Department of Public Works

Bureau of Engineering
Bureau of Sanitation
Joint Report No. 3

July 21, 2020
CD Nos. 1, 4, 11, and 14

SOLE SOURCE PROCUREMENT OF CARBON SCRUBBER SYSTEMS FOR THE CAPITAL IMPROVEMENT PROJECT 7190-COLLECTION SYSTEMS RADFORD CARBON SCRUBBER FACILITY UPGRADE (WORK ORDER NO. SZC12797), CAPITAL IMPROVEMENT PROJECT 7191-COLLECTION SYSTEMS RICHMOND CARBON SCRUBBER FACILITY UPGRADE (WORK ORDER NO. SZC12916), CAPITAL IMPROVEMENT PROJECT 7194-COLLECTION SYSTEMS HUMBOLDT CARBON SCRUBBER FACILITY UPGRADE (WORK ORDER NO. SZC13276), CAPITAL IMPROVEMENT PROJECT 7195-COLLECTION SYSTEMS BALLONA CARBON SCRUBBER FACILITY UPGRADE (WORK ORDER NO. SZC13277), CAPITAL IMPROVEMENT PROJECT 7196-COLLECTION SYSTEMS DACOTAH CARBON SCRUBBER FACILITY UPGRADE (WORK ORDER NO. SZC13278)

RECOMMENDING THE BOARD OF PUBLIC WORKS (BOARD):

1. At the request of LA Sanitation and Environment (LASAN) Director and General Manager, AUTHORIZE the City Engineer to sole source the procurement of the carbon scrubber system manufactured by Afras Industries, Inc. (Afras) for the following Capital Improvement Projects (CIP):

   - CIP 7190: Collection Systems Radford Carbon Scrubber Facility Upgrade (Radford), for an amount not-to-exceed $760,000.

   - CIP 7191: Collection Systems Richmond Carbon Scrubber Facility Upgrade (Richmond), for an amount not-to-exceed $1,315,000.

   - CIP 7194: Collection Systems Humboldt Carbon Scrubber Facility Upgrade (Humboldt), for an amount not-to-exceed $1,315,000.

   - CIP 7195: Collection Systems Ballona Carbon Scrubber Facility Upgrade (Ballona), for an amount not-to-exceed $760,000.

   - CIP 7196: Collection Systems Dacotah Carbon Scrubber Facility Upgrade (Dacotah), for an amount not-to-exceed $535,000.

2. AUTHORIZE the City Engineer to negotiate a price agreement with Afras for the above referenced carbon scrubber systems which will be procured by the City of Los Angeles (City) and installed by the general contractor awarded the construction project.
Reference List of Previous Installations by Afras

- In 2015, a 500-cubic feet per minute (cfm) carbon scrubber unit was tested at the Hyperion Water Reclamation Plant.
- In 2018, a 10,000-cfm carbon scrubber unit was installed at the Genesee Odor Control Facility, 5898 W. Venice Boulevard, Los Angeles, CA 90019.
- In 2019, a 10,000-cfm carbon scrubber unit was installed at the Sierra Bonita Odor Control Facility, 1403 N. Gardner Street, Los Angeles, CA 90046.

TRANSMITTALS


2. The BOE and LASAN Joint Report No. 1, titled “Authority to Utilize the Wastewater Treatment Plant Program Emergency Contract for Both Capital Improvement Projects (CIP) 7192 - Collection Systems North Outfall Treatment Facility (NOTF) Carbon Scrubber Facility Upgrades Project (Work Order No. SZC12917) and CIP 7193 - Collection Systems Sierra Bonita Carbon Scrubber Facility Upgrades (Work Order No. SZC13275),” Adopted by the Board on September 24, 2018.

