SB 5X
Agricultural Peak Load Reduction Program
2004 Final Report
Appendices

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California Energy Commission and the
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Section 1 Agricultural MV&E Plan

1.1 Introduction to the MV&E Plan

Senate Bill 5X (SB 5X) was enacted in April 2001 as urgency legislation in response to an imbalance in electricity supply and demand in the State. The goal of SB 5X is to reduce peak period electricity demand. The California Energy Commission (Energy Commission), acting under authority of Section 5(b) of the legislation, has developed the Agricultural Peak Load Reduction Program.

The Agricultural Peak Load Demand Program provides incentive grant payments to the agriculture industry to install energy efficient hardware or make other conservation efforts in order to reduce peak period electricity demand. Electricity demand will be measured as true kilowatts (kW).

1.2 Program Element Description

There are four categories of projects eligible for grants under this Program.

1. The purchase and installation of high-efficiency electrical equipment and other conservation efforts to achieve peak period electricity reduction for agricultural operations. Projects installed on or after January 1, 2001 can qualify for funding. Eligible projects include, but are not limited to lighting, refrigeration and other cold storage equipment, pumps and premium motors, and automated control systems.
2. The testing of agricultural water pumps and retrofit or replacement of pumps and motors to increase efficiency. Pump test grants simply require that the applicants have the pump test completed by an approved pump tester. Pump repairs may require before and after repair/retrofit pump tests by participating pump test companies to qualify for a grant.
3. The purchase and installation of advanced metering and telemetry equipment for agricultural and water pumping customers to improve load management and use demand responsiveness techniques. Projects include scheduling systems for irrigation and water pumping, and assistance to grantees to participate in other demand reduction programs.
4. The purchase and installation of equipment for the replacement or retrofit of natural gas fired equipment in order to burn an alternative fuel. Alternative fuels include, but are not limited to, in state produced “non spec” or “off spec” natural gas.

Grants in the four project categories will help buy down the capital cost of energy efficient retrofits, advanced metering, telemetry and demand controls, or retrofits of gas powered equipment to alternative fuels and are available to eligible grant recipients statewide. Grant recipients include:

- Water Agencies and Irrigation Districts engaged in the delivery of water to agricultural water users and/or removal of water from agricultural land
- Confined Animal Feeding Operations (e.g., poultry houses, hog farms, feed lots, dairies)

- Greenhouses and Nurseries
- Food processors and others handling or processing agricultural products or commodities
- Cold Storage or refrigerated warehouses used for agricultural commodities
- Agricultural and commodity non-profit organizations serving agricultural customers

The program administrators for this program element are The Center for Irrigation Technology, California State University, Fresno (CIT/CSUS, Fresno) and The Irrigation Training and Research Center, California Polytechnic State University, San Luis Obispo (ITRC/Cal Poly). The administrators are responsible for the grant application procedures for measurement and verification (M&V) as outlined in sections C and D and the program element description, http://www.energy.ca.gov/ag/DESCRIPTION.PDF. A list of grant projects accepted by program administrators is provided in Tables 2 and 3.

1.3 Measurement Verification & Evaluation Objectives

The primary objective of Nexant's MV&E efforts is to quantify a program level seasonal average peak electricity demand reduction resulting from the projects in the Agricultural Peak Load Reduction Categories 1, 2 (pump repair), and 3 (this plan uses demand or load reduction and demand or load savings interchangeably). For the Agricultural Peak Load Reduction Program, the peak period is defined as 12:00 pm to 6:00pm weekdays from June 1 to September 30, excluding holidays. The peak period demand savings identified are relative to a baseline that would have occurred without the implementation of this program element.

Nexant will perform those activities necessary to estimate peak period demand savings based on the existing program M&V requirements and procedures developed by the Energy Commission and program administrators. Nexant will complete an evaluation of the overall effectiveness of the program in achieving peak period kW reductions in categories 1, 2 (pump repair or retrofit) and 3. Nexant will also review administrators' performance in following its M&V requirements and procedures. Most Category 2 pump repair or retrofit projects will be awarded grants based on peak energy reduction. Category 4 projects will include verification that the installed equipment is functional and can be used to offset natural gas consumption. It is expected that installed equipment will be in place for at least 3 years from the date of commissioning.

Nexant will complete the program level evaluation of this element. Time and budget constraints make it impractical to directly monitor and analyze the demand reduction of the entire population of projects in categories 1, 2 (pump repair or retrofit) and 3. Therefore, Nexant will identify statistically valid samples of projects within each Category for inspection and direct monitoring where applicable. Inspection and monitoring results from these samples will allow Nexant to infer the estimated demand reductions at all sites these categories. Demand savings for each project identified through a sampling of projects will be verified through post installation monitoring and/or analysis of available data. The results of our findings will be described in reports to the Commission.

1.4 Program Administrator M&V Procedure and Assumptions

All grant recipients will submit a completed application to the program administrators that details their plan to reduce electrical demand, or in the case of Category 4 projects, lists the specifics of enabling a switch to burn an alternative fuel. The applicant identifies the existing peak period demand, the baseline, and proposes a M&V plan that is both feasible and accurate for identifying the peak period demand savings for equipment affected by the project proposal.

Administrators will complete a technical evaluation of the application to verify the accuracy of assumptions and calculations – There may be requests for more detailed monitoring or utility metering information from applicants. Baseline and post installation demand will be established by the Program Administrators, and will form the basis for the demand savings.

In all projects in Categories 1,2 (pump repair or retrofit) and 3 the baseline demand is a critical component of the eventual savings estimates. With relatively broad guidelines for determining the baseline demand for a project, any MV&E activities performed after the Program Administrators review of pre and post demands must either use a similar methodology, or recognize the differences in approach for estimating any demand savings from a project.

1.5 Summary of Program Administrators' M&V Methodology to Determine Impacts and Grant Payments

Category 1 and 3 Projects

The grant payment for a Category 1 or 3 project is based on reduced peak period electrical demand by comparing the current peak period demand and the after-project peak period demand. The Agricultural PLRP description lists two available methodologies for the applicant to estimate reduced peak period demand for Category 1 and 3 type projects. The current program description states:

Reduced electrical demand this will be determined using one of two methodologies:

Method 1

This is the methodology used in the Energy Commission's AB 970 Peak Demand Reduction Program. The peak load reduction formula is:

$kW_{reduced}$ = (System kWh Usage pre-project – System kWh Usage post-project) / 6 hours
Where:

$kW_{reduced}$ = the Reduced Electrical Demand used for calculating the grant.
System kWh Usage = consumption of kilowatt-hours of affected /system(s) during the peak period with typical or average operating conditions.

Method 2

This is based on instantaneous kW demand either measured directly or as it appears on the applicant's utility bills, and averaged over the six-hour peak period.

The simplest projects will involve situations where only one piece of equipment is connected to the service meter and the service meter is a time-of-use meter (capable of measuring loads and segmenting them by time-of-use costing periods). Thus, verification may be simply a matter of inspecting and analyzing the utility bills demand and/or energy usage before and after the project and developing an average peak kW reduction.

More complex projects can involve several types of equipment, some or all with variable operating schedules and characteristics, connected to one or more service meters. For these projects, often only a potion of the total metered demand is modified. The measurement and verification required by the administrators might include pre-installation monitoring (e.g., with a power meter for spot measurements, data loggers for demand, hours of operation, or both, or sub metering arrangement) to isolate the effects of those modifications. Engineering models that predict demand for pre- and post-project installation cases may also be the basis for demand savings calculations.

Project applicants are responsible for both accurately identifying the existing peak period demand and proposing a feasible and accurate plan for identifying the after-project peak period demand and savings for the equipment or facility affected by the project proposal. This may involve analysis of utility billing records, on-site energy audits by experienced and knowledgeable companies, or installation of specialized instrumentation. The most recent available data should be used for the application. Thus, if peak-period data is available for 2001, do not use peak-period data for 2000 unless there is a compelling reason to do so (i.e. “year 2000 data are more representative of normal operations because..”). Installing time-of-use meters may be required as a condition for project acceptance.

Category 2 Projects

Category 2 projects include grant applications to offset the cost of a pump test to determine the efficiency of the agricultural water pumping plant/s, or for making improvements to the pump and motor system to increase plant efficiency. The M&V component of Category 2 pump repair projects requires accurate measurement or documentation of energy use for the 12 months prior to or after the pump repair or retrofit so that annual energy or peak period operating hours can be determined and applied to the applicable grant methodology. There are currently 4 methods for determining the grant amount for pump repair or retrofit. In most cases M&V for these projects require pre and post-repair pump tests or field measurements to determine peak demand or energy reduction in determining the grant payment. Where an applicant has multiple water pumps on a service meter, they must propose a viable method for determining energy use for the project by providing the future or past energy use of each pump via utility metered or billing data or other verifiable spot or auxiliary metered measurements. Grants are awarded based on the following:

Pump Testing

80 percent of the cost of the test up to a maximum of $200 per standard test and up to a maximum of $250 if the test requires two transects in order to measure velocity.

Pump Repairs

There are currently four methods for calculating the incentive payment for pump repair/retrofit projects. The grant is based on one of the following methods but in no case exceeds 65 percent of the total project cost.

The first method used by CIT/CSUS, Fresno for individual agricultural business applicants involve the ratio of the pumping plant efficiency, OPE, before and after the repair/retrofit. This method requires that pump efficiency tests be performed under similar operating conditions. The grant payment is based on the following:

CATI/CSUS, Fresno Grant = \$0.10 /kWh * (kWh_{annual} – (kWh_{annual} * pre-repair OPE / post-repair OPE))

Where:

KWh_{annual} = 12 months of energy use prior to or after at the discretion of the applicant.
OPE = Operating Plant Efficiency as tested.

A second method used by ITRC/Cal Poly for water and irrigation districts and CIT/CSUS, Fresno for individual agricultural businesses also requires pump efficiency tests before and after the repair/retrofit and these tests are performed under similar operating conditions.

However, the grant calculation uses a variant of the OPE, comparing the repaired pumping plant's kWh/Acre Foot (AF) to kWh/Acre-Foot before the repair. The Cal Poly grant uses pump test information and pre-repair kW test data and prorates the grant based on calculated operating hours during the peak period. The CSUS, Fresno grant relies on an applicant's pre and post-repair pump tests and the total AF pumped over 12 months.

ITRC/Cal Poly Grant = \$0.1025 / kWh * [1 – ((post-repair kWh per AF) / (pre-repair kWh per AF))] * (total operating hours, June 1 – September 30) * (pre-repair kW)

CATI/CSUS, Fresno Grant = \$0.10 / kWh * (AF_{annual} * (pre-repair kWh per AF - post-repair kWh per AF))

Where:

AF_{annual} = acre-feet of water pumped in 12 months
kWh /AF = Kilowatt-hours required to pump an acre-foot of water through the system as determined by a pump efficiency test

Method 3

A third method used by both administrators is based on 25% of 12 months energy (kWh) following the repair/retrofit (.25 is based on a ENERGY COMMISSION assumption that a pump repair will result in increased pump efficiency).

$$\text{Grant} = \$0.10 / \text{kWh} * .25 * \text{kWh}_{annual}$$

Where:

KWh_{annual} = 12 months of energy use prior to or after at the discretion of the applicant

Method 4

The fourth method used by ITRC/Cal Poly for Water and Irrigation District applicants uses pre and post-repair measured kW and billing data to determine the grant.

ITRC/Cal Poly Grant = $300/ kW * [(total operating hours, June 1 – September 30) / 2928 total hours, June 1 – September 30)] * [(Pre-repair kW) - (Post-repair kW)].

Where:

Pre-and post-repair kW must be verified by (a) a pump company representative, (b) an authorized pump tester, (c) a registered engineer, or (d) a union electrician.

Category 4 Projects

Program Administrators, and Nexant, will conduct M&V activities for Category 4 projects that consist of observing the operation of the installed equipment. For projects in this Category the equipment must be capable of burning an alternative fuel, however quantification of actual natural gas savings are not required under the program guidelines.

Program administrators will evaluate all Category 4 project applications and perform any pre-installation verifications of existing equipment if necessary.

The Program Administrators will also evaluate post installation documentation, however any post installation fieldwork on Project 4 applications will be performed on a sampling basis by Nexant personnel. See Category 4 Sampling Plan for details on selection of sites for post installation site verification by Nexant.

1.6 Outline of Administrators M&V Procedures

The M&V activities for the agricultural program element consist of:

1. Analysis - Technical evaluation of the engineering calculations and/or review of utility bills, pre- or post-metering of loads or operational hours to verify the accuracy of assumptions and calculations.
2. Construction and commissioning of the project - Note that recipients may be required to submit monthly progress reports depending on the size of the project.
3. Verification of construction and operation by the Program Administrator.
4. For Category 1 and 3 projects payment of 50 percent of estimated incentive grant payment after completion and verification of construction and operation - Copies of all invoices, service contracts, personnel time records, and other relevant information to document final

installation of the project, will be required. Full grant payments are made for categories 2 and 4 once applicant has completed installation and provides proof of operational capability (Category 4) or required energy and pump test data (Category 2).

5. Final grant payment for Category 1 and 3 projects are made after verification of the project's actual peak period demand reduction. This generally requires one full peak period of operation (June through September) after construction and operation. Note that the total of actual grant payments may be less than the estimated grant. The basic verification process consists of establishing a *baseline,* the existing peak period demand, then verifying a post-project peak period demand.

Establishing the baseline – the existing demand can be established through:

- Historical metering data (i.e. from a Time-of-Use meter).
- An engineering model accepted by the Grant Administrator.
- Direct measurements of demand.
- Field verification of existing equipment

Post-project – post-project demand or peak energy use will be verified through electric billing or monitoring/metering equipment where appropriate. During post installation review, the program element administrators complete one of the following activities:

- Confirmation that the equipment was installed and operable for all project categories.
- Verification through field monitoring, review of utility billing, or other acceptable metering methods to verify the post installation demand or peak energy use of the equipment affected by the project

The estimated baseline or post-installation kW (or kWh for Category 2 pump repair or retrofit) for non-monitored projects may be adjusted by the program administrators as part of their M&V process and for determining the final grant payment. For example, the program administrator may find that the estimated baseline demand for a process pumping plant load assumed it operated noon to six, Mondays through Fridays, all 4 months of the June through September peak season. The administrator reviews the operating data and determines that it operated during those peak hours but only 2 months of the peak season. Based on program guidelines the baseline average demand would be reduced 50 percent. The post-installation demand (kW) may also be adjusted if a review of the post-installation peak operating season load data shows a change in load from that estimated. The verified kW (or kWh) reduction (savings) and the final grant payment would be adjusted accordingly.

1.7 Evaluation Activities

Each grant recipient submits an application from which the program administrators assure data is sent to the database administrator within two (2) weeks of receipt of application. This information will be used to, generate sample populations for the evaluation process, and establish initial demand and energy savings estimates.

Nexant will choose representative samples of projects from each Category and sub-Category usage group to conduct post installation inspections and monitoring. Among the parameters that Nexant will verify during on site post installation inspections are the following:

- Confirmation that the equipment was installed and is operable for all project categories.
- Verification through field monitoring, review of utility billing or other acceptable metering records, or field checks for engineering models to verify the post demand reduction of the installed equipment.
- Review of engineering models, assumptions, and any model calibrations used to estimate demand reductions for complex projects.

Nexant Post-Installation Monitoring

Nexant's post-installation MV&E activities will include use of techniques ranging from desk reviews of utility billing for single load easily verified measures, to short or long-term monitoring at sites with multiple pieces of equipment operating at variable loads or schedules. During any post-installation monitoring, the following parameters may be verified:

- Post installation operating schedules and associated load factors of affected equipment, and instantaneous demand of affected equipment.
- Load profiles for variable load equipment where appropriate for analyzing overall system performance improvements.
- Spot measurements of instantaneous demands for individual pieces of equipment in a project's scope.

Field verification and monitoring will be conducted over the post-installation period, beginning in August 2001 and will continue beyond the end of the installation phase of the program in May 2002. Once the final population of projects is determined, inspection and monitoring samples will be finalized, and the inspection and monitoring activities schedule can be completed. Based on program timelines, the post retrofit monitoring should be completed by the end of the 2002 summer peak season, on or about September 30, 2002. Due to the currently low program subscription rates for Category 1 and 3 projects, and the start of the harvest and food processing activities by the agricultural industry, there may be a significant number of projects that cannot be completed until after the 2001 summer peak season. Post installation MV&E activities through the 2002 summer peak season would allow for these projects to be included in sampling populations for each of the four project categories.

Analysis

The demand from post-installation monitoring, utility billing, or engineering models will be compared against baseline demand established by the program administrators. Validation of baseline demand by Nexant as part of the MV&E efforts will typically be infeasible, however, where possible Nexant will collect information to validate or further refine baseline and savings calculations.

Overall Reporting

Quantitative and qualitative End-of-summer peak period reports will present the average demand savings during the peak period by project category. Reports will be generated in a format consistent with other program element evaluations and submitted for review to the Commission according to the deliverable schedule in Nexant's work authorization.

1.8 Audit of Program Administrator Performance

The purpose of the Program Administrator Audit is to determine the effectiveness of third-party program administration for the Energy Commission's Peak Load Reduction Program. In the Agricultural Peak Load Reduction Program Element, there are two third-party administrators:

- Center for Irrigation Technology, California State University, Fresno
- Irrigation Training and Research Center, California Polytechnic State University, San Luis Obispo.

These program administrators have developed their own plan for processing applications and performing measurement and verification responsibilities as required under their scopes of work with the Commission. Their plan is outlined in the program description, http://www.energy.ca.gov/ag/DESCRIPTION.PDF.

The Commission has a separate contract with Onsite Energy for achieving 8 MW of peak period demand reduction. While Nexant will perform an evaluation of their efforts to achieve the demand reduction they are not considered an administrator for the purposes of this audit.

1.9 Audit Plan

Each administrator will be evaluated using the attached audit checklist. Information for the completion of the checklist will use the following sources: Interviews with the administrators, audits of a sample of administrators' participant files of approved projects. If time and budget allow we may also include several participant interviews of selected approved projects for each of the administrators. These interviews would be a source of information to get an indication of the level of satisfaction with the administrator's application process. A draft participant questionnaire is included.

1.10 Evaluation and Reporting

From the information gathered in the audit checklists, the administrator's performance will be evaluated in the following areas: Part A: Project Information and; Part B: Audit Checklist which consists of:

- Key Milestones (ref. Administrators' Scopes of Work)
- Education, Training & Technical Support (refer to Administrators' Scope of Work)
- Participant Management and Care - Application Process
- Participant Management and Care - At Project Completion
- M&V Requirements (as required by the contract with the participant)

- Reports

1.11 Audit of Program Participants

The purpose of the Program Participant Audit is to check for compliance with program requirements as specified by the program guidelines and agreements between the administrators and participants.

The Commission has a separate contract with Onsite energy for achieving 20 MW of peak period demand reduction. While Nexant will perform an evaluation of their efforts to achieve the demand reduction contracted for, Nexant will not audit this project.

The Onsite Energy project is not addressed in this audit plan.

1.12 Audit Plan

Each participant will be evaluated using the attached audit checklist. Information for the completion of the checklist will audit a sample of approved project files.

1.13 Evaluation and Reporting

From the information gathered in the audit checklists, the administrator's performance will be evaluated in the following areas: Part A: Participant Information and; Part B: Audit Checklist which consists of: Applicant Eligibility.

- Project is Eligibility
- Application Process
- Completed Project
- M&V Requirements
- Miscellaneous

These checklist audits will be completed and the results reported to the Energy Commission during the first quarter of 2002**.**

1.14 Project Sampling for Program Element Evaluation

Nexant will complete the program level evaluation of the Agriculture element. Time and budget constraints make it impractical to directly monitor and analyze the demand reduction (and as necessary energy savings, e.g., Category 2, pump repair projects) of the entire population of projects in categories 1 through 3. Therefore the MV&E plan will rely on statistically valid samples of projects within each Category for inspection and direct monitoring. From these samples we can infer the estimated demand reductions at all sites in categories 1 and 3.

Category 2 projects present difficulties in verification of demand savings. Demand on some pumps will likely increase due to improvements in the pumps flow and pressure relationships. Savings for many of these projects are largely dependent on increased flow rates offering the operator an opportunity to shift pumping to off peak hours. Changes in energy from baseline

conditions to the retrofit case will be examined for a statistical sample; however, assigning demand savings to pump repair projects is somewhat speculative and may not meet the program's statistical precision and confidence goals. Where possible Nexant will verify peak demand reductions through post-installation direct measurement for comparison to baseline peak period demand under similar operational conditions, and for similar crop cycles.

Nexant will work with the program administrators to perform post installation verification of Category 4 projects in order to reduce the time and cost of administration for these projects which provide no electrical demand savings.

Stratified sampling is a technique employed to identify a sample of projects that meet statistical precision and confidence guidelines for the program element. Effective use of stratified sampling depends on defining sub-populations that are relatively homogenous for a given parameter. Random samples can then be drawn from each strata resulting in improved overall variance at lower overall MV&E costs. Each Category of project grants is considered an overall stratum, and within Category 1 and 2, the population of each Category is further segmented into relatively homogenous strata; a random sample of projects is then selected from each stratum for post-installation evaluation.

The final population of projects is undetermined at this time due to extension of the deadlines for project approval. A slight revision to the sampling plan may be required should the proportion of projects in individual strata change significantly. The approach used to generate the list of projects for post-installation evaluation will be repeated in case of shifts in populations.

Category 4 projects are treated as another strata of projects for sample selection. While Category 1 to 3 projects lead to kW demand reductions, Category 4 projects do not. Category 4 project participants are offered incentives for the installation of equipment that allows a facility owner or manager to switch from burning natural gas to an alternative fuel. With no requirement in the program to switch to burning an alternative fuel, only a requirement to enable the switch, these projects are well suited to using the Acceptable Quality Level (AQL) method of sampling on the basis of the attribute sampling for completion of equipment installation.

Meeting the required degree of precision and confidence in the overall demand savings is difficult given the range and diversity of project types received to date, as well as expected portfolio of submittals for the agriculture program element. Based on the most up to date population of project applications received by the program administrators, projects will be placed in several sub-populations within project categories for sampling and MV&E work. Overall levels of sampling within a project Category are to be determined with a stratified approach to program level savings and the contribution from each project Category on an aggregated kW demand reduction basis. Individual projects will be chosen from the sub-populations within each project Category to meet the results of the stratified calculator.

Additional considerations in meeting MV&E goals of precision and accuracy include concerns for adequate baseline analysis and verification. Nexant's MV&E sampling plans are designed to meet the precision and confidence goals of the program, however, the actual statistics achieved

through the MV&E efforts will not be known until the monitoring and analysis of the projects are completed. Note that all verified demand savings are based on the difference between pre- and post-installation demands, and many instances the baseline demands cannot be verifiable by Nexant in their MV&E activities. The following sections describe the proposed approach for defining samples from the sub-populations of Category 1-4 projects. are listed below.

1.15 Subpopulation Designations

Category 1

This group includes the purchase and installation of high-efficiency electrical equipment and other conservation efforts for agricultural operations. The current population of Category 1 projects includes a variety of sub-Category technologies for achieving demand savings. Category 1 projects will be grouped for homogeneity as follows:

- Lighting and lighting controls,
- HVAC, refrigeration measures, and refrigeration controls
- Motors, motor controls including VSDs and non irrigation pump resize/trim projects

Envelope improvement projects may not appear to fit readily into the Category 1 technologies listed above. An example is reflective roof installation for a cold storage warehouse.

The installation of a high albedo roof surface achieves no actual reduction in energy use of the roof (the building envelope does not use energy), but peak demand savings accrue at the chiller plant. Typically, building insulation projects will be grouped in HVAC&R groups. Projects that are not readily grouped within the three main groups will be evaluated and grouped for the best overall fit with a Category 1 technology. Should the need become apparent, additional Category 1 technology groups can be incorporated into the sampling approach as needed.

Where a group makes up only a small portion of the overall demand savings of Category 1 projects, sampling may be deferred for that group until a larger population is defined for the particular technology group. All sampling within Category 1 will be considered as interim samples until the close of project acceptance and final population definition.

Where projects fall into multiple groups for comprehensive retrofits at a facility, all measures for that project will be analyzed, and overall sampling will be revised to reflect the sampling of the additional measures. This approach can help lower overall MV&E costs provided any single measure was selected as part of the Category 1 sample.

A sampling approach for an undefined population requires an approach that is flexible, while achieving the goal of evaluating program wide savings estimates on a statistically valid basis. One approach that minimizes the number of site inspections and costs while preserving statistical validity is to develop a stratified sample of peak kW demand savings across the Category 1 and 3 projects, and develop samples within each category.

The following methodology is proposed for developing MV&E samples in Category 1and 3 projects:

1. Sum all peak kW demand savings from Category 1 and Category 3 projects.
2. Identify a kW amount from all Category 1 and 3 projects to be sampled from to meet the statistical goals of 80/20; i.e., an 80 percent chance that the true kW of the entire population falls within a 20 percent interval around the estimate of kW savings from the project applications.
3. Stratify the kW identified for sampling through proportional weighting of the kW contributions for Category 1 technologies or Category 3.
4. Choose random samples of projects within each Category 1 technology or Category 3 such that the sum of kW from the projects equals the stratified kW for sampling determined in step 3 above.

The following formula is used to calculate the sample size for a hypothetical infinite population of projects:

$$n^i = \frac{\lfloor C_v^{\,2} \times z^2 \rfloor}{p^2}$$

Where:

n^i = sample size for an infinite population
Cv = Coefficient of variation (depends on expected variation of key parameters)
Z = z-statistic (equal to 1.2817 for an 80 percent confidence level)
P = precision level (set at 20 percent for 80/20 reliability)

To determine the sample size for a finite population of projects:

Where:

N = size of the actual population to be measured

As the population of projects grows as a result of additional applications accepted, the process of revised sample selection can be repeated as required. Projects previously selected for MV&E activities are excluded when determining additional randomly selected projects, but the peak kW demand savings contributions are included for the revised stratified sample size calculations.

The initial stratified sampling will be performed with an assumed coefficient of variation (C_v) of 0.5. Experience in many years of utility demand savings programs using an assumed C_v of 0.5 has shown that using a C_v of 0.5 to be reasonable. Possible effects of assuming a conservative C_v include a slightly higher sampling rate, increased precision, and higher confidence in the estimates of program level savings. The trade-off for conservative assumptions in sampling is a higher cost for additional inspections and analysis, however, there is no guarantee that an assumed C_v of 0.5 will be conservative, and the actual C_v will not be known until sampling is completed.

Table App-1 shows an initial sample size determination for Category 1 projects accepted by the program administrators and readily identifiable for technology type.

As none of these projects are reported as installed and verified by the program administrators, the sampling at this time is merely for demonstration of the approach.

Table App-1: Stratified kW Sampling Example for Category 1 and Category 3 Projects

Category Technology	Number of Projects in Group	Estimated kW Savings	Number Projects to sample from Tech. Group
1, HVAC & R	13	802.6	1
1, Lighting	2	68.3	1
1, Motors/Others	15	1,371.8	1
1, Water District pumps	3	7,802	3
3, Water Pumping	8	44,417	8
Totals	41	54,461.7	14

Based on the stratified sample sizes identified above, and considering the large influence of the 8 projects in Category 3, a minimum of 1 project from each technology group is recommended for sampling. The sampling equation for infinite population results in a total of 41 projects. Using the finite population correction factor, a total of 21 projects sites are suggested. By stratifying for kW, the majority of MV&E activities will currently be associated with the Category 3 projects, with a suggested sample size of 17 projects. With a total of only 8 projects received to date, and in excess of 81 percent of total peak demand savings from these 8 projects, Category 3 projects will all be chosen as part of the sample.

Category 2

Category 2 projects include grants for the express purpose of testing the efficiency and flow of pumps, and a second sub Category for repairing or retrofitting of the pumps. Pump repairs approved for a post retrofit must follow grants by or repair test to establish a new efficiency and capacity point for the motor and pump system. Peak demand savings for the pump retrofit or repair projects are assumed to derive from improved load management and by moving pumping energy to off peak hours. This strategy is particularly appealing when combined with telemetry to remotely control pumping equipment while meeting irrigation or other water delivery needs.

Pump test projects will be verified by the program administrators through a desk review of submitted documentation as described on the program administrators web sites. The grants will be paid in full at the completion of the review and approval. For purposes of program evaluation, these projects will be ignored for post installation inspections or monitoring. With no demand savings from testing alone, there is little need to evaluate these projects for savings.

Pump repair or retrofit projects, however, may lead to energy and peak period demand savings provided the peak period operation of these pumps is reduced from increased pumping capacity. The four methods of determining the energy or demand savings are based on utility billing records.

Nexant at the request of the Energy Commission program element manager developed estimates of demand savings for Category 2 pump repair projects. Energy based savings (kWh) determined by point-in-time pump tests along with meter or billing demand data supplied by the participant would be used to provide a desk-based estimate of average seasonal demand (kW) savings. Sampling for this Category will be treated as a separate class of projects apart from demand reduction categories 1 and 3. Using project grant amounts as a measure of project impact, we would perform a similar evaluation of the projected savings from a representative sample of the project applications for pump repair or retrofit.

Category 3

This group includes the installation of advanced metering and telemetry equipment for agricultural and water pumping load reduction strategies. Current projects received include increases in water storage capacity in order to shift load to off peak hours, installation of interval metering for use with the ISO programs, and changes to pipeline system to reduce head loss. The projected kW demand reductions are not expected to be consistent throughout the summer peak season, and the total kW is a maximum estimate if full subscription of an aggregator is achieved. Category 3 projects will be sampled along with Category 1 projects in order to minimize MV&E costs. Details of the sampling for these projects are described in the section for Category 1 projects.

Category 4

This group includes retrofitting existing natural gas powered equipment to burn alternative fuels. For projects in Category 4, there are no kW demand savings from the conversion to alternative fuels, nor are the project applicants required to document the use of the alternative fuel as a condition for the grant. The test for completion of a project is the successful demonstration that the equipment is capable of burning an alternative fuel.

Nexant, in conjunction with the program administrators, will conduct post installation inspections for a representative sample of the completed projects. Pre- and post-installation desk review of each of the projects will continue to be the responsibility of the program administrator at CSU Fresno, however cost savings will be realized by utilizing Nexant personnel for both post installation inspection and MV&E activities for Category 4 projects.

The post installation inspection reporting will be based on whether or not the retrofit equipment can utilize an alternative fuel. The sampling for Category 4 projects can then be based on principles from Acceptable Quality Level (AQL) sampling for attributes (equipment is installed and functional, or not) where the sample size is determined from an AQL table of the specified precision. The sample population to be inspected will then be drawn randomly from the overall population without regard to cost of installation, grant amount, or likely gas savings from the project.

Based on the current population of 35 Category 4 projects either accepted or pending, in the Fresno database report of July 31, 2001, a sample of eight sites would be selected for inspection based on the 10/100 AQL tables, which is appropriate for a 20 percent precision interval.

1.16 Demand Savings Calculations

Secondary Issues

As outlined in the program description estimated demand savings (reduction) are the difference between the baseline and post-installation peak period demands *averaged over the entire season*. Project estimated *average* baseline demand is derived from the desk-based or measured estimates provided by the applicants and verified by the program administrators as part of their M&V responsibilities. The administrators using measured or utility-based meter or billing data verifies post-installation average peak period demands. This verification requires one full peak period of operation (June through September) after construction and operation.

Analysis of the sampled sites will determine the realized demand reduction at each of the sites identified in Table 1. Realized demand saved (reduced) over the entire season will be determined by:

$$kW_{saved} = \frac{\sum_{12pm}^{6pm} kWh_{baseline} - \sum_{12pm}^{6pm} kWh_{post\text{-}installation}}{6}$$

Where:

kWh_{baseline} and $kWh_{\text{post-installation}}$ = The average daily energy usage of the project system(s) from 12pm and 6pm on a non-holiday weekday from June 1 through September 30.

Average daily energy = Daily use is averaged using the total weekdays from June 1 through September 30. There are 84 weekdays in the 2001 season, excluding July 4 and September 3 holidays.

Method I. complies with the program description methodology for establishing baseline and verifying post-installation peak period demand averaged over the entire season. This method will require time of use billing data or seasonal monitoring of peak period usage.

The program description also provides for a second method for determining averaged demand. This method relies on spot-measurements or metered data for energy and demand for before and after project installation to determine demand savings averaged over the entire peak season.

The following equation, as an alternative, can be used to determine the realized demand saved (reduced):

$$kW_{saved} = \frac{\left[kW_{baseline} \times \sum_{12\,p.m.}^{6\,p.m.} \left(Average\ daily\ peak\ hours_{baseline} \right) - kW_{post\text{-}installation} \times \sum_{12\,p.m.}^{6\,p.m.} \left(Average\ daily\ peak\ hours_{post\text{-}installation} \right) \right]}{6}$$

Where:

$kW_{baseline}$ = Instantaneous kW demand either measured directly or as documented by utility metering
billing data for the project system(s) prior to installation.
$kW_{post\text{-}installation}$ = Instantaneous kW demand either measured directly or as documented by utility metering billing data for the project system(s) after installation.
Average daily peak hours = the average daily operating hours of the project system(s) from 12pm to 6pm on a non-holiday weekday from June 1 through September 30 season. In most cases baseline and post-installation hours will remain the same. There are 84 weekdays in the 2001 season, excluding July 4 and September 3 holidays.

This method complies with the program description methodology for establishing baseline and verifying post-installation peak period demand averaged over the entire season.

Where necessary, the demand reduction determined by program administrators for the site will be compared to the sites analyzed by Nexant as part of its sample population and a realization factor will be determined. The realization factors of all monitored sites within a sub-population will be averaged to give a sub-population realization factor, which will then be applied to determine the demand reduction of the entire sub-population. The following calculation will be used to determine the realization factor for a sub-population.

$$RF = \sum_{j=1}^{n} \left[\frac{kW_Sample_j}{kW_Administrator_j} \right]$$

Where:

RF = sub-population realization factor
kW_Sample = demand reduction of site j in Nexant analysis.
kW_administrator = demand reduction for site j verified by program administrator
n = total number of monitored sites in sub-population

Demand reduction for the Agricultural Peak Load Reduction program element will be calculated by the summation of all sub-populations that comprise all completed projects within the program element. The total savings is determined by,

$$kW_\text{Savings} = \sum_k \left[RF_k \times Sub\text{-}Population_kW_k \right]$$

Where:

kW_Savings = the realized total demand reduction for the Agricultural Peak Load Reduction program element
RF = realization factor associated with sub-population k
Sub-Population_kW = total demand reduction verified by administrators for all projects within sub-population *k*

1.17 Definitions

Peak Period

For the Agricultural Peak Load Reduction Program, the peak period is defined as noon to 6:00pm weekdays from June 1 to September 30.

Operating Hours

The hours of operation during the peak period are estimated by the applicant's using operational logs, utility metered or billing data, pump efficiency tests or spot field measurements. The administrators will review the applicant's data to verify these hours. For the purposes of determining peak demand reduction the administrators will estimate the average daily operating hours based on total no-holiday weekdays from June 1 through September 30.

Baseline Demand

For categories 1 and, 3 and the pump repair portion of Category 2 baseline demand (i.e. the existing conditions from which savings are calculated) will be defined as the existing equipment, systems and procedures in place at the time of retrofit. The baseline equipment will not be required to meet state or federal minimum efficiencies to receive incentives for the equipment upgrade. The baseline demand (Kilowatts, kW) can be established by,

- Historical metering data (i.e. from a Time-of-Use meter)
- An engineering model accepted by the Grant Administrator
- Direct measurements of demand including pump tests

Project baseline demand is the average the daily consumption (kWh) of the system(s) between the hours of 12pm and 6pm on a non-holiday, summer weekday from June 1 through September 30 and dividing by the total peak hours in the peak period. There are 84 weekdays in the 2001 season, excluding July 4 and September 3 holidays.

Baseline Energy Use

For categories 1 and 2 Baseline (i.e. the existing conditions from which savings are calculated) will be defined as the existing equipment, systems and procedures in place to be affected by the retrofit. The baseline equipment will not be required to meet state or federal minimum efficiencies to receive incentives for the equipment upgrade. The baseline energy (Kilowatts-hours, kWh) use will be established by:

- Historical metering data (e.g., from a Time-of-Use meter)
- An engineering model accepted by the Grant Administrator
  - Estimates derived from spot measurements, including pump tests, and documentation of project equipment operating hours.

Project baseline kWh is the *average* daily consumption of the system(s) between the hours of 12pm and 6pm on a non-holiday summer weekday from June 1 through September 30. There are 84 weekdays in the 2001 season, excluding July 4 and September 3 holidays.

Adjustments to Baseline Demand or Energy

Program administrators as part of their M&V function may adjust baseline energy or demand if verification of the data submitted by the applicant reveals that project equipment operating hours or loading vary significantly from those reported by the applicant in estimating baseline demand. Nexant may also adjust baseline energy or demand based on administrator changes or monitoring data from a site(s) in our sampling plan.

Completed Demand or Energy

The post-installation energy or demand will be verified by the administrators through post-installation demand engineering calculations, utility billing analysis, pump tests, or spot power (kW) measurements as necessary in determining demand in categories 1, 3 and the pump repair component of Category 2. Nexant will use program administrators' data and its analysis of post-installation sites in its sampling plan to determine this demand.

The Agricultural program element has successfully recruited and approved more than 800 projects that are expected to contribute nearly 80 MW of peak demand savings. Of the expected contributions, more than 48 MW of demand-responsive project contracts were executed within months of the program element kick-off in June 2001. The demand-responsive projects account for a majority of expected program element impacts at a cost of less than $22/kW, among the most cost-effective of the overall PLRP.

Pump testing and pump repair projects account for the majority of projects (590 of 837 approved projects), enabling more efficient delivery of water to the economic benefit of the agricultural sector. It is not clear, however, that the projects reduce peak demand for electricity unless combined with TOU metering or other strategies that would change pumping usage patterns.

The program element has demonstrated success in encouraging the more widespread adoption of advanced energy technologies in California's agricultural industry. Clean technology

applications, for example, include biogas generation, alternative fuels, telemetry equipment and control systems, and thermal storage load shifting.

Section 2 Agricultural Program Sampling Plan

Nexant's general approach to verifying savings involves calculating the difference between equipment energy use during peak operating hours after an energy efficiency retrofit with that equipment's baseline energy use, which is what the load *would have been* had the retrofit not occurred. A representative sample of projects is chosen for analysis, and the findings from that sample are extrapolated to the population as a whole. The sample population must be large and diverse enough to meet the statistical confidence and accuracy levels established as targets by the Energy Commission. The remainder of this Appendix discusses Nexant's sampling methods in detail.

The sampling plan spreadsheets are included on the CD accompanying this Appendix and contain six spreadsheets: two for Category 1, two for Category 2, one for Category 3 and one for Category 4. All sampling plan documentation, calculations, and assumptions by Category are found in these spreadsheets.

Sub-Population Designations and Sampling

Nexant is completing the program level evaluation of the Agriculture element. Time and budget constraints make it impractical to directly monitor and analyze the demand reduction (and as necessary, energy savings, e.g., Category 2 pump repair projects) of the entire population of projects in Categories 1 through 3. Therefore, the measurement, verification, and evaluation (MV&E) plan relies on statistically valid samples of projects within each category for inspection and direct monitoring. From the post-installation evaluations of the samples, Nexant infers the estimated demand reductions at all sites in Categories 1 and 3.

Nexant uses stratified sampling techniques to identify a sample of projects that will meet statistical precision and confidence guidelines for the program element. Effective use of stratified sampling depends on defining sub-populations that are relatively homogenous for a common parameter. Accordingly, Nexant drew random samples from homogenous strata within each project category, resulting in reduced overall variance for category level savings. Each category of project grants was treated separately, and within Category 1, Category 2, and Category 3, each category population is further segmented into relatively homogenous strata. A random sample of projects was selected from each category's strata for post-installation evaluation and verification. The following paragraphs discuss the process and resulting samples, also listed below in Table App-2 through Table App-8.

