MONTHLY PROGRESS REPORT FOR CONTRACT NO. 500-00-036

PROJECT 2.2 – ENHANCED ENERGY RECOVERY THROUGH OPTIMIZATION OF ANAEROBIC DIGESTION AND MICROTURBINES PROJECT

REPORT PREPARED BY: COMMONWEALTH ENERGY TEAM

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Contractor Project Director:	Patrick Lilly (360) 906-0616
Contractor Project Manager:	Bill Kitto (503) 235-5022
Commission Project Manager:	Zhiqin Zhang (916) 654-4063

What we planned to accomplish this period:

- It was anticipated that during October, operation of the two ultrasound systems at Riverside's wastewater treatment plant would continue. Equipment installed from June to August and prior initiated "started-up" activities in September also would continue. This planned work included control system modifications identified during the installation process that were needed to ensure that the two systems would meet all their design requirements.
- On the gas cleaning project, design efforts were to continue, with the focus being on the efforts needed to ensure the connections to the existing gas distribution system were adequate. In addition, equipment layouts and the associated mechanical, civil and electrical/instrumentation and control engineering activity were also to continue. It was anticipated that the draft design report documentation for the gas cleaning system would be completed and reviewed internally by the Commonwealth Team so that it could be submitted to the Commission in October. Work on the first quarterly report, focusing on plant baseline data, was also planned to continue. This included data collection for both the ultrasound system at the City of Riverside's plant and the gas cleaning data at IEUA Regional Plant 1. The bi-weekly coordination calls with the City of Riverside were to continue and it was expected that a coordination meeting would be held with IEUA to review the draft design approach for the moisture removal, siloxane removal and H_2S removal systems.
- It was also anticipated that the preparation of the as-built drawings would continue so that they could be completed and submitted to the Energy Commission in November.

What we actually accomplished this period:

Task 2.2.1 Process Selection:

- Work on this task is complete. The results have been have been incorporated into the design process and are being implemented into the project in the field.

Task 2.2.2 Site Selection and Test Plan:

- Work on this task is complete. The results have been have been incorporated into the design process and are being implemented into the project in the field.

Task 2.2.3.a. Design Gas Cleaning System:

- Efforts on this task continued in October. Design data and other information on site conditions collected earlier were incorporated into the design of the gas cleaning systems. Design drawings, showing the layout of the various gas cleaning elements (gas drying, H_2S removal and siloxane removal) were reviewed and refined with the host (IEUA) staff so that efforts with the various vendors could be undertaken to ensure that the design incorporated all equipment requirements. Design data related to sizing of the piping, electrical, instrumentation/control and other project elements were incorporated into the design and reviewed with project host engineering and operations staff. The result of these efforts was a set of drawings that was circulated for review and comment within the project team. These gas cleaning system drawings were reviewed so that the final completed design could be submitted to the Commission in November.

Task 2.2.3b Design Ultrasound System:

- Design activities were completed on this task previously and the design documents were submitted to the Commission in June. Effort on this task was very limited in October with the only activity being use of the results of this task to complete the as-built drawings prepared under Task 2.2.4.b. The City of Riverside staff worked closely with CE Team staff to ensure that piping, electrical, instrumentation/ control and other design activities were conducted in a manner so that the ultrasound test units were properly sized and functioned effectively. Effective communication with City of Riverside has been accomplished through bi-weekly calls where project activities are discussed to ensure that the proposed system's design was fully compatible with existing facilities at the City of Riverside.

Task 2.2.4b Install Ultrasound System:

- Installation of the ultrasound systems was completed in August. The installation allowed start up testing to occur in August and September. Work continued with IWe Tech and Sonico, the two ultrasound vendors used on this project. Efforts undertaken in October included updating the design drawings with as-built information so that adequate project documentation would be achieved. Photos of

the equipment were taken and the vendors were asked to provide technical support as operational issues arose.

- Under this task, both systems were placed in their proper location at the plant and activities related to connecting them to the plant's electrical, instrumentation and control and mechanical systems were undertaken. Improvements were needed at the site so that equipment could be placed and secured at the proper location at the Riverside Treatment Plant. Each system was connected to the plant's digesters in a manner that would enable both units to be run in parallel so that their performance could be directly compared. This was accomplished so that each unit could be run in accordance with the Project's test plan.

