



REGIONAL WASTEWATER RECLAMATION FACILITIES

# Organics Upgrade Project



CASA 2011  
Achievement Awards Program

Outstanding Capital Project Award



casa611r2-FresnoOrgUpgrade.psd

June 2011





**Department of Public Utilities**

Wastewater Management Division  
5607 West Jensen Avenue  
Fresno, California 93706-9458  
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*Providing Life's Essential Services*

June 17, 2011

California Association of Sanitation Agencies  
Awards Committee  
1215 K Street, Suite 2290  
Sacramento, CA 95814

Subject: CASA 2011 Achievement Award Program

To CASA Awards Committee:

It is with great pride and accomplishment that the City of Fresno and Carollo Engineers present the Outstanding Capital Project Award Application for the Fresno-Clovis Regional Wastewater Reclamation Facility Organics Upgrade Project. The Organics Upgrade Project is an excellent example of a large-scale project designed and constructed successfully as a result of effective teamwork between the sanitary agency and consulting engineer.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stephen A. Hogg".

Stephen A. Hogg  
Assistant Director  
Department of Public Utilities

CC: Steve Swanback, P.E. Carollo Engineers

Enclosures: Award Application and Supporting Information



## CASA GENERAL INFORMATION SHEET

**Type of Award**

**Check One**

Technological Innovation and Achievement Award

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Public Outreach/Education Award

\_\_\_\_\_

Organizational Excellence Award

\_\_\_\_\_

**Outstanding Capital Project Award**

  X  

**Name of Agency:** City of Fresno

**Name of Associate Partner (if applicable):** Carollo Engineers

**Project/Program Title:** Organics Upgrade Project

**Number of Full Time Employees (FTEs):** 153

**Contact Person Submitting Application:** Mr. Steve Hogg, Assistant Director, Public Utilities Wastewater Manager

**Address:** 5607 West Jensen Avenue, Fresno, CA 93706-9458

**Phone Number:** (559) 621-5110

**E-mail:** Steve.Hogg@fresno.gov

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## **CASA 2011 ACHIEVEMENT AWARD APPLICATION**

**Agency/Firm Name:** City of Fresno

**Award Category:** Outstanding Capital Project Award

**Project/Program Title:** Organics Upgrade Project

**Please answer the following questions (as applicable) in the space provided or submit the information on separate sheets of paper. Please be sure to include the questions on your response and limit your responses to four single-sided pages of double-spaced 12-point font type. Supporting information or references will be accepted, however the Awards Committee will have a limited opportunity to review such materials and will base their decisions primarily on details included in the applications.**

**1. Describe the activity/project:**

The design and construction of the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) \$105,000,000 Organics Upgrade Project was part of the Master Plan update and was required to address the facility's large industrial load and stringent regulations. The project included two new activated sludge aeration basins, four new secondary sedimentation basins, a new return activated sludge/waste activated sludge pump station, retrofit of two existing dissolved air flotation thickeners (DAFTs), a new anaerobic digester, and a new anaerobic digester control building.

**2. What was the time frame of the activity/project? How long has it been in operation?**

The concept for the \$105,000,000 Organic Upgrade Project was developed as part of the 2004 Master Plan Update. The project design was completed in 2005 and construction began in 2006. The Organic Upgrade Project has been operational since 2010.

**3. What were the goals and objectives of the activity/project?**

The City of Fresno began experiencing a significant increase in organic loadings to the Regional Wastewater Reclamation Facility between 2000 and 2004. The increase was attributed to growth in industrial development within the community. The project's intent was to increase the organic capacity of the existing secondary treatment facilities to handle these increased loads, return the treatment facilities to the original rated capacity, position the treatment plant to provide nutrient removal to meet possible future permit requirements, and to upgrade the existing solids handling facilities.

**4. What were the results of the activity/project? Were the goals and objectives met and, if so, how were they measured?**

Construction ended in 2010 and the treatment plant went into immediate operation. The City restored its average-day maximum-month secondary treatment capacity to 88 mgd and is positioned to continue to provide capacity well into the future. The treatment plant routinely provides effluent with a measured BOD and TSS of less than 10 mg/l and a turbidity of less than 2 NTU. The effluent easily exceeds requirements of its Waste Discharge Requirements. With the upgraded sludge thickening facilities and new digesters, the wastewater treatment plant has also increased the digester hydraulic retention time to assure the long term ability to meet Class "B" biosolids.

**5. What was the extent of participation in the activity/project by nominee, and or employees of the organization?**

The City provided guidance to the consultant team, and was integral in planning and selecting of the treatment process, the equipment, and the controls for the Organics Upgrade project. The City was actively involved in determining the sources of increased organic load and defining the long-term and short-term needs. City staffs actively participated in pre-planning workshops, design and construction workshops, and were key to many of the major decisions.

**6. Is the activity/project broadly replicable by others?**

The Organics Upgrade Project is a large-scale wastewater treatment plant upgrade designed to meet the short-term and long-term needs of a growing community. The steps to develop the project can be used by agencies to successfully address capacity requirements and to meet the economic needs of the industrial community.

**Planning:** Early in the project, the City determined the organic loading to the RWRF was increasing

significantly. In an initial planning phase, the City researched the sources of the increased loadings, modeled the existing treatment facilities, and developed a long-range Capital Improvement Plan to address its short-term needs and its long-term needs. The Capital Improvement Plan was one component of its Updated Master Plan and was the basis for the decision to design and construct the Organic Upgrade Project.

**Design:** Based upon experience with previous design projects, RWRf management staff recognized the need for an increased level of operations and maintenance staff involvement in the facility layout and equipment selection. The design was a collaborative effort with management, operations, maintenance, and the design engineer meeting in frequent workshop settings. Workshops focused on key process areas or structures allowing staff to provide detailed comments. These were followed up with a very detailed decision log. Because of the high level of staff involvement, alternatives such as the reuse of a vacant Power Generation Building for the new blowers and rehabilitation of the existing primary sludge DAFTs to be used for WAS thickening were identified as potential cost savings measures. Using this approach, there were no comprehensive submittals of the entire project until the design completion; saving design time and effort.

**Construction:** Although the project was bid and built under a conventional design-bid-build format, the City not only requested the full-time on-site presence of the design engineer during construction, they also dedicated a senior operator to the project. The high level of onsite involvement of the design engineer and the operations staff especially during process shutdown and tie-ins were essential to a successful project. All shutdowns including the complete shutdown of a major effluent conveyance canal and the connection of two- 1,500 HP blowers into the existing aeration system were completed with no significant impacts on the project construction and the project was completed on-budget.

**7. How does the program/project utilize sustainable practices?**

- Optimizes energy utilization
- Provides additional gas generation capacity with the construction of a new digester
- Utilizes high efficiency equipment such as high volume, single stage blowers

**8. How does this project/activity meet the criteria of this award?**

This project and its implementation methods were delivered utilizing workshops that allow comprehensive decision-making and assure City staff receive a quality design. It was necessary to address the immediate needs of a growing community while keeping all improvements on budget and in service to provide for long-term needs. The large-scale upgrade of this 88 mgd treatment facility was an undertaking that can be replicated using the methods and teamwork demonstrated between the City of Fresno and Carollo Engineers working tirelessly to meet deadlines and budget while assuring these improvements meet the City's needs.

**9. Additional information:**

# ORGANICS UPGRADE PROJECT



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*It was necessary to address the immediate needs of a growing community while keeping all improvements on budget and in service to provide for long-term needs.*