The final population of approved projects has not been determined, but is anticipated during the next few months. A slight revision to the sampling plan may be required for Category 1 and Category 2 if the representation of projects in individual strata changes significantly from the original sample selection. The approach used to generate the list of projects for post-installation evaluation will be repeated to test whether shifts in populations have changed the sampling stratification.

Nexant's MV&E sampling plans are designed to meet the precision and confidence goals of the program; however, the actual statistics achieved through the MV&E efforts will not be known until post-installation monitoring and analysis of the sample projects are completed.

Equation 1, below is the formula used to calculate the sample size for a hypothetical infinite population of projects that follow criteria for normal distributions:

(1)
$$n^i = \frac{\left\lfloor C_v^{\,2} \times z^2 \right\rfloor}{p^2}$$

Where:
n^i = sample size for an infinite population
C_v = Coefficient of variation (assumed to be 0.50 for sampling purposes)
Z = z-statistic (equal to 1.2817 for an 80% confidence level)
P = precision level (set at 20% for 80/20 reliability)

Previous experience with utility-sponsored DSM programs has shown that a starting value for the coefficient of variation of 0.5 is reasonable and conservative for a large variety of project technologies. With C_v set at 0.5, the sample size for a normally distributed, infinite population was found to be 11 from Equation 1 above.

None of the program categories has an infinite population of projects, of course, which requires compensatory adjustments to the sample size. The formula given in Equation 2 below is used to determine the sample size for a finite population of projects, and is used to adjust the sample sizes:

(2)
$$SampleSize = \frac{n^i}{\left[1 + \left(\frac{n^i}{N}\right)\right]}$$

The sampling formulas in Equation 1 and Equation 2 both apply to normal distributions. Sampling with these formulas assumes the populations are relatively similar in the parameters of interest. Approved projects from the two administrators are not similar in typical savings, technology type, and persistence of peak demand savings for Category 3 demand response projects; Category 4 projects do not have electrical savings.

To accommodate the heterogeneity of projects within program categories, sampling within each category of projects helps to ensure that each sub-population is closer to a normal distribution and results of sampling are statistically valid. This in turn ensures inferred sub-population demand savings are statistically valid within the target confidence level and precision interval. Within each project category there are a wide range of savings and project technologies. A

stratified sampling technique was used to identify the sample sizes for Category 1, Category 2, and Category 3. The technique is designed to improve the overall variance of the sampling efforts while reducing the sample sizes to a minimum. The stratified approach assigns sampling efforts for each of the strata in relation to the proportion of demand savings each individual stratum contributes to the overall category level demand savings.

A stratified sample calculator, developed for other energy savings programs by Nexant, was used to estimate the sample sizes for each project category and stratum. A spreadsheet of each of the Category 1, 2, and 3 sub-populations was characterized and populated for an appropriate number of strata for each project category. The defined stratum within each sub-population was examined for the number of approved projects and contribution to category level demand savings in kW; these were input to the calculator with an annual peak period operating total of 522 hours. The operating hours figure was derived from total number of summer peak period hours for this program element; however, the actual number is relatively unimportant – the number serves to reduce bias in the sampling. The resulting sample size for each category of projects is proportioned for each stratum within a sub-population according to its contribution to the project category's demand savings.

Sampling for Category 4 projects was treated in a slightly different manner—an Acceptable Quality Level (AQL) sampling approach was used to identify a representative sample of projects. The AQL sampling approach (ANSI/ASQC Z1.4) is based on sampling for an attribute, in this case the ability of the facility to switch to burning an alternative fuel, and applying the test results to the sub-population of Category 4 projects. If the number of sites that fail is less than the acceptance limit, the sample is accepted and the lot, or sub-population of Category 4 projects, is accepted as installed and presumed able to switch to alternative fuels.

Tables of AQL sample sizes are published for various precision levels. The 10 percent AQL table corresponds to a 20% precision interval, and for the sub-population of 27 approved projects, the sample size is eight (8)[1].

For all project categories, after the stratified sample sizes were calculated, each project on a sub-population spreadsheet was assigned a random number from the Excel RAND function. All projects within each stratum were then sorted and ranked by their random numbers. The sample size for the corresponding stratum was next applied to identify the projects for post-installation evaluation. Each stratum of projects in Category 1, 2, and 3 was treated in the same manner. Projects for Category 4 were also identified using this approach; however, there was no initial stratification of the population.

The following paragraphs describe the procedures used to identify post-installation samples from the four project categories and individual strata within the project categories. Projects for post-installation evaluation selected with the stratified calculator and random sampling are presented in Table App-2 through Table App-8. The entire list of approved projects from the two administrators and Onsite Energy Corporation can be found in the Appendices.

[1] An online AQL sample size calculator is available at: http://iew3.technion.ac.il/sqconline/milstd105.html

Sub-population—Category 1

Category 1 projects include a wide variety of technologies and range of demand savings estimates. The diversity of technology and demand savings in Category 1 approved projects and the need to keep the number of strata at a reasonably low level require that not all strata adhere to the ideal of homogeneity in either technology type or demand savings. In order to identify samples from strata with similar characteristics, five individual strata were defined and populated with projects approved by the two administrators.

Category 1 projects were allocated to the following strata:

1. Lighting efficiency and lighting controls
2. Motors, VFDs, and motor controls
3. HVAC and refrigeration
4. Reservoir improvements and TOU meters for load shifting
5. Drip irrigation conversions, new irrigation wells and booster pumps

Lighting projects of all types, including lighting efficiency, lighting controls, and skylights, have been grouped into the first Category 1 stratum. The second stratum is a broader grouping of motor efficiency, variable frequency drives (VFDs), automated controls and other measures involving installation of high efficiency electrical equipment. Refrigeration, HVAC, evaporative condensers, or other projects leading to refrigeration savings are grouped into the third stratum. The fourth stratum includes projects related to reservoir expansions, and time-of-use (TOU) meters that encourage facility owners to move operations to off peak hours. The fifth and final stratum for Category 1 projects includes conversion to drip irrigation, and irrigation pump equipment installations to offset peak period demand. Individual projects chosen from the five strata in Category 1 are shown in Table App-2.

Table App-2: Category 1 Stratified Samples

Stratum #	Stratum Name	Population in Stratum	Projects in Sample	Demand Reduction of Sample, kW
1	Lighting Efficiency/Controls	8	1	48
2	Motors/Drives/Controls	80	2	1,159
3	HVAC&R	29	2	683
4	Reservoir Improvement, TOU meters	40	6	386
5	Drip Irrigation, Boosters, Wells	19	1	45
Totals		168	12	2,320

Some of the approved Category 1 projects fall into multiple strata due to comprehensive retrofits at a facility; all measures for such projects are analyzed, and overall sampling will be revised to reflect the evaluation of the additional measures.

The 12 projects selected for post-installation evaluation are listed in Table App-3. Each project is identified by its unique APLRP number and is listed in the order of the strata to which it was assigned.

Table App-3: Category 1 Projects Selected for Post-Installation Evaluation

APLRP	Stratum #	Technology Description	Demand Savings, kW	Applicant
1-0378-A	1	DC Lighting efficiency retrofit	48	Blue Diamond Growers
1-0134-A	2	Comprehensive plant retrofit	1,029	Campbell Soup Company
1-0152-A	2	Power factor correction, lighting voltage reduction	129	Trinchero Family Estates
1-0177-A	3	Add suction line; increase capacity for off peak ops.	654	Puritan Ice Company
1-0404-A	3	Increased refrigeration coil capacity	29	Taylor Farms
1-0100-A	4	Lockouts for nursery circulation fans	9	Rote Greenhouses
1-0101E	4	Water pump time controls	168	Sierra View Farms
1-0351-A	4	Install TOU meters	47	Sandhu Bros. Farm
1-0367-A	4	Install TOU meters	2	Ewy Enterprises
1-0367-A	4	Install TOU meters	2	Ewy Enterprises
02-022-47310	4	Expand existing storage reservoir for off peak pumping	158	Belridge Water Storage District
01-269-A	5	Drip irrigation conversion	45	Silva Vineyards
Totals			2,320	

Sub-population—Category 2

Category 2 project grants help pay for testing the efficiency and flow of pumps, with a second sub-category for repairing or retrofitting of the pumps. Pump repairs must be followed by a post-retrofit or repair test to establish a new efficiency and capacity point for the motor and pump system. Peak demand savings for the pump retrofit or repair projects are assumed to result from improved load management and by moving pumping energy to off peak hours. This strategy is appealing when combined with telemetry to remotely control pumping equipment while meeting irrigation or other water delivery needs.

Pump test projects are verified by the program administrators through a desk review of submitted documentation, as described on the program administrators' web sites. The grants are paid in full at the completion of the review and approval process. For purposes of program evaluation, these projects are ignored for post-installation inspections or monitoring. With no demand savings attributable to testing alone, there is little need to evaluate these projects for savings.

Peak period demand savings are not reported, and choosing a stratified sample of projects for post-installation evaluation requires a slightly modified approach. The two administrators offer incentives for pump repair projects through one of three options for calculating incentives. There

are slight differences in each administrator's documentation and calculation of the project incentives; however, both administrators have comparable grant options, and all pump repair projects are grouped together by grant option.

There is a large sub-population of pump repair projects, with a current total of 590 individual pumps approved by the two administrators. Annual energy use was reported for the majority of the individual project sites for projects approved by the Fresno CIT administrator. CalPoly's ITRC administrator required the submittal of peak period billing from June through September, but has not yet provided energy use data for the projects in their database of approved projects.

Each of the projects was grouped by the grant option number on a spreadsheet for sample selection in four strata that are defined by the three grant options and an additional stratum for the projects paid at 65 percent of repair cost. Projects that had no reported annual energy use were assigned an energy use equal to the average of all other projects in the same grant option, with the exception of the projects that were approved at 65% of cost. The resulting sample sizes are proportioned according to the number of projects approved under each grant option, as well as the relative size of expected energy savings resulting from the pump repairs. Table App-4 lists the four strata and sample sizes from the stratified calculator.

Table App-4: Category 2 Stratified Samples

Stratum #	Stratum Name	Population in Stratum	Projects in Sample	Demand Reduction of Sample, kW*
1	Grant Option 1	80	2	6
2	Grant Option 2	33	1	18
3	Grant Option 3	309	8	77
4	65% of Cost	37	1	6
Total		459	12	107

*kW estimates are for sampling size calculations only. Annual kWh was divided by 2000 operating hours per year; with 8% savings assumed for pump repairs. Operating hours and savings rate suggested in utility study of irrigation pump repairs.

The selected projects in Table App-5 were randomly selected from each of the four strata defined for Category 2 projects.

Table App-5: Category 2 Projects Selected for Post-Installation Evaluation

APLRP*	Stratum #	Grant Option Description	Annual kWh Use	Applicant
02-0280-A	1	Change in plant operating efficiency	92,560	Tracy Ranch, Inc.
02-0369-A	1	Change in plant operating efficiency	63,633	E&M Dairy
02-0183-A	2	Change in kWh/AF from repairs	447,636	JG Boswell Co.
#27-D-10 #5	3	Grant paid at 25% of kWh	161,003	Delano-Earlimart Irrigation District
02-0266-A	3	Grant paid at 25% of kWh	26,736	A-G Sod Farms Inc.
#19-White #1	3	Grant paid at 25% of kWh	161,003	Reclamation District #548

APLRP*	Stratum #	Grant Option Description	Annual kWh Use	Applicant
#32-Area 18-10hp	3	Grant paid at 25% of kWh	161,003	Tulare Irrigation District
#34-C-82	3	Grant paid at 25% of kWh	161,003	James Irrigation District
#31-1R4.OD	3	Grant paid at 25% of kWh	161,003	Westlands Water District
02-0129-A	3	Grant paid at 25% of kWh	870,280	J.G. Boswell Co.
02-0333-A	3	Grant paid at 25% of kWh	217,520	M&C Farms
#13-Station B, Pump 2	4	Grant paid at 65% of cost, kWh use not provided	65% of cost	Cawelo Water District

* APLRP numbers preceded by "#" are from ITRC. The first number corresponds to water district application number for multiple site Category 2 projects.

Sub-population—Category 3

Technologies for Category 3 projects include installation of advanced metering and telemetry equipment for agricultural and water pumping load reduction strategies. Approved projects include increases in water storage capacity for load shifting, installation of interval metering for use with the ISO programs, and changes to pipeline systems to reduce head loss. Eleven of the eighteen approved Category 3 projects took part in the CAISO demand response program, and were required to shed load when an emergency signal was received from the CAISO. Two strata were defined for the sub-population: those projects with and those without a CAISO contract.

Projected kW demand reductions are not persistent throughout the summer peak season for projects with CAISO contracts, and the total kW is an estimate of *potential* demand savings if full subscription of an aggregator is achieved.

Table App-6 lists the strata defined for Category 3 demand responsive projects and calculated sample sizes.

Table App-6: Category 3 Stratified Samples

Stratum #	Stratum Name	Population in Stratum	Projects in Sample	Demand Reduction of Sample, kW
1	ISO Contracts	11	6	4,550
2	Non-ISO Contracts	7	1	425
Totals		18	7	4,975

Table App-7 lists the randomly selected Category 3 project sites for post-installation evaluation.

Table App-7: Category 3 Projects Selected for Post-Installation Evaluation

APLRP*	Stratum #	Project Description	kW Demand Reduction	Applicant
#01-020-47330	1	Interval meters for ISO program	1,000	Solano Irrigation District
03-0064-A	1	Install interval meters and telemetry equipment	1,595	Joseph Gallo Farms

#02-03-47330	1	Install 3 interval meters and telemetry for ISO contract	1,270	Natomas Central Mutual Water District
03-0112-A	1	Artesia Dairy ISO drip irrigation telemetry	450	Artesia Dairy
03-0113-A	1	Triangle-M Dairy ISO drip irrigation telemetry	100	Triangle-M Dairy
03-0118-A	1	Tevelde Dairy ISO drip irrigation telemetry	135	Ralph Tevelde Dairy
03-0095-A	2	Advanced metering/telemetry	425	Diamond D Dairy

*APLRP numbers preceded by "#" are from ITRC. The first number corresponds to the water district application number for multiple site Category 3 projects.

Sub-population—Category 4

Category 4 projects include retrofits to convert existing natural gas-powered equipment to burn alternative fuels. There are no kW demand savings for projects in Category 4, nor are the project applicants required to switch to full-time use of an alternative fuel. The test for completion of a project is the successful demonstration that the equipment is capable of burning an alternative fuel.

The post-installation inspection reporting will be based on whether or not the retrofit equipment can utilize an alternative fuel. The sample size calculation for Category 4 projects was based on principles from Acceptable Quality Level (AQL) sampling for attributes (equipment is installed and functional, or not). At the specified precision, the sample size was determined from an AQL table in correlation to the number of approved projects. The sample population to be inspected was then drawn randomly from the overall population without regard to cost of installation, grant amount, or possible natural gas savings from the project.

Based on the current population of 24 Category 4 projects, a sample of eight sites has been selected for inspection. The sample size was based on the 10 percent AQL table, which is appropriate for a 20 percent precision interval.

Table App-8 lists the randomly selected project sites for Category 4 sub-population post-installation evaluation. All Category 4 projects were submitted to CIT for evaluation and grant funding.

Table App-8: Category 4 Projects Selected for Post-Installation Evaluation

APLRP #	Project Name	Project Description	Applicant
04-0017-A	Fresno poultry plant yellow grease project	Vegetable oil project proposal #2	J.G. Boswell Co.
04-0018-A	Del Mesa Porterville plant propane project	Cotton gins 2&3 – project proposal #3	J.G. Boswell Co.
04-0019-A	Del Mesa Feed Mill yellow grease project	Cotton gin #5 – project proposal #4	J.G. Boswell Co.
04-0022-A	Waste heat boiler oxidizer to burn yellow grease	Waste heat boiler oxidizer to burn yellow grease	Merced Milling Co. LLC
04-0038-A	Dual fuel conversion	Retrofit boiler 1 gas burner to burn yellow grease	Baker Commodities Inc.

04-0041-A	Propane tank and vaporizer conversion	Waste heat boiler oxidizer to burn yellow grease	Baker Commodities Inc.
04-0059-A	Natural gas-powered equipment retrofit	Natural gas to propane conversion	Fowler Dehydrator
04-0065-A	Natural gas powered equipment retrofit	Dual fuel gas conversion	Farmers Cooperatives Gin, Inc.

Section 3 Agricultural Program Project List

Program Administrator	Project Category	Application #/Incentive Agreement Number	Project Description / Address	City/Area	Comments - estimated construction completion dates from application.	Administrator Grant Payments	Anticipated or Contracted Savings, kW	Reported Savings, kW	Simple Cost Effectiveness, $/kW
Category 1 Projects for Cal Poly									
Cal Poly	1	01-018-47310	Add reservoir and modify deep wells to curtail deep well pumping during peak times.	Bakersfield	Project approved; second grant payment on Feb 11, 2002	$ 346,204.90	7,643	5,135	$ 67.42
Cal Poly	1	02-006-47310	Hills Valley Irrigation District is proposing to install a VFD on an existing 60 HP pump, thereby reducing the peak load usge by an average of 16 kW. The district obtains water from the Friant-Kern Canal and currently has a pumping plant that switches pumps on and off depending upon the demand. By installing a VFD, the supply can more closely match the demand.	San Joaquin Valley	Project has been completed October 31, 2001. First grant payment on 8/7/02.	$ 4,800.00	16.0	16	$ 300.00

Program Administrator	Project Category	Application #/Incentive Agreement Number	Project Description / Address	City/Area	Comments - estimated construction completion dates from application.	Administrator Grant Payments	Anticipated or Contracted Savings, kW	Reported Savings, kW	Simple Cost Effectiveness, $/kW
Cal Poly	1	02-009-47310	Berrenda Mesa WD proposes to raise the height of the spillway on the Berrenda Mesa Reservoir. The increased height (15 inches) will allow for additional storage in the reservoir and therefore reduced pumping during the peak periods. The stored water will supply growers during the on-peak times, while filled during the off-peak times.	Bakersfield/Kern	Project completed 5/2/02. First payment on 6/4/02	$ 28,754.00	770.0	4,400	$ 6.54
Cal Poly	1	02-013-47310	North Kern Water Storage District will modify deep wells and regulating reservoirs to reduce the peak load. Telemetry at selected sites will also be installed.	Bakersfield	Signed contract sent to Tranquillity ID. Amendment extends project completion date from April 30, 2002 to May 31, 2003.	$ 813,750.00	3,255	3,331	$ 244.30

Program Administrator	Project Category	Application #/Incentive Agreement Number	Project Description / Address	City/Area	Comments - estimated construction completion dates from application.	Administrator Grant Payments	Anticipated or Contracted Savings, kW	Reported Savings, kW	Simple Cost Effectiveness, $/kW
Cal Poly	1	02-014-47310	Sutter Extension Water District proposes to install a variable frequency drive to reduce the peak load. Flow meters are also part of the application.	Yuba City	Signed contract sent to North Kern WSD. Amendment to contract extends project completion date from April 15, 2002 to December 31, 2002. Sent for signature 4/8/2002.	$ 8,250.00	66.0	23	$ 358.70
Cal Poly	1	02-015-47310	The City of Santa Rosa proposes to replace an existing pump station, which includes 3-40 HP and 1-10 HP motors with 2-60 HP motors and variable frequency drives to operate irrigation systems. This new station will allow the grower to operate almost completely off-peak.	Santa Rosa	Project completed 4/20/02. First payment on6/1/02	$ 8,625.00	35.0	46	$ 187.50
Cal Poly	1	02-020-47310	Orange Cove ID proposes to reduce the peak load by constructing a regulating reservoir, coupled with telemetry equipment. Peak load will further be reduced by the installation of time-of-use meters, flow control valves, and/or clock timers for individual growers.	Fresno County	Project completed 4/1/02 - first payment 6/14/02	$ 44,500.00	178	178	$ 250.00
Cal Poly	1	03-001-43710	Berrenda Mesa WD proposes to remove sediment from their main storage reservoir and use the increased storage to reduce peak load.	Bakersfield	Signed contract sent to Orange Cove ID; project completion predicted for December 2002	$ 61,750.00	250	270	$ 228.70

Program Administrator	Project Category	Application #/Incentive Agreement Number	Project Description / Address	City/Area	Comments - estimated construction completion dates from application.	Administrator Grant Payments	Anticipated or Contracted Savings, kW	Reported Savings, kW	Simple Cost Effectiveness, $/kW
Cal Poly	1	03-009-47310	North Kern Water Storage District will modify deep wells and add a low lift pumping station to a reservoir to reduce peak load. Telemetry at selected sites will also be installed.	Bakersfield	Contract approved, project completion projected for Nov. 2003	$ 375,400.00	1502	1,502	$ 249.93
Cal Poly	1	03-013-47310	Tulare ID proposes to increase their water demand through Kaweah river during the peak period thus increasing the on peak generation. During the off-peak the demand will be reduced and supplied by another source (CVP). SCADA will be used for monitoring and control of remote sites whcih will make this project logistically feasible.	Tulare	Project Pre-approved, contract sent for signature 1/20/03	$ 98,033.00	470	470	$ 208.58
Subtotal projects	10				Subtotal of Grant Payments	**$2,288,132.90**			
					Subtotal of expected savings		**16,458**		
					Subtotal of Verified Savings, kW			**16,824**	
					Average project cost effectiveness (preliminary)				**$123.82**
Category 1 Fuel Switching Projects for Cal Poly									
Cal Poly	1	1	Natural gas engine driven pump conversion	Greenfield	Project pre-approved	$62,000	248.0		
Cal Poly	1	2	Natural gas engine driven pump conversion	Eastern Municipal Water District	Project pre-approved	$62,500	250.0	250	$250.00
Cal Poly	1	3	Natural gas engine driven pump conversion	Eastern Municipal Water District	Project pre-approved	$80,500	322.0	322	$250.00
Subtotal projects	3				Subtotal of Grant Payments	**$205,000**			
					Subtotal of contracted savings		**820.0**		

					Sub total of reported savings			**577.0**	
					Average project cost effectiveness (preliminary)				**$250.00**
Category 1 Electrical Efficiency Projects for California State University, Fresno Foundation									
Program Administrator	***Category***	***Project #***	***Project Name***	***City***	***Grant Payment Date***	***Grant Payment Total***	***Contracted Savings, kW***	***Verified Savings, kW***	***Simple Cost Effectiveness, $/kW***
CSU Fresno	1	01-0008-A	Meridian Facility - Bean Mill	Meridian	12/15/03	$24,600.00	82	82	$300.00
CSU Fresno	1	01-0026-A	VFD Compressor	Finley	01/02/02	$1,096.55	6.06	6.06	$179.76
CSU Fresno	1	01-0026-B	Water recirculation pump	Finley	06/11/03	$7,230.00	24.1	24.1	$301.25
CSU Fresno	1	01-0026-C	Scotts Valley - Condensor Fans VFDs	Finley	01/02/02	$7,448.00	21.28	21.28	$354.67
CSU Fresno	1	01-0027-A	Finley Pre-cooling Fan	Finley	01/02/02	$2,445.30	22.2	22.2	$111.15
CSU Fresno	1	01-0027-B	Finley Evaporative Cooling Tower VFD	Finley	01/02/02	$8,450.00	25.25	25.25	$338.00
CSU Fresno	1	01-0027-C	VFD on Recirculating Pump	Finley	01/02/02	$1,300.00	6.77	6.77	$185.71
CSU Fresno	1	01-0027-D	VFD on Compressor	Finley	01/02/02	$6,912.00	19.75	19.75	$345.60
CSU Fresno	1	01-0029-A	Insulate Tanks 7001 and 7003	Ripon	11/26/02	$17,745.00	50.7	50.7	$350.00
CSU Fresno	1	01-0035-A	Dyer Creek	Bakersfield	05/21/03	$564.46	45	45	$12.54
CSU Fresno	1	01-0042-A	Insulate Tanks 2019 & 2021	Ripon	11/26/02	$6,360.00	25.44	25.44	$250.39
CSU Fresno	1	01-0053-A	Alternate Sequence Gin Processing	Firebaugh	07/24/02	$10,954.42	219.09	219.09	$50.02

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0054-A	Time Management Load Control Device	Hanford	10/07/03	$3,282.83	37	37	$88.73
CSU Fresno	1	01-0054-B	Time Management Load Control Device	Hanford	11/05/01	$820.71	44	44	$18.65
CSU Fresno	1	01-0054-C	Time Management Load Control Device	Hanford	11/05/01	$820.70	130	130	$6.31
CSU Fresno	1	01-0060-A	Alternate Sequence Gin Processing	Mendota	03/05/03	$7,800.00	156	156	$50.00
CSU Fresno	1	01-0067-A	Lighting Office & Cooler	Encinitas		$595.00	1.7	1.7	$350.00
CSU Fresno	1	01-0067-B	Roof Vent	Encinitas	10/29/04	$12,336.39	25.3	36.48	$337.98
CSU Fresno	1	01-0067-C	Water Storage Tank	Encinitas		$910.00	8.3	8.3	$0.00
CSU Fresno	1	01-0068-A		Stocton	10/06/04	$19,627.91	98.4	119	$164.94
CSU Fresno	1	01-0076-A	Evaporative Condenser Replacement	Arvin	06/02/03	$16,555.00	47.3	47.3	$350.00
CSU Fresno	1	01-0078-A	Golden Valley Grape Juice Tanks	Madera	02/08/02	$4,410.00	14.7	14.7	$300.00
CSU Fresno	1	01-0080-A	Turlock Turkey Plant #1 Air Compressor	Livingston		$33,950.00	97	0	$0.00
CSU Fresno	1	01-0082-A	Pressure System Re-Configuration	Fillmore	04/30/03	$9,543.00	31.81	31.81	$300.00
CSU Fresno	1	01-0084-A	Flash Cooler/T-60 Installation Project	Colusa	11/04/02	$53,200.00	152	152	$350.00
CSU Fresno	1	01-0086-A	Variable Speed Vacum Pump For Dairy	Riverdale	04/11/02	$1,812.50	7.25	7.25	$258.93

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0088-A	South Avenue	Delhi	10/28/02	$17,636.50	50.89	50.89	$345.81
CSU Fresno	1	01-0091-A	Lighting System Upgrade	Fresno	11/06/01	$8,799.70	25.142	25.142	$350.00
CSU Fresno	1	01-0100-A	Rote Greenhouses	San Marcos	06/02/04	$471.90	8.95	8.95	$52.43
CSU Fresno	1	01-0100-B	Rote Greenhouses	San Marcos	06/02/04	$468.00	2.24	2.24	$234.00
CSU Fresno	1	01-0100-C	Rote Greenhouses	San Marcos	06/02/04	$165.10	2.21	2.21	$82.55
CSU Fresno	1	01-0101-A	Time Management Load Control Device	Hanford	11/02/04	$208.36	56	56	$3.72
CSU Fresno	1	01-0101-B	Surface Drip System/Time Management	Hanford	11/02/04	$31,006.50	88.59	88.59	$350.00
CSU Fresno	1	01-0101-D	Time Management Load Control Device	Hanford	11/02/04	$304.36	84	84	$3.62
CSU Fresno	1	01-0101-E	Time Management Load Control Device	Hanford	11/02/04	$305.06	158	158	$1.93
CSU Fresno	1	01-0106-A	Efficient Electrical Equipment	Carlsbad	01/10/02	$8,238.13	49.5	49.5	$164.76
CSU Fresno	1	01-0108-A	Energy reduction I	Sacramento	11/01/04	$33,728.15	104	104	$324.31
CSU Fresno	1	01-0108-B	Energy reduction I	Sacramento	11/22/02	$3,731.00	10.66	10.66	$373.10
CSU Fresno	1	01-0109-A	Indianola Drip System Retrofit	Kingsburg	11/12/02	$5,621.00	16.06	16.06	$351.31
CSU Fresno	1	01-0119-A		Escalon	11/08/01	$8,354.50	23.87	23.87	$348.10

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0120-A	Variable Speed Pump For Dairy	Fresno	11/05/01	$5,700.00	19	19	$300.00
CSU Fresno	1	01-0122-A		Santa Paula	06/05/02	$2,550.00	17	17	$150.00
CSU Fresno	1	01-0126-A		Linden	06/02/03	$1,197.86	9.05	9.05	$133.10
CSU Fresno	1	01-0128-A	Energy Reduction	Sacramento	06/10/03	$9,100.00	89	89	$102.25
CSU Fresno	1	01-0128-B	Energy Reduction	Sacramento	06/10/03	$10,209.00	72.2	72.2	$141.79
CSU Fresno	1	01-0128-C	Energy Reduction	Sacramento	06/10/03	$3,250.00	14	14	$232.14
CSU Fresno	1	01-0133-A	Hormel Foods Corporation	Stockton	06/17/03	$253,300.00	1029.75	1013.2	$250.00
CSU Fresno	1	01-0134-A	Dixon Plant Electrical Load Reduction Project	Dixon	11/22/02	$2,947.50	15	15	$196.50
CSU Fresno	1	01-0135-A	60hp VSD system	Grimes	11/06/01	$27,061.00	101.46	101.46	$266.72
CSU Fresno	1	01-0136-A		Stockton	11/18/02	$4,907.50	30	30	$163.58
CSU Fresno	1	01-0142-A	Efficienct Electrical Equipment	Ventura		$2,730.00	9.1	9.1	$300.00
CSU Fresno	1	01-0144-A	Replace Vacuum Pump with Variable Speed drive	Riverdale	11/01/04	$38,745.37	74.8	342.9	$112.99
CSU Fresno	1	01-0146-A	Efficient Regenerative Cooling	Delano	02/05/03	$3,292.70	34.7	16.45	$348.94
CSU Fresno	1	01-0151-A	Coil Replacement	Watsonville	03/20/02	$2,464.80	0	0	$0.00

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-152-A	Power factor correction and lighting power controls	St. Helena		$32,302.00	128.81	0	$350.00
CSU Fresno	1	01-0157-A	Replacing a water tower	Salinas	11/01/04	$68,705.00	104.07	196.3	$298.72
CSU Fresno	1	01-0158-A	Frito-Lay Modesto	Modesto	12/14/01	$29,245.00	97.9	97.9	$492.21
CSU Fresno	1	01-0159-A	Frito-Lay Bakersfield	Bakersfield	12/12/02	$69,845.00	149.9	141.89	$250.00
CSU Fresno	1	01-0160-A	Variable speed vacuum pump for dairy	Fresno	03/26/03	$4,825.00	19.3	19.3	$292.34
CSU Fresno	1	01-0161-A	AC Drive	Reedley	11/01/04	$10,302.00	24.2	35.24	$299.70
CSU Fresno	1	01-0162-A	AC Drive	Reedley	11/01/04	$3,027.00	5.68	10.09	$250.33
CSU Fresno	1	01-0172-A	Jongsma Dairy	Pixley	07/09/02	$5,632.50	22.53	22.53	$250.00
CSU Fresno	1	01-0182-A	Lighting Retrofit	Sonoma	11/18/02	$8,250.00	33	33	$9.37
CSU Fresno	1	01-0185-A	GlenEagles Agricultural Water Pump Timer Addition	Solvang	10/09/02	$655.79	70	70	$15.78
CSU Fresno	1	01-0186-A	Ake Boosters	Hanford	12/03/02	$1,641.42	104	104	$301.15
CSU Fresno	1	01-0189-A	VSD for vacuum pump	Laton	06/01/04	$2,349.00	7.83	7.83	$249.96
CSU Fresno	1	01-0191-A	Natural gas engine-driven chiller	Chico	11/01/04	$55,715.00	154	222.86	$249.00

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0195-A	McCall Pump	Fowler	12/13/02	$1,867.50	7.47	7.47	$250.92
CSU Fresno	1	01-0200-A	Drip irrigation retrofit	Hanford	01/13/04	$27,350.00	109.4	109.4	$251.18
CSU Fresno	1	01-0204-A	S&S Farms	Bakersfield	11/18/02	$4,270.00	17.08	17.08	$355.46
CSU Fresno	1	01-0207-A	Sprinkler System Conversion	Corning	09/04/03	$1,208.55	3.453	3.453	$350.00
CSU Fresno	1	01-0209-A	B67386	Lodi	01/24/02	$2,905.00	8.3	8.3	$0.00
CSU Fresno	1	01-0217-A	Livingston Processing Plant Air Compressors	Livingston		$9,720.00	38.8	0	$373.39
CSU Fresno	1	01-0218-A	James Murphy	Fallbrook	05/15/02	$4,107.25	11.375	11.375	$350.00
CSU Fresno	1	01-0219-A	Room #'s 1-4 Ammonia Pump Replacement	Reedley	06/01/02	$15,750.00	45	45	$250.08
CSU Fresno	1	01-0223-A	Schechert Ranches	Susanville	02/06/03	$15,330.00	61.32	61.32	$250.00
CSU Fresno	1	01-0225-A	Schechert Ranches	Terrebonne	02/06/03	$1,825.00	7.3	7.3	$125.96
CSU Fresno	1	01-0232-A	Del Puerto Farms	Patterson	02/11/03	$11,437.50	90.77	90.77	$248.96
CSU Fresno	1	01-0241-A	H.D. Plocher Partnership	Woodland	03/30/04	$1,170.13	4.68	4.68	$247.86
CSU Fresno	1	01-0244-A	Pine Crest Farms Dairy	Fresno	03/01/02	$1,735.00	6.94	6.94	$250.00

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0245-A	Rocking S Dairy	Fresno	02/28/02	$3,500.00	14	14	$247.83
CSU Fresno	1	01-0246-A	Louie Durrer & Sons Dairy	Fresno	02/22/02	$2,280.00	9.18	9.18	$350.00
CSU Fresno	1	01-0249-A	Marugliano Farms	Linden	05/01/02	$4,760.00	13.6	13.6	$349.69
CSU Fresno	1	01-0251-A	Wolff Vineyards	San Luis Obispo	10/21/02	$3,916.50	11.19	11.19	$175.60
CSU Fresno	1	01-0269-A	6179R2- project was Category 2, but switch to Cat 1 for conversion to 40hp pump from 125hp.	Soledad	06/03/04	$7,902.17	44.98	45	$250.00
CSU Fresno	1	01-0287-A	Ray Avansino	Linden	11/15/02	$7,500.00	30	30	$0.00
CSU Fresno	1	01-0312-A	Delano Farms Reservoir 18	Delano		$12,500.00	50	0	$0.00
CSU Fresno	1	01-0312-B	Delano Farms Reservoir 25	Delano		$7,250.00	29	0	$0.00
CSU Fresno	1	01-0312-C	Delano Farms Reservoir 23	Delano		$10,250.00	41	0	$300.00
CSU Fresno	1	01-0315-A	Boiler Plant Modification	Fresno	05/06/02	$19,986.00	66.62	66.62	$250.04
CSU Fresno	1	01-0318-A		Tulare	12/02/02	$34,706.00	140	138.8	$250.53
CSU Fresno	1	01-0328-A	Scully Packing Company LLC	Finley	04/17/03	$2,380.00	17.81	9.52	$269.06
CSU Fresno	1	01-330-A	Replace cooling Tower	Fresno	11/25/03	$28,250.83	104.8	104.8	$250.00

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0345-A	Horseradish Refrigeration	Tulelake	02/05/03	$4,250.00	30.5	17	$249.74
CSU Fresno	1	01-0348-A	Enology Wine Chiller Replacement & Tank Insulation	Fresno	09/25/03	$9,540.00	50.7	38.16	$250.00
CSU Fresno	1	01-350-A	Talley Farms Reservoir	Arroyo Grande	06/02/04	$7,150.00	41.03	28.6	$14.64
CSU Fresno	1	01-351-A	TOU Meter	Tracy	05/05/03	$683.80	46.7	46.7	$250.64
CSU Fresno	1	01-0353-A	Freemark Abbey Winery	Saint Helena	05/21/03	$1,955.00	7.82	7.82	$252.78
CSU Fresno	1	01-0355-A	Quest Dairy	Chino	04/05/02	$910.00	3.64	3.64	$250.00
CSU Fresno	1	01-357-A		Chandler	12/03/02	$2,950.00	11.8	11.8	$249.99
CSU Fresno	1	01-0358-A	E & J Gallo Winery	Fresno	11/02/04	$87,447.50	174.08	349.79	$247.50
CSU Fresno	1	01-0359-A	Tony Machado Dairy	Merced	09/06/02	$3,465.00	13.86	13.86	$143.33
CSU Fresno	1	01-0367-A	Time of Use Meter	Parlier	01/27/03	$286.66	2.24	2.24	$143.33
CSU Fresno	1	01-0367-B	Time of Use Meter	Parlier	01/27/03	$286.66	1.86	1.86	$143.33
CSU Fresno	1	01-0367-C	Time of Use Meter	Parlier	01/27/03	$286.66	2.24	2.24	$286.66
CSU Fresno	1	01-0367-D	Time of Use Meter	Parlier	01/27/03	$286.66	1.49	1.49	$71.67

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0367-E	Time of Use Meter	Parlier	01/27/03	$286.66	3.7	3.7	$286.66
CSU Fresno	1	01-0367-F	Time of Use Meter	Parlier	01/27/03	$286.66	1.2	1.2	$57.33
CSU Fresno	1	01-0367-G	Time of Use Meter	Parlier	01/27/03	$286.66	4.92	4.92	$143.33
CSU Fresno	1	01-0367-H	Time of Use Meter	Parlier	01/27/03	$286.66	2.24	2.24	$286.66
CSU Fresno	1	01-0367-I	Time of Use Meter	Parlier	01/27/03	$286.66	1.87	1.87	$249.85
CSU Fresno	1	01-0368-A	Packinghouse Remodel	Lindsay	07/19/02	$16,790.00	67.16	67.16	$250.00
CSU Fresno	1	01-0376-A	Valley Fig Growers	Fresno	06/02/03	$12,100.00		48.4	$248.44
CSU Fresno	1	01-0378-A	DC Lighting	Sacramento	11/18/02	$11,925.00	47.7	47.7	$240.83
CSU Fresno	1	01-0380-A	Vacuum pump VSD	Fresno	04/24/02	$2,890.00	11.56	11.56	$358.75
CSU Fresno	1	01-0391-A	MRD Dairy	Chino	02/22/02	$2,152.50	6.15	6.15	$253.89
CSU Fresno	1	01-0392-A	L&M Dairy	Merced	05/16/02	$2,285.00	9.14	9.14	$256.25
CSU Fresno	1	01-0402-A	Ronnie Ray Dairy	Fresno	08/19/02	$1,537.50	6.15	6.15	$350.00
CSU Fresno	1	01-0404-A	Replacing Water Tower	Salinas	06/25/02	$10,115.00	28.9	28.9	$249.77

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0405-A	Sun Maid Growers	Kingsburg	09/20/02	$32,470.00	144.28	129.88	$251.88
CSU Fresno	1	01-0412-A	Clos Pegase	Calistoga	12/06/02	$3,022.50	12.09	12.09	$386.71
CSU Fresno	1	01-0415-A	Ed Brower dairy	Exeter	08/12/02	$6,690.00	17.34	17.34	$249.14
CSU Fresno	1	01-0416-A	Toledo Dairy	Kingburg	05/31/02	$2,890.00	11.56	11.56	$249.49
CSU Fresno	1	01-0417-A	M.F. Gomes & Sons Dairy	Tulare	11/26/03	$2,470.00	9.88	9.88	$250.02
CSU Fresno	1	01-0422-A	Ice Production	Santa Maria	05/25/04	$53,705.00	220.35	214.82	$260.00
CSU Fresno	1	01-0428-A	Vacuum pump VSD	San Jacinto	10/01/02	$2,340.00	9.36	9.36	$250.37
CSU Fresno	1	01-0433-A	Franciscan Vineyards - Solar Bees	St. Helena	11/18/03	$6,735.00	26.93	26.93	$248.19
CSU Fresno	1	01-0436-A	2Vel Dairy Dairy	Winton	09/03/02	$4,467.50	17.87	17.87	$342.31
CSU Fresno	1	01-0449-A	Vacuum pump VSD	Tulare	08/19/02	$5,477.00	15.67	15.67	$293.81
CSU Fresno	1	01-0449-B	Vacuum pump VSD	Tulare	08/19/02	$4,701.00	15.67	15.67	$249.80
CSU Fresno	1	01-0453-A	JP Farms	Tulare	01/16/03	$39,892.50	159.57	159.57	$350.00
CSU Fresno	1	01-0465-A	Frank Guidera Co.	Tulare	09/11/02	$18,445.00	52.7	52.7	$250.00

