

Commonwealth Energy Biogas/PV Mini-Grid  
Renewable Resources Program

***Making Renewables Part of an Affordable and  
Diverse Electric System in California***

**Contract No. 500-00-036**

**Letter of Notification Plant Digesters' Gas  
Cleaning, Gas Collection and Piping and Safety  
Systems Upgrade**

Project No. 3.1 Dairy Waste to Energy

*Task 3.1.4(a)2 Report*

**Prepared For:**  
California Energy Commission  
Public Interest Energy Research - Renewables Program

**Prepared By:**

**CH2MHILL**

Bill Kitto, CH2M HILL, Santa Ana, California  
3 Hutton Centre Drive, Suite 200  
Santa Ana, CA 92707

**Legal Notice**

This report was prepared as a result of work sponsored by the California Energy Commission (Commission). It does not necessarily represent the views of the Commission, its employees, or the State of California. The Commission, the State of California, its employees, contractors, and subcontractors, make no warranty, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the use of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the Commission nor has the Commission passed upon the accuracy or adequacy of the information in this report.

February 2006



March 3, 2006

Subject: Letter of Notification: Installation of Ultrasound Systems at City of Riverside Water Quality Control Plant, California

This letter, including the attached drawings and electronic submittal on CDs document the completion of Task 3.1.4, Construct Pilot Plant. The completed subtasks include:

- 3.1.4(a)1: Construct Pilot (demonstration) Plant's Materials Handling System
- 3.1.4(a)2: Construct Pilot (demonstration) Plant digester's gas cleaning, and gas collection, piping and safety systems upgrade
- 3.1.4.(b): Construct Pilot (demonstration) Plant -Start Up Activities
- 3.1.4.(c): Construct Pilot Plants – Specifications, as built drawings and initial performance report.

Task 3.1.4(a)1: Construct Pilot (demonstration) Plant's Materials Handling System

This letter serves as notification that the materials handling system has been successfully installed including all pumps, storage tanks, valves, metering, electrical and instrumentation and control systems, sampling ports and related equipment in accordance with the design for the Materials Handling Systems in accordance with the design completed under Task 3.1.3. Pictures showing completion of the system are included in the as built drawings included in the attached set of drawings submitted with this letter. The attached drawings represent the as built condition of the project and serves to document completion of this task.

Task 3.1.4(a)2: Construct Pilot (demonstration) Plant digester's gas cleaning, and gas collection, piping and safety systems upgrade

This letter notifies completion of four activities including: 1) installation of new physical-chemical processes for H<sub>2</sub>S treatment in close coordination with activities under Project 2.2. This will involve new sponge media for H<sub>2</sub>S absorption under anaerobic conditions and oxygen injection for operating the system under aerobic conditions, 2) expansion of gas collection system to accommodate increased gas production, 3) safety system upgrades to the existing piping systems and 4) piping modifications to connect the co-digestion modified digesters with the existing gas distribution system. Pictures showing completion of the project are included in the drawings submitted with this letter. The attached drawings represent the as built condition of the project and serve to document completion of this task.

Task 3.1.4.(b): Construct Pilot (demonstration) Plant -Start Up Activities

This letter serves as notification that for RP-1 systems start-up and commissioning has been completed and that initial operating data meet performance requirements. This notice pertains to start up activities and initial testing of the materials handling system (Task 3.4.(a) 1) and gas cleaning, and gas collection, piping and safety systems upgrades (Task 3.4(a).2). Additional information on start up activities can be found in the monthly reports submitted under task 3.1.5 and in weekly meeting notes provided previously.

Task 3.1.4.(c): Construct Pilot Plants - Specifications, as built drawings and initial performance report.

Accompanying this letter are the as built drawings documenting completion of this task. In addition specifications are found in drawings submitted previously under Task 3.1.3.c and the results of initial performance testing is included in the first monthly report submitted previously.

Total installation costs for the co-digestion equipment at RP-1 for conducting these tests are shown in Table 1 below. Costs to install iron sponge modifications, which were incurred as a part of the co-digestion project, are shown and broken out as well. Costs shown in these tables also include matching cost contributions for gas system upgrades and safety improvements that were incurred by the host.

TABLE 1

Co-Digestion and Gas Cleaning Project Installation Costs

	<b>Gas System Analysis and Safety Upgrade</b>	<b>Codigestion (Including Materials Handling)</b>	<b>Gas Cleaning on Project 3.1 (Iron Sponge)</b>	<b>Total</b>
<b>PIER Costs</b>				
Engineering	\$ 0	\$ 85,000	\$ 31,000	\$ 116,000
Installation	\$ 0	\$ 788,000	\$ 172,000	\$ 960,000
Total	\$ 0	\$ 873,000	\$ 203,000	\$ 1,076,000
<b>Match Costs</b>				
Engineering	\$ 129,000	\$ 79,000	\$ 17,000	\$ 225,000
Installation	\$ 1,300,000	\$ 353,000	\$ 0	\$ 1,653,000
Total	\$ 1,429,000	\$ 432,000	\$ 17,000	\$ 1,878,000
<b>TOTAL</b>	<b>\$ 1,429,000</b>	<b>\$ 1,305,000</b>	<b>\$ 220,000</b>	<b>\$ 2,954,000</b>

NOTE: All costs rounded to nearest \$1,000.

Table 2 lists as built drawings and other supporting documentation as required for each of the tasks addressed in this letter.

<b>Table 2</b>				
Co-Digestion and Gas Cleaning Tasks and Supporting Documentation				
<b>As Built Drawing Number and Title or Other Supporting Documents</b>	<b>3.1.4(a)1 Materials Handling System</b>	<b>3.1.4(a)2: Co-digestion gas cleaning, and gas collection, piping and safety systems upgrade and iron sponge</b>	<b>3.1.4.(b): Construct Pilot</b>	<b>3.1.4.(c): Specifications, as built drawings and initial performance report.</b>
Materials Handling Drawing Package (5 Drawings)	X			X
Co-Digestion Drawing Package (7 Drawings)		X		X
Gas Cleaning - Iron Sponge Drawing Package (5 Drawings)		X		X
Monthly Operating Reports Under Project 3.1.5			X	X
Weekly Meeting Agendas, Minutes and Action Items			X	X

This letter, and attachments, is intended to serve as the deliverable documenting completion of Task 3.1.4, Construct Pilot (Demonstration) Plant. If you have any questions or would like additional information, please do not hesitate to call me at 503-235-5022 ext. 4427.

Sincerely,



William D. Kitto, Project Manager  
Attachments:

- Drawing Set for Materials Handling System
- Drawing Set for Codigestion System
- Drawing Set for Gas Cleaning System - Iron Sponge
- CD containing electronic version of Material Handling System, Co-digestion and Gas Cleaning - Iron Sponge System