Task 2.2.5.a First Quarter Data Collection and Analysis

- Baseline data at the City of Riverside's Treatment Plant for the ultrasound systems was collected starting in June and this continued until September when start up began. For the gas cleaning project, baseline data collection activities began approximately two months later. In both cases it was important to have data that described the performance of the existing systems *before* the project started. This information was needed to document operating conditions prior to startup so that the effectiveness of the units could be assessed. As part of this effort, close coordination with the City of Riverside continued through the bi weekly calls referenced previously. Regular coordination with IEUA also continued as the design of the gas cleaning system under Task 2.2.3.b, continued and baseline data collection activities were initiated.

Task 2.2.5.b Second Quarterly Data Collection and Analysis

- In October, data collection during the ultrasound system operational phase continued. As noted previously, start up activities occurred during September and several performance issues with the testing of the ultrasound units arose. Both vendors, IWe Tech and Sonico, provided technical support during this period so that the units would operate satisfactorily. On the gas cleaning project, baseline data collection continued and the CE Team worked closely with IEUA host facility staff to coordinate data collection activity with operations. This activity was expected to continue throughout the quarterly data collection efforts.

How we are doing compared to our plan:

As reported previously, the redirection of our approach (two ultrasound technologies, instead of one ultrasound and one thermal hydrolysis technology) will make the project findings more relevant to the State of California, but required additional consultation and planning with the technology vendors. This modified focus delayed completion of the *Site Selection and Test Plan Report*. However, the findings produced will clearly document how the use of ultrasound technology can help increase gas production as well as improve the treatment process.

As part of the ongoing coordination with the technology vendors, the CE Team sought to streamline the site selection and design tasks by involving the vendors in the project planning. This allowed efforts to focus on project implementation, rather than evaluations and design activities. However, these additional processes/steps additionally delayed the finalization of the *Site Selection and Test Plan Report*. These challenges have been largely overcome, and the testing program was initiated in the second half of 2004. This will enable all testing to be completed by the end of the third quarter of 2005 with the results being incorporated into the Final Report, which will be drafted by the end of 2005.

Significant problems or changes:

There are no significant fiscal problems to report during this period and work is proceeding within budget. Progress and expenditures will result in project being completed on our revised project schedule and within budget.

What we expect to accomplish during the next period:

Continued testing of the IWe Tech and Sonico ultrasound systems at the City of Riverside Wastewater Treatment Plant will continue in November. This will include baseline data for the gas cleaning tasks at IEUA's Regional Plant Number 1 and data from the first operating period for the ultrasound systems. It is also anticipated that the documents marking completion of the ultrasound installation task will be completed and submitted to the Commission. These documents are expected to include as-built drawings, photographs and a letter signed by representatives of the City of Riverside certifying that the installation is complete. It is also anticipated that the design of the gas cleaning system will be completed and submitted to the Commission. This design work will be for systems to be installed at IEUA Regional Plant Number 1.

Work will continue on the first quarterly report, which will include baseline data. Baseline data related to the ultrasound systems collected in the June to September time frames will be summarized and baseline data at RP-1 will be incorporated as it becomes available. The data collection on the gas cleaning lags the data collection on the ultrasound systems by two to three months and the quarterly reports to be prepared will reflect this. It is anticipated that the draft first quarterly report will be completed in November so that it can be reviewed internally by the Commonwealth Team in November and December prior to its submittal to the Commission.

Status of Milestones and Deliverables:

Table 1 below summarizes the status of Project 2.2 task deliverables as of the end of the current reporting period.