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0468-A	Lee Cardoza Dairy	Hanford	09/03/02	$1,025.00	4.1	4.1	$250.96
CSU Fresno	1	01-0469-A	Vacuum pump VSD	Tulare	11/20/02	$1,957.50	7.83	7.83	$250.00
CSU Fresno	1	01-0471-A	Tony Souza Dairy	Selma	11/27/02	$3,825.00	15.3	15.3	$247.98
CSU Fresno	1	01-0474-A	Vacuum pump VSD	Hanford	08/06/02	$1,537.50	6.15	6.15	$250.00
CSU Fresno	1	01-0477-A	James Brower	Modesto	11/12/02	$1,000.00	4	4	$235.76
CSU Fresno	1	01-0479-A	David Allan H.P. Reduction	Cedarville	11/15/02	$8,487.36	36.09	36.09	$250.05
CSU Fresno	1	01-0480-A	Lance Mouw Dairy	Bakersfield	02/27/03	$24,805.00	99.22	99.22	$0.00
CSU Fresno	1	01-0488-A	Vander Schaaf Dairy	Chino		$2,025.00	8.1	0	$256.67
CSU Fresno	1	01-0489-A	VSD for vacuum pump	Newman	10/07/02	$1,540.00	6.16	6.19	$53.62
CSU Fresno	1	01-0493-A	Chandlers 60 HP	Stockton	06/16/03	$2,000.00	26.4	37.3	
CSU Fresno	1	01-0493-B	Tulare 50hp	Stockton		$0.00	0	0	$0.00
CSU Fresno	1	01-0500-A	If2 Drip Station	Madera		$1,991.50	5.69	0	$244.95
CSU Fresno	1	01-0503-A	Don Cardey Pump	Turlock	10/27/03	$25,720.00	105	105	$249.21
CSU Fresno	1	01-0513-A	Golden Valley Grape Juice and Wine	Madera	12/05/02	$3,937.50	15.75	15.75	$249.49

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0514-A	J. Wine Company	Healdsburg	05/22/03	$4,940.00	19.76	19.76	$302.67
CSU Fresno	1	01-0519-A	A&T Dairy	Chowchilla	03/05/03	$2,270.00	9.08	7.45	$256.25
CSU Fresno	1	01-0521-A	S & S Dairy	Visalia	10/03/02	$2,050.00	8.2	8.2	$256.25
CSU Fresno	1	01-0522-A	Harry Miersma Dairy	Chino	11/29/02	$2,050.00	8.2	8.2	$250.00
CSU Fresno	1	01-0525-A	Palla Rosa #3 Dairy	Bakersfield	06/02/03	$3,075.00	12.3	12.3	$249.49
CSU Fresno	1	01-0526-A	Jack Mendonsa Dairy	Tipton	04/30/03	$2,470.00	9.88	9.88	$250.00
CSU Fresno	1	01-0533-A	J&L Dairy	Tulare	11/27/02	$2,875.00	11.5	11.5	$247.00
CSU Fresno	1	01-0538-A	Three Palms Dairy/Antonio Rodriguez	Chino	11/27/02	$2,470.00	9.88	9.88	$15.94
CSU Fresno	1	01-583-A	Family Limited Partnership 2 and 3	Delano	03/05/03	$6,565.65	412	412	$250.00
CSU Fresno	1	01-0592-A	Red Diamond Cooling, Inc.	Santa Maria	05/17/04	$33,475.00	133.9	133.9	$250.00
CSU Fresno	1	01-0595-A	Rio Pluma Company	Gridley	10/20/03	$5,150.00	0	0	$250.00
CSU Fresno	1	01-0616-A	Cordeniz & Gomes Dairy	Tulare	10/23/03	$2,875.00	11.5	11.5	$250.00
CSU Fresno	1	01-0618-A	Tony Mendonca #2	Tulare	12/16/03	$2,470.00	9.88	9.88	$250.00

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0621-A	Harry Hoffman Dairy	Tulare	10/27/03	$1,950.00	7.8	7.8	$227.53
CSU Fresno	1	01-0628-A	Puritan Ice Co.	Guadalupe	02/25/03	$139,705.54	614	614	$250.00
CSU Fresno	1	01-0637-A	Manual Rosa Dairy	Bakersfield	06/30/03	$4,860.00	19.44	19.44	$251.70
CSU Fresno	1	01-652-A	James R. Samuel	Stockton	08/18/03	$3,642.14	14.57	14.47	$250.00
CSU Fresno	1	01-0724-A	Scott Mather	Morro Bay	10/28/03	$932.50	0	3.73	$250.00
CSU Fresno	1	01-0725-A	Puritan Ice Company		06/23/04	$105,950.00	423.8	423.8	$250.00
CSU Fresno	1	01-0727-A	El Solyo Water District	Vernalis	12/09/03	$1,762.50	30	7.05	$250.00
CSU Fresno	1	01-0728-A	El Solyo Water District	Vernalis	12/09/03	$620.00	27.45	2.48	$250.00
CSU Fresno	1	01-0734-A	Rockview Dairies Inc	Downey	10/10/04	$60,342.50	199.45	241.37	$250.00
CSU Fresno	1	01-0737-A	Rosemary Farms	Santa Maria	12/16/03	$4,275.00	17.1	17.1	
CSU Fresno	1	01-0747-A	Walsh Vineyard Management	Napa		$0.00	0	0	$0.00
CSU Fresno	1	01-0754-A	Enns Packing	Dinuba		$12,675.00	50.7	0	$250.00
CSU Fresno	1	01-0765-A	Central California Almond Growers Assoc.	Sanger	06/02/04	$6,075.00	33.57	24.3	$0.00

Program Administrator	Category	Project #	Project Name	City	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU Fresno	1	01-0766-A	Lindauer River Ranch	Red Bluff		$3,370.00	13.48	0	$250.02
CSU Fresno	1	01-0771-A	Ag Foundation CSU, Fresno	Fresno	10/10/03	$15,628.50	62.51	62.51	$0.00
CSU Fresno	1	01-0778-A	Fox Point Farms	Encinitas		$4,070.00	16.28	0	$250.00
CSU Fresno	1	01-0780-A	Selma Cold & Dry Storage, LLC	Selma	12/08/03	$20,272.50	81.09	81.09	$0.00
CSU Fresno	1	01-0781-A	Netle USA Carnation Products	Mendota		$256,030.00	1024.12	0	$0.00
CSU Fresno	1	01-0794-A	Whitehouse Rd Irrigation System	Linden		$5,000.00	23.4	0	$250.94
CSU Fresno	1	01-0795-A	Keithly-Williams Seeds	Holtville	11/04/04	$2,662.50	11.1	10.61	$243.72
CSU Fresno	1	01-0799-A	Paul Masson	Madera	11/10/04	$38,787.50	175	159.15	$300.00
Subtotal projects	179				Subtotal of Grant Payments	**$2,094,337**			
					Subtotal of contracted savings, kW		**10,632**		
					Subtotal of verified savings			**9,676**	
					Average simple cost effectiveness				**$216.44**

Cal Poly Category 2 Pump Repair Projects

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	1	Chamberlain Water Company (M-141)	(M-141)	Pre-Approved 7/127/01	$16,802.25		Option 3	
Cal Poly	2	1	Chamberlain Water Company (M-142)	(M-142)	Pre-Approved 7/127/01	$15,332.75		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	1	Chamberlain Water Company (M_147)	(M_147)	Pre-Approved 7/127/01	$28,340.00		Option 1; 65% of Cost	
Cal Poly	2	2	Westlands WD - Vasto Valle Farms (#108)	(#108)	07/02/02	$40,235.33		Option 3	
Cal Poly	2	3	Lloyd-Butler Mutual Water Company		12/06/01	$ 2,548.20		Option 3	
Cal Poly	2	4	Patterson Irrigation District- Station 4, Pump 4	Station 4, Pump 4	Pre-Approved 8/31/01	$ 4,002.65		Option 2: Pre vs Post kW/AF	
Cal Poly	2	5	Westlands Water District - Vasto Valle Farms	#109	07/02/02	$40,570.95		Option 1; 65% of Cost	
Cal Poly	2	5	Westlands Water District - Vasto Valle Farms	#1	07/02/02	$37,622.08		Option 3	
Cal Poly	2	5	Westlands Water District - Vasto Valle Farms	#3	07/02/02	$46,764.17		Option 3	
Cal Poly	2	6	Patterson Irrigation District	Station 1, Pump 7	04/26/02	$ 7,529.62		Option 2	
Cal Poly	2	6	Patterson Irrigation District	Station 2, Pump 4	Pre-Approved 9/10/01	$ 5,678.75		Option 2	
Cal Poly	2	6	Patterson Irrigation District	Station 4, Pump 1	Pre-Approved 9/10/01	$ 6,271.13		Option 2	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	5PP4, Unit 2	Pre-Approved 11/7/01	$ 4,550.00		Option 2	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	PC-1, Unit 1	08/08/03	$ 3,256.00		Option 2	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	WRM4, Unit 4	Pre-Approved 11/7/01	$ 4,448.00		Option 3	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	WRM4, Unit 5	08/08/03	$ 1,352.00		Option 3	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	WRM7, Unit 4	08/08/03	$ 4,109.00		Option 3	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	WRM7, Unit 5	Pre-Approved 11/7/01	$ 4,550.00		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	WRM9, Unit 1	08/08/03	$ 2,222.00		Option 3	
Cal Poly	2	7	Wheeler Ridge - Maricopa Water Storage District	WRM9, Unit 3	08/08/03	$ 1,899.00		Option 3	
Cal Poly	2	8	Westside WD	Lateral 5, Pump 3	05/16/03	$ 2,363.16		Option 2	
Cal Poly	2	8	Westside WD	Lateral 5, Pump 4	09/18/02	$ 1,128.73		Option 2	
Cal Poly	2	8	Westside WD	Lateral 5, Pump 5	09/18/02	$ 1,116.77		Option 2	
Cal Poly	2	8	Westside WD	Lateral 7, Pump 4	09/18/02	$ 1,098.75		Option 2	
Cal Poly	2	9	Westlands WD	6-1, Unit 1	12/13/01	$ 6,063.50		Option 3	
Cal Poly	2	9	Westlands WD	6-1, Unit 7	12/13/01	$ 1,732.43		Option 3	
Cal Poly	2	9	Westlands WD	7RA, Unit 3	12/13/01	$ 8,001.20		Option 3	
Cal Poly	2	9	Westlands WD	23R, Unit 5	12/13/01	$ 523.03		Option 3	
Cal Poly	2	10	Central California ID	5A	05/09/03	$ 3,950.50		Option 3	
Cal Poly	2	10	Central California ID	6A	05/09/03	$ 3,219.10		Option 2	
Cal Poly	2	10	Central California ID	9A	05/09/03	$ 3,402.68		Option 3	
Cal Poly	2	10	Central California ID	12C	05/09/03	$ 4,228.75		Option 3	
Cal Poly	2	10	Central California ID	13	05/09/03	$ 2,852.10		Option 3	
Cal Poly	2	10	Central California ID	15B	05/09/03	$ 2,483.58		Option 3	
Cal Poly	2	10	Central California ID	18B	05/09/03	$ 3,724.70		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	10	Central California ID	19B	05/09/03	$ 2,363.00		Option 3	
Cal Poly	2	10	Central California ID	21A	05/09/03	$ 3,742.75		Option 3	
Cal Poly	2	10	Central California ID	23B	05/09/03	$ 4,007.05		Option 3	
Cal Poly	2	10	Central California ID	29	05/09/03	$ 4,063.03		Option 3	
Cal Poly	2	10	Central California ID	30	05/09/03	$ 1,390.68		Option 3	
Cal Poly	2	10	Central California ID	32B	05/09/03	$ 4,405.00		Option 3	
Cal Poly	2	10	Central California ID	35A	05/09/03	$ 3,954.03		Option 3	
Cal Poly	2	10	Central California ID	36	05/09/03	$ 3,560.48		Option 2	
Cal Poly	2	10	Central California ID	37A	05/09/03	$ 4,099.30		Option 3	
Cal Poly	2	10	Central California ID	41	05/09/03	$ 5,140.00		Option 3	
Cal Poly	2	10	Central California ID	42	05/09/03	$ 2,949.05		Option 3	
Cal Poly	2	10	Central California ID	45A	05/09/03	$ 1,787.18		Option 3	
Cal Poly	2	10	Central California ID	46	05/09/03	$ 3,416.73		Option 3	
Cal Poly	2	10	Central California ID	48A	05/09/03	$ 3,646.05		Option 3	
Cal Poly	2	10	Central California ID	49A	05/09/03	$ 4,063.63		Option 3	
Cal Poly	2	10	Central California ID	51	05/09/03	$ 3,653.00		Option 2	
Cal Poly	2	10	Central California ID	53	05/09/03	$ 2,107.63		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	10	Central California ID	54A	05/09/03	$ 2,267.65		Option 3	
Cal Poly	2	10	Central California ID	55	05/09/03	$ 3,007.73		Option 3	
Cal Poly	2	11	Westlands WD	3R, Unit 1	12/02/01	$ 3,658.92		Option 3	
Cal Poly	2	11	Westlands WD	24R, Unit 3	12/02/01	$ 2,945.32		Option 3	
Cal Poly	2	11	Westlands WD	2RB, Unit 3	12/02/01	$10,694.81		Option 3	
Cal Poly	2	11	Westlands WD	2RA, Unit 2	12/02/01	$ 8,169.12		Option 3	
Cal Poly	2	12	Lost Hills WD	Station 1, Pump 1	09/23/03	$ 6,712.42		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1, Pump 2	Accpeted 1/16/02	$13,000.00		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1, Pump 3	09/23/03	$33,562.09		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1, Pump 4	09/23/03	$33,562.09		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1, Pump 5	Accpeted 1/16/02	$12,052.00		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1, Pump 6	Accpeted 1/16/02	$ 5,529.00		Option 3	
Cal Poly	2	12	Lost Hills WD	Station 1, Pump 7	Accpeted 1/16/02	$14,300.00		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1R, Pump 1	09/23/03	$ 5,889.99		Option 3	
Cal Poly	2	12	Lost Hills WD	Station 1R, Pump 2	Accpeted 1/16/02	$11,375.00		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1R, Pump 3	Accpeted 1/16/02	$11,375.00		Option 1; 65% of Cost	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	12	Lost Hills WD	Station 1R, Pump 4	Accpeted 1/16/02	$11,375.00		Option 1; 65% of Cost	
Cal Poly	2	12	Lost Hills WD	Station 1R, Pump 5	09/23/03	$ 5,889.99		Option 3	
Cal Poly	2	12	Lost Hills WD	Station 5, Pump 1	09/23/03	$ 1,550.50		Option 2	
Cal Poly	2	12	Lost Hills WD	Station 5, Pump 2	Accpeted 1/16/02	$ 2,455.00		Option 3	
Cal Poly	2	12	Lost Hills WD	Station 7, Pump 1	09/23/03	$ 2,913.78		Option 2	
Cal Poly	2	12	Lost Hills WD	Station 7, Pump 2	09/23/03	$ 3,642.22		Option 2	
Cal Poly	2	13	Cawelo WD	Station B, Pump 1	Accpeted 1/16/02	$12,350.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station B, Pump 2	Accpeted 1/16/02	$14,625.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station B, Pump 3	Accpeted 1/16/02	$14,625.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station B, Pump 4	Accpeted 1/16/02	$14,625.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station B, Pump 6	Accpeted 1/16/02	$14,950.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station B, Pump 7	Accpeted 1/16/02	$14,950.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station C, Pump 1	Accpeted 1/16/02	$11,700.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station C, Pump 2	Accpeted 1/16/02	$14,300.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station C, Pump 3	Accpeted 1/16/02	$14,300.00		Option 1; 65% of Cost	
Cal Poly	2	13	Cawelo WD	Station C, Pump 5	Accpeted 1/16/02	$14,300.00		Option 1; 65% of Cost	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	14	James ID	C - 59	03/10/03	$ 3,588.00		Option 3	
Cal Poly	2	14	James ID	D - 36	03/10/03	$ 7,543.00		Option 3	
Cal Poly	2	14	James ID	D - 39	03/10/03	$ 2,770.00		Option 3	
Cal Poly	2	14	James ID	D - 47	03/10/03	$ 4,282.00		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 1	08/29/03	$17,439.00		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 2	08/29/03	$16,707.45		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 3	06/20/03	$18,793.00		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 4	Accpeted 3/4/02	$11,912.95		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 5	08/29/03	$17,655.00		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 6	Accpeted 3/4/02	$13,583.67		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 10	Accpeted 3/4/02	$13,077.20		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 12	Accpeted 3/4/02	$11,041.27		Option 3	
Cal Poly	2	15	Kern County Water Agency	KCWA 13	Accpeted 3/4/02	$10,242.22		Option 3	
Cal Poly	2	15	Kern County Water Agency	BK 4	Accpeted 3/4/02	$13,566.32		Option 3	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-5K1	03/06/03	$24,981.97		Option 3	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-6K1	03/06/03	$23,660.00		Option 3	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-18P1	07/08/03	$10,047.81		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-4L1	03/06/03	$21,101.84		Option 3	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-20C1	07/08/03	$13,965.50		Option 3	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-15C1	07/08/03	$15,503.18		Option 3	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-15O1	07/08/03	$25,791.54		Option 3	
Cal Poly	2	16	Kern Water Bank Authority	30S/25E-15B1	07/08/03	$30,012.70		Option 3	
Cal Poly	2	17	Westlands WD	2RB, Unit 1	03/22/02	$10,694.81		Option 3	
Cal Poly	2	17	Westlands WD	4R, Unit 2	03/22/02	$ 3,881.49		Option 3	
Cal Poly	2	17	Westlands WD	6-1, Unit 2	03/22/02	$ 6,063.50		Option 3	
Cal Poly	2	17	Westlands WD	9L, Unit 1	03/22/02	$ 959.68		Option 3	
Cal Poly	2	17	Westlands WD	9L, Unit 2	03/22/02	$ 959.68		Option 3	
Cal Poly	2	17	Westlands WD	11R, Unit 1	03/22/02	$ 8,706.98		Option 3	
Cal Poly	2	17	Westlands WD	18L, Unit 1	03/22/02	$ 1,053.87		Option 3	
Cal Poly	2	17	Westlands WD	21L, Unit 1	03/22/02	$ 495.79		Option 3	
Cal Poly	2	17	Westlands WD	21R, Unit 4	03/22/02	$ 2,817.02		Option 3	
Cal Poly	2	17	Westlands WD	21R, Unit 5	03/22/02	$ 1,355.33		Option 3	
Cal Poly	2	17	Westlands WD	29L, Unit 4	03/22/02	$ 3,808.40		Option 3	
Cal Poly	2	17	Westlands WD	32L, Unit 4	03/22/02	$ 1,538.30		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	18	RD 2068	PS4, #1	Approved 3/21/02	$ 2,159.00		Option 3	
Cal Poly	2	19	RD 548	#5	09/18/02	$ 5,035.50		Option 3	
Cal Poly	2	19	RD 548	White #1	09/18/02	$ 3,827.00		Option 3	
Cal Poly	2	20	RD 2028	#3 - North	Pre-Approved 3/21/02	$ 1,650.00		Option 3	
Cal Poly	2	20	RD 2028	#2 - West	04/12/02	$ 3,166.33		Option 3	
Cal Poly	2	21	RD 830	Jersey Island	04/08/02	$ 5,592.50		Option 3	
Cal Poly	2	22	Patterson Irrigation District	Sta 4 VFD+Pump Repair	Approved 4/4/02	$10,000.00		Option 2	
Cal Poly	2	22	Patterson Irrigation District	Station 5 VFD	Approved 4/4/02	$ 8,000.00		Option 2	
Cal Poly	2	23	Westlands WD	14RA, Unit 3	04/08/02	$17,034.01		Option 3	
Cal Poly	2	23	Westlands WD	3L, Unit 4	04/08/02	$ 5,842.16		Option 3	
Cal Poly	2	23	Westlands WD	32L, Unit 2	04/08/02	$ 769.15		Option 3	
Cal Poly	2	24	RD 2058	R37463	04/24/02	$ 3,431.43		Option 3	
Cal Poly	2	25	Westlands WD	26R, Unit 1	04/25/02	$ 2,334.80		Option 3	
Cal Poly	2	25	Westlands WD	11R, Unit 2	04/25/02	$ 4,568.77		Option 1; 65% of Cost	
Cal Poly	2	25	Westlands WD	16RB, Unit 2	04/25/02	$ 6,164.55		Option 1; 65% of Cost	
Cal Poly	2	25	Westlands WD	3R, Unit 3	04/25/02	$ 6,237.73		Option 3	
Cal Poly	2	26	James Irrigation District	C - 67	03/10/03	$ 3,914.00		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	26	James Irrigation District	C - 70	03/10/03	$ 5,085.00		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-17 #1	08/06/02	$ 345.13		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-12 #2	08/06/02	$ 472.29		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-1 #3	08/06/02	$ 802.20		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-18 #5	08/06/02	$ 641.76		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-12 #1	08/06/02	$ 472.29		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-10 #5	08/06/02	$ 2,951.28		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-2 #3	08/06/02	$ 187.06		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-17 #2	08/06/02	$ 443.74		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-10 #2	08/06/02	$ 1,475.64		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-10 #4	08/06/02	$ 2,951.28		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-10 #1	08/06/02	$ 1,475.64		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-11 #3	08/06/02	$ 393.86		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-2 #1	08/06/02	$ 187.06		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-10 #3	08/06/02	$ 2,951.28		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-17 #3	08/06/02	$ 887.47		Option 3	
Cal Poly	2	27	Delano-Earlimart Irrigation District	D-12 #3	08/06/02	$ 787.16			

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	28	Maxwell Irrigation District	West PS #4	05/22/02	$ 1,643.25		Option 3	
Cal Poly	2	29	Reclamation District #2033	North Pump of South Plant	Approved 5/23/02	$ 1,115.45		Option 3	
Cal Poly	2	29	Reclamation District #2033	South Pump of South Plant	Approved 5/23/02	$ 3,135.28		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	WRM-10,4	08/08/03	$ 4,532.00		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	WRM-10,7	08/08/03	$ 8,970.00		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	WRM-3,4	08/08/03	$ 521.00		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	WRM4,3	Approved 6/4/02	$ 256.50		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	WRM-6,1	Approved 6/4/02	$ 3,575.00		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	5P-P2,5	Approved 6/4/02	$ 2,219.75		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	5P-P3,3	Approved 6/4/02	$ 2,219.75		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	6P-P2,2	Approved 6/4/02	$ 2,567.50		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	6P-P2,3	Approved 6/4/02	$ 2,278.69		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	7P-P2,1	Approved 6/4/02	$ 2,414.75		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	PA-2,3	Approved 6/4/02	$ 2,827.50		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	PB-1,5	Approved 6/4/02	$ 3,575.00		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	PB-2,1	Approved 6/4/02	$ 2,219.75		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	PB-2,2	Approved 6/4/02	$ 2,219.75		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	PB-2,3	Approved 6/4/02	$ 690.75		Option 3	
Cal Poly	2	30	Wheeler Ridge-Maricopa Water Storage District	PD-1,3	Approved 6/4/02	$ 2,567.50		Option 3	
Cal Poly	2	31	Westlands Water District	26R, Unit 4	06/19/02	$ 2,523.18		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	1R2.0 B, Unit 1	06/19/02	$ 2,728.34		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	12R, Unit 6	06/19/02	$ 3,312.91		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	7RC, Unit 5	06/19/02	$ 1,859.30		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	24L, Unit 2	06/19/02	$ 779.90		Option 3	
Cal Poly	2	31	Westlands Water District	DU#4, Unit 3	06/19/02	$ 2,641.51		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	PV6, Unit 3	06/19/02	$ 1,054.95		Option 3	
Cal Poly	2	31	Westlands Water District	38RA, Unit 4	06/19/02	$ 3,929.61		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	1R4.0D	06/19/02	$ 2,614.63		Option 3	
Cal Poly	2	31	Westlands Water District	32L, Unit 1	06/19/02	$ 549.98		Option 3	
Cal Poly	2	31	Westlands Water District	22R, Unit 2	06/19/02	$ 7,520.88		Option 3	
Cal Poly	2	31	Westlands Water District	24L, Unit 3	06/19/02	$ 1,559.83		Option 3	
Cal Poly	2	31	Westlands Water District	14RA, Unit 5	06/19/02	$ 4,004.15		Option 1; 65% of Cost	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	31	Westlands Water District	17L, Unit 1	06/19/02	$ 842.93		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	6-1, Unit 4	06/19/02	$ 6,063.50		Option 3	
Cal Poly	2	31	Westlands Water District	16L, Unit 1	06/19/02	$ 2,617.38		Option 3	
Cal Poly	2	31	Westlands Water District	11R, Unit 4	06/19/02	$ 4,594.67		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	6L, Unit 2	06/19/02	$ 2,768.15		Option 1; 65% of Cost	
Cal Poly	2	31	Westlands Water District	7RC, Unit 2	06/19/02	$10,371.28		Option 1; 65% of Cost	
Cal Poly	2	32	Tulare Irrigation District	Area 7	Pre-Approved 7/16/02	$ 76.50		Option 3	
Cal Poly	2	32	Tulare Irrigation District	Area 12	Pre-Approved 7/16/02	$ 258.00		Option 3	
Cal Poly	2	32	Tulare Irrigation District	Area 18-10HP	Pre-Approved 7/16/02	$ 214.80		Option 3	
Cal Poly	2	32	Tulare Irrigation District	Area 18-20HP	Pre-Approved 7/16/02	$ 564.50		Option 3	
Cal Poly	2	32	Tulare Irrigation District	City	Pre-Approved 7/16/02	$ 561.00		Option 3	
Cal Poly	2	33	Jackson Valley Irrigation District	1	09/18/02	$ 3,625.00		Option 3	
Cal Poly	2	34	James Irrigation District	D-35	03/10/03	$ 7,718.00		Option 1; 65% of Cost	
Cal Poly	2	34	James Irrigation District	C-82	03/10/03	$ 8,298.00		Option 1; 65% of Cost	
Cal Poly	2	34	James Irrigation District	C-75	03/10/03	$ 3,989.00		Option 3	
Cal Poly	2	35	Garden Hwy. Mutual Water Company	1	03/26/03	$ 8,017.75		Option 1; 65% of Cost	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	36	South San Joaquin Irrigation District	92	Pre-Approved 9/18/02	$ 270.65		Option 3	
Cal Poly	2	36	South San Joaquin Irrigation District	72	02/18/03	$ 732.95		Option 3	
Cal Poly	2	36	South San Joaquin Irrigation District	39	02/18/03	$ 955.31		Option 3	
Cal Poly	2	38	Westlands Water District	Unit 2@PV6	09/20/02	$ 1,054.95		Option 3	
Cal Poly	2	38	Westlands Water District	Unit 4@7RC	09/20/02	$ 3,241.03		Option 3	
Cal Poly	2	38	Westlands Water District	Unit 2@25L	09/20/02	$ 1,518.35		Option 3	
Cal Poly	2	38	Westlands Water District	Unit 3@16RB	09/20/02	$11,372.48		Option 3	
Cal Poly	2	38	Westlands Water District	Unit 5@1R4.0.B	09/20/02	$ 4,493.95		Option 3	
Cal Poly	2	38	Westlands Water District	Unit 5@13RA	09/20/02	$ 2,364.25		Option 3	
Cal Poly	2	38	Westlands Water District	Unit 5@22R	09/20/02	$ 1,764.50		Option 1; 65% of Cost	
Cal Poly	2	38	Westlands Water District	Unit 3@7L	09/20/02	$ 1,377.58		Option 1; 65% of Cost	
Cal Poly	2	38	Westlands Water District	Unit 5@6-2	09/20/02	$ 1,036.98		Option 1; 65% of Cost	
Cal Poly	2	38	Westlands Water District	Unit 1@28R1.0W	09/20/02	$ 1,915.64		Option 1; 65% of Cost	
Cal Poly	2	38	Westlands Water District	Unit 6@6-2PP	09/20/02	$ 472.97		Option 1; 65% of Cost	
Cal Poly	2	40	Madera Water District	Well 1	11/01/02	$ 7,033.00		Option 3	
Cal Poly	2	40	Madera Water District	Well 16	11/01/02	$10,677.00		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	40	Madera Water District	Well 6	11/01/02	$ 8,277.00		Option 3	
		41		Well 32-1	03/06/03	$17,550.98		Option 1; 65% of Cost	
Cal Poly	2	41	Westlands WD - Borba Farms	Well 32-2	Pre-Approved 11/4/02	$22,500.00		Option 3	
Cal Poly	2	41	Westlands WD - Borba Farms	Well 33-5	02/19/03	$13,675.91		Option 3	
Cal Poly	2	42	Corcoran Irrigation District	Well 2	11/01/02	$10,366.33		Option 3	
Cal Poly	2	42	Corcoran Irrigation District	Well 35	11/01/02	$12,367.01		Option 1; 65% of Cost	
Cal Poly	2	42	Corcoran Irrigation District	Well 34	12/09/02	$13,701.00		Option 1; 65% of Cost	
Cal Poly	2	42	Corcoran Irrigation District	Well 54	11/01/02	$ 8,278.80		Option 3	
Cal Poly	2	42	Corcoran Irrigation District	Well 16	11/01/02	$ 3,730.00		Option 1; 65% of Cost	
Cal Poly	2	42	Corcoran Irrigation District	Well 69	11/01/02	$14,909.54		Option 1; 65% of Cost	
Cal Poly	2	42	Corcoran Irrigation District	Well 51	11/01/02	$14,180.00		Option 1; 65% of Cost	
Cal Poly	2	43	Westlands Water District	Unit 1@16RA	11/25/02	$16,168.10		Option 1; 65% of Cost	
Cal Poly	2	43	Westlands Water District	Unit 1@4R	11/25/02	$ 8,893.53		Option 3	
Cal Poly	2	43	Westlands Water District	Unit 2@3R	11/25/02	$ 4,929.00		Option 1; 65% of Cost	
Cal Poly	2	43	Westlands Water District	Unit 5@28RA	11/25/02	$ 4,203.20		Option 3	
Cal Poly	2	43	Westlands Water District	Unit 3@25R	11/25/02	$ 2,978.85		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	43	Westlands Water District	Unit 8@6-1	11/25/02	$ 1,732.43		Option 3	
Cal Poly	2	43	Westlands Water District	Unit 4@25R	11/25/02	$ 1,489.43		Option 3	
Cal Poly	2	43	Westlands Water District	Unit 5@25R	11/25/02	$ 1,489.43		Option 3	
Cal Poly	2	43	Westlands Water District	Unit 5@28RB	11/25/02	$ 1,297.19		Option 1; 65% of Cost	
Cal Poly	2	43	Westlands Water District	Unit 3@26L	11/25/02	$ 664.63		Option 1; 65% of Cost	
Cal Poly	2	44	Browns Valley Irrigation District	50	10/27/03	$ 3,640.12		Option 3	
Cal Poly	2	44	Browns Valley Irrigation District	100	10/27/03	$ 6,667.21		Option 3	
Cal Poly	2	44	Browns Valley Irrigation District	125	10/27/03	$ 9,749.50		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-1	01/07/03	$ 5,700.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-2	01/07/03	$12,800.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-3	01/07/03	$ 7,600.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-4	01/07/03	$ 8,360.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-5	01/07/03	$10,660.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-6	01/07/03	$10,400.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-7	01/07/03	$ 8,200.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-9	01/07/03	$11,200.00		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	45	City of Fresno Waste Water Management	R-12	01/07/03	$ 6,875.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-13	01/07/03	$ 8,480.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-15	01/07/03	$ 8,820.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-16	01/07/03	$ 4,160.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-17	01/07/03	$ 6,980.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-20	01/07/03	$10,400.00		Option 3	
Cal Poly	2	45	City of Fresno Waste Water Management	R-21		$10,000.00	01/07/03	Option 3	
Cal Poly	2	46	Corcoran Irrigation District	Well 44	01/17/03	$17,031.00		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 4@30R	02/19/03	$ 1,617.28		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 2@21R	02/19/03	$ 9,279.48		Option 1; 65% of Cost	
Cal Poly	2	47	Westlands Water District	Unit 1@29L	02/19/03	$ 1,904.20		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 2@33L	02/19/03	$ 1,164.05		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 1@20R	02/19/03	$ 6,564.55		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 3@1R4.0D	02/19/03	$ 1,307.31		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 1@21R	02/19/03	$ 9,758.99		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 2@30R	02/19/03	$ 2,425.91		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	47	Westlands Water District	Unit 2@30L	02/19/03	$ 1,738.71		Option 3	
Cal Poly	2	47	Westlands Water District	Unit 1@27R	02/19/03	$15,245.84		Option 1; 65% of Cost	
Cal Poly	2	48	James Irrigation District	D-15	03/10/03	$ 5,017.00		Option 3	
Cal Poly	2	49	Corcoran Irrigation District	Well 52	04/07/03	$15,948.00		Option 3	
Cal Poly	2	49	Corcoran Irrigation District	Well 53	04/07/03	$15,846.64		Option 1; 65% of Cost	
Cal Poly	2	50	Westlands WD	Unit 2@25R	04/17/03	$ 4,964.76		Option 3	
Cal Poly	2	50	Westlands WD	Unit 5@13RB	04/17/03	$ 3,921.42		Option 1; 65% of Cost	
Cal Poly	2	50	Westlands WD	Unit 3@17RC	04/17/03	$ 2,721.61		Option 3	
Cal Poly	2	50	Westlands WD	Unit 1@28RA	04/17/03	$16,812.80		Option 3	
Cal Poly	2	50	Westlands WD	Unit 5@30L	04/17/03	$ 6,518.14		Option 3	
Cal Poly	2	50	Westlands WD	Unit 3@16L	04/17/03	$ 1,570.43		Option 3	
Cal Poly	2	50	Westlands WD	Unit 2@27R	04/17/03	$16,967.80		Option 1; 65% of Cost	
Cal Poly	2	50	Westlands WD	Unit 1@22R	04/17/03	$ 7,520.87		Option 3	
Cal Poly	2	50	Westlands WD	Unit 2@1R4.01.0C	04/17/03	$ 6,564.19		Option 1; 65% of Cost	
Cal Poly	2	50	Westlands WD	Unit 2@20R	04/17/03	$ 3,282.28		Option 3	
Cal Poly	2	50	Westlands WD	Unit 5@26L	04/17/03	$ 6,378.45		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	51	Corcoran Irrigation District	Well 5	04/21/03	$13,207.00		Option 3	
Cal Poly	2	51	Corcoran Irrigation District	Well 62	04/21/03	$ 6,778.00		Option 3	
Cal Poly	2	52	James Irrigation District	C-79	04/24/03	$ 6,391.00		Option 1; 65% of Cost	
Cal Poly	2	52	James Irrigation District	C-86	10/23/03	$ 7,567.00		Option 3	
Cal Poly	2	53	Corcoran Irrigation District	Well 75	06/10/03	$12,821.48		Option 1; 65% of Cost	
Cal Poly	2	54	Westlands WD - Vasto Valle Farms	#107	Pre-Approved 8/4/03	$41,316.25		Option 3	
Cal Poly	2	55	Corcoran Irrigation District	Well 25	10/08/03	$20,960.00		Option 3	
Cal Poly	2	55	Corcoran Irrigation District	Well 41	10/08/03	$ 6,152.50		Option 3	
Cal Poly	2	56	RD 2037	Pump 1 South	Pre-Approved 10/20/03	$ 3,674.63		Option 3	
Cal Poly	2	56	RD 2037	Pump 4 West	Pre-Approved 10/20/03	$10,022.13		Option 3	
Cal Poly	2	56	RD 2037	Pump 2 West	Pre-Approved 10/20/03	$ 6,013.28		Option 3	
Cal Poly	2	57	RD 2040, Victoria Island Farms	Pump A	11/29/03	$ 7,924.44		Option 3	
Cal Poly	2	58	Corcoran Irrigation District	Well 12	11/13/03	$ 2,268.49		Option 1; 65% of Cost	
Cal Poly	2	58	Corcoran Irrigation District	Well 45	11/13/03	$12,267.03		Option 1; 65% of Cost	
Cal Poly	2	59	Corcoran Irrigation District	Well 44	11/21/03	$11,654.96		Option 1; 65% of Cost	
Cal Poly	2	59	Corcoran Irrigation District	Well 46	11/21/03	$10,153.12		Option 1; 65% of Cost	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	60	Natomas Central WC	Pump 2, Plant 8	11/21/03	$ 7,823.72		Option 3	
Cal Poly	2	60	Natomas Central WC	Pump 1, E Drain	11/21/03	$ 1,206.60		Option 3	
Cal Poly	2	60	Natomas Central WC	Pump 1, Plant 30	11/21/03	$ 2,282.09		Option 3	
Cal Poly	2	60	Natomas Central WC	Pump 4, Plant 30	11/21/03	$ 1,040.65		Option 1; 65% of Cost	
Cal Poly	2	61	Corcoran Irrigation District	Well 43	12/30/03	$10,937.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Alamo Pintado	12/31/03	$ 9,126.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Refugio 3	12/31/03	$ 1,934.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Well 18	12/31/03	$ 1,639.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Well 9	12/31/03	$ 3,012.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Mesa Verde #1	12/31/03	$ 4,720.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Mesa Verde #2	12/31/03	$ 3,071.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Mesa Verde #3	12/31/03	$ 3,463.00		Option 3	
Cal Poly	2	62	Santa Ynez WCD	Mesa Verde #4	12/31/03	$ 2,695.00		Option 3	
Cal Poly	2	63	City of Fresno Water Division	1	Pre-Approved 12/31/03	$ 9,750.00		Option 1; 65% of Cost	
Cal Poly	2	63	City of Fresno Water Division	2	Pre-Approved 12/31/03	$29,250.00		Option 1; 65% of Cost	
Cal Poly	2	63	City of Fresno Water Division	3	Pre-Approved 12/31/03	$16,910.00		Option 3	