DISCUSSION

Background

LASAN operates multiple odor control facilities throughout the City. Many of these facilities use the carbon adsorption process to scrub pressurized foul air originating from the wastewater collection system. Carbon adsorption is the process of accumulating malodorous hydrogen sulfide gas and volatile organic compounds onto the surface of carbon particles as the foul airstream passes through the carbon, thereby removing the odor from the airstream. Five of these carbon scrubber facilities (Radford, Richmond, Humboldt, Ballona, and Dacotah) were designed to scrub foul air and discharge the treated air to the atmosphere, as approved by the Southern California Air Quality Management District (SCAQMD). At the above-mentioned facilities, the existing equipment, including the fans, carbon vessel, mist eliminator, isolation dampers, and the associated air ducts have exceeded their service life and show signs of deterioration beyond repair. Additionally, some facilities are undersized relative to current and/or anticipated treatment capacity
requirements. Additional details about these LASAN-operated carbon scrubber facilities are outlined in Table No. 1 below:

<table>
<thead>
<tr>
<th>CIP</th>
<th>Site Name</th>
<th>Project Address</th>
<th>Year Constructed</th>
<th>Foul Air Source</th>
<th>Existing Flow (CFM)</th>
<th>Proposed Flow (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7190</td>
<td>Radford</td>
<td>4200 Radford Avenue, Los Angeles, 91604</td>
<td>1999</td>
<td>North Outfall Sewer Collection System</td>
<td>5,000 cfm</td>
<td>5,000 cfm</td>
</tr>
<tr>
<td>7191</td>
<td>Richmond</td>
<td>850 N. Mission Road, Los Angeles, 90033</td>
<td>2005</td>
<td>Drop Structure at North Mission Road and Richmond Street</td>
<td>10,000 cfm</td>
<td>15,000 cfm</td>
</tr>
<tr>
<td>7194</td>
<td>Humboldt</td>
<td>303 N. San Fernando Road, Los Angeles, 90031</td>
<td>2005</td>
<td>North Outfall Sewer – Northeast Interceptor Sewer Drop Structure Collection System</td>
<td>10,000 cfm</td>
<td>15,000 cfm</td>
</tr>
<tr>
<td>7195</td>
<td>Ballona</td>
<td>5550 Inglewood Boulevard, Los Angeles, 90230</td>
<td>2005</td>
<td>Ballona Creek Wastewater Pumping Plant Wet Well</td>
<td>5,000 cfm</td>
<td>5,000 cfm</td>
</tr>
<tr>
<td>7196</td>
<td>Dacotah</td>
<td>1164 South Dacotah Street Los Angeles, 90023</td>
<td>2005</td>
<td>Dacotah Wastewater Pumping Plant Wet Well</td>
<td>3,000 cfm</td>
<td>3,000 cfm</td>
</tr>
</tbody>
</table>

**Proposed Project**

The proposed projects will replace existing carbon scrubbers with new scrubbers which are engineered, factory-fabricated systems designed for capacities respective of each site’s requirements, complete with mist eliminator/degreaser, media containment vessel, centrifugal fan with enclosure, carbon media, exhaust stack, interconnecting ductwork,
fan control panel, and other minor appurtenances for a complete operating system. Coconut shell-based activated carbon will be used as the dry filter media. A typical process flow schematic for the facilities is shown in Figure No. 1. The foul air will be pulled from the sewer headspace through the mist eliminator/degreaser and subsequently pushed through the carbon bed via blowers installed in-line between the mist eliminator and the carbon absorber unit. All of the units, except for the Dacotah unit, will include two blowers, one running and one standby. This will allow for planned and unplanned maintenance activities. The treated air will be released to the atmosphere via an exhaust stack routed in accordance with the requirements of the site’s SCAQMD permit. Figure No. 2 below shows the carbon scrubber installed at the Genesee Carbon Scrubber Facility (Genesee) location (Transmittal No. 1).

(Figure No. 1): Typical process flow diagram for the carbon scrubber systems.

(Figure No. 2): Carbon scrubber at Genesee.
**Sole Source Justification**

LASAN conducted a pilot study in 2016 at the City’s Hyperion Water Reclamation Plant comparing the performance of a standard vertical flow carbon scrubber with the Afras' suspended media radial flow carbon scrubber unit. The study reported a significantly improved performance with the Afras scrubber design. Operation and Maintenance (O&M) cost is a large component of the life cycle cost of a scrubber facility and carbon procurement, and change-out costs account for a major portion of the O&M costs. Based on the study, the Afras scrubber design with its patented moisture deflector increased the life of the carbon by reducing air moisture to the carbon bed. This resulted in improved performance due to a lower rate of carbon saturation and increased time before break-through of foul gas through the system.