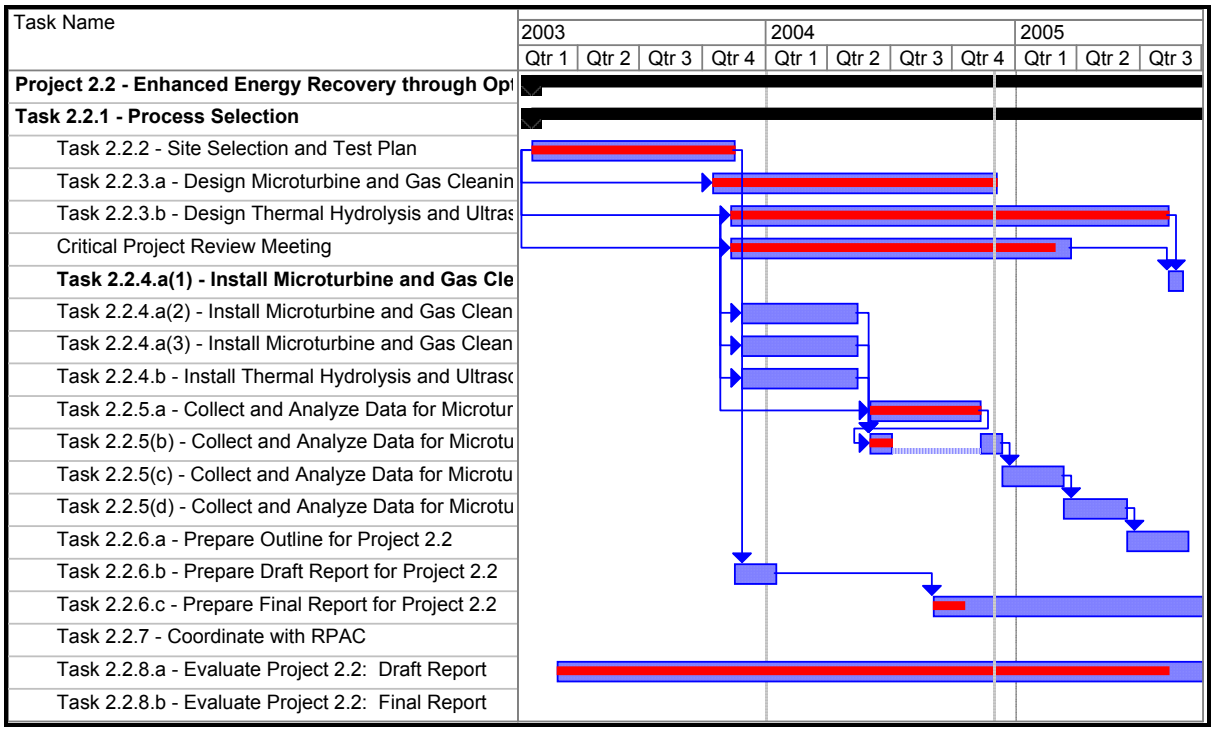
Table 1: Summary of Project Status and Deliverables – Project 2.2

Task No.	Description	Start Date		Due Date		Status (%)
		Planned	Actual	Planned	Actual	
2.2.1	Process Selection	01/24/02	01/24/03	09/04/03	11/10/03	100%
2.2.2	Site Selection and Test Plan	02/15/02	10/15/03	10/26/03	3/31/04	100%
2.2.3.a	Design Gas Cleaning System	02/15/02	11/10/03	11/24/03		90%
2.2.3.b	Design Ultrasound Systems	02/15/02	11/10/03	11/24/03	6/23/04	100%
2.2.4.b	Install Ultrasound System	12/5/03	6/1/04	5/21/04		100%
2.2.5.a	First Quarterly Report	6/20/04	6/1/04	8/20/04		50%
2.2.6.b	Second Quarterly Report	8/20/03	9/1/04	11/19/04		10%
2.2.7	Coordinate w/TAC& RPAC	01/24/02	2/1/03	01/16/06		95%

Explanation of any Difference(s) in Schedule

Task 2.2.2 – Site Selection and Test Plan – The findings of the *Process Selection Report* identified the technologies that are to being used at the Riverside plant for enhanced anaerobic digestion and at RP-1 for gas cleaning. As noted previously, additional coordination activities with vendors has been required. Efforts were undertaken to streamline the site selection and test plan and design processes by conducting more detailed coordination with the vendors on their technologies. This approach shortened the time needed to secure the long lead-time equipment items and execute the project most efficiently.

Overall Schedule for Project 2.2:



Overview of Fiscal Status:

Table 2 below summarizes the fiscal status of Project 2.2 by task as of the end of the current reporting period.

Table 2: Fiscal Status by Task – Project 2.2

Task Number	Budget	Invoiced[1] To-Date	Fiscal Status *
2.2.1	$236,563	$236,563	OT
2.2.2	$182,543	$182,543	OT
2.2.3.a	$242,995	$0	OT
2.2.3.b	$215,842	$215,842	OT
2.2.4.b	$229,585	$0	OT
2.2.5.a	$87,073	$0	OT
2.2.5.b	$87,073	$0	OT
2.2.7	$22,557	$0	OT

*Fiscal Status – Please indicate if you are "On Track" (OT), OverBudget (OB), or UnderBudget (UB)

[1] Invoice to-Date refers to amount invoiced prior to 10% retention withheld.