Administrator	Cat.	Project #	Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
Cal Poly	2	63	City of Fresno Water Division	4	Pre-Approved 12/31/03	$ 9,750.00		Option 1; 65% of Cost	
Cal Poly	2	63	City of Fresno Water Division	5	Pre-Approved 12/31/03	$ 1,193.40		Option 3	
Cal Poly	2	63	City of Fresno Water Division	6	Pre-Approved 12/31/03	$ 9,375.00		Option 3	
Cal Poly	2	63	City of Fresno Water Division	7	Pre-Approved 12/31/03	$ 3,955.98		Option 3	
Cal Poly	2	63	City of Fresno Water Division	8	Pre-Approved 12/31/03	$ 8,061.50		Option 3	
Cal Poly	2	63	City of Fresno Water Division	9	Pre-Approved 12/31/03	$ 4,084.75		Option 3	
Cal Poly	2	63	City of Fresno Water Division	10	Pre-Approved 12/31/03	$19,500.00		Option 1; 65% of Cost	
Subotal of Cal Poly Cat. 2	319				Subtotal of grant payments	**$2,266,399.89**			
		Category 2 Pump Repair Projects from California State University, Fresno Foundation							
Administrator	**Cat.**	**Project #**	**Applicant or Irrigation District**	**Pump ID**	**Grant Status or Payment Date**	**Grant Payment**		**Grant Option**	
CSU, Fresno	2	02-0079-A	Darrell & Norma Cordova	E057394	11/08/01	$ 441.50		Option 3	
CSU, Fresno	2	02-0093-A	Robert & Violet McCorkle	R44532	11/05/01	$ 1,220.00		Option 3	
CSU, Fresno	2	02-0093-B	Robert & Violet McCorkle	R28003	11/05/01	$ 1,410.00		Option 3	
CSU, Fresno	2	02-0093-C	Robert & Violet McCorkle	R51257	11/05/01	$ 1,657.00		Option 3	
CSU, Fresno	2	02-0094-A	Ekizian Farms	732K-1870	10/30/01	$ 1,847.42		Option 3	
CSU, Fresno	2	02-0115-A	Shenandoah Vineyards	789R30	11/15/01	$ 375.00		Option 3	
CSU, Fresno	2	02-0117-A	J.G. Boswell	732-11180	06/06/02	$ 7,762.80		Option 3	
CSU, Fresno	2	02-0117-B	J.G. Boswell	8416-1846	06/06/02	$ 5,393.00		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0117-C	J.G. Boswell	645R57	06/06/02	$ 7,049.70		Option 3	
CSU, Fresno	2	02-0117-F	J.G. Boswell	84161791	02/06/02	$ 7,104.90		Option 3	
CSU, Fresno	2	02-0117-G	J.G. Boswell	Y7282590	02/12/03	$ 12,467.00		Option 3	
CSU, Fresno	2	02-0125-A	La Verne Nursery, Inc.	Y728-2153	12/06/02	$ 5,045.58		Option 3	
CSU, Fresno	2	02-0129-B	J.G. Boswell Company	8412-443		$ -		Option 3	
CSU, Fresno	2	02-0129-F	J.G. Boswell Company	91363T	07/31/02	$ 9,785.29		Option 3	
CSU, Fresno	2	02-0141-A	Gary Howard	51833R	05/09/02	$ 1,216.94		Option 1: 65% of Cost	
CSU, Fresno	2	02-0143-A	Paramount Farming Company	426-2R	10/08/04	$ 14,391.00		Option 3	
CSU, Fresno	2	02-0145-A	Cal- Clark Farms	7008R6	11/29/01	$ 4,971.00		Option 3	
CSU, Fresno	2	02-0147-A	Watson Ranch	490-76R	05/29/03	$ 9,840.83		Option 1: 65% of Cost	
CSU, Fresno	2	02-0150-A	Five Dot Land & Cattle Co.	55251092	07/22/02	$ 2,573.27		Option 2	
CSU, Fresno	2	02-0154-A	Den Dulk Farming Companies	318R43	09/18/02	$ 1,781.52		Option 1: 65% of Cost	
CSU, Fresno	2	02-163-A	Cal- Clark Farms	14R303	12/12/01	$ 452.18			
CSU, Fresno	2	02-0164-A	Five Dot Land & Cattle Co.	64753425	07/22/02	$ 5,038.22		Option 1: 65% of Cost	
CSU, Fresno	2	02-0165-A	Five Dot Land & Cattle Co.	19908160	07/22/02	$ 3,153.48		Option 1: 65% of Cost	
CSU, Fresno	2	02-0166-A	Five Dot Land & Cattle Co.	19908173	07/22/02	$ 3,352.25		Option 3	
CSU, Fresno	2	02-0168-A	Bob Ennen	R97642	11/26/02	$ 873.80		Option 3	
CSU, Fresno	2	02-0169-A	Don Pedro Pump		11/20/01	$ 2,443.00		Option 3	
CSU, Fresno	2	02-0170-A	Al Sebasto - 4712T3	4712T3	06/16/03	$ 272.63		Option 3	
CSU, Fresno	2	02-0174-A	Braden Farms Inc.	E0502278		$ 2,472.00		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0175-A	Braden Farms Inc.	R12090	02/06/02	$ 8,029.96		Option 3	
CSU, Fresno	2	02-0176-A	Brian's Ranch	2T1921	11/04/02	$ 2,344.50		Option 1: 65% of Cost	
CSU, Fresno	2	02-0178-A	South Valley Farms	R28-588	03/20/02	$ 10,402.00		Option 3	
CSU, Fresno	2	02-0179-A	Kirschenmann Farms	0568R2	01/18/02	$ 6,127.00		Option 3	
CSU, Fresno	2	02-0180-A	Mr. R.J. Christensen	EO53738	10/28/02	$ 638.07		Option 3	
CSU, Fresno	2	02-0184-A	Gallo Vinyards Inc.	2587R0	06/25/02	$ 5,722.00		Option 3	
CSU, Fresno	2	02-0187-A	D.W. KETCHER TRUST	R51630	12/21/01	$ 526.00		Option 3	
CSU, Fresno	2	02-0190-A	Duinkerken Farms	627R98	05/27/03	$ 667.08		Option 2	
CSU, Fresno	2	02-0192-A	Spomer & Sons Turkeys	8057T4	01/18/02	$ 2,352.00		Option 2	
CSU, Fresno	2	02-0193-A	Sierra Vista Ranches	6963R8	02/06/02	$ 765.85		Option 3	
CSU, Fresno	2	02-0199-A	Stone Fruit Farming	R31189	04/02/02	$ 1,086.00		Option 1: 65% of Cost	
CSU, Fresno	2	02-0202-A	Joseph Fontes	R42163	01/10/01	$ 432.88		Option 3	
CSU, Fresno	2	02-0203-A	MARTHEDAL FARMS	R09519	05/10/02	$ 1,323.08			
CSU, Fresno	2	02-0205-A	Cedric Kleinhans	Y278-3727	01/18/02	$ 1,042.70		Option 3	
CSU, Fresno	2	02-0206-A	Self-Realization Fellowship	1661088	01/03/02	$ 632.26		Option 3	
CSU, Fresno	2	02-0210-A	Double "G" Farms	7401R0	05/29/03	$ 3,493.80		Option 3	
CSU, Fresno	2	02-0211-A	Castle Farms Inc.	4894R4	01/14/02	$ 9,074.82		Option 3	
CSU, Fresno	2	02-0212-A	A&R Farms	03560R	01/02/02	$ 1,849.27		Option 3	
CSU, Fresno	2	02-0213-A	DeJager Farms North	59R518	01/18/02	$ 8,122.00		Option 3	
CSU, Fresno	2	02-0214-A	D&T Farms	25305R	01/02/02	$ 5,644.00		Option 3	
CSU, Fresno	2	02-0215-A	DeJager Farms North	40926R	01/02/02	$ 4,422.80		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0216-A	Robert E. Saak	33-4597	04/02/02	$ 992.25		Option 3	
CSU, Fresno	2	02-0220-A	Alamo West	R08400	06/12/03	$ 6,996.54			
CSU, Fresno	2	02-0221-A	Silver Creek Ranch	626R16	01/31/02	$ 7,096.00		Option 3	
CSU, Fresno	2	02-0222-A	Marvin Vespermann	27292-R	02/22/02	$ 1,228.40		Option 3	
CSU, Fresno	2	02-0224-A	Schechert Ranches	551-79-653	03/18/02	$ 133.12		Option 3	
CSU, Fresno	2	02-0229-A	Double Diamond Dairy	223R30	04/02/02	$ 3,408.50		Option 3	
CSU, Fresno	2	02-0231-A	Santa Maria Berry Farms	51857R	06/04/02	$ 7,690.58		Option 1: 65% of Cost	
CSU, Fresno	2	02-0233-A	JC Adams Ranch 1	94T951	01/07/02	$ 212.10		Option 3	
CSU, Fresno	2	02-0236-A	Harley Handel	215R11	03/08/02	$ 775.70		Option 1: 65% of Cost	
CSU, Fresno	2	02-0238-A	De Jager Farms North	6856R0	04/02/02	$ 2,835.50		Option 3	
CSU, Fresno	2	02-0240-A	Ben Nydam	R93528	11/14/03	$ 232.65		Option 2	
CSU, Fresno	2	02-0242-A	Laguna Farm	47495T	01/21/02	$ 2,002.43		Option 1: 65% of Cost	
CSU, Fresno	2	02-0243-A	Citrus Ranch	815-3039	06/06/02	$ 899.00		Option 3	
CSU, Fresno	2	02-0247-A	Rancho Alexander	R37327	04/05/02	$ 5,188.00		Option 3	
CSU, Fresno	2	02-0248-A	Douglas McRee	58R907	04/02/02	$ 1,215.50		Option 3	
CSU, Fresno	2	02-0252-A	John P. Satragni	R97722	01/18/02	$ 2,036.53		Option 3	
CSU, Fresno	2	02-0253-A	Double Diamond Dairy	067R96	04/17/03	$ 2,497.00		Option 3	
CSU, Fresno	2	02-0254-A	Tracy Ranch, Inc.	7122R0	09/11/02	$ 9,301.29		Option 3	
CSU, Fresno	2	02-0256-A	Gian S Bhangu	402R19	03/25/02	$ 1,423.45		Option 3	
CSU, Fresno	2	02-0257-A	Vlot Brothers	84R126	01/31/02	$ 7,752.92		Option 3	
CSU, Fresno	2	02-0258-A	Fawcett Farms Inc	99R517	02/20/02	$ 999.27		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0259-A	Red Top Jersey's LLC	R42751	04/05/02	$ 4,273.25		Option 3	
CSU, Fresno	2	02-0260-A	AG SOD FARMS	732-3850	05/06/02	$ 3,274.24		Option 1: 65% of Cost	
CSU, Fresno	2	02-0261-A	A-G Sod Farms Inc.	732-6416	05/06/02	$ 3,489.56		Option 1: 65% of Cost	
CSU, Fresno	2	02-0262-A	A-G SOD FARMS INC.	732K-1857	04/19/02	$ 2,925.36		Option 1: 65% of Cost	
CSU, Fresno	2	02-0263-A	A-G SOD FARMS INC.	732-5927	04/19/02	$ 3,547.87		Option 1: 65% of Cost	
CSU, Fresno	2	02-0264-A	A-G SOD FARMS INC.		04/19/02	$ 2,894.45		Option 1: 65% of Cost	
CSU, Fresno	2	02-0265-A	A-G SOD FARMS INC.	732-08313	04/19/02	$ 2,827.08		Option 1: 65% of Cost	
CSU, Fresno	2	02-0266-A	A-G SOD FARMS INC.	732-6166	04/19/02	$ 996.74		Option 3	
CSU, Fresno	2	02-0267-A	A-G SOD FARMS INC.	732-10178	04/19/02	$ 791.20		Option 1: 65% of Cost	
CSU, Fresno	2	02-0268-A	A-G SOD FARMS INC.	732-10490	04/19/02	$ 984.60		Option 3	
CSU, Fresno	2	02-0271-A	Seasholtz Farms	R37314	08/25/04	$ 2,389.00		Option 3	
CSU, Fresno	2	02-0272-A	DeJager Farms North	5060R2	04/15/02	$ 2,767.25		Option 3	
CSU, Fresno	2	02-0273-A	DeJager Farms North	43325R	04/05/02	$ 2,935.12		Option 3	
CSU, Fresno	2	02-0274-A	DeJager Farms North	43384R	02/20/02	$ 1,514.82		Option 3	
CSU, Fresno	2	02-0275-A	DeJager Farms North	R39509	04/02/02	$ 4,177.15		Option 3	
CSU, Fresno	2	02-0276-A	James C. Roberts, Inc.	1572607	02/12/02	$ 2,421.48		Option 3	
CSU, Fresno	2	02-0278-A	DeJager Farms North	99R662	03/19/02	$ 1,324.52		Option 3	
CSU, Fresno	2	02-0279-A	Coburn Ranch	151431001	01/24/03	$ 28,493.96		Option 1: 65% of Cost	
CSU, Fresno	2	02-0280-A	Tracy Ranch Inc.	065939	03/20/02	$ 3,807.48		Option 1: 65% of Cost	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0281-A	Tracy Ranch Inc.	6899R0	03/20/02	$ 4,559.46		Option 1: 65% of Cost	
CSU, Fresno	2	02-0282-A	Tracy Ranch	R71984	03/20/02	$ 3,269.99		Option 1: 65% of Cost	
CSU, Fresno	2	02-0283-A	Riverview Ranches	40802R	10/21/02	$ 3,231.02		Option 3	
CSU, Fresno	2	02-0284-A	A&P Growers	44205R	01/31/02	$ 2,383.40		Option 2	
CSU, Fresno	2	02-0285-A	Zanker Brothers	33347	04/05/02	$ 1,263.78		Option 1: 65% of Cost	
CSU, Fresno	2	02-0286-A	Zanker Brothers	71980	04/05/02	$ 850.67		Option 1: 65% of Cost	
CSU, Fresno	2	02-0288-A	D&T Farms	92915R	04/02/02	$ 3,250.30		Option 3	
CSU, Fresno	2	02-0290-A	Castle Farms Inc.	621R44	04/05/02	$ 4,498.79		Option 3	
CSU, Fresno	2	02-0291-A	DeJager Farms North	R04262	04/18/02	$ 3,538.00		Option 3	
CSU, Fresno	2	02-0292-A	DeJager Farms North	R40347	04/16/03	$ 2,949.88		Option 3	
CSU, Fresno	2	02-0293-A	DeJager Farms North	9534R2	04/05/02	$ 3,756.75		Option 3	
CSU, Fresno	2	02-0294-A	De Jager Farms North	43360R	04/16/02	$ 2,128.22		Option 3	
CSU, Fresno	2	02-0295-A	DeJager Farms North	43318R	04/15/02	$ 2,368.00		Option 3	
CSU, Fresno	2	02-0296-A	DeJager Farms North	32483R	09/02/03	$ 1,162.48		Option 3	
CSU, Fresno	2	02-0297-A	Four Star Fruit, Inc.	92312R	08/13/03	$ 947.93		Option 3	
CSU, Fresno	2	02-0298-A	Four Star Fruit, Inc.	X18438	09/02/03	$ 61.73		Option 1: 65% of Cost	
CSU, Fresno	2	02-0299-A	Riverview Ranches	R69951	10/23/02	$ 4,942.13		Option 1: 65% of Cost	
CSU, Fresno	2	02-0301-A	Riverview Ranches	36993R	10/21/02	$ 708.25		Option 3	
CSU, Fresno	2	02-0303-A	Albert Rossini LTD	1038R6	06/05/02	$ 1,634.76		Option 3	
CSU, Fresno	2	02-0305-A	Linda G. Young	49351R	07/31/02	$ 113.33		Option 3	

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CSU, Fresno	2	02-0306-A	Cauzza Brothers Farms	R29245	04/18/02	$ 13,127.29		Option 1: 65% of Cost	
CSU, Fresno	2	02-0307-A	Odie Huckabay	641R41	09/02/03	$ 1,784.99		Option 2	
CSU, Fresno	2	02-0308-A	Dimare Company	AQ523-104DKS	10/30/02	$ 4,012.50		Option 3	
CSU, Fresno	2	02-310-A	Ron Samuelson	657R12	07/28/03	$ 1,548.75		Option 3	
CSU, Fresno	2	02-311-A	James Ranch	R42639	05/06/02	$ 1,621.03		Option 3	
CSU, Fresno	2	02-0314-A	Kenneth Hajek	8252R8	03/28/02	$ 650.50		Option 1: 65% of Cost	
CSU, Fresno	2	02-0316-A	DeWitt Senter	17R897	03/07/03	$ 228.23		Option 2	
CSU, Fresno	2	02-0319-A	Riverview Ranches	R40100	10/23/02	$ 3,170.92		Option 1: 65% of Cost	
CSU, Fresno	2	02-0320-A	A & P Growers	646R14	04/02/02	$ 1,864.72		Option 3	
CSU, Fresno	2	02-0321-A	A & P Growers	82R026	04/02/02	$ 1,665.59		Option 3	
CSU, Fresno	2	02-0322-A	Kehar Grill	R39648	04/05/02	$ 718.20		Option 3	
CSU, Fresno	2	02-0323-A	San Felipe Ranch	60R827	05/24/02	$ 3,956.03		Option 3	
CSU, Fresno	2	02-0324-A	San Felipe Ranch	59R176	05/17/02	$ 4,376.79		Option 3	
CSU, Fresno	2	02-0325-A	San Felipe Ranch	5479R2	05/17/02	$ 5,080.75		Option 3	
CSU, Fresno	2	02-0326-A	Oliras & Stewart	5064R4	04/02/02	$ 5,667.13		Option 1: 65% of Cost	
CSU, Fresno	2	02-0327-A	Crooked Creek Ranch	E732M-000074	05/13/03	$ 4,520.00		Option 1: 65% of Cost	
CSU, Fresno	2	02-0329-A	B & H Farms	6514R8	05/22/02	$ 994.68		Option 3	
CSU, Fresno	2	02-0331-A	DeJager Farms	43315R	10/20/04	$ 5,120.43		Option 3	
CSU, Fresno	2	02-0332-A	DeJager Farms	99R402	05/24/02	$ 2,108.65		Option 3	
CSU, Fresno	2	02-0333-A	M&C Farms	R72029	05/09/02	$ 5,438.00		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0334-A	Dennis Elam	10R657	05/31/02	$ 3,859.70		Option 1: 65% of Cost	
CSU, Fresno	2	02-0334-B	Dennis Elam	10R657	05/31/02	$ 3,859.70		Option 1: 65% of Cost	
CSU, Fresno	2	02-0335-A	Bernett/Wagner Farming	36608	04/05/02	$ 2,708.00		Option 3	
CSU, Fresno	2	02-0336-A	Jimi Valov	R97-456	05/27/03	$ 4,250.00		Option 1: 65% of Cost	
CSU, Fresno	2	02-337-A	Adam Blas	767T37	03/06/03	$ 428.95		Option 3	
CSU, Fresno	2	02-338-A	Douglas H. King/KMG & King Ranch	332-006430	03/22/03	$ 1,177.00		Option 3	
CSU, Fresno	2	02-0339-A	Riverview Ranches	7404R6	10/24/02	$ 2,440.23		Option 3	
CSU, Fresno	2	02-0341-A	Golden State Vintners	R28377	05/24/02	$ 8,135.00		Option 3	
CSU, Fresno	2	02-0342-A	TJM Thomsen Farms	171615N01	04/05/02	$ 8,522.48		Option 3	
CSU, Fresno	2	02-0343-A	Double Diamnond Dairy	223R3	03/01/02	$ 3,408.50		Option 3	
CSU, Fresno	2	02-0344-A	WP Roduner Cattle	6843R8	03/01/02	$ 3,788.75		Option 3	
CSU, Fresno	2	02-0347-A	Slenders Dairy	R37908	04/29/02	$ 6,770.07		Option 1: 65% of Cost	
CSU, Fresno	2	02-0354-A	Section 32 Partnership	732K001849	03/15/02	$ 301.80		Option 1: 65% of Cost	
CSU, Fresno	2	02-0356-A	Robert H. Astone	100R80	01/07/04	$ 791.58		Option 1: 65% of Cost	
CSU, Fresno	2	02-0360-A	WM Brad McCord	057R23	03/25/02	$ 250.63		Option 3	
CSU, Fresno	2	02-0361-A	Kendall Farms	01029551	04/24/02	$ 3,775.19		Option 1: 65% of Cost	
CSU, Fresno	2	02-0363-A	Valov & Sons Farming	04R506	10/04/04	$ 4,462.26		Option 1: 65% of Cost	
CSU, Fresno	2	02-0364-A	Valov & Sons Farming	229R40	10/04/04	$ 6,064.61		Option 1: 65% of Cost	

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CSU, Fresno	2	02-0365-A	B & H Farms	0464R0	08/20/03	$ 695.27		Option 1: 65% of Cost	
CSU, Fresno	2	02-0366-A	Philip Verwey Farms	R55256	08/19/02	$ 4,890.00		Option 3	
CSU, Fresno	2	02-0369-A	Mateus M. Evangelho	724M-14	06/17/02	$ 4,264.92		Option 1: 65% of Cost	
CSU, Fresno	2	02-0370-A	Mateus M. Evengelho	23-13626	06/17/02	$ 1,681.25		Option 3	
CSU, Fresno	2	02-0371-A	South Valley Famrs	52018R	05/28/02	$ 2,099.65		Option 3	
CSU, Fresno	2	02-0373-A	Ritter & Goode	P729-8107	05/29/03	$ 13,098.67		Option 3	
CSU, Fresno	2	02-0374-A	Clark Brothers # 16	R55245	06/30/03	$ 2,547.75		Option 3	
CSU, Fresno	2	02-0375-A	Ron Rink	118-2924	12/22/03	$ 2,444.68		Option 3	
CSU, Fresno	2	02-0377-A	Tiera Rejada Ranch LLC	32-9134	05/20/02	$ 2,250.00		Option 3	
CSU, Fresno	2	02-0381-A	Coalinga Pistacchio LLC	4810T7	05/29/03	$ 1,648.53		Option 1: 65% of Cost	
CSU, Fresno	2	02-0384-A	Errotabere Ranches	1819R2	06/11/03	$ 4,159.95		Option 3	
CSU, Fresno	2	02-0385-A	Oasis Ranch Management	01464360	09/02/03	$ 6,754.15		Option 3	
CSU, Fresno	2	02-387-A	Venida Packing Co.	SY28-676	04/17/02	$ 866.00		Option 3	
CSU, Fresno	2	02-0388-A	Pacific Earth Resources	41060R	07/28/03	$ 994.58		Option 2	
CSU, Fresno	2	02-0389-A	Pacific Earth Resources	51707R	04/08/02	$ 7,387.36		Option 1: 65% of Cost	
CSU, Fresno	2	02-0394-A	Mary Gomes Dairy	36266R	05/27/03	$ 3,457.60		Option 3	
CSU, Fresno	2	02-0395-A	Mary Gomes Dairy	5469R6	05/27/03	$ 6,710.26		Option 3	
CSU, Fresno	2	02-0398-A	Hidden Valley Dairy	E034643	04/12/02	$ 1,567.75		Option 3	
CSU, Fresno	2	02-0399-A	Ebi Fiorini	54R993	08/20/03	$ 1,022.05		Option 3	
CSU, Fresno	2	02-0400-A	Dewit Dairy	R07720	04/29/02	$ 1,404.58		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0401-A	Farmland Management Services	84R120	08/27/02	$ 2,208.80		Option 1: 65% of Cost	
CSU, Fresno	2	02-0403-A	John Totoian	T23362	04/17/02	$ 312.25		Option 3	
CSU, Fresno	2	02-0406-A	Nakayama Farms	R93498	06/23/03	$ 365.18		Option 3	
CSU, Fresno	2	02-0407-A	Grimway Enterprises Inc.	52305T	05/02/02	$ 3,116.00		Option 3	
CSU, Fresno	2	02-0408-A	Chapman Farms III	40992R	07/02/02	$ 2,359.15		Option 3	
CSU, Fresno	2	02-0408-B	Chapman Farms III	0050R9	09/04/02	$ 5,120.31		Option 1: 65% of Cost	
CSU, Fresno	2	02-0408-C	Chapman Farms III	R71144	07/02/02	$ 2,115.22		Option 1: 65% of Cost	
CSU, Fresno	2	02-0410-A	Harmon & Sons	43178R	05/17/02	$ 2,637.63		Option 3	
CSU, Fresno	2	02-0411-A	California Valley Land Co.	X20602	05/14/02	$ 7,850.00		Option 3	
CSU, Fresno	2	02-0413-A	McDevitt Ranch	60R644	07/02/02	$ 2,438.00		Option 3	
CSU, Fresno	2	02-0414-A	D. Podesta Ranch	58R099	07/02/02	$ 904.20		Option 3	
CSU, Fresno	2	02-0418-A	Coastal Valley Management	3516R9	05/01/02	$ 3,899.87		Option 2	
CSU, Fresno	2	02-0419-A	Coastal Valley Management	2930R3	05/01/02	$ 1,120.40		Option 2	
CSU, Fresno	2	02-0420-A	Coastal Valley Management	3515R6	05/01/02	$ 2,246.09		Option 2	
CSU, Fresno	2	02-0423-A	Thoring and Williams	R12152	09/02/03	$ 2,761.88		Option 3	
CSU, Fresno	2	02-0424-A	Dotta Farms	R98971	05/30/03	$ 1,225.08		Option 3	
CSU, Fresno	2	02-0426-A	Tri-Boro Fruit Co. Inc.	R51224	05/06/02	$ 312.10		Option 3	
CSU, Fresno	2	02-0427-A	David Torigiani Farms	43602R	06/07/02	$ 2,153.18		Option 3	
CSU, Fresno	2	02-0429-A	Ken Lam	81546T	05/16/02	$ 200.00		Option 3	
CSU, Fresno	2	02-0430-A	Delta Pump	14R111	05/22/02	$ 1,180.00		Option 3	
CSU, Fresno	2	02-0431-A	Simpson Farm Co.	58R926	07/03/02	$ 3,557.92		Option 1: 65% of Cost	

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CSU, Fresno	2	02-0432-A	Griffen Ranch	9988R0	12/22/03	$ 9,040.43		Option 3	
CSU, Fresno	2	02-0434-A	Rynsburger Dairy	382-000617	07/11/03	$ 1,286.43		Option 1: 65% of Cost	
CSU, Fresno	2	02-0437-A	F & B Ranches	R05496	05/09/02	$ 3,403.19		Option 3	
CSU, Fresno	2	02-0438-A	LV Ranch	732K-2077	07/03/02	$ 6,304.40		Option 1: 65% of Cost	
CSU, Fresno	2	02-0439-A	Hillview Dairy	R04793	05/15/02	$ 3,931.00		Option 3	
CSU, Fresno	2	02-0440-A	John W. Jost	9253	11/18/02	$ 5,039.24		Option 1: 65% of Cost	
CSU, Fresno	2	02-0441-A	John Jost	6620	10/09/02	$ 2,019.92		Option 1: 65% of Cost	
CSU, Fresno	2	02-0442-A	Dennis Pecarovich	R40520	07/03/02	$ 1,121.40		Option 1: 65% of Cost	
CSU, Fresno	2	02-0443-A	California Valley Land Co.	R93037	08/27/03	$ 8,517.49		Option 3	
CSU, Fresno	2	02-0444-A	H.B. Orchard Co., Inc.	33602R	07/19/02	$ 2,030.85		Option 3	
CSU, Fresno	2	02-0447-A	Singh Malhi Sukhminder	0935802-5	07/02/02	$ 108.55		Option 1: 65% of Cost	
CSU, Fresno	2	02-0448-A	David Allan (Ranches)	2835	05/30/02	$ 3,579.55		Option 3	
CSU, Fresno	2	02-0450-A	Larry Shehady Farms Ltd.	650R23	10/02/02	$ 7,079.70		Option 3	
CSU, Fresno	2	02-0451-A	Bar 20 Partners Ltd.	R06337	10/03/02	$ 4,408.69		Option 1: 65% of Cost	
CSU, Fresno	2	02-0452-A	Bar 20 Partner Ltd.	42831T	10/03/02	$ 3,131.20		Option 3	
CSU, Fresno	2	02-0454-A	Diepersloot Ranch	R28350	05/30/02	$ 4,252.00		Option 3	
CSU, Fresno	2	02-0455-A	Diepersloot Ranch	R27146	05/30/02	$ 2,665.08		Option 3	
CSU, Fresno	2	02-0456-A	Diepersloot Ranch	R27090	05/30/02	$ 3,060.83		Option 3	
CSU, Fresno	2	02-0457-A	Diepersloot Ranch	R28458	05/30/02	$ 3,223.00		Option 3	

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CSU, Fresno	2	02-0458-A	Diepersloot Ranch	R28363	05/30/02	$ 4,869.00		Option 3	
CSU, Fresno	2	02-0459-A	Diepersloot Ranch	R53070	05/30/02	$ 972.33		Option 3	
CSU, Fresno	2	02-0462-A	DeBenedetto Ag	0610R1	02/19/03	$ 4,241.48		Option 3	
CSU, Fresno	2	02-0464-A	Mendrin Trust Agreement	202T21	09/02/03	$ 1,163.94		Option 2	
CSU, Fresno	2	02-0466-A	Oakdale Farms	25581R	07/08/03	$ 2,992.83		Option 3	
CSU, Fresno	2	02-0467-A	Dan Dentoni	R54067	07/28/03	$ 1,331.88		Option 1: 65% of Cost	
CSU, Fresno	2	02-0472-A	David Kendall	1161062	07/28/03	$ 2,310.14		Option 2	
CSU, Fresno	2	02-0475-A	JP Farms	8412-252	09/25/02	$ 5,806.98		Option 1: 65% of Cost	
CSU, Fresno	2	02-0476-A	Arvance Turkey Ranch Inc.	28222T	06/26/02	$ 1,337.00		Option 3	
CSU, Fresno	2	02-0478-A	R & B Enterprises	07R501	08/01/02	$ 823.80		Option 1: 65% of Cost	
CSU, Fresno	2	02-0482-A	Batth & Mahil Farms	69122T	07/19/02	$ 3,903.00		Option 3	
CSU, Fresno	2	02-0483-A	Paramount Citrus	R99699	07/02/02	$ 4,379.08		Option 1: 65% of Cost	
CSU, Fresno	2	02-0485-A	Guthrie Farming Co.	113-7693		$ 2,339.33		Option 1: 65% of Cost	
CSU, Fresno	2	02-0486-A	Mike Hospenthal	317324	09/09/04	$ 712.24		Option 1: 65% of Cost	
CSU, Fresno	2	02-0487-A	South Valley Farms	628R13	07/28/03	$ 3,565.79		Option 3	
CSU, Fresno	2	02-0490-A	Carleton Properties	7146R2	09/23/02	$ 4,132.06		Option 1: 65% of Cost	
CSU, Fresno	2	02-0492-A	Sumner Peck Ranch, Inc.	3242R6	01/22/03	$ 4,298.00		Option 1: 65% of Cost	
CSU, Fresno	2	02-0495-A	Kenneth Lasiter	4673R9	09/03/02	$ 1,360.82		Option 3	
CSU, Fresno	2	02-0496-A	Garden Grove Ranch Trust	732-10824	12/22/03	$ 1,450.40		Option 1: 65% of Cost	

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CSU, Fresno	2	02-0497-A	Garden Grove Ranch Trust	724-16316	09/02/03	$ 270.40		Option 3	
CSU, Fresno	2	02-0501-A	Santa Barbara Farms LLC	R97523	07/24/02	$ 5,590.00		Option 1: 65% of Cost	
CSU, Fresno	2	02-0502-A	Santa Barbara Farms LLC	33180R	07/24/02	$ 3,555.19		Option 1: 65% of Cost	
CSU, Fresno	2	02-0505-A	Four Star Dairy	6962R1	08/01/02	$ 4,299.97		Option 1: 65% of Cost	
CSU, Fresno	2	02-0506-A	Charlotte Saroyan	17R879	08/07/02	$ 284.98		Option 1: 65% of Cost	
CSU, Fresno	2	02-0507-A	Joe Lewis		07/28/03	$ 703.79		Option 1: 65% of Cost	
CSU, Fresno	2	02-0509-A	Jon Caywood, Jerrold Olivera	5254R9	08/27/02	$ 8,583.63		Option 3	
CSU, Fresno	2	02-0510-A	M. Curti and Sons	R06777	08/09/02	$ 7,174.23		Option 3	
CSU, Fresno	2	02-0511-A	Brooks Farms IV	X46113	01/22/03	$ 24,990.11		Option 1: 65% of Cost	
CSU, Fresno	2	02-0515-A	Ron Rink	0378-002253	09/25/02	$ 715.95		Option 3	
CSU, Fresno	2	02-0517-A	42836R	Grimmway Enterprises Inc.	09/20/02	$ 6,897.98		Option 3	
CSU, Fresno	2	02-0518-A	Braden Farms	3606R7	09/17/02	$ 3,936.00		Option 3	
CSU, Fresno	2	02-0520-A	CJ & T ITO Farms	0171R9	10/24/02	$ 14,986.00		Option 3	
CSU, Fresno	2	02-0523-A	Betteravia Farms	9913R2	10/30/02	$ 4,404.62		Option 3	
CSU, Fresno	2	02-0524-A	Betteravia Farms	86R182	10/28/02	$ 3,454.29		Option 1: 65% of Cost	
CSU, Fresno	2	02-0528-A	Errotabere Ranches	R37502	09/25/02	$ 10,405.43		Option 3	
CSU, Fresno	2	02-0529-A	Watson Ag Chemicals	61529T	09/11/02	$ 1,497.73		Option 3	
CSU, Fresno	2	02-0531-A	Nishihara Farms	E029388	09/23/02	$ 1,434.75		Option 3	
CSU, Fresno	2	02-0534-A	Espinola Family Trust of 1990	32844R	10/16/02	$ 2,293.00		Option 3	

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CSU, Fresno	2	02-0535-A	Vlot Brothers	0086R5	12/09/02	$ 2,644.00		Option 3	
CSU, Fresno	2	02-0536-A	Wagner Dairy	R29377	09/17/02	$ 3,142.32		Option 3	
CSU, Fresno	2	02-0537-A	Lyons Investments	1398	02/19/03	$ 1,866.83		Option 3	
CSU, Fresno	2	02-0540-A	Viking Ranches	1353442	10/16/02	$ 2,823.00		Option 3	
CSU, Fresno	2	02-0541-A	Grimmway Enterprises, Inc.	57R698	11/08/02	$ 3,502.00		Option 3	
CSU, Fresno	2	02-0542-A	Johnny Romeri	R97960	05/27/03	$ 6,931.61		Option 1: 65% of Cost	
CSU, Fresno	2	02-0543-A	Alamo Farming Co	89R239	11/22/02	$ 8,026.61		Option 3	
CSU, Fresno	2	02-0544-A	Kevin Herman	3645R7	02/05/03	$ 5,420.75		Option 3	
CSU, Fresno	2	02-0545-A	William Bristow	PL13649	11/18/02	$ 3,185.94		Option 3	
CSU, Fresno	2	02-0546-A	Setter Farms	03R645	11/19/02	$ 6,546.99		Option 3	
CSU, Fresno	2	02-0547	Hadley Farms	055R13	08/13/03	$ 3,467.18		Option 1: 65% of Cost	
CSU, Fresno	2	02-0548-A	Setter Farms	R94897	02/24/03	$ 8,265.00		Option 3	
CSU, Fresno	2	02-0550-A	Costamagna Farms 4	X06730	10/18/03	$ 13,256.76		Option 3	
CSU, Fresno	2	02-0551-A	Palms Ranch	1031330	12/22/03	$ 690.17		Option 3	
CSU, Fresno	2	02-0552-A	Costamagna Farms 4	R52344	09/19/03	$ 449.06		Option 3	
CSU, Fresno	2	02-0554-A	Flint Dairy	59R155	03/06/03	$ 6,165.53		Option 1: 65% of Cost	
CSU, Fresno	2	02-0555-A	Mike L. Rego	93636R	10/24/02	$ 1,120.65		Option 3	
CSU, Fresno	2	02-0556-A	Mike L. Rego	21508T	10/24/02	$ 1,255.50		Option 3	
CSU, Fresno	2	02-0558-A	Gretta Vallerga	R09220	11/18/02	$ 1,293.85		Option 3	
CSU, Fresno	2	02-0559-A	Premier Ag Products and Services	21508T	07/09/03	$ 2,458.18		Option 3	
CSU, Fresno	2	02-0560-A	P-R Farms	5876R4	12/11/02	$ 5,556.00		Option 3	

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CSU, Fresno	2	02-0561-A	P-R Farms	9904R6	12/11/02	$ 5,941.00		Option 3	
CSU, Fresno	2	02-0563-A	Bright's Nursery	55R021	11/01/02	$ 1,713.86		Option 1: 65% of Cost	
CSU, Fresno	2	02-0564-A	Roberti Ranch	22793379	01/24/03	$ 4,002.93		Option 3	
CSU, Fresno	2	02-0565-A	Roberti Ranch	22793376	02/19/03	$ 3,800.68		Option 3	
CSU, Fresno	2	02-0566-A	Fortune Farms #6	625R72	04/16/03	$ 11,982.00		Option 3	
CSU, Fresno	2	02-0567-A	P-R Farms, Inc.	4323R4	12/11/02	$ 6,513.00		Option 3	
CSU, Fresno	2	02-0568-A	Deiner Water Company, LLC	R36849	07/29/03	$ 7,813.53		Option 3	
CSU, Fresno	2	02-0569-A	Deiner Water Company, LLC	87290T	07/29/03	$ 5,736.00		Option 3	
CSU, Fresno	2	02-0570-A	Bill Strohm	4180178	04/21/03	$ 6,528.00		Option 3	
CSU, Fresno	2	02-0571-A	G. Oberti & Sons	26R084	11/27/02	$ 4,785.12		Option 3	
CSU, Fresno	2	02-0572-A	Vista Avenue Pistacchio Orchards	094R46	02/28/03	$ 6,031.07		Option 3	
CSU, Fresno	2	02-0573-A	Diamond Farming Company	93121T	01/21/03	$ 4,404.00		Option 3	
CSU, Fresno	2	02-0574-A	Diamond Farming Company	5138R0	02/19/03	$ 10,004.15		Option 3	
CSU, Fresno	2	02-0575-A	Gerawan Farming Partners	R40384	11/19/02	$ 3,823.30		Option 3	
CSU, Fresno	2	02-0576-A	Gerewan Farming Partners, Inc.	R39848	11/19/02	$ 2,172.75		Option 3	
CSU, Fresno	2	02-0577-A	Gerawan Farming Partners, Inc.	04R526	11/19/02	$ 1,267.75		Option 3	
CSU, Fresno	2	02-0578-A	San Felipe Ranch	53R835	02/28/03	$ 3,500.15		Option 3	
CSU, Fresno	2	02-0581-A	Castle Farms Inc.	02336R	02/19/03	$ 6,196.58		Option 3	
CSU, Fresno	2	02-582-A	South Valley Farms	R04-185	07/13/04	$ 9,488.00		Option 3	
CSU, Fresno	2	02-585-A	Cagliero Ranches, Inc.	R79351	12/20/02	$ 343.00		Option 3	
CSU, Fresno	2	02-586-A	Cagliero Ranches, Inc.	58777T	12/20/02	$ 1,913.03		Option 3	
CSU, Fresno	2	02-589-A	Cagliero Ranches, Inc.	R08316	01/06/03	$ 416.77		Option 3	

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CSU, Fresno	2	02-590-A	Cagliero Ranches, Inc.		01/13/03	$ 1,934.13		Option 3	
CSU, Fresno	2	02-591-A	Cagliero Ranches, Inc.	33065R	12/20/02	$ 456.85		Option 3	
CSU, Fresno	2	02-0593-A	Richard Allen	R45063	07/30/03	$ 1,013.55		Option 3	
CSU, Fresno	2	02-594-A	Cory Vineyards	0T0905	01/13/03	$ 135.40		Option 3	
CSU, Fresno	2	02-596-A	3-Way Vineyard	89R037	01/13/03	$ 2,126.25		Option 3	
CSU, Fresno	2	02-0597-A	Harris Farms, Inc.	616R44	01/13/03	$ 24,583.91		Option 1: 65% of Cost	
CSU, Fresno	2	02-598-A	John D. Coelho	9251R6	02/07/03	$ 22,278.20		Option 3	
CSU, Fresno	2	02-0599-A	Simonian Farming Co.	1852R0	02/19/03	$ 593.04		Option 1: 65% of Cost	
CSU, Fresno	2	02-0602-A	Simonian Farming Co.	100R83	02/20/03	$ 564.53		Option 3	
CSU, Fresno	2	02-0603-A	Handel + Wilson Farms	94185T	01/15/03	$ 6,537.00		Option 3	
CSU, Fresno	2	02-0604-A	Junction Farms	32-007438	01/28/03	$ 2,706.57		Option 1: 65% of Cost	
CSU, Fresno	2	02-0605-A	Worth Farms	60R346	01/16/03	$ 6,988.00		Option 3	
CSU, Fresno	2	02-0606-A	De Jager Farms North	6454R7	04/16/03	$ 2,999.65		Option 3	
CSU, Fresno	2	02-0607-A	De Jager Farms North	2114R9	06/20/03	$ 3,488.50		Option 3	
CSU, Fresno	2	02-0608-A	De Jager Farms North	01357R	04/16/03	$ 3,469.95		Option 3	
CSU, Fresno	2	02-0609-A	De Jager Farms North	40796R	02/28/03	$ 3,007.20		Option 3	
CSU, Fresno	2	02-610-A	Chester Tortia	R38227	02/07/03	$ 29.18		Option 1: 65% of Cost	
CSU, Fresno	2	02-0611-A	A + R Farms	R28299	04/16/03	$ 6,746.86		Option 3	
CSU, Fresno	2	02-0612-A	Couchman Farms	8753		$ -		Option 3	
CSU, Fresno	2	02-0613-A	Edgemar Farms	6906R6	04/24/03	$ 9,910.25		Option 3	
CSU, Fresno	2	02-0614-A	Gary B. & Mitch Bagdasarian	51822R	06/19/03	$ 1,548.76		Option 3	

