optimization of the ferric feed for phosphorous removal, and the rehabilitation of the existing Raw Wastewater Pump Station Number 2 to add \$124,650 to the contract for a total amount of the amended contract not to exceed \$282,175.

**BACKGROUND**

The PUB and City Council authorized the contract with Hazen and Sawyer (Hazen) in December 2014 to develop a computer model of the Pecan Creek Water Reclamation Plant (PCWRP) treatment processes. The consultant has completed the development, calibration and training of plant operations staff on the process model.

The PCWRP discharge permit was amended by Texas Commission on Environmental Quality (TCEQ) to add a limit of 0.5 mg/l phosphorous in the plant effluent. The construction of the facilities at the PCWRP to meet this phosphorous permit limit will be finished in March. Staff requested a proposal from Hazen to do additional real time testing of the ferric feed for phosphorous removal and update the process model with the additional data. Hazen has submitted a proposal to assist in optimizing the PCWRP iron feed system, update the process model iron to phosphorus molar ratio for more accurate prediction of iron usage, and also quantify the impacts of Lake Lewisville Water Treatment Plant solids on the PCWRP solids handling facilities for the amount of \$29,670. The consultant Scope of Work and Cost Proposal are included in Exhibit 2.

During the plant process model development Hazen did the computational fluid dynamics (CFD) modeling of the flow patterns from the raw wastewater screen to the inlet of the raw wastewater pumps for the Raw Wastewater Pump Station No. 2 (RSPS2). Staff had noticed issues with vibration, noise and limited pumping capacity in the RSPS2 pumps. The CFD analysis shows the approach velocities to the pump suction bells are much higher than recommended by the Hydraulic Institute (HI) Standards, cross flow is visible under the wall across the suction bell of Pump No. 6, and there are signs of swirling flow near the suction bell of Pump no. 6 and No. 7 in particular. The combination of the above hydraulic and structural deficiencies has created an inefficient and unsustainable pumping station. The CFD analysis results recommend the following improvements;

1. Install wet well improvements including a baffle wall and extend the existing wall to divide the pump station in half
2. Install new pumps further away from the wet well wall to meet HI Standards
3. Relocate the existing check valves to the horizontal position to prevent solids accumulation on the back side of the check valves
4. Further evaluate baffle and center wall materials under various design forces and time constraints to support alternate materials

Staff requested a Scope and Cost Proposal from Hazen to do a design level hydraulic and CFD evaluation, and design of the rehabilitation of the RSPS2 with new pumps and valves. The Hazen Scope and Cost Proposal are included in Exhibit 3. The cost of the Hazen services is estimated at \$94,980.

**RECOMMENDATION**

Staff recommends approval of the scope and cost proposal as submitted by Hazen and Sawyer.

**PRIOR ACTION/REVIEW (Council, Boards, Commissions)**

December 8, 2014: PUB recommended for approval Scope of Work and Cost Proposal from Hazen and Sawyer engineers for developing a computer model of the plant processes

January 6, 2015: City Council approved the Scope of Work and Cost Proposal from Hazen and Sawyer engineers for developing a computer model of the plant processes

**FISCAL INFORMATION**

Funds for the amendment to the contract will be funded from revenue funds set aside in job account number 640321541.

**EXHIBITS**

1. Map
2. Hazen Scope of Work and Cost Proposal for additional testing and plant process model optimization
3. Hazen Scope of Work and Cost Proposal for CFD evaluation and Rehabilitation Design of RSPS2
4. Hazen Technical Memorandum for RSPS2 Preliminary Hydraulic Investigation

Respectfully submitted:

A handwritten signature in black ink, appearing to read 'P. S. Arora'.

P. S. Arora, P.E.  
Assistant Director of Wastewater Utilities