Based on the above study performed, an Afras scrubber was installed as part of the emergency CIP 7193 Sierra Bonita Carbon Scrubber Installation project (Sierra Bonita) (Transmittal No. 2) to replace the previous carbon scrubber and was put into continuous operation on September 20, 2019. The previous scrubber required a carbon changeout every 3 to 4 weeks. The new scrubber installed at Sierra Bonita was able to operate without break-through from September 20, 2019 to January 3, 2020 before the next changeout. From the data collected between initial startup and the date of the first carbon changeout for the new system, a table was created to show the initial costs savings between the previous scrubber and the Afras scrubber below:

<table>
<thead>
<tr>
<th>Cost of Carbon Changeout</th>
<th>Old Carbon Scrubber</th>
<th>Afras Carbon Scrubber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of days between carbon change out</td>
<td>28</td>
<td>105</td>
</tr>
<tr>
<td>Pounds of carbon required</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Cost of carbon per pound</td>
<td>$0.78</td>
<td>$0.78</td>
</tr>
<tr>
<td>Cost of carbon per day</td>
<td>$557</td>
<td>$149</td>
</tr>
<tr>
<td>Cost of carbon per year</td>
<td>$203,357</td>
<td>$54,229</td>
</tr>
<tr>
<td>Cost of carbon over 10 years</td>
<td>$2,033,571</td>
<td>$542,288</td>
</tr>
<tr>
<td>Cost savings over 10 years</td>
<td>$1,491,286</td>
<td></td>
</tr>
</tbody>
</table>

The estimated total O&M cost savings is $1,491,286 (present value in 2020) over 10 years.
LASAN is currently seeking to replace the five existing carbon scrubber facilities at Radford, Richmond, Humboldt, Ballona and Dacotah. The existing carbon scrubber units have exceeded their useful service life, which is typically 10 years, and are due for replacement. The upgraded replacement scrubbers using the Afras carbon scrubber design would bring improved odor control performance and resulting reduced life cycle costs. It is also LASAN’s preference to standardize their use of Afras scrubbers to streamline O&M, spare parts inventory and O&M training. It is, therefore, recommended that the Afras Industries carbon scrubber systems be procured and installed at the five above described locations.

**City Attorney Review**

The City Attorney’s Office has reviewed this matter on May 8, 2020 and concurs that it is reasonable and justifiable to award this contract on a sole source basis.

**Program Review Committee (PRC) Approval**

The Radford project (CIP 7190) was approved by the PRC for a total construction budget of $2,428,000 at its meeting on April 8, 2020. The budget includes costs for a carbon scrubber system manufactured by Afras for an amount around $760,000.

The Richmond project (CIP 7191) was approved by the PRC for a total construction budget of $2,428,000 at its meeting on April 8, 2020. The budget includes costs for a carbon scrubber system manufactured by Afras for an amount around $1,315,000.

The Humboldt project (CIP 7194) was approved by the PRC for a total construction budget of $2,428,000 at its meeting on April 8, 2020. The budget includes costs for a carbon scrubber system manufactured by Afras for an amount around $1,315,000.

The Ballona project (CIP 7195) was approved by the PRC for a total construction budget of $2,428,000 at its meeting on April 8, 2020. The budget includes costs for a carbon scrubber system manufactured by Afras for an amount around $760,000.

The Dacotah project (CIP 7190) was approved by the PRC for a total construction budget of $2,428,000 at its meeting on April 8, 2020. The budget includes costs for a carbon scrubber system manufactured by Afras for an amount around $535,000.

**Status of Financing**

There is no impact to the General Fund. No funding is required at this time. The project will be funded from the Sewer Construction and Maintenance Fund. Specific funding information will be provided at the time of project award.
Department of Public Works
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Joint Report No. 3

July 17, 2020
Page 7

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