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CSU, Fresno	2	02-0615-A	Newman Land Company	R71000	02/28/03	$ 1,191.23		Option 3	
CSU, Fresno	2	02-0617-A	Jasvir S. khosa Farm	58R813	04/16/03	$ 2,352.78		Option 1: 65% of Cost	
CSU, Fresno	2	02-0619-A	M & C Farms	57R801	04/16/03	$ 2,810.00		Option 3	
CSU, Fresno	2	02-0620-A	Kevin Herman	4872R6	03/26/03	$ 10,391.00		Option 3	
CSU, Fresno	2	02-0622-A	Samarin Citrus	352227	02/25/03	$ 2,606.33		Option 3	
CSU, Fresno	2	02-0623-A	S & S Farms	573R74	02/21/03	$ 1,457.57		Option 1: 65% of Cost	
CSU, Fresno	2	02-0624-A	Errotabere Ranches	239R32	03/26/03	$ 7,211.75		Option 3	
CSU, Fresno	2	02-0625-A	Mt Whitney Farms, LLC	R36912	05/29/03	$ 17,372.00		Option 3	
CSU, Fresno	2	02-0626-A	Mendota Land Company	9898R2	07/21/04	$ 3,172.00		Option 3	
CSU, Fresno	2	06-0627-A	Helmut Klauer	88197R	04/15/04	$ 659.20		Option 3	
CSU, Fresno	2	06-0629-A	Errotabere Ranches	25788R	06/16/03	$ 3,907.75		Option 3	
CSU, Fresno	2	06-0631-A	Farm of the Future, West Hills College	5543R6	03/05/04	$ 4,308.57		Option 1: 65% of Cost	
CSU, Fresno	2	02-0634-A	Lee Farms	4208R8	06/20/03	$ 4,488.00		Option 3	
CSU, Fresno	2	02-0635-A	Couchman Farms	8753	03/27/03	$ 1,255.52		Option 3	
CSU, Fresno	2	02-0638-A	Mark McKean Farms	065R40	12/22/03	$ 10,761.89		Option 1: 65% of Cost	
CSU, Fresno	2	02-0641-A	MBK Engineers	185-968	12/02/03	$ 4,368.17		Option 1: 65% of Cost	
CSU, Fresno	2	02-0643-A	MKB Engineers	2632R8	12/03/03	$ 23,367.54		Option 1: 65% of Cost	
CSU, Fresno	2	02-0646-A	MBK Engineers	620R64	12/03/03	$ 3,628.78		Option 1: 65% of Cost	
CSU, Fresno	2	02-0647-A	MBK Engineers	620R64	12/03/03	$ 2,941.95		Option 1: 65% of Cost	

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CSU, Fresno	2	02-0648-A	Ibara Farms	81523T	05/28/03	$ 405.65		Option 3	
CSU, Fresno	2	02-0649-A	Ballantine Produce	21R681	07/28/03	$ 782.60		Option 1: 65% of Cost	
CSU, Fresno	2	02-0650-A	Ballentine Produce	R97501	05/29/03	$ 3,561.33		Option 3	
CSU, Fresno	2	02-0651-A	Pioneer Nursery	57580R	10/20/04	$ 9,361.77		Option 3	
CSU, Fresno	2	02-0653-A	Kamangar Ranches	33641R	06/06/03	$ 3,783.90		Option 3	
CSU, Fresno	2	02-0655-A	California Valley Land Company	04R154	06/12/03	$ 8,954.39		Option 3	
CSU, Fresno	2	02-0656-A	Rosedale Ranch	9992R6	02/17/04	$ 4,875.27		Option 3	
CSU, Fresno	2	02-0657-A	Double Diamond Dairy & Ranch	99R399		$ 1,855.38		Option 3	
CSU, Fresno	2	02-0658-A	J. Oberti Vineyards II	09426R	04/17/03	$ 7,385.89		Option 3	
CSU, Fresno	2	02-0659-A	Matthew P. McGuire	AS5A8-314DKS	09/02/03	$ 1,528.00		Option 3	
CSU, Fresno	2	02-0660-A	Richard De Bendedtto	99R029	07/02/03	$ 7,156.75		Option 3	
CSU, Fresno	2	02-0661-A	Westlands Water District	1R-40B unit 1	09/15/03	$ 15,214.03		Option 3	
CSU, Fresno	2	02-0662-A	Westlands Water District	28RA	04/15/04	$ 14,004.02		Option 3	
CSU, Fresno	2	02-0664-A	Westlands Water District	4R	05/10/04	$ 4,775.85		Option 3	
CSU, Fresno	2	02-0665-A	Westlands Water District	18R	03/16/04	$ 14,795.95		Option 3	
CSU, Fresno	2	02-0666-A	Westlands Water District	17RB pump 2	05/24/04	$ 8,605.51		Option 3	
CSU, Fresno	2	02-0667-A	Westlands Water District	17RB pump 1	03/16/04	$ 10,096.03		Option 3	
CSU, Fresno	2	02-0668-A	Westlands Water District	17RA pump 2	06/02/04	$ 8,667.02		Option 3	
CSU, Fresno	2	02-0669-A	Westlands Water District	17RA pump1	03/16/04	$ 5,144.97		Option 3	
CSU, Fresno	2	02-0670-A	Westlands Water District	15R pump 2	03/16/04	$ 14,457.30		Option 3	
CSU, Fresno	2	02-0672-A	Westlands Water District	14RB #2	08/18/03	$ 5,179.95		Option 3	
CSU, Fresno	2	02-0673-A	Westlands Water District	13RBpump #3	11/11/03	$ 13,165.05		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0674-A	Westlands Water District	13RBpump2	04/15/04	$ 13,165.04		Option 3	
CSU, Fresno	2	02-0675-A	Westlands Water District	13RA pump1	03/16/04	$ 13,165.04		Option 3	
CSU, Fresno	2	02-0676-A	Westlands Water District	13 RA pump 4	02/12/04	$ 4,729.05		Option 3	
CSU, Fresno	2	02-0677-A	Westlands Water District	13RA pump 1	01/27/04	$ 9,458.10		Option 3	
CSU, Fresno	2	02-0678-A	Westlands Water District	12R pump 3	01/27/04	$ 10,369.91		Option 3	
CSU, Fresno	2	02-0679-A	Westlands Water District	12Rpump2	05/24/04	$ 10,641.85		Option 3	
CSU, Fresno	2	02-0680-A	Westlands Water District	12R pump 1	06/08/04	$ 10,381.78		Option 3	
CSU, Fresno	2	02-0681-A	Westlands Water District	11R	06/08/04	$ 5,283.20		Option 3	
CSU, Fresno	2	02-0682-A	Westlands Water District	7RD	05/24/04	$ 1,674.93		Option 3	
CSU, Fresno	2	02-0683-A	Westlands Water District	7RB	01/27/04	$ 7,019.44		Option 3	
CSU, Fresno	2	02-0684-A	Westlands Water District	7RA pump 5	06/08/04	$ 2,720.32		Option 3	
CSU, Fresno	2	02-0685-A	Westlands Water District	7RA pump 1	04/15/04	$ 9,067.72		Option 3	
CSU, Fresno	2	02-0686-A	Westlands Water District	2RA pump 6	05/10/04	$ 3,153.48		Option 3	
CSU, Fresno	2	02-0688-A	Westlands Water District	2RA pump 3	06/02/04	$ 9,460.40		Option 3	
CSU, Fresno	2	02-0689-A	Westlands Water District	1RA pump 7	01/27/04	$ 6,351.93		Option 3	
CSU, Fresno	2	02-0690-A	Westlands Water District	1RA pump 6	06/02/04	$ 11,115.87		Option 3	
CSU, Fresno	2	02-0691-A	Westlands Water District	1R-4.0C	09/15/03	$ 4,853.63		Option 3	
CSU, Fresno	2	02-0694-A	Westlands Water District	PV2	03/16/04	$ 1,660.75		Option 3	
CSU, Fresno	2	02-0695-A.	Westlands Water District	29RA	09/15/03	$ 9,313.25		Option 3	
CSU, Fresno	2	02-0696-A	Westlands Water District	18R	09/02/03	$ 3,370.90		Option 3	
CSU, Fresno	2	02-0698-A	Westlands Water District	15R	09/15/03	$ 5,865.20		Option 3	
CSU, Fresno	2	02-0700-A	Westlands Water District	16RC	03/16/04	$ 1,458.69		Option 3	
CSU, Fresno	2	02-0702-A	Westlands Water District	30L pump 4	09/02/03	$ 5,903.29		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0703-A	Westlands Water District	11L	09/15/03	$ 2,046.51		Option 3	
CSU, Fresno	2	02-0706-A	Westlands Water District	24R pump 1	08/27/03	$ 9,139.19		Option 3	
CSU, Fresno	2	02-0707-A	Westlands Water District	16RB	09/15/03	$ 4,847.70		Option 3	
CSU, Fresno	2	02-0711-A	Westlands Water District	1R4.0-1.0 C	08/27/03	$ 5,030.36		Option 3	
CSU, Fresno	2	02-0712-A	Westlands Water District	1R-4.0 B	11/11/03	$ 15,214.03		Option 3	
CSU, Fresno	2	02-0713-A	Doug and Julie Freitas Farms	47T322	07/30/04	$ 882.68		Option 3	
CSU, Fresno	2	02-0714-A	Mark McKean Farms	STLSB 12541	09/02/03	$ 796.73		Option 3	
CSU, Fresno	2	02-0715-A	California Valley Land Co.	7559R6	06/05/03	$ 19,254.50		Option 3	
CSU, Fresno	2	02-0716-A	R & J Dondero, Inc.	193R05	05/27/03	$ 651.20		Option 3	
CSU, Fresno	2	02-0717-A	P-R Farms, Inc.	44490R	06/30/03	$ 5,552.00		Option 3	
CSU, Fresno	2	02-0718-A	Power Hydrodynamics			$ -		Option 3	
CSU, Fresno	2	02-0719-A	Double D Farms	6916R4	06/16/03	$ 3,336.75		Option 3	
CSU, Fresno	2	02-0720-A	Polder Bros. Ranch, Inc.	30148T	06/30/03	$ 8,544.48		Option 3	
CSU, Fresno	2	02-0721-A	Danieli Ranch	8004R8	06/23/03	$ 437.50		Option 3	
CSU, Fresno	2	02-0722-A	Sierra View Dairy	113-01063	06/05/03	$ 1,969.25		Option 3	
CSU, Fresno	2	02-0723-A	Sierra View Dairy	3412-001000	06/05/03	$ 4,860.47		Option 3	
CSU, Fresno	2	02-0726-A	Edgemar Farms	67R476	09/02/03	$ 6,057.29		Option 3	
CSU, Fresno	2	02-0729-A	Don Schnoor Farms	59R409	06/30/03	$ 2,566.59		Option 3	
CSU, Fresno	2	02-0730A	Eastman Bros.	R53122	06/30/03	$ 1,718.27		Option 3	
CSU, Fresno	2	02-0732-A	Ruby Lin Farms	R53122	06/23/03	$ 2,174.00		Option 3	
CSU, Fresno	2	02-0735-A	Castoro Cellars	32481R	09/09/03	$ 803.98		Option 3	
CSU, Fresno	2	02-0736-A	De Groot Dairy Farms	R36756	06/11/03	$ 9,203.70		Option 1: 65% of Cost	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0738-A	Batth & Mahil Farms	066R62	06/16/03	$ 11,796.00		Option 3	
CSU, Fresno	2	02-0739-A	DeGroot Dairy Farms	732K002016	06/18/03	$ 7,457.58		Option 1: 65% of Cost	
CSU, Fresno	2	02-0740-A	DeGroot Dairy Farms	0828960	06/18/03	$ 2,587.05		Option 3	
CSU, Fresno	2	02-0741	R & J Dondero, Inc	R54990	06/19/03	$ 2,139.55		Option 3	
CSU, Fresno	2	02-0743-A	Woods Irrigation Company	502R06	06/30/03	$ 3,198.00		Option 3	
CSU, Fresno	2	02-0744-A	Jagtar S. Gill	43110R	06/30/03	$ 1,080.79		Option 1: 65% of Cost	
CSU, Fresno	2	02-0745-A	Jagtar S. Gill	5824R9	06/30/03	$ 1,466.72		Option 1: 65% of Cost	
CSU, Fresno	2	02-0746-A	Satragni Bros. Ranch	32918R	07/01/03	$ 2,806.37		Option 3	
CSU, Fresno	2	02-0749-A	Dennis A. Quashnick	R43711	07/28/03	$ 57.98		Option 3	
CSU, Fresno	2	02-0750-A	Porto Bros	276R51	09/09/03	$ 2,384.18		Option 1: 65% of Cost	
CSU, Fresno	2	02-0751-A	Anthony T Oliverira	R92142	09/02/03	$ 5,578.14		Option 2	
CSU, Fresno	2	02-0752-A	Anthony T Oliveira	7023R1	09/09/03	$ 9,547.51		Option 1: 65% of Cost	
CSU, Fresno	2	02-0753-A	David C Sani	210R78	09/02/03	$ 155.08		Option 3	
CSU, Fresno	2	02-0755-A	Don Gragnani	1514R8	11/10/03	$ 7,678.36		Option 3	
CSU, Fresno	2	02-0757-A	Arnold Dadian	62330T	09/02/03	$ 14,099.07		Option 1: 65% of Cost	
CSU, Fresno	2	02-0758-A	Duane Martin Jr.	61994	10/10/03	$ 654.14		Option 3	
CSU, Fresno	2	02-0759-A	Duane Martin Jr	316351	09/22/03	$ 838.05		Option 3	
CSU, Fresno	2	02-0760-A	William Powers III			$ -		Option 3	
CSU, Fresno	2	02-0761-A	H20 Pump Testing Services			$ -		Option 3	
CSU, Fresno	2	02-0762-A	Wayne Cooper Ag. Services			$ -		Option 3	

Administrator	Cat.	Project #	Applicant or Irrigation District	Pump ID	Grant Status or Payment Date	Grant Payment		Grant Option	
CSU, Fresno	2	02-0763-A	Pump Efficiency Testing Services			$ -		Option 3	
CSU, Fresno	2	02-0764-A	John G. Oliveira	59R591	10/20/03	$ 1,762.67		Option 3	
CSU, Fresno	2	02-0770-A	Pump Check Pumping Systems Analysts			$ -		Option 3	
CSU, Fresno	2	02-0772-A	Rincon Farms Inc.	3689R4	01/05/04	$ 3,720.30		Option 2	
CSU, Fresno	2	02-0773-A	Power Services, Inc.	Pump Tests per Contract 02-0773-A		$ -		Option 3	
CSU, Fresno	2	02-0774-A	Irrigation Pump Testing Service	Pump Tests per Contract 02-0774-A		$ -		Option 3	
CSU, Fresno	2	02-0775-A	Energy & Water Management	Pump Tests per Contract 02-0775-A		$ -		Option 3	
CSU, Fresno	2	02-0776-A	Britz Colusa - TIC	0M5057	12/22/03	$ 8,767.86		Option 3	
CSU, Fresno	2	02-0779-A	Douglas Mederos	Y728-006216	12/22/03	$ 731.25		Option 3	
CSU, Fresno	2	02-0789-A	H2O Pump Testing Services	Pump Tests per Contract 02-0789-A		$ -		Option 3	
CSU, Fresno	2	02-0790-A	Wayne Cooper Ag Services	Pump Tests per Contract 02-0790-A		$ -		Option 3	
CSU, Fresno	2	02-0791-A	Pump Efficiency Testing	Pump Tests per Contract 02-0791-A		$ -		Option 3	
CSU, Fresno	2	02-0792-A	Irrigation Pump Testing Services	Pump Tests per Contract 02-0792-A		$ -		Option 3	
CSU, Fresno	2	02-0793-A	Energy and Water Management	Pump Tests per Contract 02-0793-A		$ -		Option 3	
Subototal of CIT Category 2 projects	429				Subotal of Grant Payments (includes first of two payments)	**$1,783,157.72**			
Category 3 Advanced Telemetry Projects, Cal Poly San Luis Obispo									
Program Administrator	**Category**	**Project #**	**Project Name**	**Description**	**Grant Payment Date**	**Grant Payment Total**	**Contracted Savings, kW**	**Verified Savings, kW**	**Simple Cost Effectiveness, $/kW**
Cal Poly	3	01-020-47730	Solano Irrigation District (ISO contract)	Interval Meters used for demand relief program for an ISO program	10/29/01	$ 5,371.37	1,000	1,000	

Program Administrator	Category	Project #	Project Name	Description	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
Cal Poly	3	01-021-47730	City of Bakersfield Agricultural & Domestic Water Resources Division (ISO contract)	Interval Meters used for demand relief program for an ISO program	10/1/01	$ 26,058.00	1,737	1,737	
Cal Poly	3	01-022-47730	Westlands Water District (ISO contract)	Interval Meters used for demand relief program on district owned farmer operated wells within the district. The actual amount of kW reduction may vary between 0-37,800 kW depending on how many farmers sign up for the program.	12/6/01	$266,373.12	37,800	17,703	
Cal Poly	3	02-002-47330	Orange Cove Irrigation District	Telemetry and interval meters to assist in load reduction for a particular section of their system. Amended contract includes increased peak kW reduction and potential grant payment in response to the installation of additional SCADA equipment as well as the compilation of grower peak load reductions.	12/16/02	$180,000.00	600	637	
Cal Poly	3	02-003-47330	Natomas Central Mutual Water District	Natomas Central Mutual Water Company is committing to the ISO program. Greg Allen of Energy Solutions (800-270-7007) has prepared the application for the proposed installation of 3 meters and the required communication equipment to participate in the ISO program.	4/22/02	$ 7,976.99	1,270	1,270	
Cal Poly	3	02-004-47330	Westlands Water District -- Woolf Telemetry (ISO contract)	Under a Westlands Water District program, Woolf Farms is committing average reduction of 534 kW during the four peak period months for the ISO program. The project application is for communication equipment for 3 existing meters. Each site will require a cellular phone link that will be installed by PG&E.	12/6/01	$ 4,657.56	534	534	

Program Administrator	Category	Project #	Project Name	Description	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
Cal Poly	3	02-005-47330	Westlands Water District -- Vasto Valle Telemetry (ISO contract)	Under a Westlands Water District program, Vasto Valle Farms is committing an average reduction of 725 kW during the four peak period months for the ISO program. The project application is for communication equipment for 5 existing meters. Each site will require a cellular phone link that will be installed by PG&E.	12/6/01	$ 7,762.59	725	725	
Cal Poly	3	03-013-47330	Tulare ID	Tulare ID proposes to increase their water demand through Kaweah river during the peak period thus increasing the on peak generation. During the off-peak the demand will be reduced and supplied by another source (CVP). SCADA will be used for monitoring and control of remote sites which will make this project logistically feasible.	Contract signed 4/18/03; payments for category 3 portion of project pending completion.	$401,167.00	1,923		
subtotal (cal poly)	8				Subtotal of Grant Payments (includes first of two payments)	**$899,366.63**			
					Subtotal of Contracted Savings, kW		**45,589**		
					Subtotal of Verified Savings, kW			**25,529**	
					Simple Cost Effectiveness, $/kW				**$35.23**

Category 3 Advanced Telemetry Projects, California State University, Fresno, Fresno Foundation									
Program Administrator	***Category***	***Project #***	***Project Name***	***Description***	***Grant Payment Date***	***Grant Payment Total***	***Contracted Savings, kW***	***Verified Savings, kW***	***Simple Cost Effectiveness, $/kW***
CSU, Fresno	3	03-0061-A	Naumes Inc.	Marysville	2/19/04	$1,493.38	90	90	$ 16.59
CSU, Fresno	3	03-0064-A	Joseph Gallo Farms (ISO contract)	Atwater	9/18/01	$8,100.60	1595	1595	$ 5.08
CSU, Fresno	3	03-0072-A	Sloughouse Operating LLC	Farmington	4/29/03	$8,748.76	46	46	$ 190.19
CSU, Fresno	3	03-0075-A	Paramount Farming Company	Bakersfield	11/27/02	$69,115.24	1306	1306	$ 52.92
CSU, Fresno	3	03-0095-A	Diamond D Dairy (Danell Bros.)	Hanford	11/1/02	$2,005.84	425	425	$ 4.72
CSU, Fresno	3	03-0102-A	Farmington Capital Group	Farmington	4/30/03	$7,440.00	56	56	$ 132.86
CSU, Fresno	3	03-0111-A	M. Curti & Sons Dairy (Ancillary Services contract)	Tulare	2/23/04	$1,810.84	425	198	$ 9.15
CSU, Fresno	3	03-0112-A	Artesia Dairy (Ancillary Services contract)	Corcoran	10/30/02	$1,810.84	450	450	$ 4.02
CSU, Fresno	3	03-0113-A	Triangle M Dairy (Ancillary Services contract)	Chowchilla	11/18/02	$1,810.84	100	100	$ 18.11
CSU, Fresno	3	03-0118-A	Ralph B. Tevelde Dairy (Ancillary Services contract)	Bakersfield	11/6/01	$1,810.84	135	135	$ 13.41
CSU Fresno Subtotal	10				Subtotal of Grant Payments	**$104,147.18**			
					Subtotal of Contracted Savings, kW		**4,628**		
					Subtotal of Verified Savings, kW			**4,401**	
					Average Simple Cost Effectiveness, $/kW				**$23.66**

Category 4 Fuel Switching Projects, California State University, Fresno, Fresno Foundation									
Program Administrator	***Category***	***Project #***	***Project Name***	***Description***	***Grant Payment Date***	***Grant Payment Total***	***Contracted Savings, kW***	***Verified Savings, kW***	***Simple Cost Effectiveness, $/kW***
CSU, Fresno	4	04-0001-A	J.G. Boswell Company	Cotton Gins 2&3 - Project Proposal #3	4/15/02	$36,574.18			
CSU, Fresno	4	04-0001-D	J.G. Boswell Company	Cotton Gin #5 - Project Proposal #4	4/15/02	$23,857.81			
CSU, Fresno	4	04-0003-A	Central Valley Coop.	Conversion to Propane for Dual Fuel	9/10/01	$37,510.91			
CSU, Fresno	4	04-0004-A	Panoche Ginning Company	Propane Conversion	10/18/01	$73,430.84			
CSU, Fresno	4	04-0005-A	Merced Milling Co. LLC		1/2/02	$14,608.91			
CSU, Fresno	4	04-0006-A	Cantua Cooperative Gin	Dual Fuel Conversion	12/18/01	$38,337.85			
CSU, Fresno	4	04-0007-A	Rio Bravo Tomato Company,LLC	Alternative Propane Fuel Sstem-Buttonwillow Fac.	9/10/01	$300,000.00			
CSU, Fresno	4	04-0011-A	Tenicom Ranch	Tenincom Ranch	7/26/01	$52,734.46			
CSU, Fresno	4	04-0012-A	Lone Star Dehydrator	Propane- Alternative Fuel	9/18/01	$37,675.58			
CSU, Fresno	4	04-0015-A	Darling International Inc	Natural gas boiler retrofit to burn alternative fu	7/6/03	$130,000.00			
CSU, Fresno	4	04-0020-A	Foster Poultry Farms	Kingsburg Plant Yellow Grease Project	11/24/03	$66,856.41			
CSU, Fresno	4	04-0034-A	Six Jewels	Ag. Fruit Dehydrator Retrofitted from Natural Gas	9/10/01	$38,830.64			
CSU, Fresno	4	04-0041-A	A&C Dryers Inc.	Propane Tank & Vaporizer Conversion	7/9/02	$62,458.25			
CSU, Fresno	4	04-0056-A	Rosendahl Farms, Inc.	Rosendahl Farms, Inc.	9/18/01	$89,501.10			

Program Administrator	Category	Project #	Project Name	Description	Grant Payment Date	Grant Payment Total	Contracted Savings, kW	Verified Savings, kW	Simple Cost Effectiveness, $/kW
CSU, Fresno	4	04-0062-A	Central Avenue Dry Yard	Propane Tank & Vaporizer Conversion	9/11/01	$19,157.88			
CSU, Fresno	4	04-0073-A	Foster Farms Dairy	(Modesto) Kansas Ave Plant Propane Project	10/20/03	$202,995.00			
CSU, Fresno	4	04-0085-A	Fowler Dehydrator	Natural Gas to Propane Conversion	5/17/02	$52,073.07			
CSU, Fresno	4	04-0110-A	Tri-Counties Walnut Co.	Tri-Counties Walnut Co.	11/29/01	$62,644.80			
CSU, Fresno	4	04-0255-A	Farmers	Dual Fuel Gas Conversion	11/12/02	$89,050.00			
CSU, Fresno	4	04-0270A	Foster Poultry Farms	Livingston Poultry Plant Alternative Fuel	2/5/04	$204,750.00			
CSU, Fresno	4	04-0001-A	J.G. Boswell Company	Cotton Gins 2&3 - Project Proposal #3	4/15/02	$36,574.18			
Subtotal	**24**				Subtotal of Grant Payments	**$1,633,047.68**			
Total of All Projects from CSU, Fresno and Cal Poly	**976**				**Total Grant Payments for CSU, Fresno and Cal Poly**	**$11,068,589.55**			
					Total Contracted savings, Category 1 & 3, kW	**78,126**			
					Total Verified Savings, Category 1 & 3, kW	**57,250**			

Onsite Energy Corporation Projects									
Contractor	***Category***	***Project #***	***Project Site***	***Project Description***	***Installation notes***	***Grant Payments***	***Demand Savings Filed, kW***	***Verified Demand Savings, kW***	
Onsite Energy	1	1	Gatorade	VSD air compressor and plant air mods	Project completed.	$ 15,255.00	83	61	
Onsite Energy	1	2	Frito Lay, Visalia	VFDs for boiler feedwater pump (100 hp), and FD fan for boiler (75hp)	System complete and operating.	$ 19,075.00	117.0	76.3	
Onsite Energy	1	2	Frito Lay, Visalia	Install 20 SR controllers for dynamic power factor and harmonics control	System complete and operating.	$ 1,300.00	65.5	5.2	
Onsite Energy	1	2	Frito Lay, Visalia	Replace 16 1.5hp vacuum caser motors with central system	System complete and operating.	$ 7,150.00	12.3	28.6	
Onsite Energy	1	2	Frito Lay, Visalia	Expander controls on existing plant air system to eliminate one of electric air compressors	System complete and operating.	$ 35,100.00	123.5	140.4	
Onsite Energy	1	2	Frito Lay, Visalia	Replace remaining electric driven air compressor for plant air with nat. gas driven Kaeser compressor	System complete and operating.	$ 28,750.00	117.0	115.0	
Onsite Energy	1	2	Frito Lay, Visalia	Install Solatube sky lighting for manufacturing floor and office areas	Installation complete - lighting levels too low for company spec in some places; circuit revisions in Phase II.	$ 31,800.00	100	127.2	
Onsite Energy	1	2	Frito Lay, Visalia	Install PowerIT Demand limiting system for plant loads	System installed and undergoing tuneup	$ 40,000.00	250.0	160.0	
Onsite Energy	1	3	Frito Lay, Modesto	Installation of 100 Hp VFD compressor will allow shut down of one 250 Hp unit.	System complete.	$ 36,575.00	120.0	146.3	
Onsite Energy	1	3	Frito Lay, Modesto	Install VFDs on Boiler Pumps.	System complete.	$ 8,425.00	32.0	33.7	
Onsite Energy	1	3	Frito Lay, Modesto	Install PowerIT Demand limiting system for plant loads	System Complete, ongoing tuning of setpoint	$ 87,500	200.0	350.0	
Onsite Energy	1	3	Frito Lay, Modesto	Mytech bi-level HID controls for warehouse lighting (includes Phase II)	System is complete.	$ 7,200	26.5	28.8	
Onsite Energy	1	3	Frito Lay, Modesto	Daylighting Controls for expansion warehouse	System is Complete	$ 50,175.00			

Contractor	Category	Project #	Project Site	Project Description	Installation notes	Grant Payments	Demand Savings Filed, kW	Verified Demand Savings, kW	
Onsite Energy	1	4	Leprino Foods, Tracy	Reduce condenser head pressure from 180 to 155 psig	System is complete and running, SPC baseline data from previous SPC project.	$ 122,525.00	300	490.1	
Onsite Energy	1	4	Leprino Foods, Tracy	Install new heat exchangers, split brine system	System is complete and running, SPC baseline data from previous SPC project.		400		
Onsite Energy	1	5	Del Monte Foods, Hanford	Reconfiguration of the flume piping and pump locations resulted in the removal of 4 each 40 Hp water pumps used for many years	Plant retrofits complete	$ 22,375.00	89.5	89.5	
Onsite Energy	1	5	Del Monte Foods, Hanford	Replace tomato flumes with conveyer belts and eliminate match motor size to loads	Plant retrofits complete	$ 44,750.00	179.0	179.0	
Onsite Energy	1	5	Del Monte Foods, Hanford	Replace current hydraulically driven equipment with properly sized electric motor/gearboxes and VFD.	Plant retrofits complete.	$ 53,650.00	212.7	214.6	
Onsite Energy	1	5	Del Monte Foods, Hanford	Replace 5 each Manzini pulpers with 3 each Fenco pulpers Fenco pulpers are more energy efficient and have higher capacity	Plant retrofits complete.	$ 27,975.00	111.9	111.9	
Onsite Energy	1	5	Del Monte Foods, Hanford	Install cooling water control valves so that pumps may be shut down if one evaporator is turned off (Evaps 1,2 & 8). Estimated to be approximately 900 hours/summer.	Plant retrofits complete.	$ 9,625.00	37.3	38.5	
Onsite Energy	1	6	Dreisbach, Richmond	Install motion detectors and bi-level lighting on existing HID fixtures	No post inspection - equipment verified during installation phase. Project complete.	$ 7,200.00	300.0	25.7	
Onsite Energy	1	6	Dreisbach, Oakland	Install motion detectors and bi-level lighting on existing HID fixtures	No post inspection - equipment verified during installation phase. Project complete.	$ 6,325.00		25.3	
Onsite Energy	1	6	Dreisbach, Moss Landing	Install motion detectors and bi-level lighting on existing HID fixtures	No post inspection - equipment verified during installation phase. Project complete.	$ 6,425.00		28.8	

Contractor	Category	Project #	Project Site	Project Description	Installation notes	Grant Payments	Demand Savings Filed, kW	Verified Demand Savings, kW	
Onsite Energy	1	7	Pacific Coast Producers	Comprehensive plant retrofit	Plant retrofits complete, M&V report reviewed from R. Mowris and Associates, amended, and approved	$ 366,000.00	1464	1,464.0	
Onsite Energy	1	8	Frito Lay Rancho Cucamunga	Install demand limiting system	Project Installed; tuning setpoint	$ 92,000.00	300	368.0	
Onsite Energy	1	9	Dreisbach Demand Limiting System - Richmond	Install demand limiting system	Project Installed, Final report reviewed		75	-	
Onsite Energy	1	10	Dreisbach Demand Limiting System - Oakland	Install demand limiting system	Project Installed, Final report reviewed	$ 84,750.00	110	339	
Onsite Energy		11	Dreisbach Demand Limiting System – Moss Landing	Install demand limiting system	Project Installed, Final report reviewed	$ 28,000.00	190	112	
Onsite Energy		12	Del Mar Foods, Watsonville, Plant Side	Install demand limiting system	Project Installed	$ 99,750.00	500	399	
Onsite Energy		12	Del Mar Foods, Watsonville, Cold Storage Rooms	Install demand limiting system	Project Installed	$ 35,750.00		143	
Onsite Energy		13	Bonita Pak Foods	Install demand limiting system	Project Installed; tuning setpoint	$ 208,500.00	583	834	
Onsite Energy		14	Cool Pacific Foods	Install demand limiting system	Project Installed	$ 52,000.00	300	208	
Onsite Energy		15	Richmond Wholesale Meats	Install demand limiting system	Project Installed	$ 102,900.00	300	412	
Onsite Energy		16	P&O Cold Logistics -Vernon #1	Install demand limiting system	Project Installed	$ 110,300.00	1,500	441	
Onsite Energy		16	P&O Cold Logistics -Vernon #2	Install demand limiting system	Project Installed	$ 39,325.00		157	
Onsite Energy		16	P&O Cold Logistics -City of Industry #4	Install demand limiting system	Project Installed	$ 110,325.00		441	
Onsite Energy		16	P&O Cold Logistics - Dominquez Hills #6	Install demand limiting system	Project Installed	$ 10,900.00		44	

Contractor	Category	Project #	Project Site	Project Description	Installation notes	Grant Payments	Demand Savings Filed, kW	Verified Demand Savings, kW	
Onsite Energy		16	P&O Cold Logistics - Carson #10	Install demand limiting system	Project Installed	$ 48,975.00		196	
Onsite Energy		16	P&O Cold Logistics - Anaheim#11	Install demand limiting system	Project Installed	$ 25,425.00		102	
Onsite Energy		16	P&O Cold Logistics - La Habra #13	Install demand limiting system	Project Installed	$ 28,400.00		114	
Onsite Energy		16	P&O Cold Logistics - Brea #14	Install demand limiting system	Project Installed	$ 24,150.00		97	
Onsite Energy		16	P&O Cold Logistics - Salinas #18	Install demand limiting system	Project Installed	$ 15,600.00		62.0	
Onsite Energy		17	P&O Cold Logistics - Modesto #15	Install demand limiting system	Project Installed	$ 49,525.00	450.0	198.0	
Subtotals for Onsite contract		**17**				**$2,201,730**	**8,884.5**	**8,807.3**	

Section 4 Agricultural Program Cost Effectiveness

Cat 1 = High Efficiency; Cat 3 = Advanced metering & Telemetry												
Cal Poly Category 1 Projects												
Cat	*Administrator*	*Project*	*Project Number*	*Administrator M&V verified Demand Reduction, kW*	*Demand Reduction, per ISO contract, kW*	*Verified Total Reduction, kW*	*Revised CEC Allocation*	*Projected Lifetime, Years*	*NPV factor at 4.1%*	*NPV of kW-Yr*	*Levelized $/kW*	*Simple $/kW*
1	Cal Poly	North Kern Water	01-018-47310	5,135	0	5,135	$ 346,204.90	5	4.62	23,731	$15	$67.42
1	Cal Poly	Hills Valley Irrigation	02-006-47310	16	0	16	$ 4,800.00	10	8.40	134	$36	$300.00
1	Cal Poly	Berrenda Mesa Water	02-009-47310	770	0	4,400	$ 28,754.00	15	11.49	50,572	$1	$6.54
1	Cal Poly	North Kern Water	02-013-47310	3,331	0	3,331	$ 813,750.00	9	7.71	25,665	$32	$244.30
1	Cal Poly	Sutter Extension	02-014-47310	23	0	23	$ 8,250.00	10	8.40	193	$43	$358.70
1	Cal Poly	City of Santa Rosa	02-015-47310	46	0	46	$ 8,625.00	10	8.40	386	$22	$187.50
1	Cal Poly	Orange Cove Irrigation	02-020-47310	178	0	178	$ 44,500.00	10	8.40	1,495	$30	$250.00
1	Cal Poly	Berrenda Mesa Water	03-001-43710	270	0	270	$61,750	5	4.62	1,248	$49	$228.70
1	Cal Poly	North Kern Water	03-009-47310	1,502		1,502	$375,400	10	8.40	12,619	$30	$249.93
1	Cal Poly	North Kern Water Storage	03-009-47310	1,502	0	1,502	$375,400.00	6	5.44	8,170	$46	$249.93
Subtotals				**16,458**		**16,824**	**$ 2,083,132.90**			**132,201**		**$123.82**
Category 1 Natural Gas Engine Projects												
2	Cal Poly	City of Greenfield		248	0	248	$62,000.00	15	11.49	2,850	$22	$250.00
3	Cal Poly	Eastern Municipal Water District		250	0	250	$62,500.00	15	11.49	2,873	$22	$250.00
4	Cal Poly	Eastern Municipal Water District		322	0	322	$80,500.00	15	11.49	3,701	$22	$250.00
Subtotals				**820**	**0**	**820**	**$ 205,000.00**			**6,889**		**$ 250.00**

CSU, Fresno Category 1 Projects												
Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Levelized $/kW	Simple $/kW
1	CSU, Fresno	VFD on Recirculating	01-0027-C	6.77		6.77	$24,600.00	5	4.62	379	$65	$300.00
1	CSU, Fresno	VFD on Compressor	01-0027-D	19.75		19.75	$1,096.55	14	10.92	66	$17	$180.95
1	CSU, Fresno	Insulate Tanks 7001	01-0029-A	50.7		50.7	$7,230.00	14	10.92	263	$27	$300.00
1	CSU, Fresno	Dyer Creek	01-0035-A	45		45	$7,448.00	14	10.92	232	$32	$350.00
1	CSU, Fresno	Insulate Tanks 2019 &	01-0042-A	25.44		25.44	$2,445.30	10	8.40	187	$13	$110.15
1	CSU, Fresno	Alternate Sequence	01-0053-A	219.09		219.09	$8,450.00	20	14.02	354	$24	$334.65
1	CSU, Fresno	Time Management	01-0054-A	37		37	$1,300.00	14	10.92	74	$18	$192.02
1	CSU, Fresno	Time Management	01-0054-B	44		44	$6,912.00	14	10.92	216	$32	$349.97
1	CSU, Fresno	Time Management	01-0054-C	130		130	$17,745.00	15	11.49	583	$30	$350.00
1	CSU, Fresno	Alternate Sequence	01-0060-A	156		156	$564.46	5	4.62	208	$3	$12.54
1	CSU, Fresno	Lighting Office &	01-0067-A	1.7		1.7	$6,360.00	15	11.49	292	$22	$250.00
1	CSU, Fresno	Roof Vent	01-0067-B	25.3		36.48	$10,954.42	5	4.62	1,012	$11	$50.00
1	CSU, Fresno	Water Storage Tank	01-0067-C	8.3		8.3	$3,282.83	5	4.62	171	$19	$88.73
1	CSU, Fresno		01-0068-A	98.4		119	$820.71	5	4.62	203	$4	$18.65
1	CSU, Fresno	Evaporative Condenser	01-0076-A	47.3		47.3	$820.70	5	4.62	601	$1	$6.31
1	CSU, Fresno	Golden Valley Grape Juice	01-0078-A	14.7		14.7	$7,800.00	5	4.62	721	$11	$50.00
1	CSU, Fresno	Turlock Turkey Plant	01-0080-A	97		0	$595.00	15	11.49	20	$30	$350.00
1	CSU, Fresno	Pressure System Re-	01-0082-A	31.81		31.81	$12,336.39	25	16.09	587	$21	$338.17

