

November 5, 2012

Mr. Robert Lee City of Reno 350 S. Center Street, Suite 400 Reno, NV 89505

Subject:Proposal to Perform Final Design of the Digester Gas Conditioning System
for the Truckee Meadows Water Reclamation Facility

Dear Mr. Lee:

At your request, we are excited to submit this letter proposal to perform Final Design of the Digester Gas Conditioning System Project for the Truckee Meadows Water Reclamation Facility (TMWRF).

INTRODUCTION

TMWRF is being required by the local air pollution control authority to reduce total sulfur emissions. In addition, Siloxanes present in the gas will need to be removed in order to reduce their impact and improve on the operation of the boilers, sludge heaters, and cogeneration engine. To do this, a proven digester gas conditioning system is required to reduce sulfur and Siloxanes in all of the digester gas used throughout the plant, the flare, the boilers, sludge heaters, and the cogeneration engine. To treat the gas going to the flare from both the acid and methane phase digesters, as well as that going to the boilers, sludge heaters, and cogeneration engine, the gas piping will also require significant modifications as the piping currently separates these flow streams in widely different locations. Therefore, the purpose of this project is to perform final design of a digester gas conditioning system for removal of H2S and Siloxanes in the digester gas at TMWRF.

SCOPE OF WORK

The following Scope of Work outlines the tasks that Carollo will perform.

Task 1 – Project Management and Meetings

Carollo will provide project management necessary to perform planning, execution, monitoring, and reporting of the final design progress to the City. Carollo will attend one (1) kickoff meeting and two (2) progress meetings with the City to discuss design criteria, update project progress, discuss key design issues, and review design drawings as appropriate. Meeting notes will be prepared and submitted to the City after each meeting.

Task 2 – Final Design

Carollo will perform final design of the following key project elements and prepare biddable drawings and specifications for this project:

• **Digester gas conditioning system for removal of H2S and Siloxanes.** This system will utilize a packaged system based on H2S removal via media vessels sized to utilize either iron

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sponge or Sulfa-Treat media to treat up to 900 scfm, followed by refrigeration, and carbon adsorption Siloxane removal systems to treat up to 625 scfm of combined digester gas. The location of the packaged digester gas conditioning system is preliminary based on locating it along the south side of the primary sedimentation basins between the grit handling facilities and the gravity thickeners.

- Digester gas piping improvements to remove digester gas piping from within the existing digester control building basements and adjacent gallery structures. Existing gas piping will remain within the rooms housing sludge heaters, boilers, and cogeneration engine but will be removed from service within the tunnels and basement areas of the digester control buildings with the exception of new solidly welded gas piping necessary to provide gas through the existing tunnels from the digester complex across the North-South roadway to serve the existing flare, boilers and cogeneration system, and possibly the gas conditioning system dependent upon the final location of the packaged digester gas conditioning system. Demolition of the existing gas piping beyond that required to isolate the piping passing through these below grade areas from the existing above grade piping is assumed to be performed by TMWRF staff at a later date, and will not be included in this design. The goal of the piping modifications is to bring the TMWRF tunnel area and Digester Control Buildings into compliance with NFPA 820 guidelines concerning location of digester gas piping and equipment within these spaces. Piping modifications included in this proposal assume any piping traversing the North-South roadway as well as any other existing roadways will be done via solidly welded piping within existing tunnels, and does not include the design of any above grade bridge structures for these traverses. The use of existing tunnels also includes the design of external, below grade vaults to house condensate removal equipment external to the tunnels. Piping modifications also include design of new digester gas condensate collection equipment adjacent to the existing digesters. Relocation or replacement of the existing flare is not included in this design.
- Associated civil, geotechnical, structural, electrical, and instrumentation facilities to support the new digester gas conditioning system.

Construction drawings will be prepared in computer aided drafting (CAD) format per Carollo's CAD standards. Construction specifications will be prepared using City's standard Divisions 0 and 1 "Front End" contract documents and Carollo's technical specifications in MS Word using the CSI format.

Carollo will prepare progress submittals for review by the City at the 90% design stage. City will provide written comments to Carollo within two (2) weeks after receipt of the 90% design submittal. Based on the review comments received, Carollo shall prepare and submit the 100% design bid package to the District for printing, selling, and distributing to the bidders.

Carollo will also prepare and submit construction cost estimates within one week after submittal of the 90% design submittal.

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Task 3 – Bid Period Support Services

Carollo will provide bid period support services for this project. These services will include: attend prebid meeting, respond to bidders' questions, and preparation of one (1) addenda for the project.

Assumptions

The following key assumptions were used in preparing the scope of work:

- Grant funding assistance from Carollo is not needed as City will manage this process.
- Construction management and engineering services during construction are not included. These services can be added at the City's request after construction bids are received.

COST AND SCHEDULE

Our estimated cost to perform the Scope of Work is attached as Exhibit A. We will begin our services immediately after receiving a written notice to proceed from the City and will complete final design within four months.

Please call us if you have any questions concerning this proposal.

Sincerely,

CAROLLO ENGINEERS, INC.

Rick Chan

Rick Chan, P.E. Vice President

cc: Tom Mossinger – Carollo Todd Saxberg – City of Sparks

EXH	IBIT	Α
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LABOR AND BUDGET ESTIMATE

TRUCKEE MEADOWS WATER RECLAMATION FACILITY DIGESTER GAS CONDITIONING SYSTEM FINAL DESIGN

		Rick	Tom	Electrical	Structural	Design				Carollo			1
		Chan	Mossinger	Engineer	Engineer	Engineer	CAD	WP	Total	Labor	Subconsultants		Total
Task	Task Description	\$258	\$250	\$190	\$190	\$170	\$140	\$108	Hours	Cost	Surveyor	Geotech	Cost
1.0	Project Management and Meetings												1
	1.1 Project Management and Meetings	16	16	0	0	16	0	0	48	\$10,848			\$10,848
	Task 1.0 Totals =	16	16	0	0	16	0	0	48	\$10,848			\$10,848
2.0	Final Design												
	2.1 Prepare Drawings and Specifications	85	136	237	102	407	627	102	1,694	\$287,946	\$6,600	\$12,100	\$306,646
	Task 2.0 Totals =	85	136	237	102	407	627	102	1,694	\$287,946			\$306,646
3.0	Bid Period Services												
	3.1 Bid Period Services	4	8	<u>0</u>	<u>0</u>	<u>16</u>	8	4	40	\$7,304			\$7,304
	Task 3.0 Totals =	4	8	0	0	16	8	4	40	\$7,304			\$7,304
	Project Totals =	105	160	237	102	439	635	106	1,782	\$306,098	\$6,600	\$12,100	\$324,798
(1) Labor rate includes all Carollo's direct cost, overhead, communication, and other material costs.													