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Leveliz ed $/kW	Simple $/kW
1	CSU, Fresno	Flash Cooler/T-60	01-0084-A	152		152	$0.00	5	4.62	38	$0	$0.00
1	CSU, Fresno	Variable Speed Vacum	01-0086-A	7.25		7.25	$19,627.91	5	4.62	550	$36	$164.94
1	CSU, Fresno	South Avenue	01-0088-A	50.89		50.89	$16,555.00	20	14.02	663	$25	$350.00
1	CSU, Fresno	Lighting System	01-0091-A	25.142		25.142	$4,410.00	15	11.49	169	$26	$300.00
1	CSU, Fresno	Rote Greenhouses	01-0100-A	8.95		8.95	$0.00	5	4.62	0		N/a
1	CSU, Fresno	Rote Greenhouses	01-0100-B	2.24		2.24	$9,543.00	5	4.62	147	$65	$300.00
1	CSU, Fresno	Rote Greenhouses	01-0100-C	2.21		2.21	$53,200.00	5	4.62	702	$76	$350.00
1	CSU, Fresno	Time Management	01-0101-A	56		56	$1,812.50	14	10.92	79	$23	$250.00
1	CSU, Fresno	Surface Drip System/Time	01-0101-B	88.59		88.59	$17,636.50	8	6.98	355	$50	$346.56
1	CSU, Fresno	Time Management	01-0101-D	84		84	$8,799.70	15	11.49	289	$30	$350.00
1	CSU, Fresno	Time Management	01-0101-E	158		158	$471.90	5	4.62	41	$11	$52.73
1	CSU, Fresno	Efficient Electrical	01-0106-A	49.5		49.5	$468.00	5	4.62	10	$45	$208.93
1	CSU, Fresno	Energy reduction I	01-0108-A	104		104	$165.10	5	4.62	10	$16	$74.71
1	CSU, Fresno	Energy reduction I	01-0108-B	10.66		10.66	$208.36	5	4.62	259	$1	$3.72
1	CSU, Fresno	Indianola Drip System	01-0109-A	16.06		16.06	$31,006.50	8	6.98	618	$50	$350.00
1	CSU, Fresno		01-0119-A	23.87		23.87	$304.36	5	4.62	388	$1	$3.62
1	CSU, Fresno	Variable Speed Pump	01-0120-A	19		19	$305.06	5	4.62	730	$0	$1.93
1	CSU, Fresno		01-0122-A	17		17	$8,238.13	5	4.62	229	$36	$166.43
1	CSU, Fresno		01-0126-A	9.05		9.05	$33,728.15	5	4.62	481	$70	$324.31

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Leveliz ed $/kW	Simple $/kW
1	CSU, Fresno	Energy Reduction	01-0128-A	89		89	$3,731.00	5	4.62	49	$76	$350.00
1	CSU, Fresno	Energy Reduction	01-0128-B	72.2		72.2	$5,621.00	8	6.98	112	$50	$350.00
1	CSU, Fresno	Energy Reduction	01-0128-C	14		14	$8,354.50	5	4.62	110	$76	$350.00
1	CSU, Fresno	Dixon Plant Electrical	01-0134-A	1029.75		1013.2	$5,700.00	14	10.92	208	$27	$300.00
1	CSU, Fresno	Poundstone Bros., Inc.	01-0135-A	15		15	$2,550.00	5	4.62	79	$32	$150.00
1	CSU, Fresno	Unilever Best Foods NA	01-0136-A	101.46		101.46	$1,197.86	5	4.62	42	$29	$132.36
1	CSU, Fresno	Efficienct Electrical	01-0142-A	30		30	$9,100.00	5	4.62	411	$35	$22
1	CSU, Fresno	Replace Vacuum	01-0144-A	9.1		9.1	$10,209.00	5	4.62	334	$27	$31
1	CSU, Fresno	Efficient Regenerative	01-0146-A	74.8		342.9	$3,250.00	5	4.62	65	$24	$232.14
1	CSU, Fresno	Coil Replacement	01-0151-A	34.7		16.45	$253,300.00	5	4.62	4,682	$17	$54
1	CSU, Fresno	Power factor correction and	01-152-A	128.81		0	$2,947.50	5	4.62	69		$43
1	CSU, Fresno	Replacing a water tower	01-0157-A	104.07		196.3	$27,061.00	5	4.62	469	$25	$266.72
1	CSU, Fresno	Frito-Lay Modesto	01-0158-A	97.9		97.9	$4,907.50	5	4.62	139	$35	$163.58
1	CSU, Fresno	Frito-Lay Bakersfield	01-0159-A	149.9		141.89	$2,730.00	14	10.92	99	$27	$300.00
1	CSU, Fresno	Variable speed	01-0160-A	19.3		19.3	$38,745.37	5	4.62	1,585	$24	$112.99
1	CSU, Fresno	AC Drive	01-0161-A	24.2		35.24	$3,292.70	15	11.49	189	$17	$200.16
1	CSU, Fresno	AC Drive	01-0162-A	5.68		10.09	$0.00	5	4.62	0		#DIV/0!
1	CSU, Fresno	Jongsma Dairy	01-0172-A	22.53		22.53	$68,705.00	20	14.02	2,753	$25	$350.00
1	CSU, Fresno	Lighting Retrofit	01-0182-A	33		33	$29,245.00	15	11.49	1,125	$26	$298.72

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Leveliz ed $/kW	Simple $/kW
1	CSU, Fresno	GlenEagles Agricultural	01-0185-A	70		70	$69,845.00	10	8.40	1,192	$59	$492.25
1	CSU, Fresno	Ake Boosters	01-0186-A	104		104	$4,825.00	14	10.92	211	$23	$250.00
1	CSU, Fresno	VSD for vacuum pump	01-0189-A	7.83		7.83	$10,302.00	14	10.92	385	$27	$292.34
1	CSU, Fresno	Natural gas engine-driven	01-0191-A	154		222.86	$3,027.00	14	10.92	110	$27	$300.00
1	CSU, Fresno	McCall Pump	01-0195-A	7.47		7.47	$5,632.50	14	10.92	246	$23	$250.00
1	CSU, Fresno	Drip irrigation retrofit	01-0200-A	109.4		109.4	$8,250.00	15	11.49	379	$22	$250.00
1	CSU, Fresno	S&S Farms	01-0204-A	17.08		17.08	$655.79	5	4.62	323	$2	$9.37
1	CSU, Fresno	Sprinkler System	01-0207-A	3.453		3.453	$1,641.42	5	4.62	481	$3	$15.78
1	CSU, Fresno	B67386	01-0209-A	8.3		8.3	$2,349.00	14	10.92	86	$27	$300.00
1	CSU, Fresno	Livingston Processing	01-0217-A	38.8		0	$55,715.00	20	14.02	3,125	$18	$250.00
1	CSU, Fresno	James Murphy	01-0218-A	11.375		11.375	$1,867.50	5	4.62	35	$54	$250.00
1	CSU, Fresno	Room #'s 1-4 Ammonia	01-0219-A	45		45	$27,350.00	8	6.98	764	$36	$250.00
1	CSU, Fresno	Schechert Ranches	01-0223-A	61.32		61.32	$4,270.00	5	4.62	79	$54	$250.00
1	CSU, Fresno	Schechert Ranches	01-0225-A	7.3		7.3	$1,208.55	8	6.98	24	$50	$350.00
1	CSU, Fresno	Del Puerto Farms	01-0232-A	90.77		90.77	$2,905.00	5	4.62	38	$76	$350.00
1	CSU, Fresno	H.D. Plocher Partnership	01-0241-A	4.68		4.68	$0.00	5	4.62	0		N/a
1	CSU, Fresno	Pine Crest Farms Dairy	01-0244-A	6.94		6.94	$4,107.25	5	4.62	53	$78	$361.08
1	CSU, Fresno	Rocking S Dairy	01-0245-A	14		14	$15,750.00	20	14.02	631	$25	$350.00
1	CSU, Fresno	Louie Durrer & Sons Dairy	01-0246-A	9.18		9.18	$15,330.00	9	7.71	472	$32	$250.00

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Leveliz ed $/kW	Simple $/kW
1	CSU, Fresno	Marugliano Farms	01-0249-A	13.6		13.6	$1,825.00	9	7.71	56	$32	$250.00
1	CSU, Fresno	Wolff Vineyards	01-0251-A	11.19		11.19	$11,437.50	5	4.62	419	$27	$126.01
1	CSU, Fresno	6179R2-project was	01-0269-A	44.98		45	$1,170.13	5	4.62	22	$54	$250.03
1	CSU, Fresno	Ray Avansino	01-0287-A	30		30	$1,735.00	14	10.92	76	$23	$250.00
1	CSU, Fresno	Delano Farms Reservoir 18	01-0312-A	50		0	$3,500.00	14	10.92	153	$23	$250.00
1	CSU, Fresno	Delano Farms Reservoir 25	01-0312-B	29		0	$2,280.00	14	10.92	100	$23	$248.37
1	CSU, Fresno	Delano Farms Reservoir 23	01-0312-C	41		0	$4,760.00	14	10.92	149	$32	$350.00
1	CSU, Fresno	Boiler Plant Modification	01-0315-A	66.62		66.62	$3,916.50	14	10.92	122	$32	$350.00
1	CSU, Fresno		01-0318-A	140		138.8	$7,902.17	9	7.71	347	$23	$175.60
1	CSU, Fresno	Scully Packing	01-0328-A	17.81		9.52	$7,500.00	5	4.62	139	$54	$250.00
1	CSU, Fresno	Replace cooling Tower	01-330-A	104.8		104.8	$0.00	5	4.62	0		#DIV/0!
1	CSU, Fresno	Horseradish Refrigeration	01-0345-A	30.5		17	$0.00	5	4.62	0		#DIV/0!
1	CSU, Fresno	Enology Wine Chiller	01-0348-A	50.7		38.16	$0.00	5	4.62	0		#DIV/0!
1	CSU, Fresno	Talley Farms Reservoir	01-350-A	41.03		28.6	$19,986.00	15	11.49	766	$26	$300.00
1	CSU, Fresno	TOU Meter	01-351-A	46.7		46.7	$34,706.00	5	4.62	641	$54	$250.04
1	CSU, Fresno	Freemark Abbey Winery	01-0353-A	7.82		7.82	$2,380.00	14	10.92	104	$23	$250.00
1	CSU, Fresno	Quest Dairy	01-0355-A	3.64		3.64	$28,250.83	20	14.02	1,470	$19	$269.57
1	CSU, Fresno		01-357-A	11.8		11.8	$4,250.00	5	4.62	79	$54	$250.00
1	CSU, Fresno	E & J Gallo Winery	01-0358-A	174.08		349.79	$9,540.00	20	14.02	535	$18	$250.00

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Leveliz ed $/kW	Simple $/kW
1	CSU, Fresno	Tony Machado	01-0359-A	13.86		13.86	$7,150.00	5	4.62	132	$54	$250.00
1	CSU, Fresno	Time of Use Meter	01-0367-A	2.24		2.24	$683.80	5	4.62	216	$3	$14.64
1	CSU, Fresno	Time of Use Meter	01-0367-B	1.86		1.86	$1,955.00	5	4.62	36	$54	$250.00
1	CSU, Fresno	Time of Use Meter	01-0367-C	2.24		2.24	$910.00	14	10.92	40	$23	$250.00
1	CSU, Fresno	Time of Use Meter	01-0367-D	1.49		1.49	$2,950.00	5	4.62	55	$54	$250.00
1	CSU, Fresno	Time of Use Meter	01-0367-E	3.7		3.7	$87,447.50	15	11.49	4,020	$22	$250.00
1	CSU, Fresno	Time of Use Meter	01-0367-F	1.2		1.2	$3,465.00	14	10.92	151	$23	$250.00
1	CSU, Fresno	Time of Use Meter	01-0367-G	4.92		4.92	$286.66	5	4.62	10	$28	$127.97
1	CSU, Fresno	Time of Use Meter	01-0367-H	2.24		2.24	$286.66	5	4.62	9	$33	$154.12
1	CSU, Fresno	Time of Use Meter	01-0367-I	1.87		1.87	$286.66	5	4.62	10	$28	$127.97
1	CSU, Fresno	Packinghouse Remodel	01-0368-A	67.16		67.16	$286.66	5	4.62	7	$42	$192.39
1	CSU, Fresno	Valley Fig Growers	01-376-A			48.4	$286.66	5	4.62	17	$17	$77.48
1	CSU, Fresno	DC Lighting	01-0378-A	47.7		47.7	$286.66	5	4.62	6	$52	$238.88
1	CSU, Fresno	Vacuum pump VSD	01-0380-A	11.56		11.56	$286.66	5	4.62	23	$13	$58.26
1	CSU, Fresno	MRD Dairy	01-0391-A	6.15		6.15	$286.66	5	4.62	10	$28	$127.97
1	CSU, Fresno	L&M Dairy	01-0392-A	9.14		9.14	$286.66	5	4.62	9	$33	$153.29
1	CSU, Fresno	Ronnie Ray Dairy	01-0402-A	6.15		6.15	$16,790.00	5	4.62	310	$54	$250.00
1	CSU, Fresno	Replacing Water Tower	01-0404-A	28.9		28.9	$12,100.00	5	4.62	224	$54	$250.00
1	CSU, Fresno	Sun Maid Growers	01-0405-A	144.28		129.88	$11,925.00	15	11.49	548	$22	$250.00

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Leveliz ed $/kW	Simple $/kW
1	CSU, Fresno	Clos Pegase	01-0412-A	12.09		12.09	$2,890.00	14	10.92	126	$23	$250.00
1	CSU, Fresno	Ed Brower dairy	01-0415-A	17.34		17.34	$2,152.50	14	10.92	67	$32	$350.00
1	CSU, Fresno	Toledo Dairy	01-0416-A	11.56		11.56	$2,285.00	14	10.92	100	$23	$250.00
1	CSU, Fresno	M.F. Gomes & Sons Dairy	01-0417-A	9.88		9.88	$1,537.50	14	10.92	67	$23	$250.00
1	CSU, Fresno	Ice Production	01-0422-A	220.35		214.82	$10,115.00	20	14.02	405	$25	$350.00
1	CSU, Fresno	Vacuum pump VSD	01-0428-A	9.36		9.36	$32,470.00	5	4.62	600	$54	$250.00
1	CSU, Fresno	Franciscan Vineyards -	01-0433-A	26.93		26.93	$3,022.50	5	4.62	56	$54	$250.00
1	CSU, Fresno	2Vel Dairy Dairy	01-0436-A	17.87		17.87	$6,690.00	14	10.92	189	$35	$385.81
1	CSU, Fresno	Vacuum pump VSD	01-0449-A	15.67		15.67	$2,890.00	14	10.92	126	$23	$250.00
1	CSU, Fresno	Vacuum pump VSD	01-0449-B	15.67		15.67	$2,470.00	14	10.92	108	$23	$250.00
1	CSU, Fresno	JP Farms	01-0453-A	159.57		159.57	$53,705.00	20	14.02	3,012	$18	$250.00
1	CSU, Fresno	Frank Guidera Co.	01-0465-A	52.7		52.7	$2,340.00	14	10.92	102	$23	$250.00
1	CSU, Fresno	Lee Cardoza Dairy	01-0468-A	4.1		4.1	$6,735.00	20	14.02	378	$18	$250.09
1	CSU, Fresno	Vacuum pump VSD	01-0469-A	7.83		7.83	$4,467.50	14	10.92	195	$23	$250.00
1	CSU, Fresno	Tony Souza Dairy	01-0471-A	15.3		15.3	$5,477.00	14	10.92	171	$32	$349.52
1	CSU, Fresno	Vacuum pump VSD	01-0474-A	6.15		6.15	$4,701.00	14	10.92	171	$27	$300.00
1	CSU, Fresno	James Brower	01-0477-A	4		4	$39,892.50	5	4.62	737	$54	$250.00
1	CSU, Fresno	David Allan H.P.	01-0479-A	36.09		36.09	$18,445.00	5	4.62	244	$76	$350.00
1	CSU, Fresno	Lance Mouw Dairy	01-0480-A	99.22		99.22	$1,025.00	14	10.92	45	$23	$250.00

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Levelized $/kW	Simple $/kW
1	CSU, Fresno	Vander Schaaf Dairy	01-0488-A	8.1		0	$1,957.50	14	10.92	86	$23	$250.00
1	CSU, Fresno	VSD for vacuum pump	01-0489-A	6.16		6.19	$3,825.00	14	10.92	167	$23	$250.00
1	CSU, Fresno	Chandlers 60 HP	01-0493-A	26.4		37.3	$1,537.50	14	10.92	67	$23	$250.00
1	CSU, Fresno	Tulare 50hp	01-0493-B	0		0	$1,000.00	9	7.71	31	$32	$250.00
1	CSU, Fresno	If2 Drip Station	01-0500-A	5.69		0	$8,487.36	9	7.71	278	$31	$235.17
1	CSU, Fresno	Don Cardey Pump	01-0503-A	105		105	$24,805.00	5	4.62	459	$54	$250.00
1	CSU, Fresno	Golden Valley Grape Juice	01-513-A	15.75		15.75	$0.00	14	10.92	0		#DIV/0!
1	CSU, Fresno	J. Wine Company	01-0514-A	19.76		19.76	$1,540.00	14	10.92	68	$23	$248.79
1	CSU, Fresno	A&T Dairy	01-0519-A	9.08		7.45	$2,000.00	5	4.62	172	$12	$53.62
1	CSU, Fresno	S & S Dairy	01-0521-A	8.2		8.2	$0.00	5	4.62	0		#DIV/0!
1	CSU, Fresno	Harry Miersma	01-0522-A	8.2		8.2	$0.00	8	6.98	0		#DIV/0!
1	CSU, Fresno	Palla Rosa #3 Dairy	01-0525-A	12.3		12.3	$25,720.00	5	4.62	485	$53	$244.95
1	CSU, Fresno	Jack Mendonsa	01-0526-A	9.88		9.88	$3,937.50	15	11.49	181	$22	$250.00
1	CSU, Fresno	J&L Dairy	01-0533-A	11.5		11.5	$4,940.00	5	4.62	91	$54	$250.00
1	CSU, Fresno	Three Palms Dairy/Antonio	01-0538-A	9.88		9.88	$2,270.00	14	10.92	81	$28	$304.70
1	CSU, Fresno	Family Limited	01-0583-A	412		412	$2,050.00	14	10.92	90	$23	$250.00
1	CSU, Fresno	Red Diamond Cooling, Inc.	01-0592-A	133.9		133.9	$2,050.00	14	10.92	90	$23	$250.00
1	CSU, Fresno	Rio Pluma Company	01-0595-A	0		0	$3,075.00	14	10.92	134	$23	$250.00
1	CSU, Fresno	Cordeniz & Gomes Dairy	01-0616-A	11.5		11.5	$2,470.00	14	10.92	108	$23	$250.00

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Levelized $/kW	Simple $/kW
1	CSU, Fresno	Tony Mendonca #2	01-0618-A	9.88		9.88	$2,875.00	14	10.92	126	$23	$250.00
1	CSU, Fresno	Harry Hoffman	01-0621-A	7.8		7.8	$2,470.00	14	10.92	108	$23	$250.00
1	CSU, Fresno	Puritan Ice Co.	01-0628-A	614		614	$6,565.65	5	4.62	1,904	$3	$15.94
1	CSU, Fresno	Manual Rosa Dairy	01-0637-A	19.44		19.44	$33,475.00	5	4.62	619	$54	$250.00
1	CSU, Fresno	James R. Samuel	01-0652-A	14.57		14.47	$5,150.00	5	4.62	0		#DIV/0!
1	CSU, Fresno	Scott Mather	01-0724-A	0		3.73	$2,875.00	5	4.62	53	$54	$250.00
1	CSU, Fresno	Puritan Ice Company	01-0725-A	423.8		423.8	$2,470.00	5	4.62	46	$54	$250.00
1	CSU, Fresno	El Solyo Water District	01-0727-A	30		7.05	$1,950.00	5	4.62	36	$54	$250.00
1	CSU, Fresno	El Solyo Water District	01-0728-A	27.45		2.48	$139,705.54	5	4.62	2,838	$49	$227.53
1	CSU, Fresno	Rockview Dairies Inc	01-0734-A	199.45		241.37	$4,860.00	5	4.62	90	$54	$250.00
1	CSU, Fresno	Rosemary Farms	01-0737-A	17.1		17.1	$3,642.14	5	4.62	67	$54	$251.70
1	CSU, Fresno	Walsh Vineyard	01-0747-A	0		0	$932.50	5	4.62	17	$54	$250.00
1	CSU, Fresno	Enns Packing	01-0754-A	50.7		0	$105,950.00	5	4.62	1,959	$54	$250.00
1	CSU, Fresno	Central California	01-0765-A	33.57		24.3	$1,762.50	5	4.62	33	$54	$250.00
1	CSU, Fresno	Lindauer River Ranch	01-0766-A	13.48		0	$620.00	5	4.62	11	$54	$250.00
1	CSU, Fresno	Ag Foundation	01-0771-A	62.51		62.51	$60,342.50	5	4.62	1,115	$54	$250.00
1	CSU, Fresno	Fox Point Farms	01-0778-A	16.28		0	$4,275.00	5	4.62	79	$54	$250.00
1	CSU, Fresno	Selma Cold & Dry Storage,	01-0780-A	81.09		81.09	$0.00	5	4.62	0		N/a
1	CSU, Fresno	S & S Produce	01-0781-A	1024.12		0	$0.00	5	4.62	0		N/a

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Leveliz ed $/kW	Simple $/kW
1	*CSU, Fresno*	Whitehouse Rd Irrigation	01-0794-A	23.4		0	$6,075.00	5	4.62	112	$54	$250.00
1	*CSU, Fresno*	Keithly-Williams	01-0795-A	11.1		10.61	$0.00	5	4.62	0		N/a
1	*CSU, Fresno*	Paul Masson	01-0799-A	175		159.15	$15,628.50	5	4.62	289	$54	$250.02
1	**CSU, Fresno subtotals**			**10,632**		**9,676**	**$2,094,337.53**			**169,256**	**$ 24.02**	**$ 182.66**

Cal Poly Category 3 projects												
Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Levelized Cost Effectiveness, $/kW-Yr	Simple cost effectiveness, $/kW
3	Cal Poly	Solano Irrigation District (ISO contract)	01-020-47730	1,000	1,000	$ 5,371.37	3	1	1.00	1,000	$5	$ 5.37
3	Cal Poly	City of Bakersfield Agricultural & Domestic Water Resources Division (ISO contract)	01-021-47730	1737	1,737	$ 26,058.00	3	1	1.00	1,737	$15	$ 15.00
3	Cal Poly	Westlands Water District (ISO contract)	01-022-47730	37800	17,703	$ 266,373.12	3	1	1.00	17,703	$15	$ 15.05
3	Cal Poly	Orange Cove Irrigation District	02-002-47330	600	637	$ 180,000.00	3	5	4.62	2,944	$61	$ 282.57
3	Cal Poly	Natomas Central Mutual Water District	02-003-47330	1270	1,270	$ 7,976.99	3	1	1.00	1,270	$6	$ 6.28
3	Cal Poly	Westlands Water District -- Woolf Telemetry (ISO contract)	02-004-47330	534	534	$ 4,657.56	3	1	1.00	534	$9	$ 8.72

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Levelized Cost Effectiveness, $/kW-Yr	Simple cost effectiveness, $/kW
3	Cal Poly	Westlands Water District -- Vasto Valle Telemetry (ISO contract)	02-005-47330	725	725	$ 7,762.59	3	1	1.00	725	$11	$ 10.71
3	Cal Poly	Tulare ID	03-013-47330	1923	1,923	$ 401,167.00	3	10	8.40	16,156	$25	$ 208.62
3		**Totals**		**45,589.0**	**25,529.0**	**$899,366.63**				**112,263**	**$ 8.01**	**$ 35.23**

Onsite Energy Company Project Cost Effectiveness												
Cat	Administrator	Project	Project Number	Estimated Demand Reduction Filed	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Levelized Cost Effectiveness, $/kW-Yr	Simple cost effectiveness, $/kW
1	Onsite Energy Corporation	Gatorade	1	83		61	$15,255.00	5	4.62	282	$54	$250.08
1	Onsite Energy Corporation	Pacific Coast Producers	2	1,464		1,464	366,000.00	5	4.62	6,766	$54	$ 250.00
1	Onsite Energy Corporation	Del Monte Hanford	3	89.5		89.5	$22,375.00	5	4.62	414	$54	$ 35.32
1	Onsite Energy Corporation	Del Monte Hanford	3	179		179	$44,750.00	5	4.62	827	$54	$ 250.00
1	Onsite Energy Corporation	Del Monte Hanford	3	212.7		214.6	$53,650.00	5	4.62	992	$54	$ 250.00
1	Onsite Energy Corporation	Del Monte Hanford	3	111.9		111.9	$27,975.00	5	4.62	517	$54	$ 250.00

Cat	Administrator	Project	Project Number	Administrator M&V verified Demand Reduction, kW	Demand Reduction, per ISO contract, kW	Verified Total Reduction, kW	Revised CEC Allocation	Projected Lifetime, Years	NPV factor at 4.1%	NPV of kW-Yr	Levelized Cost Effectiveness, $/kW-Yr	Simple cost effectiveness, $/kW
1	Onsite Energy Corporation	Del Monte Hanford	3	37.3		38.5	$ 9,625.00	5	4.62	178	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Visalia	4	117		76.3	$ 19,075.00	5	4.62	353	$54	$29.22
1	Onsite Energy Corporation	Frito Lay, Visalia	4	65.5		5.2	$ 1,300.00	5	4.62	24	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Visalia	4	12.3		28.6	$ 7,150.00	5	4.62	132	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Visalia	4	123.5		140.4	$ 35,100.00	5	4.62	649	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Visalia	4	117		115	$ 28,750.00	5	4.62	531	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Visalia	4	100		127.2	$ 31,800.00	5	4.62	588	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Visalia	4	250		160	$ 40,000.00	5	4.62	739	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Modesto	5	120		146.3	$ 36,575.00	5	4.62	676	$54	$40.77
1	Onsite Energy Corporation	Frito Lay, Modesto	5	32		33.7	$ 8,425.00	5	4.62	156	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Modesto	5	200		350	$ 87,500.00	5	4.62	1,617	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Modesto	5	26.5		17.2	$ 4,300.00	5	4.62	79	$54	$250.00
1	Onsite Energy Corporation	Frito Lay, Modesto	5			11.6	$2,900.00	5	4.62	54	$54	$250.00

1	Onsite Energy Corporation	Frito Lay, Modesto	5	175.9		200.7	$50,175.00	5	4.62	928	$54	$250.00
Cat	**Administrator**	**Project**	**Project Number**	**Administrator M&V verified Demand Reduction, kW**	**Demand Reduction, per ISO contract, kW**	**Verified Total Reduction, kW**	**Revised CEC Allocation**	**Projected Lifetime, Years**	**NPV factor at 4.1%**	**NPV of kW-Yr**	**Levelized Cost Effectiveness, $/kW-Yr**	**Simple cost effectiveness, $/kW**
1	Onsite Energy Corporation	Frito Lay Rancho Cucamunga	6	300		368	$ 92,000.00	5	4.62	1,701	$54	$ 250.00
1	Onsite Energy Corporation	Leprino Foods	7	700		490.1	$125,000.00	5	4.62	2,265	$54	$ 250.00
1	Onsite Energy Corporation	Dreisbach Lighting Controls	6	300		28.8	$7,200.00	5	4.62	133	$54	$ 250.00
1	Onsite Energy Corporation	Dreisbach Lighting Controls	7			25.3	$6,325.00	5	4.62	117	$54	$ 250.00
1	Onsite Energy Corporation	Dreisbach Lighting Controls	8			25.7	$6,425.00	5	4.62	119	$54	$ 250.00
1	Onsite Energy Corporation	Dreisbach Demand Limiting System	9	75		0	$	5	4.62	0		N/A
1	Onsite Energy Corporation	Dreisbach Demand Limiting System	10	110		339	$84,750.00	5	4.62	1,567	$54	$ 250.00
1	Onsite Energy Corporation	Dreisbach Demand Limiting System	11	190		112	$28,000.00	5	4.62	518	$54	$ 250.00
1	Onsite Energy Corporation	Del Mar Foods, Watsonville, Plant Side	12	300		398.8	$99,695.00	5	4.62	1,844	$54	$ 250.00
1	Onsite Energy Corporation	Del Mar Foods, Watsonville, Cold Storage Rooms	12	200		142.8	$35,692.50	5	4.62	661	$54	$ 250.00
1	Onsite Energy Corporation	Bonita Pak Foods	13	583		834	$208,500.00	5	4.62	3,854	$54	$ 250.00

1	Onsite Energy Corporation	Cool Pacific Foods	14	300		208	$52,000.00	5	4.62	961	$54	$ 250.00
Cat	**Administrator**	**Project**	**Project Number**	**Administrator M&V verified Demand Reduction, kW**	**Demand Reduction, per ISO contract, kW**	**Verified Total Reduction, kW**	**Revised CEC Allocation**	**Projected Lifetime, Years**	**NPV factor at 4.1%**	**NPV of kW-Yr**	**Levelized Cost Effectiveness, $/kW-Yr**	**Simple cost effectiveness, $/kW**
1	Onsite Energy Corporation	Richmond Wholesale	15	300		411.6	$ 102,900.00	5	4.62	1,902	$54	$250.00
1	Onsite Energy Corporation	P&O Cold Logistics - Vernon #1	16	1,500		441.2	$ 110,300.00	5	4.62	2,039	$54	$250.00
1	Onsite Energy Corporation	P&O Cold Logistics - Vernon #2	16			157.3	$39,325.00	5	4.62	727	$54	$250.00
1	Onsite Energy Corporation	P&O Cold Logistics - City of Industry #4	16			441.5	$ 110,375.00	5	4.62	2,039	$54	$250.11
1	Onsite Energy Corporation	P&O Cold Logistics - Dominquez Hills #6	16			43.6	$ 10,901.20	5	4.62	201	$54	$250.03
1	Onsite Energy Corporation	P&O Cold Logistics - Carson #10	16			195.9	$ 48,976.73	5	4.62	905	$54	$250.01
1	Onsite Energy Corporation	P&O Cold Logistics - Anaheim#11	16			101.7	$ 25,433.43	5	4.62	470	$54	$250.08
1	Onsite Energy Corporation	P&O Cold Logistics - La Habra #13	16			113.6	$ 28,400.00	5	4.62	525	$54	$250.00
1	Onsite Energy Corporation	P&O Cold Logistics - Brea #14	16			96.6	$ 24,159.48	5	4.62	446	$54	$250.10
1	Onsite Energy Corporation	P&O Cold Logistics - Modesto #15	16	450		198.1	$ 49,525.00	5	4.62	915	$54	$250.00
1	Onsite Energy Corporation	P&O Cold Logistics - Salinas #18	16			62.4	$ 15,607.50	5	4.62	288	$54	$250.12
1		**Totals**		**8,884.5**		**8,807.3**	***$2,000,000**			**40,699.8**	**$54.00**	**$ 250.00**

*Note: The Onsite Contract was limited to 8MW for a total of $2,000,000 in incentives. Projects shown resulted in 8,807.3 kW in demand savings; projects above the limit may be moved to the CIT program.

Cost Effectiveness Summary of Category 1, Category 3, and Onsite Category 1 Projects												
Cat	*Project*	*Administrator Reported Demand Reduction, kW*	*Demand Reduction, per ISO contract, kW*	*Administrator Reported Total Reduction, kW*	*Revised CEC Allocation*	*NPV factor at 4.1%*	*NPV of kW-Yr*	*Levelized Cost Effectiveness $/kW-Yr*	*Total # projects in data*	*Average project savings, kW*	*Average Grant, $*	*Simple Cost Effectiveness*
1		27,910	0	27,320	$ 4,382,470.43	varies	203,333	$ 21.55	191	146.1	$22,944.87	$ 157.02
3		50,217		29,930	$ 1,003,513.81	varies	56,632	$ 17.72	18	2,789.8	$55,750.77	$ 19.98
Onsite (1)		8,884.5		*8,807.3	*$ 2,000,000	varies	40,700	$ 54.00	43	204.8	$46,511.63	$ 250.00
subtotals		**86,952**		**66,057**	**$ 7,385,984.24**		**300,664**	**$ 24.57**	**252**	**262.13**	**$36,029.19**	**$ 111.81**
Cost Effectiveness of all projects based on demand savings for Category 1, Category 3, and Onsite projects												
Cat					**Paid CEC Grants**							
2					$4,049,557.62		N/A	N/A	747		$5,421.09	
4					$1,633,047.69		N/A	N/A	20		$81,652.35	
	All project category totals			**66,057**	**$13,068,589.55**		**297,785**	**$ 43.89**	**1337**		**$ 9,774.56**	**$ 200.28**

*Note: Onsite Energy Corporation contract limited payment to $2,000,000.00 for 8MW of savings; additional savings may be moved to CIT program

Section 5 Agricultural Program Administrator Audits

The following is a discussion of the responses to the 13 questions used as part of the administrative audits. The first seven questions are qualitative in nature; the latter six are quantitative, with an associated rating of 1 to 5, with five being the highest. Most of the responses are from an interview with the Fresno administrator, the Center for Irrigation Technology (CIT). A more limited interview was also conducted with the Irrigation Training and Research Center (ITRC) at the California Polytechnic Institute in San Luis Obispo.

Question 1: How were participants recruited?

A combination of activities was used to recruit participants. One method was a bill stuffer, which was included in the June 2001 PG&E bill another was a dedicated web page set up and linked to the CEC. In addition, informational seminars were held for farm groups, by farm bureaus, and during the Fresno County Fair with an agricultural technician. Finally, State Senator Sarah Reyes used additional industry contacts to recruit participants.

Question 2: What marketing material was used to attract participants?

A bill stuffer was included in the June 2001, PG&E bill and several seminars were held throughout the Central Valley. Web-based information on the program was made available at the CIT site. County Fair exhibits and a booth for CIT were also set up.

Question 3: (a) How many participants are participating as of December 31, 2002, and
(b) How many participants dropped out since the program's inception?

Table 1-1 gives a breakdown of the program participants by category.

Table 1-1: Reported Number of Participants and Dropouts

Category	Participants	Number Dropped Out	Percent Dropped Out
1: Efficiency	190	Small number	<10%
2: Pump Repair	568	Small number	<10%
3: Adv. Telemetry	18	Small number	
4: Fuel Switching	27	14	37%

Question 4: Were participants offered training or any other instructional help during any time of their participation?

No technical training was offered. A limited number of seminars to farmers, industry groups, and other interested parties were held in the Central Valley. An example of training included breakfast at Brooks Ranch with application assistance, marketing of program, slide show of program highlights, and technical support by CIT staff. Administrators offered rebates,

assistance with calculating savings, assistance in development of M&V strategies, and referral lists of certified pump repair firms.

Question 5: How did you evaluate your projects?

All applications were reviewed and compared to a list of eligible projects. Engineers used a "calculated savings" approach to test applications, and the more complicated projects were monitored. Some projects were forwarded to outside consultants for specialized review. Baseline demand was not measured in most applications, but was established through billing data. Post-installation demand was verified through billing data review for many Category 1 projects.

Question 6: a) How did you verify installations?
b) How many participants or sites were verified, and
c) Was a sampling plan used for this?

a) Project installations for the Fresno administrator were first verified through a notice from the participant. Final verification was through submittal of utility bills, monitoring data for the few projects that required actual M&V with metering equipment, and invoices for installed equipment. All projects were required to submit invoices and utility billing to CIT for final payment of incentives.

b) CIT staff visited an unknown number of project sites for either pre-installation or post-installation inspections. Projects with complicated project measures, or projects where conflicting information was discovered, were visited (i.e. Frito Lay Bakersfield, Puritan Ice, several dairy VSD projects).

c) It is unknown if site visits were in response to sampling plan or conducted when required for problem resolution. Database records from CIT do not indicate significant numbers of visual or on-site project verifications.

Question 7: What method was used to track and report project progress to the Energy Commission and/or the M&V contractor?

Monthly status reports were sent to the Energy Commission. The Fresno administrator used an Access database for tracking purposes, while the IRTC used an Excel spreadsheet. Reports derived from the databases were sent to Nexant for project progress tracking. Early in the program frequent errors were uncovered in the Fresno administrator database entries.

Questions 8-13 are about record keeping, and are answered with ratings based on a 5-point scale, with five being highest. Nexant gave the Fresno administrator a rating of 5 for each of the questions in Table 1-1. The IRTC administrator was not rated.

Table 1-1: Questions 8-13

Question Number	Question	Rating
8	Are documents available for the sampled projects in question?	5
9	Were invoices valid with proper documentation and consistent with the initial between parties involved and the program requirements?	5
10	Was the verification process noted above followed?	5
11	Did the installed equipment agree with the invoice?	5
12	Were participants paid according to the customer agreement?	5
13	Was the tracking/reporting method noted above maintained?	5

Section 6 Agricultural Sampled Projects

This section of the Agricultural program appendices includes information related to evaluation of peak period demand savings, or verification of project installation for projects selected in the sampling plans. The attached documents are organized by project category, and by project number within each of the four project categories. All of the Onsite Energy Corporation projects are organized by project name within the Category 1 group of project evaluations.

Project 01-0100A: Rote Greenhouses

Variances from CEC Approved Savings
Project 01-0100A: Rote Greenhouses

Project Description

This project involves the installation of electrical relays to reduce the hours of operation for convection tube fans at three plant nurseries. The facilities use the fans to circulate air and distribute the heat from overhead heaters at night. Previously the fans were in operation 24 hours/day, 7 days/week. The proposed measure involves installing relays for the fans to connect them to the 4-stage thermostat used in the nursery during the day. This will result in the fans being off during peak hours.

Nexant Calculations

Baseline

Currently the fans are in use 24 hours/day, 7 days/week. Table A lists the calculated baseline demand, based on nameplate information:

Table 1: Baseline Demand

	No. of Motors	Size (hp)*	Total (kW)**
A	16	0.75	8.95
B	4	0.75	2.24
C	9	0.33	2.24
	1	0.50	0.37
		Total:	13.8

*from nameplate information

**based on 0.746 kW/hp

Utility billing data did not include dedicated sub-metering for the motors. However, savings may still be observed in the data based on the difference between baseline and post-installation peak energy use. Using 2000 and 2001 time of use billing data, the peak energy use (kW) for the summer on-peak period for each facility was calculated. It should be noted that the available billing used was for July 2000 through September 2000 and June 2001. The assumption was made that the June 2001 data was similar to June 2000. The total peak energy use (kWh) was divided by the number of peak hours to determine the average peak demand, listed in Table 2:

Table 2: Baseline Demand from Billing Data

	Peak Energy Use (kWh)	Avg Peak Demand (kW)
A	4,040	31.3
B	1,460	11.3
C	2,171	16.8

Demand Savings

The relays installed on the circulation fans will result in a reduction in hours. The fans will be off during peak hours. Therefore, post-installation demand is expected to be 0 kW.

Billing data was included with the project application. Post-installation billing data will verify that the motors are not in operation during peak hours and verify the demand (kW) savings. Based on baseline billing data and motor nameplate data, Table 3 lists the expected demand that will be observed in the post-installation billing data.

Table 3: Expected Demand in Post-Installation Billing Data

	Baseline Peak Demand (kW)	Demand Savings (kW)	Expected Post-Install Billing Demand (kW)
A	31.3	8.95	22.4
B	11.3	2.24	9.1
C	16.8	2.61	14.2

The incentive for this project is $1,105 and was based on 65% of the project costs.

Conclusions

The demand savings for this project were based on nameplate data. Baseline utility billing data did not sub-meter, therefore post-installation billing data may not truly reflect these savings. However, if the facility does operate the motors off-peak, the demand savings should be fairly accurate.

Differences from Approved Savings and Incentive

Demand Savings Discrepancies

The approved demand savings for this project were based on nameplate data. Based on the available information, Nexant's calculations agreed with the approved calculations.

Incentive Discrepancies

The incentive paid for this project was based on the project costs. Based on the total project costs of $1,700, this project was granted $1,105. Nexant's calculations agreed with this incentive.

Project 01-0134A: Campbell Soup Supply Co.

Variances from CEC Approved Savings
Project 01-0134A: Campbell Soup Supply Co.

Project Description

This project involves modifications to the facility's operations that result in the removal of two electric motors totaling 1,850 hp. The modifications include utilizing higher-pressure steam in the tomato evaporation process and using new steam turbines as the evaporation source, replacing the two existing electric motors. Three small (3 hp) condensate pumps will be also be installed as part of the modification. The changes will not affect the facility's production. The facility evaporates tomatoes 24 hours per day, 7 days per week during the tomato season, which typically runs during the months of July, August, and September.

Nexant Calculations

Baseline and Demand Savings

The baseline demand from the two electric motors to be removed and the three condensate pumps to be installed was calculated from nameplate data:

(1,500 hp + 350 hp – (3 hp * 3 pumps) x (0.746 kW/hp) = 1,373 kW

The baseline calculation assumed that the motors and pumps are operating at full load during peak hours for the entire tomato season. However, the tomato season only occurs in July, August, and September. For the CEC Peak Load Reduction program, the summer peak period also includes June. Therefore, the average demand was adjusted based on the ratio of peak hours in July, August, and September (390 hrs) to the total peak hours from June through September (522 hrs) for an average demand savings of 1,026 kW during the summer peak period.

The application included monthly utility billing for the last 5 years, as well as summer peak load data for 2000. The billing data does not include dedicated sub-metering for the motors. However, savings may still be observed in the data based on the difference between baseline and post-installation peak energy use. As shown in Table 1 below, the average maximum demand during the entire 2000 summer peak period (June-Sep) was 3,673 kW. The average peak period demand, based on total energy use during the summer peak period (June-Sep), was 2,493 kW.

Table 1: 2000 Peak Period Utility Billing Data

Month	On-Peak Energy Use (kWh)	Max On-Peak Demand (kW)
June	19,031	270
July	224,621	4,704
August	531,354	4,893
September	526,341	4,824

Month	On-Peak Energy Use (kWh)	Max On-Peak Demand (kW)
Total:	1,301,347	
Peak Hours:	522	
Avg Demand (kW):	2,493	3,673

Using the 2000 billing data and calculated demand savings, the expected post-installation average peak demand is 1,686 kW, based on total peak energy use.

Conclusions

The demand savings for this project were based on nameplate information. According to Joe Halligan of Bellato Engineers, no spot measurements were taken of the motors prior to their removal to verify the nameplate data. The savings might be slightly high because they did not account for motor power factor or efficiency, but the figure should be fairly accurate.

Differences from Approved Savings and Incentive

Demand Savings Discrepancies

Demand savings submitted for the project were based on nameplate data. This methodology appeared accurate and Nexant agrees with the calculations. However, the approved savings did not account for the entire summer peak season. June is also included as a summer peak month for this program. Therefore the demand savings must be averaged over 4 months rather than the 3 months of the tomato season. By using the ratio of hours, the savings are reduced by approximately 25%.

In addition, the application states that the 2000 utility billing data shows the average demand to be 4600 kW. Based on Nexant's analysis, the maximum monthly demand average was 4,807 kW for July through September, and the average demand, based on total peak energy use divided by total hours was 3,288 kW for July through September. Including the energy use from June, the average peak demand for the entire summer was 2,493 kW. The expected demand savings were subtracted from this to estimate the post-installation demand on the utility's electric meter. These savings will be verified through 2002 utility billing data.

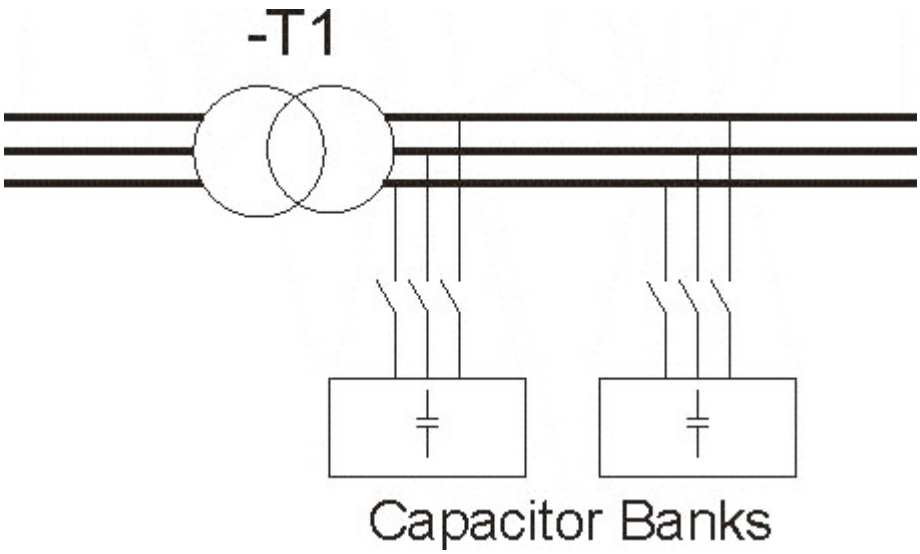
Incentive Discrepancies

The incentive paid for this project was based on the demand savings. Based on the approved savings of 1,373 kW, this project was granted $343,250. However, Nexant's savings of 1,026 result in an incentive of $256,523.

Project 01-0152A: Trinchero Winery

Bulk Correction.

The Power factor of the total current supplied to the distribution board is monitored by a controller which then switches capacitor banks In a fashion to maintain a power factor better than a preset limit. (Typically 0.95) Ideally, the power factor should be as close to unity as possible. There is no problem with bulk correction operating at unity.



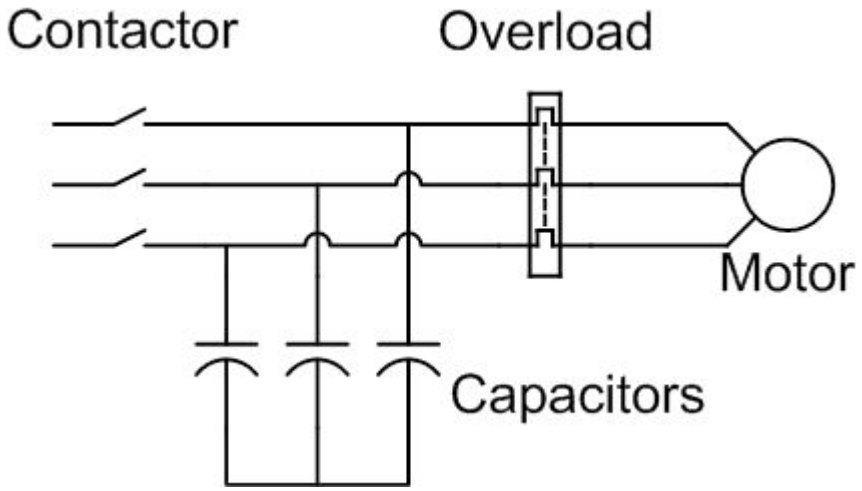
Static Correction.

As a large proportion of the inductive or lagging current on the supply is due to the magnetising current of induction motors, it is easy to correct each individual motor by connecting the correction capacitors to the motor starters. With static correction, it is important that the capacitive current is less than the inductive magnetising current of the induction motor. In many installations employing static power factor correction, the correction capacitors are connected directly in parallel with the motor windings. When the motor is Off Line, the capacitors are also Off Line. When the motor is connected to the supply, the capacitors are also connected providing correction at all times that the motor is connected to the supply. This removes the requirement for any expensive power factor monitoring and control equipment. In this situation, the capacitors remain connected to the motor terminals as the motor slows down. An induction motor, while connected to the supply, is driven by a rotating magnetic field in the stator which induces current into the rotor. When the motor is disconnected from the supply, there is for a period of time, a magnetic field associated with the rotor. As the motor decelerates, it generates voltage out its terminals at a frequency which is related to it's speed. The capacitors connected across the motor terminals, form a resonant circuit with the motor inductance. If the motor is critically corrected, (corrected to a power factor of 1.0) the inductive reactance equals the capacitive reactance at the line frequency and therefore the resonant frequency is equal to the line frequency. If the motor is over corrected, the resonant frequency will be below the line frequency. If the frequency of the voltage generated by the decelerating motor passes through the resonant frequency of the corrected motor, there will be high currents and voltages around the motor/capacitor circuit. This can result in sever damage to the capacitors and motor. It is

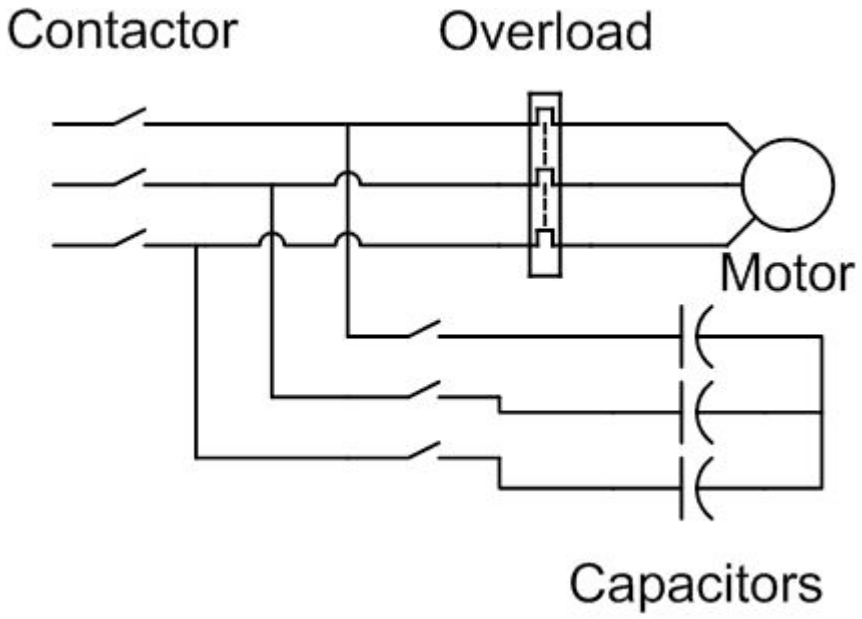
imperative that motors are never over corrected or critically corrected when static correction is employed.

Static power factor correction should provide capacitive current equal to 80% of the magnetising current, which is essentially the open shaft current of the motor.

The magnetising current for induction motors can vary considerably. Typically, magnetising currents for large two pole machines can be as low as 20% of the rated current of the motor while smaller low speed motors can have a magnetising current as high as 60% of the rated full load current of the motor. It is not practical to use a "Standard table" for the correction of induction motors giving optimum correction on all motors. Tables result in undercorrection on most motors but can result in over correction in some cases. Where the open shaft current can not be measured, and the magnetising current is not quoted, an approximate level for the maximum correction that can be applied can be calculated from the half load characteristics of the motor. It is dangerous to base correction on the full load characteristics of the motor as in some cases, motors can exhibit a high leakage reactance and correction to 0.95 at full load will result in overcorrection under no load, or disconnected conditions.



Static correction is commonly applied by using on e contactor to control both the motor and the capacitors. It is better practice to use two contactors, one for the motor and one for the capacitors. Where one contactor is employed, it should be upsized for the capacitive load. The use of a second contactor eliminates the problems of resonance between the motor and the capacitors.


Contactor
Overload
Motor
Capacitors

Projects 01-0159A, 0226A, 0227A, 0445A: Frito Lay

Randy McCall, Project Manger
Energy Delivery and Management Business Unit

February 10, 2003

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RE: APLRP project #'s 01-0159-A, 01-226-A, 01-227-A, 01-0445-A; Frito Lay, Bakersfield category 1 high-efficiency electrical-equipment project measurement and verification review.

Dear Bob and Pete,

I am writing you in response to your request to review and comment on the Measurement and Verification (M&V) plan and demand savings resulting from the four projects approved by CIT for the Frito Lay at their Bakersfield plant. As you are aware, Nexant, Inc. was retained by the CEC to provide M&V services for projects approved by the independent administrators and other contractors to the CEC. In that role, Nexant has identified a sample of projects we are conducting evaluation on to determine program level peak period demand savings. None of the four projects that are the subject of this letter are part of Nexant's random sample; therefore, our evaluation of these projects is not a full evaluation of all project documentation, nor is our investigation to be construed as a rigorous investigation of actual demand savings from the project activities for the four projects in question.

My conclusions regarding the four projects and demand savings from the four are that billing data supplied with the other documentation do not support the full savings claims for the aggregated savings from the three completed projects for which the billing data is applicable. The billing data supplied covers three summer peak period billing periods, and depending on which year is used as to establish a facility baseline average peak period demand, the peak period demand savings can be evaluated as a range from negative savings (ie increased average peak period demand) to approximately 129 kW of average peak period savings.

Based on database reports provided to Nexant, the four projects were submitted to CIT at different dates, with the first submittal for project 01-0159-A received on October 26, 2001. Project #'s 01-226-A, and 01-227-A were submitted on January 2, 2002, and the last project, # 01-445-A was received by CIT on May 16, 2002. Each of the four projects was projected for completion on different dates ranging from August 30, 2001, through November 11, 2002.

Nexant is not aware of the actual completion dates for the four projects, but the projected dates of completion include construction of the first project (01-0159-A) during the summer peak period season of 2001, and completion of the last project after the summer peak season of 2002. The M&V for each of the four projects is detailed in an attachment to each projects grant contract, titled Attachment C Protocol for Measurement and Verification. In each case the appendix is laid out with sections consisting of the following:

- Verification of Project Commissioning
- Verification of Peak Period Load Reduction (where applicable)
- Calculation of Actual Incentive Grant Payment\
- Schedule of Incentive Grant Payments
- Forfeiture of Grant Payment

Section 2.0 of each appendix, Verification of Peak Period Load Reduction, lists the CIT approved estimate of demand savings, the method of initial verification of the actual peak period load reduction, and the final verification of the actual peak period load reduction. Each Appendix has a relatively short section that details the methods of initial and final verification.

Project 01-0159-A is a lighting efficiency installation. The verification of initial savings is indicated to be through physical inspection of the facility and paid invoices. Final verification is to be accomplished through comparison of utility billing "…indicating that facility was in full operation June through September, 2002, to be submitted when that billing becomes available."

Nexant is in agreement with CIT regarding the initial verification methodology, however, the final verification is not specific regarding the billing comparison. While the post-installation billing year is specified in this appendix, the pre-installation baseline is not. Comparing the billing data from the summer of 2000 to the summer of 2002, there are no average peak period demand savings. Comparing the billing data from the summer of 2001 to the summer of 2002 results in an average on peak demand savings of approximately 129 kW.

Project 01-0226-A is a plant wide retrofit of the compressed air system to reduce capacity requirements. The initial verification for this project is accomplished through utility billing comparisons for the summer peak periods of 2001 and 2002 "…showing that peak load was reduced by at least the amount accepted for participation for each of the Applications for this facility and the facility was in full operation for the entire peak period." Although the text is not specific, Nexant believes this includes savings from project 01-0159-A, and possibly projects 01-227-A, and 01-445-A. Project 01-445-A was not submitted to CIT until May 16, 2002; the database records appear to indicate this contract appendix was not meant to include the fourth project by virtue of contract mailing and completion prior to CIT receipt of the last project.

Final verification of the project is to be accomplished through logging of compressor run times showing a net 250hp reduction in compressor usage. Nexant's review of the summer peak billing data between 2001 and 2002 shows an average of 129 kW in average peak reduction, however, if this level of savings are attributed to the lighting project, 01-0159-A on the basis of

the comparison between 2001 and 2002 summer peak period billing data, then there is no additional capacity savings possible for this project.

Because of the lack of baseline year specified year for the billing data comparison in the Appendix for project 01-0159-A, a more complicated picture emerges where peak period demand savings for 01-0159-A are not approved based on comparisons between the summer peak period billing of 2000 and 2002, yet 129kW in peak period savings might be initially verified for project 01-0226-A due to the specified comparison between summer peak period billing between 2001 and 2002. The situation is further complicated by the requirement in the initial verification for 01-0226-A that the reduction is for at least the amount accepted "…for participation for each of the Applications for this facility…"

The third project received by CIT, 01-0227-A, is a refrigeration management system for air conditioning systems projected to deliver 135 kW of peak period demand savings. The Appendix includes identical language for the initial verification of peak period demand savings contained in the Appendix for project 01-226-A. Final verification of savings is to be accomplished by a combination of techniques including a sampling inspection of pre-installation and post-installation power monitoring logs for one-week intervals. In addition, the maximum outdoor air temperatures are to be supplied for use in the analysis.

Issues identified above for initial verification of the peak period demand savings for project 01-0226-A are similar to the problems in initial verification of demand savings for project 01-0227-A, except in magnitude of the expected project savings. In both Appendices, initial verification of the peak period demand savings is contingent on a demonstration that peak period demand "…was reduced by at least the amount accepted for participation for each of the Applications…"

The fourth and final project received by CIT for the Bakersfield plant is for another lighting efficiency project. Similar to project 01-0159-A, the initial verification is accomplished through physical inspection of the facility and paid invoices. Final verification is also similar, "…by utility billing indicating that facility was in full operation June through September, 2002, to be submitted when that billing becomes available."

Due to the projected completion date for this project of November 11, 2002, as reported in the CIT database, Nexant does not agree that the billing data comparison for a non-specific summer peak period baseline year and summer of 2002 peak period billing data will be useful. The project was not delivering savings during the summer peak period of 2002 according the CIT records. PG&E does report partial peak period loads and energy use during the spring and fall time periods, however this is not specified as an option in the Appendix for conducting final savings verification.

Nexant agrees with the initial demand savings estimates for each of the four projects approved for the program, and on an individual basis the peak period demand savings can be verified except as noted above. Billing data comparisons for summer peak periods as specified for each project for either initial or final verification cannot support the savings claimed for the four projects as a group.

In summary, my evaluation of the documentation provide for these four projects reveals that final verification for the two lighting projects includes use of an unspecified baseline peak period year resulting in a range of savings from negative to 129 kW. Furthermore, initial verification of the peak period demand savings for the refrigeration and air compressor projects are complicated by the requirement of demonstrated demand savings for an unspecified number of the four projects through billing data comparisons for summer of 2001 and 2002.

Notes on Frito Lay projects:

Project 01-0159-A Received at CIT on October 26, 2001. M&V protocol contained in Appendix C of the project application requires billing history to show the reduction in peak period demand savings according to the contract appendix C at 149.9kW. Peak period demand savings are to be verified using billing from the peak season for 2002 when the billing statements are available. Grant calculation is $44,970.00 payable on completion of the project, submittal of invoices, and verification of the billing.

Project 01-0226-A Received on January 2, 2002 at CIT.
The M&V protocols specify run time meters for compressor run hours. 250 hp of compressor capacity must by taken off line as shown by the recording devices. Initial verification of the project is through comparison of 2001 and 2002 billing statements. (This does not reflect the reduction for the earlier project for lighting – ie does it really deliver the stated savings)

Project 01-0227-A received on January 2, 2002
Project 01-0445-A Received on May 16, 2002
Eligibility for the APLRP is evaluated on the basis of potential demand savings that can accrue to the California grid. The plant at Bakersfield has a site-located co-generation plant capable of meeting internal loads at the plant during some or all operations. Utility billing information shows purchased summer peak period energy during the 2000, 2001, and 2003 summer peak periods. Additionally the utility billing statements indicate that for some periods of time, the plant called on PG&E to deliver a significant amount of power to meet the internal demands of the plant during the summer peak periods, in excess of 3MW for the summer peak periods for each of the summer peak periods. Nexant has not received nor reviewed any 15-minute interval data that would show the history of the load purchases from PG&E, therefore Nexant cannot comment on how the energy was used during the summer peak periods. Based on the billed on peak energy delivered to the plant, and on peak demand recorded by PG&E, a calculation of the duration of peak period energy use implies very few hours of on peak energy delivery by the utility. Using the CIT methods for calculating average on peak energy during the summer months, the Frito lay plant had an average demand of approximately 129 kW during the entire summer peak. This calculation does not take into consideration the duration of any peak period energy purchases, on the average load for the 504 hours of the summer peak period.

Nexant's role in administration of the APLRP is to evaluate the M&V of project savings and report the information to the CEC. The M&V for the four projects pre-approved for the program by CIT is based solely on utility billing showing a reduction in summer peak period energy purchases. The approved levels of savings for each project were based on Frito Lay's engineering estimates for each technology and seem reasonable for the type of projects approved. Our review of the billing from PG&E for the plant shows a less clear picture for demand savings achieved through the projects. On peak energy purchases for the 2000 summer peak period are in fact, less than on peak energy purchases during either of the next two summer periods. The first of the four projects, 01-0159-A was submitted to CIT on October 26 2001, and was under construction prior to availability of summer 2001 peak period energy billing statements (construction completion was reported to be 8/30/2001). The second and third projects were

received at CIT on January 2, 2002 for evaluation. Construction completion for the two projects was reported to be on December 10, 2001, and May 31, 2002. The fourth project, submitted on May 16, 2002 was projected to be complete by November 11, 2002.

While it is unclear when the actual construction of the four projects was taking place, billing data from both 2001 and 2002 may not have shown the reductions for the one or more of these projects. Using as a baseline the summer of 2000 billing information, the summer of 2002 billing information actually shows a significant increase in peak period energy purchases.

Appendix C: Project 01-0159A

Protocol for Measurement and Verification

This Appendix is the controlling authority for the means and methods of:

a) Verification of Project Commissioning,

b) Verification of Peak Period Load Reduction (where applicable),

c) Calculation of the Actual Incentive Grant Payment,

d) Schedule of Incentive Grant Payments,

for the Project titled "Frito Lay Bakersfield" of Application # 01-0159 titled "Frito Lay Bakersfield".

1.0 Verification of Project Commissioning

This section shall define the Project that will be Commissioned and when it is considered Commissioned.

1.1 This Project is located at the Frito Lay facility at 22801 Highway 58, Bakersfield, CA. It consists of installing high efficiency lighting.

1.2 This Project will be considered Commissioned when it is verified that the following equipment has been purchased, installed, and is operating legally and as intended:

a) Lighting replacements as per Audit sheet supplied in the Application #01-0159 (estimated Project cost = $202,922.54).

2.0 Verification of Peak Period Load Reduction

This section shall define how Peak Period Load Reduction will be verified.

2.1 The estimated Peak Period Load Reduction as a result of this Project is One Hundred, Forty-nine and nine-tenths kiloWatts (149.9 kW).

2.2 Initial verification of the actual Peak Period Load Reduction will be by physical inspection of the facility and paid invoices.

2.3 Final verification of the actual Peak Load Reduction will be by utility billing indicating that facility was in full operation June through September 2002, to be submitted when that billing becomes available.

3.0 Calculation of the Actual Incentive Grant Payment

This section defines how the Actual Incentive Grant Payment will be calculated.

3.1 The Estimated Incentive Grant Payment for this project is Forty-four thousand, nine hundred, seventy dollars ($44,970.00) and is based on the estimated reduction in peak period load at a rate of $300/kW.

3.2 The Actual Incentive Grant Payment will be calculated after verification of actual Peak Period Load Reduction. It will be the lesser of:

a) Sixty-Five percent (65%) of the "Total Cost of the Project", or

b) A sum calculated under the following rules:

- Projects Commissioned by July 31, 2001 shall be awarded $350 per kiloWatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after July 31, 2001 and before September 30, 2001 shall be awarded $300 per kiloWatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after September 30, 2001 and before May 31, 2002 shall be awarded $250 per kiloWatt for the verified Peak Period Load Reduction achieved.

3.3 The "Total Cost of the Project" is defined as the total cost of the project submitted by the Applicant in his completed Application and approved by The Foundation. The "Total Cost of the Project" is the sum of any costs directly associated with the project including:

a) Design, Planning, and Engineering,

b) Equipment purchase,

c) Site preparation if it is required for the Project,

d) Equipment installation/Facility construction and testing, and

e) Local, State, and Federal sales taxes.

3.4 All Project costs will be verified by presentation of invoices reflecting that the amount due was originally billed on or after January 1, 2001, and then paid in full. The Applicant will gather all such invoices, calculate the "Total Cost of the Project", certify that the dates and amounts involved were timely incurred and paid, and such invoices, calculations and certification will be presented to the Foundation no later than sixty (60) days after the Commission Date. The certification of authenticity and accuracy of submitted invoices form is set forth below.

3.5 Notwithstanding section 3.2, the following will apply:

a) The Actual Incentive Grant Payment may be less than the Estimated Incentive Grant Payment.

b) The Actual Incentive Grant Payment cannot be more than Forty-four thousand, nine hundred, seventy dollars ($44,970.00).

3.6 Notwithstanding sections 3.1 and 3.2, no individual or corporate/business entity will be entitled to more than two million dollars ($2,000,000.00) of incentive payments.

4.0 Schedule of Grant Payments

This section defines when actual payments will be made.

4.1 The Actual Incentive Grant Payment will be calculated as per section 3.0 of this Appendix within ten (10) days after the later of either the date of initial verification of Peak Period Load Reduction (as per section 2.2 of this Appendix) or the date of certification of the "Total Cost of the Project". Payment will be within thirty (30) days of the calculation of the Actual Incentive Grant Payment.

4.2 All payments will be by check made payable to "Frito Lay" and delivered by United States mail to:

Mr. James Preston
22801 Highway 58
Bakersfield, CA 93312

5.0 Forfeiture of Grant Payment

In the event that the final verification of Peak Period Load Reduction as per section 2.3 of this Appendix cannot be established, the Applicant is required to promptly reimburse the Foundation the Actual Incentive Grant Payment. The reimbursement shall by check made payable to "California State University, Fresno Foundation" and delivered by United States mail to:

Mr. Randy Larson
California State University Fresno
Auxiliary Corporations
4910 North Chestnut, OF 123
Fresno, CA 93726-1852

CERTIFICATION OF AUTHENTICITY AND ACCURACY OF SUBMITTED INVOICES

The Applicant hereby certifies that all invoices submitted for Grant Payments are original invoices (or copies of original invoices) that are authentic and accurately reflect costs that were incurred by the Applicant on or after January 1, 2001, solely in connection with the Applicant's submitted project. The Applicant further certifies that all invoices submitted for Grant Payments do not overstate the costs incurred by the Applicant or reflect costs incurred not in direct connection with the Applicant's project.

Signed by:

_____ _____

APPLICANT DATE

Appendix C: Project 01-0226A

Protocol for Measurement and Verification

This Appendix is the controlling authority for the means and methods of:

e) Verification of Project Commissioning,

f) Verification of Peak Period Load Reduction (where applicable),

g) Calculation of the Actual Incentive Grant Payment,

h) Schedule of Incentive Grant Payments,

for the Project titled "Compressed Air Upgrade" of Application # 01-0226-A titled "Recot, Inc."

1.0 Verification of Project Commissioning

This section shall define the Project that will be Commissioned and when it is considered Commissioned.

1.1 This Project is located at the Frito Lay facility located at 4585 22801 Highway 58 in Bakersfield, CA. It consists of installing new equipment and reconfiguring the plant-wide compressed air system to reduce capacity requirements and thus become more efficient.

1.2 This Project will be considered Commissioned when it is verified that the following equipment has been purchased, installed, and is operating legally and as intended:

c) One DMX 1300 Demand Expander
d) One 1550 gallon air receiver
e) Modify existing piping and relocate existing 1830 receiver tank
f) Repair identified leaks in compressed air system as identified in the application
g) Lower plant air system to 75 psi

2.0 Verification of Peak Period Load Reduction

This section shall define how Peak Period Load Reduction will be verified.

2.1 The estimated Peak Period Load Reduction as a result of this Project is 199 kiloWatts (199 kW).

2.2 Initial verification of the actual Peak Period Load Reduction will be by comparison of utility statements for June through September 2001 to June through September 2002 showing that peak load was reduced by at least the amount accepted for participation for each of the Applications for this facility and that the facility was in full operation for the entire peak period.

2.3 Final verification of the actual Peak Period Load Reduction will be by comparison of logging of air compressors 1, 2, 3, 4, and 6 to show that at least a 250 HP reduction in net load was achieved by allowing Compressor #2 to remain off. A simple digital log of run hours by week may be utilized for each compressor, if the controls have digital logging capabilities. If not, an electromechanical run hours meter may be installed for each compressor, and a log generated by weekly readings of these meters.

3.0 Calculation of the Actual Incentive Grant Payment

This section defines how the Actual Incentive Grant Payment will be calculated.

3.1 The Estimated Incentive Grant Payment for this project is Forty nine thousand, seven hundred and fifty dollars ($49,750.00) and is based on the estimated reduction in peak period load.

3.2 The Actual Incentive Grant Payment will be calculated after verification of actual Peak Period Load Reduction. It will be the lesser of:

a) Sixty-Five percent (65%) of the "Total Cost of the Project", or

b) A sum calculated under the following rules:

- Projects Commissioned by July 31, 2001 shall be awarded $350 per kilowatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after July 31, 2001 and before September 30, 2001 shall be awarded $300 per kilowatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after September 30, 2001 and before May 31, 2002 shall be awarded $250 per kilowatt for the verified Peak Period Load Reduction achieved.

3.3 The "Total Cost of the Project" is defined as the total cost of the project submitted by the Applicant in his completed Application and approved by The Foundation. The "Total Cost of the Project" is the sum of any costs directly associated with the project including:

f) Design, Planning, and Engineering,

g) Equipment purchase,

h) Site preparation if it is required for the Project,

i) Equipment installation/Facility construction and testing, and

j) Local, State, and Federal sales taxes.

3.4 All Project costs will be verified by presentation of invoices reflecting that the amount due was originally billed on or after January 1, 2001, and then paid in full. The Applicant will gather all such invoices, calculate the "Total Cost of the Project", certify that the dates and amounts involved were timely incurred and paid, and such invoices, calculations and certification will be presented to the Foundation no later than sixty (60) days after the Commission Date. The certification of authenticity and accuracy of submitted invoices form is set forth below.

3.5 Notwithstanding section 3.2, the following will apply:

a) The Actual Incentive Grant Payment may be less than the Estimated Incentive Grant Payment.

b) The Actual Incentive Grant Payment cannot be more than Forty nine thousand, seven hundred and fifty dollars ($49,750.00) without prior written approval from the Foundation.

3.6 Notwithstanding sections 3.1 and 3.2, no individual or corporate/business entity will be entitled to more than two million dollars ($2,000,000.00) of incentive payments.

4.0 Schedule of Grant Payments

This section defines when actual payments will be made.

4.1 An initial payment of one half of the recalculated Estimated Incentive Grant Payment will be paid within thirty (30) days after the later of either the date of Project Commissioning or presentation of the "Total Cost of the Project" to the Foundation by the Applicant.

4.2 The Actual Incentive Grant Payment will be calculated as per section 3.0 of this Appendix within ten (10) days after the later of either the date of verification of Peak Period Load Reduction or the date of certification of the "Total Cost of the Project".

4.3 The difference between the Actual Incentive Grant Payment and the payment made under section 4.1 will be paid within thirty (30) days of the calculation of the Actual Incentive Grant Payment.

4.4 All payments will be by check made payable to "Recot, Inc." and delivered by United States mail to:

Mr. James Preston
22081 Highway 58
Bakersfield, CA 93312

5.0 Forfeiture of Grant Payment

In the event that the Actual Incentive Grant Payment is less than the initial payment made under section 4.1 of this Appendix, the Applicant is required to promptly reimburse the Foundation the difference between the Actual Incentive Grant Payment and the initial payment. The reimbursement shall by check made payable to "California State University, Fresno Foundation" and delivered by United States mail to:

Mr. Randy Larson
California State University Fresno
Auxiliary Corporations
4910 North Chestnut, OF 123
Fresno, CA 93726-1852

CERTIFICATION OF AUTHENTICITY AND ACCURACY OF SUBMITTED INVOICES

The Applicant hereby certifies that all invoices submitted for Grant Payments are original invoices (or copies of original invoices) that are authentic and accurately reflect costs that were incurred by the Applicant on or after January 1, 2001, solely in connection with the Applicant's submitted project. The Applicant further certifies that all invoices submitted for Grant Payments do not overstate the costs incurred by the Applicant or reflect costs incurred not in direct connection with the Applicant's project.

Signed by:

_____ _____
APPLICANT DATE

Appendix C: Project 01-0227A

Protocol for Measurement and Verification

This Appendix is the controlling authority for the means and methods of:

i) Verification of Project Commissioning,

j) Verification of Peak Period Load Reduction (where applicable),

k) Calculation of the Actual Incentive Grant Payment,

l) Schedule of Incentive Grant Payments,

for the Project titled "HVAC – Artic Master Refrigerant Management System" of Application # 01-0227-A titled "Frito-Lay, Inc."

1.0 Verification of Project Commissioning

This section shall define the Project that will be commissioned and when it is considered Commissioned.

1.1 This Project is located at the Frito Lay facility located at 4585 22801 Highway 58 in Bakersfield, CA. It consists of installing refrigerant management systems on air conditioning systems throughout the facility, which will achieve energy reduction by more efficient circulation of refrigerants in each unit.

1.2 This Project will be considered Commissioned when it is verified that the following equipment has been purchased, installed, and is operating legally and as intended:

h) Twenty-one (21) ArticMaster Refrigerant Management Systems (RMS) on each of the air conditioning units listed in the Peak Demand Reduction Calculations worksheet included with the Application.

2.0 Verification of Peak Period Load Reduction

This section shall define how Peak Period Load Reduction will be verified.

2.1 The estimated Peak Period Load Reduction as a result of this Project is 135 kilowatts (135 kW).

2.2 Initial verification of the actual Peak Period Load Reduction will be by comparison of utility statements for June through September 2001 to June through September 2002 showing that peak load was reduced by at least the amount accepted for participation for each of the Applications for this facility and that the facility was in full operation for the entire peak period.

2.3 Final verification of the actual Peak Period Load Reduction will be by inspection of power monitoring logs for each unit for one week immediately prior to modification and one week immediately following modification. This analysis will provide the basis for developing a net percentage kW reduction for each unit. The percentages will be applied to a sampling of actual summer loads for the units to be recorded during peak periods in the summer 2002 in order to determine actual peak load kW reduction. Each sample should be recorded for one (1) week during peak hours, with separate weeks utilized for each unit. The sampling will include Units #3, 7, 12, 42, 52, and 56. Outside maximum temperatures for each day of the recording will be provided.

3.0 Calculation of the Actual Incentive Grant Payment

This section defines how the Actual Incentive Grant Payment will be calculated.

3.1 The Estimated Incentive Grant Payment for this project is Thirty three thousand, seven hundred and fifty dollars ($33,750.00) and is based on the estimated reduction in peak period load.

3.2 The Actual Incentive Grant Payment will be calculated after verification of actual Peak Period Load Reduction. It will be the lesser of:

a) Sixty-Five percent (65%) of the "Total Cost of the Project", or

b) A sum calculated under the following rules:

- Projects Commissioned by July 31, 2001 shall be awarded $350 per kiloWatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after July 31, 2001 and before September 30, 2001 shall be awarded $300 per kilowatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after September 30, 2001 and before May 31, 2002 shall be awarded $250 per kilowatt for the verified Peak Period Load Reduction achieved.

3.3 The "Total Cost of the Project" is defined as the total cost of the project submitted by the Applicant in his completed Application and approved by The Foundation. The "Total Cost of the Project" is the sum of any costs directly associated with the project including:

k) Design, Planning, and Engineering,

l) Equipment purchase,

m) Site preparation if it is required for the Project,

n) Equipment installation/Facility construction and testing, and

o) Local, State, and Federal sales taxes.

3.4 All Project costs will be verified by presentation of invoices reflecting that the amount due was originally billed on or after January 1, 2001, and then paid in full. The Applicant will gather all such invoices, calculate the "Total Cost of the Project", certify that the dates and amounts involved were timely incurred and paid, and such invoices, calculations and certification will be presented to the Foundation no later than sixty (60) days after the Commission Date. The certification of authenticity and accuracy of submitted invoices form is set forth below.

3.5 Notwithstanding section 3.2, the following will apply:

a) The Actual Incentive Grant Payment may be less than the Estimated Incentive Grant Payment.

b) The Actual Incentive Grant Payment cannot be more than Thirty three thousand, seven hundred and fifty dollars ($33,750.00) without prior written approval from the Foundation.

3.6 Notwithstanding sections 3.1 and 3.2, no individual or corporate/business entity will be entitled to more than two million dollars ($2,000,000.00) of incentive payments.

4.0 Schedule of Grant Payments

This section defines when actual payments will be made.

4.1 An initial payment of one half of the recalculated Estimated Incentive Grant Payment will be paid within thirty (30) days after the later of either the date of Project Commissioning or presentation of the "Total Cost of the Project" to the Foundation by the Applicant.

4.2 The Actual Incentive Grant Payment will be calculated as per section 3.0 of this Appendix within ten (10) days after the later of either the date of verification of Peak Period Load Reduction or the date of certification of the "Total Cost of the Project".

4.3 The difference between the Actual Incentive Grant Payment and the payment made under section 4.1 will be paid within thirty (30) days of the calculation of the Actual Incentive Grant Payment.

4.4 All payments will be by check made payable to "Frito-Lay, Inc." and delivered by United States mail to:

Mr. James Preston
22081 Highway 58
Bakersfield, CA 93312

5.0 Forfeiture of Grant Payment

In the event that the Actual Incentive Grant Payment is less than the initial payment made under section 4.1 of this Appendix, the Applicant is required to promptly reimburse the Foundation the difference between the Actual Incentive Grant Payment and the initial payment. The reimbursement shall by check made payable to "California State University, Fresno Foundation" and delivered by United States mail to:

Mr. Randy Larson
California State University Fresno
Auxiliary Corporations
4910 North Chestnut, OF 123
Fresno, CA 93726-1852

CERTIFICATION OF AUTHENTICITY AND ACCURACY OF SUBMITTED INVOICES

The Applicant hereby certifies that all invoices submitted for Grant Payments are original invoices (or copies of original invoices) that are authentic and accurately reflect costs that were incurred by the Applicant on or after January 1, 2001, solely in connection with the Applicant's submitted project. The Applicant further certifies that all invoices submitted for Grant Payments do not overstate the costs incurred by the Applicant or reflect costs incurred not in direct connection with the Applicant's project.

Signed by:

_____ _____
APPLICANT DATE

Appendix C: Project 01-0445A

Protocol for Measurement and Verification

This Appendix is the controlling authority for the means and methods of:

m) Verification of Project Commissioning,

n) Verification of Peak Period Load Reduction (where applicable),

o) Calculation of the Actual Incentive Grant Payment,

p) Schedule of Incentive Grant Payments,

for the Project titled "Frito Lay Bakersfield" of Application # 01-0445 titled "Frito Lay Bakersfield".

1.0 Verification of Project Commissioning

This section shall define the Project that will be Commissioned and when it is considered Commissioned.

1.1 This Project is located at the Frito Lay facility at 22801 Highway 58, Bakersfield, CA. It consists of installing high efficiency lighting.

1.2 This Project will be considered Commissioned when it is verified that the following equipment has been purchased, installed, and is operating legally and as intended:

i) 343 Lighting replacements (400 W standard HID to 320 W pulse) as per Audit sheet supplied in the Application #01-01445 (estimated Project cost = $52,379.50).

2.0 Verification of Peak Period Load Reduction

This section shall define how Peak Period Load Reduction will be verified.

2.1 The estimated Peak Period Load Reduction as a result of this Project is Thirty and eight-tenths kilowatts (30.8 kW).

2.2 Initial verification of the actual Peak Period Load Reduction will be by physical inspection of the facility and paid invoices.

2.3 Final verification of the actual Peak Load Reduction will be by utility billing indicating that facility was in full operation June through September, 2002, to be submitted when that billing becomes available.

3.0 Calculation of the Actual Incentive Grant Payment

This section defines how the Actual Incentive Grant Payment will be calculated.

3.1 The Estimated Incentive Grant Payment for this project is Seven thousand, seven hundred dollars ($7,700.00) and is based on the estimated reduction in peak period load at a rate of $250/kW.

3.2 The Actual Incentive Grant Payment will be calculated after verification of actual Peak Period Load Reduction. It will be the lesser of:

a) Sixty-Five percent (65%) of the "Total Cost of the Project", or

b) A sum calculated under the following rules:

- Projects Commissioned by July 31, 2001 shall be awarded $350 per kilowatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after July 31, 2001 and before September 30, 2001 shall be awarded $300 per kiloWatt for the verified Peak Period Load Reduction achieved.
- Projects Commissioned after September 30, 2001 and before May 31, 2002 shall be awarded $250 per kiloWatt for the verified Peak Period Load Reduction achieved.

3.3 The "Total Cost of the Project" is defined as the total cost of the project submitted by the Applicant in his completed Application and approved by The Foundation. The "Total Cost of the Project" is the sum of any costs directly associated with the project including:

p) Design, Planning, and Engineering,

q) Equipment purchase,

r) Site preparation if it is required for the Project,

s) Equipment installation/Facility construction and testing, and

t) Local, State, and Federal sales taxes.

3.4 All Project costs will be verified by presentation of invoices reflecting that the amount due was originally billed on or after January 1, 2001, and then paid in full. The Applicant will gather all such invoices, calculate the "Total Cost of the Project", certify that the dates and amounts involved were timely incurred and paid, and such invoices, calculations and certification will be presented to the Foundation no later than sixty (60) days after the Commission Date. The certification of authenticity and accuracy of submitted invoices form is set forth below.

3.5 Notwithstanding section 3.2, the following will apply:

a) The Actual Incentive Grant Payment may be less than the Estimated Incentive Grant Payment.

b) The Actual Incentive Grant Payment cannot be more than Seven thousand, seven hundred dollars ($7,700.00) without prior written approval from the Foundation.

3.6 Notwithstanding sections 3.1 and 3.2, no individual or corporate/business entity will be entitled to more than two million dollars ($2,000,000.00) of incentive payments.

4.0 Schedule of Grant Payments

This section defines when actual payments will be made.

4.1 The Actual Incentive Grant Payment will be calculated as per section 3.0 of this Appendix within ten (10) days after the later of either the date of initial verification of Peak Period Load Reduction (as per section 2.2 of this Appendix) or the date of certification of the "Total Cost of the Project". Payment will be within thirty-(30)days of the calculation of the Actual Incentive Grant Payment.

4.2 All payments will be by check made payable to "Frito Lay" and delivered by United States mail to:

Mr. James Preston
22801 Highway 58
Bakersfield, CA 93312

5.0 Forfeiture of Grant Payment

In the event that the final verification of Peak Period Load Reduction as per section 2.3 of this Appendix cannot be established, the Applicant is required to promptly reimburse the Foundation the Actual Incentive Grant Payment. The reimbursement shall by check made payable to "California State University, Fresno Foundation" and delivered by United States mail to:

Mr. Randy Larson
California State University Fresno
Auxiliary Corporations
4910 North Chestnut, OF 123
Fresno, CA 93726-1852

CERTIFICATION OF AUTHENTICITY AND ACCURACY OF SUBMITTED INVOICES

The Applicant hereby certifies that all invoices submitted for Grant Payments are original invoices (or copies of original invoices) that are authentic and accurately reflect costs that were incurred by the Applicant on or after January 1, 2001, solely in connection with the Applicant's submitted project. The Applicant further certifies that all invoices submitted for Grant Payments do not overstate the costs incurred by the Applicant or reflect costs incurred not in direct connection with the Applicant's project.

Signed by:

_____ _____
APPLICANT DATE

Pacific Gas and Electric Company

DATE: 11/27/2002

PG&E Bill Usage History

Customer Name: FRITO LAY INC
Account Number: YTXT265001
Service Address: NW 20-29-25 WASCO
Meter Number(s) Electric 2078R6
Supply CO GENERATION-FOOD PLT
Rate Schedule(s) Electric STOUT

BILLING HISTORY

From	To	Days	Electric Charges	Electric Usage	Maximum Demand	On Demand	Part Demand	Off Demand	On kWh	Part kWh	Off kWh
09/26/02	10/27/02	31	$15,747.80	137,532	4,023	3,066	4,023	4,362	5,144	4,271	128,117
08/27/02	09/26/02	30	$11,115.73	104,778	4,941	60	4,941	4,791	300	6,230	98,248
07/29/02	08/27/02	29	$15,093.74	50,849	4,632	4,632	4,329	4,077	20,459	4,745	25,645
06/27/02	07/29/02	32	$20,157.55	137,280	4,920	3,903	4,920	4,479	15,546	7,284	114,450
05/29/02	06/27/02	29	$28,358.18	151,654	5,142	5,130	5,142	5,052	30,421	35,216	86,017
04/29/02	05/29/02	30	$23,981.06	141,720	4,695	4,695	4,425	4,167	23,262	15,476	102,982
03/28/02	04/29/02	32	$23,416.82	214,898	3,768	0	3,768	4,059	0	48,828	166,070
02/27/02	03/28/02	29	$5,690.52	34,350	798	0	798	2,367	0	9,003	25,347
01/28/02	02/27/02	30	$72,283.01	685,872	4,032	0	4,032	3,918	0	236,282	449,590
12/27/01	01/28/02	32	$3,020.03	6,890	222	0	222	75	0	3,759	3,131
11/27/01	12/27/01	30	$15,067.81	131,420	3,903	0	3,903	3,894	0	25,542	105,878
10/25/01	11/27/01	33	$16,464.80	150,581	3,099	36	3,099	3,456	401	9,644	140,536
09/26/01	10/25/01	29	$65,472.31	407,450	4,284	4,284	4,266	4,323	66,303	79,527	261,620
08/27/01	09/26/01	30	$37,926.79	180,195	4,851	4,851	4,701	4,293	46,769	49,517	83,909
07/29/01	08/27/01	29	$10,351.97	79,427	2,112	1,188	2,112	3,744	3,138	10,193	66,096
06/27/01	07/29/01	32	$13,358.24	120,912	2,787	1,152	2,787	2,952	2,091	12,381	106,440
05/30/01	06/27/01	28	$57,565.06	261,084	5,238	5,238	4,770	4,356	78,471	68,943	113,670
04/27/01	05/30/01	33	$5,840.53	23,906	3,294	3,294	351	4,764	9,174	3,551	11,181
03/29/01	04/27/01	29	$9,826.27	113,831	3,387	0	3,387	3,426	0	39,246	74,585

BILLING HISTORY (Continued)

From	To	Days	Electric Charges	Electric Usage	Maximum Demand	On Demand	Part Demand	Off Demand	On kWh	Part kWh	Off kWh
02/28/01	03/29/01	29	$7,094.06	74,306	240	0	240	780	0	22,295	52,011
01/29/01	02/28/01	30	$9,926.15	120,909	627	0	627	1,584	0	24,102	96,807
01/04/01	01/29/01	25	$4,984.48	48,396	138	0	138	174	0	19,534	28,862
11/29/00	12/28/00	29	$4,879.67	47,774	3,828	0	3,828	3,087	0	15,464	32,310
10/27/00	11/29/00	33	$3,112.80	20,340	24	0	24	2,415	0	878	19,462
09/28/00	10/27/00	29	$23,367.61	318,482	4,761	4,020	4,761	4,587	28,080	55,521	234,881
08/29/00	09/28/00	30	$7,601.80	133,557	3,114	0	3,114	3,633	0	4,032	129,525
07/31/00	08/29/00	29	$3,960.26	31,824	3,453	3,453	642	4,083	1,914	1,013	28,897
06/29/00	07/31/00	32	$6,575.67	107,243	4,413	6	4,413	3,474	5	5,517	101,721
05/31/00	06/29/00	29	$5,101.66	34,637	4,866	4,539	4,866	4,284	4,590	17,952	12,095
04/28/00	05/31/00	33	$5,843.10	84,431	4,401	36	4,401	4,284	21	19,329	65,081
03/30/00	04/28/00	29	$15,004.48	245,018	4,212	0	4,212	4,239	0	32,574	212,444
03/01/00	03/30/00	29	$4,259.79	37,782	4,029	0	4,029	2,970	0	14,118	23,664
01/31/00	03/01/00	30	$30,536.33	490,350	3,966	0	3,966	3,879	0	185,700	304,650
12/29/99	01/31/00	33	$5,392.09	65,754	75	0	75	3,096	0	1,764	63,990
11/30/99	12/29/99	29	$8,617.01	128,208	4,035	0	4,035	3,216	0	6,711	121,497
10/28/99	11/30/99	33	$4,386.91	45,561	3,153	0	3,153	2,856	0	9,620	35,941
09/28/99	10/28/99	30	$4,443.09	19,209	4,557	4,557	942	2,991	6,009	1,541	11,659

PLEASE READ THIS IMPORTANT INFORMATION ABOUT THE USAGE HISTORY

This information is provided to help you understand your energy usage patterns. If one of your monthly bills reflects a shorter or longer than normal billing period, your billing data displayed here may differ slightly from the monthly Energy Statement you receive in the mail.

If you purchase your electricity from an energy service provider (ESP), the charges in this report will not include the energy component charges from your ESP unless Pacific Gas and Electric Company is the bill consolidator. For more information about your “direct access” electric energy charges and credits, contact your ESP.

The mailed Energy Statement reflects your actual billing period, billed usage and amounts due.

Project 01-0269A: Silva Vineyards

Variances from CEC Approved Savings
Project 01-0269A: Silva Vineyards

Project Description

This project involves the removal of a 125 hp irrigation pump and the installation of a 40 hp pump and time of use meter. The time of use meter will allow the facility to eliminate on-peak pumping. The facility operates during the entire summer peak season from 6am to 5pm.

Nexant Calculations

Baseline

The baseline demand was calculated from 2000 utility billing data. The application included monthly billing data for the last five years of operation. No time of use information was available; therefore the baseline demand was calculated based on the facility's hours of operation. The facility operates 11 hours/day for the 122 days of the summer peak season. The total energy consumption (kWh) for the summer peak season, June through September, was collected from the utility billing data for each pump. It should be noted that for the beginning of June and the end of September, the billing data was pro-rated based on the number of days in each month compared to the total number of days in each billing period. The total kWh was divided by the total number of operating hours to calculate the average demand. For the summer peak demand, the average demand was multiplied by 5/6 because the facility only operated 5 out of the 6 daily peak hours. The average peak baseline demand is 30.0 kW.

Average Overall Summer Demand: (48,303 kWh) / (1,342 hrs) = 36.0 kW
Average Peak Summer Demand: (36 kW demand) * (5 hrs / 6 hrs) = 30.0 kW

Demand Savings

The time of use meter was intended to eliminate on-peak pumping, therefore the post-installation demand is expected to be 0 kW.

The incentive for this project is $7,902 and was based on 65% of the project costs.

Conclusions

The demand savings for this project were based on utility billing information. Baseline utility billing data did not include time of use data, and the pump hours of operation were not available. Therefore, a method had to be developed to estimate the average peak demand. By using the facility's hours of operation, an estimate of the average peak demand was calculated.

Differences from Approved Savings and Incentive

Demand Savings Discrepancies

The methodology used to calculate the approved demand savings and Nexant's calculated demand savings were similar. The monthly utility billing data and the facility's hours of operation as provided in the application were used to determine the baseline peak demand. However, there were several minor differences in the calculations. The approved demand savings were based on billing data from 5/19/00 through 9/20/00. Nexant used the billing data provided and pro-rated the billing periods at the beginning and end of the summer peak period based on the number of days. Therefore, Nexant's total kWh usage attempted to estimate the energy use from 6/1/00 through 9/30/00 more closely, resulting in a slight difference in the overall kWh. In addition, the approved savings were divided by a 75% seasonal usage figure, to account for variations in irrigation needs from year to year. However, based on the five years of utility billing data provided, 2000 summer energy use was significantly higher than any of the other years. Therefore, Nexant believes that 2000 does not need an adjustment factor based on the assumption that 2000 may have been a down year. The other step that Nexant takes in calculating the average peak demand is to multiply the average summer demand by 5/6. The stated hours of operation are 6am to 5pm. However, the summer peak period is from 12pm to 6pm. Therefore, the pump is only operating 5 out of the 6 peak hours and an adjustment must be made when calculating the average peak demand. Based on these differences, Nexant's calculated demand savings were approximately 33% lower than the approved savings.

Incentive Discrepancies

The incentive paid for this project was based on the project costs. Based on the total project costs of $12,157, this project was granted $7,902. Nexant's calculations agreed with this incentive.

SB5X Agriculture Inspection Form

Project Name 01-0101-A Time Management Load Control Device

Date 11/12/04

Address 13762 1st Avenue

City Hanford, CA

Zip 93230

Contact Johnny Starling (559) 588-9463

Inspected by Mark Galicia

Equipment

Component	Status	Meter	Nameplate data and notes
TOU Meter and Time Management Load Control Device	■ completed installed ❑ being ❑ not installed	■ yes ❑ no	A TOU meter and Sprinkler type timer were found installed on the irrigation pump.
	❑ completed installed ❑ being ❑ not installed	❑ yes ❑ no	
	❑ completed installed ❑ being ❑ not installed	❑ yes ❑ no	

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ■ utility ❑ participant ❑ other _____

Data available ❑ yes ■ no

Type of data ❑ TOU ❑ 15min ❑ run time ❑ other _____

Source of data ❑ utility ❑ participant ❑ other _____

Contact for data _____ **Ph#** _____ **Email address**

Mark Galicia of Nexant, Inc. met with Johnny Starling at the Sierra View Farms in Corcoran, CA to conduct a site inspection of the irrigation pump controls. Nexant's inspector observed that an Irritrol timer was installed on the pump to regulate pump operating hours to off peak times. The pump was not running at the time of the inspection and had not been running recently as the growing season was already over for the year. Nameplate data on the pump and motor were not legible.

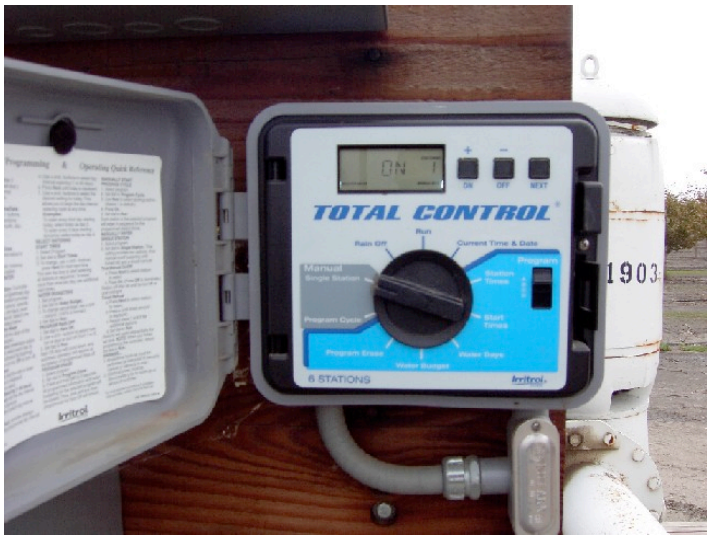

Figure 1 Timer installed on irrigation pump used to schedule pump operation for off peak times.

Figure 2 Irrigation pump at Sierra View Farms

Project 01-0351A: Sandhill Bros. Farm

Variances from CEC Approved Savings
Project 01-0351A: Sandhill Bros. Farm

Project Description

This project involves installation of time of use meters on two irrigation pumps, 75 hp and 40 hp. The time of use meters will allow the facility to eliminate on-peak pumping.

Nexant Calculations

Baseline

The baseline demand from the pumps was calculated from the available 2001 utility billing data (data provided for June 1 through September 11, 2001). No time of use information was available; therefore the total energy consumption (kWh) for summer peak season was collected from the available utility billing data for each pump. It should also be noted that for the beginning of June, the billing data was pro-rated based on the number of days in June compared to the total number of days in the billing period. The estimated on-peak energy use was 50% of the total energy use, based on information provided in the application. Two separate methods were used to calculate the average peak demand. Each method produced the same results.

The first method used the total peak energy use (50% of the total energy use) and divided this energy use by the total peak hours from 6/1/01 to 9/11/01, as shown in Table 1:

Table 1: Baseline Demand Calculations (Method 1)

	Total Summer Energy Use* (kWh)	Peak Energy Use** (kWh)	Total Peak Hours*	Avg. Demand (kW)
40 hp	7,018	3,509	438	8.01
75 hp	21,820	10,910	438	24.91
			Total:	**32.92**

*6/1 – 9/11

**based on assumption of 50% on-peak usage

The second method was to determine the equivalent hours of operation the pump would have operated at full capacity during the peak period. The peak kWh (50% of the total kWh) was divided by the created demand (kW) from the utility billing data. The operating hours were then divided by the total number of peak hours to calculate the percent on time. This percentage was multiplied with the nameplate demand rating to determine the average peak baseline demand. Table 1 lists the calculations for each pump.

Table 1: Baseline Demand Calculations

	Peak Energy Use* (kWh)	On Time (Hrs)	% On Time	Avg. Demand (kW)
75 hp	3,509	125	29%	8.01
40 hp	10,910	261	60%	24.91

	Peak Energy Use* (kWh)	On Time (Hrs)	% On Time	Avg. Demand (kW)
			Total:	**32.92**

*based on assumption of 50% on-peak usage

Demand Savings

The time of use meters were intended to eliminate on-peak pumping, therefore the post-installation demand is expected to be 0 kW. Overall, the total energy use should be ½ of the baseline energy use, based on the assumption that the facility operated 50% on peak.

The incentive paid for this project was $684 and was based on 65% of the project costs.

Conclusions

The demand savings for this project were based on utility billing information. Baseline utility billing data did not include time of use data. Therefore, a method had to be developed to estimate the average peak demand. By estimating the percent on-time, estimate of the peak hours and peak demand was calculated. The assumption of 50% on peak energy use came from the application. This estimate may be high, based on other projects, however, it was based on the application supplied by the customer, therefore was considered accurate. This estimate may be validated if post-installation energy use is 50% of baseline.

Differences from Approved Savings and Incentive

Demand Savings Discrepancies

The methodology used to calculate the approved demand savings and Nexant's calculated demand savings were similar. The monthly utility billing data was used to determine the baseline peak demand by calculating the overall on time percentage. However, the billing data used in the approved calculations covered the entire billing periods from 5/10/01 to 9/11/01. Nexant's calculations pro-rated the June billing period, so that the data was only for 6/1 – 9/11. The number of peak hours used in Nexant's calculations also covered this time period, which should provide a more exact estimate of peak period energy use.

In addition, the approved calculations also use a 75% seasonal load factor to account for year to year variations in energy use. This factor increases the average baseline demand under the assumption that the energy use in 2001 may have been lower than average. This may be true for the 40 hp pump, which did not have any recorded energy use after 8/9/01. However, the 50% on peak energy assumption may be slightly high.
Based on these differences, Nexant's calculated demand savings were approximately 27% lower than the approved savings.

Incentive Discrepancies

The incentive paid for this project was based on the project costs. Based on the total project costs of $1,052, this project was granted $683.80. Nexant's calculations agreed with this incentive.

Project 01-0367A-I: Ewy Enterprises

Variances from CEC Approved Savings
Project 01-0367A-I: Ewy Enterprises

Project Description

This project involves installation of time of use meters on nine irrigation pumps. The time of use meters will allow the facility to eliminate on-peak pumping. The pumps range in size from 7.5 hp to 20 hp.

Nexant Calculations

Baseline

The baseline demand from the pumps was calculated from 2001 utility billing data. No time of use information was available; therefore the baseline energy use was calculated based on the calculated percentage of time that the pumps operated at their nameplate capacity. The total energy consumption (kWh) for the summer peak season, June through September, was collected from the utility billing data for each pump. It should be noted that for the beginning of June and the end of September, the billing data was pro-rated based on the number of days in each month compared to the total number of days in each billing period. To determine the equivalent hours of operation the pump would have operated at full capacity during the summer, the total kWh was divided by the nameplate kW rating. The operating hours were then divided by the total number of hours during the summer months to calculate the percent on time. As a conservative assumption, the percent on time for the peak period was assumed to be the same as the overall percent on time. This percentage was multiplied with the nameplate demand rating to determine the average peak baseline demand. Table 1 lists the calculations for each pump.

Table 1: Baseline Demand Calculations

	Nameplate kW	Total Summer Energy Use* (kWh)	On Time (Hrs)	% On Time**	Avg. Demand (kW)
A: 15 hp	11.19	7,077	632	22%	2.44
B: 7.5 hp	5.60	4,954	885	30%	1.71
C: 15 hp	11.19	5,991	535	18%	2.06
D: 10 hp	7.46	4,340	582	20%	1.49
E: 15 hp	11.19	5,982	535	18%	2.06
F: 16 hp	11.94	3,489	292	10%	1.20
G: 20 hp	14.92	9,355	627	22%	3.22
H: 17 hp	12.68	7,050	556	19%	2.43
I: 10 hp	7.46	4,091	548	19%	1.41
				Total:	**18.02**

*Energy use 6/1 – 9/30

**Based on 2,904 total hours (6/1 – 9/30)

Demand Savings

The time of use meters were intended to eliminate on-peak pumping, therefore the post-installation demand was expected to be 0 kW. The 2002 utility billing data was used to verify the post-installation energy usage. The billing data showed that there was very minimal peak period energy consumption for each of the pumps. Table 2 lists the post-installation peak demand and the demand savings for each pump.

Table 2: Demand Savings

	Nameplate kW	Baseline Demand (kW)	Post-Install Peak Energy Use (kWh)	Post-Install Avg Peak Demand (kW)	Demand Savings (kW)
A: 15 hp	11.19	2.44	11	0.02	2.41
B: 7.5 hp	5.60	1.71	162	0.31	1.39
C: 15 hp	11.19	2.06	24	0.05	2.02
D: 10 hp	7.46	1.49	46	0.09	1.41
E: 15 hp	11.19	2.06	113	0.22	1.84
F: 16 hp	11.94	1.20	155	0.30	0.90
G: 20 hp	14.92	3.22	66	0.13	3.09
H: 17 hp	12.68	2.43	41	0.08	2.35
I: 10 hp	7.46	1.41	12	0.02	1.39
				Total:	**16.8**

The incentive paid for this project was $2,579.85 and was based on 65% of the project costs.

Conclusions

The demand savings for this project were based on utility billing information. Baseline utility billing data did not include time of use data, and the pump hours of operation were not available. Therefore, a method had to be developed to estimate the average peak demand. By estimating the percent on-time, a conservative estimate of the peak hours and peak demand was calculated.

Differences from Approved Savings and Incentive

Demand Savings Discrepancies

The methodology used to calculate the approved demand savings and Nexant's calculated demand savings were similar. The monthly utility billing data was used to determine the baseline peak demand by calculating the overall on time percentage. However, the calculations for several of the pumps were slightly different. The difference may have been due to the partially illegible billing data that was used and from differences in significant figures used. In addition, Nexant's final demand savings number was based on post-installation data, which indicated a small amount of post-installation peak period energy use, reducing the demand savings. Based on these differences, Nexant's calculated demand savings were approximately 24% lower than the approved savings.

Incentive Discrepancies

The incentive paid for this project was based on the project costs. Based on the total project costs of $3969, this project was granted $2,579.85. Nexant's calculations agreed with this incentive.

SB5X Agriculture Inspection Form

Project Name: 01-0367-A Ewy Enterprise Inc.
Date: 11/10/04
Address: 6002 Jac Lac Ave.
City: Parlier, CA
Zip: 93648
Contact: Donald Ewy
Inspected by: Mark Galicia

Equipment

Component	Status	Meter	Nameplate data and notes
TOU Meter on Pump	■ completed installed ❑ being installed ❑ not installed	■ yes ❑ no	AH Reliance Motor Model P21J3335A 15 HP 230/460V S.F 1.0 36.4/18.2 Amps Pump has its own TOU meter
TOU Meter on Pump	■ completed installed ❑ being installed ❑ not installed	■ yes ❑ no	AH Marathon Electric Motor 10 HP Pump has its own TOU meter
	❑ completed installed ❑ being installed ❑ not installed	❑ yes ❑ no	

Meter data

Component(s) is metered separately ■ yes o no **If yes, by:** ■ utility ❑ participant ❑ other _____

Data available ❑ yes ■ no

Type of data ❑ TOU ❑ 15min ❑ run time ❑ other _____

Source of data ❑ utility ❑ participant ❑ other _____

Contact for data _____ **Ph#** _____ **Email address**

Mark Galicia of Nexant, Inc. met with Donald Ewy at the Ewy Enterprise Farm in Parlier, CA. and verified that TOU Meters were installed on two pumps at the farm. Photographs of both pumps are shown below.

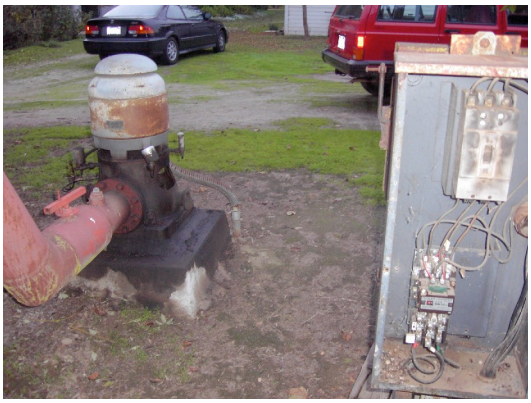

Figure 1 Reliance Pump and TOU Meter

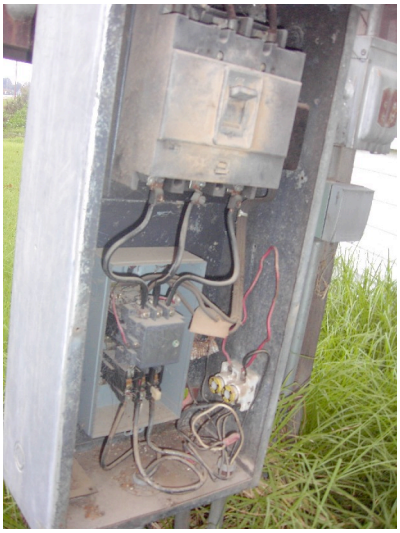

Figure 2 TOU Meter for Marathon Electric Motor of Pump 2

Project 01-0378A: Blue Diamond Growers

Variances from CEC Approved Savings
Project 01-0378A: Blue Diamond Growers

Project Description

This project involves the replacement of (300) 400-watt mercury vapor high bay fixtures with 250-watt metal halide fixtures. The proposed measure will reduce the kW load at the facility due to the reduction in fixture wattage.

Nexant Calculations

Baseline

The existing mercury vapor fixtures are rated at 455 watts each in the central standard wattage table. Therefore, the calculated baseline peak period demand, based on nameplate information, is:

(455 watts/fixture) x (300 fixtures) x (1 kW/1,000 watts) = 136.5 kW

Utility billing data does not include dedicated sub-metering for the motors. However, savings may still be observed in the data based on the difference between baseline and post-installation peak energy use.

Demand Savings

The proposed metal halide fixtures are rated at 295 watts each. The calculated post-installation demand, based on nameplate information, is:

(295 watts/fixture) x (300 fixtures) x (1 kW/1,000 watts) = 88.5 kW

Based on nameplate data, the expected demand savings are 48 kW.

The incentive for this project, based on the demand savings, is $12,000.

Conclusions

The demand savings for this project were based on nameplate data. The calculated savings should be fairly accurate.

Differences from Approved Savings and Incentive

Demand Savings Discrepancies

The approved demand savings for this project were based on fixture specifications. The only minor discrepancy was that the application listed the baseline wattage as 454 watts/fixture, and Nexant's central standard wattage table listed the 400 watt mercury vapor fixtures as 455 watts. The difference is relatively insignificant in terms of overall savings (47.7 kW approved versus 48 kW in Nexant's calculations).

Incentive Discrepancies

The incentive paid for this project was based on the demand savings. Based on the total savings of 47.7 kW, this project was granted $11,925. Nexant's calculations resulted in an incentive of $12,000.

SB5X Agriculture Inspection Form

Project Name: 01-0378-A Blue Diamond Growers

Date: 11/22/04

Address: 1802 C Street

City: Sacramento, CA

Zip: 95814

Contact: Dan Ford (916) 446-8482

Inspected by: Mark Galicia

Equipment

Component	Status	Meter	Nameplate data and notes
HID Metal Halide Lighting Fixtures	■ completed ❑ being installed ❑ not installed	❑ yes ■ no	All lighting fixtures in the Distribution Center building were verified to be 250 Watt Metal Halide fixtures.

Meter data

Component(s) is metered separately ❑ yes ■ no **If yes, by:** ❑ utility ❑ participant ❑ other _____

Data available ❑ yes ■ no

Type of data ❑ TOU ❑ 15min ❑ run time ❑ other _____

Source of data ❑ utility ❑ participant ❑ other _____

Contact for data _____ **Ph#** _____ **Email address**

Mark Galicia of Nexant, Inc. met with Ben Viones at the Blue Diamond Growers facility in Sacramento, CA to conduct a lighting inspection of the Distribution Center building. Nexant's inspector walked through the entire warehouse and verified that all fixtures were 250 Watt Metal Halide fixtures. None of the previous Mercury Vapor fixtures were found anywhere throughout the building.

Figure 1 250 Watt Metal Halide Fixtures found throughout entire Distribution Center building.

Project 01-0453-A: JP Farms

SB5X Agriculture Inspection Form

Project Name 01-0453-A JP Farms

Date 11/12/04

Address 658 N. Cherry Ave.

City Tulare, CA

Zip 93274

Contact Jatinder Chopra

Inspected by Mark Galicia

Equipment

Component	Status	Meter	Nameplate data and notes
Drip Irrigation System	■ completed installed ❑ being installed ❑ not installed	■ yes ❑ no	All fields were verified to use the drip irrigation system in place of the flood irrigation system
	❑ completed installed ❑ being installed ❑ not installed	❑ yes ❑ no	
	❑ completed installed ❑ being installed ❑ not installed	❑ yes ❑ no	

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ■ utility ❑ participant ❑ other _____

Data available ❑ yes ■ no

Type of data ❑ TOU ❑ 15min ❑ run time ❑ other _____

Source of data ❑ utility ❑ participant ❑ other _____

Contact for data _____ **Ph#** _____ **Email address**

Mark Galicia of Nexant, Inc. conducted a site visit at JP Farms in Alpaugh, CA. Nexant's inspector verified that all fields had the drip irrigation system installed in place of the flood irrigation system as the drip system tubing was visible along the rows of crops. The irrigation pump was identified, however the nameplate data was inaccessible.

Figure 1 Close up of crops showing tubing for drip irrigation system

Figure 2 Pump and filtration system for the fields at JP Farms

Onsite Projects: Frito Lay Visalia and Modesto; Del Monte Hanford

On August 29, 2002 Randy McCall from Nexant and I visited Frito Lay Visalia and Del Monte Hanford to do post installation inspections of Peakload projects that have been completed to date. The efficiency measures outlined below and on the attached sheets are complete and should be filed for the first payments for these measures. In addition there are several measures that are complete at Frito Lay in Modesto and have already been seen by Randy.

Frito Lay Visalia

These projects have been installed and are in use, additional measures shown on the attached sheet are in various stages of completion.

- VFDs and the associated controls have been installed on the boiler feedwater pumps (100 Hp) and on the boiler FD fan motor (125 Hp). Both feedwater pumps have VFDs installed, however only one pump runs at any given time. Peak load savings are based on load studies and engineering evaluation by CPL Systems. Onsite Energy Corporation has taken pre-installation readings and is currently taking post installation load data.
  Estimated Peak load savings: 117.0 kW
- Install Power planners on 20 of the plant's larger motor loads. The 20 units are installed and in operation, these units will adjust the power wave to reduce kW demand. Onsite is currently testing representative units for actual demand savings.
  Estimated Peak load savings from the manufacturer: 65.5 kW
- Replace existing caser mounted vacuum pumps with a central vacuum pump system. This project eliminated 16 each 1.5 Hp vacuum pumps and substituted one 7.5 Hp operating pump. This system is in operation.
  Estimated Peak load savings: 12.3.0 kW
- Air compressor capacity tank and demand expander system. Additional compressed air surge tanks were added, a new air header to key users and a demand expander air system was added to reduce system demand surges and to reduce necessary system pressure. All phases are installed and operational. System pressure has been dropped to 75 psi and the back up air compressors are no longer in regular operation. System savings are based on an engineering study of the plant air system.
  Estimated Peak load savings: 123.5 kW
- Plant lighting. The company has installed 33 each 4'x 8' skylights in the production and warehouse areas of the plant. In addition, they have installed 140 "Solatube" type skylights in areas of the plant and offices. Unneeded lights are manually turned off during daylight hours. Based on site visits (see attached summary), the original site lighting has been reduced by 87.4 kW. Automatic controls and additional lighting changes are being considered.
  Estimated Peak load savings: 100 kW
  Current savings being realized: 87.4 kW
- **Total Frito Lay Visalia Peak load savings installed to date: 405.7 kW**

Del Monte Hanford

These projects have been installed and are in use, a lighting measure shown on the attached sheet is still being considered.

- Flume pump reconfiguration. The pump and piping configuration of the plant tomato unloading system was reconfigured to eliminate 4 each 40 Hp circulating pumps. Load savings based on nameplate motor loads. Normal seasonal operation is 24 hours/day, 7 days per week from the beginning of July until the early part of October
  Peak load savings: 89.5 kW
- Tomato handling systems. Existing water flumes used to distribute tomatos to the various processing lines were rebuilt to use low horsepower conveyors instead of circulating water pumps. Elimination of over 300 Hp in circulating pumps. Net horsepower savings of 240 horsepower based on nameplate capacities.
  Peak load savings: 179.0 kW
- Hydraulic driven conveyors. In 2001 the plant averaged 301 kW of load from electrically driven hydraulic pumps used to power hydraulic motors used throughout the plant. Reconfiguration of the systems and better matching of motor horsepower using electric motors has reduced the necessary hydraulic system needs.
  Estimated Peak load savings: 212.7 kW
- Manzini Pulpers. The pulping process removes skins and seeds from tomato pulp prior to making finished products. Replacement of 5 each 60 Hp units with 3 each 50 Hp units of a newer design reduce the system load by 150 horsepower.
  Estimated Peak load savings: 111.9 kW
- Control valve installations. Installation of a series of control valves and system controls will allow the operators to shut down cooling tower-circulating pumps when one or more of the plant (#1, #2, or #8) evaporators are not in service due to production requirements. Prior to the changes additional volumes of water were circulated to maintain operation of the remaining unit(s). This will allow the elimination of one 100 Hp pump for approximately 900 hours per season.
  Estimated average Peak load savings: 74.6 kW x ½ season = 37.3 kW average
- **Total Del Monte Hanford Peak load savings installed to date: 630.4 kW**

Frito Lay Modesto

Based on prior visits and the completion of their air compressor installation the following projects are being submitted for this plant. Additional measures are being installed and/or evaluated, but are not complete at this time.

- Installed SR controllers on the primary electrical service for the plant system. These units modify the electrical sequencing and power wave to minimize upset and to reduce power consumption and demand. On line load data is being taken and analyzed by the Plant's Utility, Modesto Irrigation District, preliminary data has shown a 6% reduction in demand.
  Estimated Peak load savings: 236.0 kW
- Installation of VFD based compressor. Installation of a 100 Hp VFD compressor allows the shut down of one 250 Hp compressor and still maintain the system pressure requirements.

Savings based on an engineering study of the plant air systems.
Estimated Peak load savings: 120 kW

- Install VFDs and controls on boiler feed water and transfer pumps. Savings based on CPL System engineering study of the boiler system.
  Estimated Peak load savings: 32.6 kW
- **Total Frito Lay Modesto Peak load savings installed to date: 388.6 kW**

SB5X Agriculture Inspection Form

Project Name: Onsite Energy projects, APLRP
Date: 8/30/02
Address: Frito Lay, Visalia
City: 2000 N. Plaza Drive
Contact: Visalia, CA
Zip:
Inspected by: Ron Allen, Onsite Energy
Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
VFDs on 100hp Feedwater pump and 125hp Fan Motor	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Onsite has installed VFDs to control a 100hp feedwater pump for the boiler, as well as a VFD to control the 125hp forced draft fan for the boiler.
Install Power Planners and SR Controllers to modify Power Factor	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Install wave form modification equipment for plant; SR controllers add capacitors to motor circuits to adjust displacement power factor – debatable savings potential.
Replace individual 1.5hp vacuum pumps with central system	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Replace 16 1.5hp powered vacuum pumps for caser with central 7.5hp system with 7.5hp backup.
Install Compressed Air system improvments	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Replace existing Kaiser compressor with gas driven compressor; install air expander controls to lower system pressure (pressure/flow controller), additional storage.
Install efficient lighting; install solatube skylighting, install mfgr floor skylighting	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Retrofit T-12 lighting, install solatube skylighting in office areas, install 33 large skylights in mfgr floor and warehouse area, integrate lighting system with daylighting to shut down when possible.

Meter data

Component(s) is metered separately ❑ yes ■ no **If yes, by:** ❑ utility ❑ participant ❑ other _____

Data available ■ yes ❑ no

Type of data ■ TOU ❑ 15min ❑ run time ❑ other
Source of data ■ utility ❑ participant ❑ other
Contact for data __Ron Allen, Onsite Energy__ Ph# (925) 358-4264_ Email address Rallenonsite@aol.com

Randy McCall, of Nexant, Inc., conducted a post-installation site inspection at Frito Lay, Visalia in Visalia, CA on August 30, 2002 in order to verify the installation of several measures related to the compressed air system, the lighting system, a central vacuum system used to complete packaging on the manufacturing floor, and power factor control equipment for the facility.. In attendance for the inspection was Mr. McCall, Ron Allen from Onsite energy, and facility engineering staff from Frito Lay, Visalia.

A walk through of the facility was conducted to verify the installation of the lighting equipment; solatubes had been installed throughout the office areas with the electric lighting turned off at the time of the inspection. In addition, the skylights installed on the manufacturing floor were also evident, however, the HID lighting system was still operating as a result of problems with the circuit controls. According to Ron Allen, some of the HID circuits are wired such that they cannot easily be controlled as originally intended. A second phase project at Frito Lay, Visalia is expected to address these issues and allow for emergency egress lighting.

All air compressor projects were installed during the inspection including the reduced head pressure from the installation of the pressure/flow controller, as well as installation of a natural gas powered air compressor.

The last measure, installation of SR Controllers to modify the overall power factor of the facility is also installed, however, Nexant is not convinced of the value of the installation for actual demand savings. While transformer capacity may be freed up from the power factor correction, initial results for another similar project predict little in the way of true kW savings from these projects, unless the overall Power Factor is extremely poor. Even in such cases, it appears that the overall savings from reduction in VA may be slight. Demand savings potential from the Power Planners installed throughout the facility are unknown at this time, but are predicted to be on the order of 65 kW.

Figure 1: Alternate feedwater pump VFDs.

Figure 2: Main Feedwater pumps VFDs

Figure 3: Power Planners for Cooling Tower and HVAC

Figure 4: Power Planner for Additional equipment

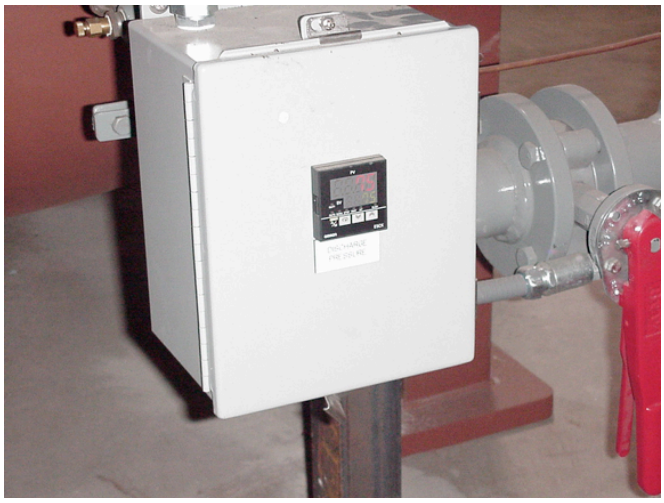

Figure 5: Controls for compressed air expander

Figure 6: Existing compressors to be removed after Completion of natural gas engine driven compressor.

Figure 7: Lighting controls for existing HID system.

Figure 7: Solatube installed on manf. floor.

SB5X Agriculture Inspection Form

		Grand Total Controllable Load kW	>>>>>>>>	1265

Project Name: Onsite Energy projects, APLRP
Date: 6/30/03
Address: Frito Lay, Visalia (Second Post – Inspection for add. Measures)
2000 N. Plaza Drive
City: Visalia, CA
Zip: _____
Contact: Ron Allen, Onsite Energy;
Inspected by: Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Powerit load controls	■ completed installed ❑ being ❑ not installed	■ yes ❑ no	Load control hardware and software to limit peak demands of facility through unloading or turning off selected equipment in response to predicted 5 minute average peak loads from monitoring of utility meters.
Additional Lighting Controls	■ completed installed ❑ being ❑ not installed	■ yes ❑ no	Lighting controls were improved for some of the HID lighting at the plant through rewiring of lighting circuits to allow for individual fixture control independent of emergency lighting.
	❑ completed installed ❑ being ❑ not installed	❑ yes ❑ no	

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ■ utility ■ participant ❑ other _____

Data available ■ yes ❑ no

Type of data ❑ TOU ❑ 15min ❑ run time ■ other **__5minute interval data for facility peak loads and control actions through Powerit software.**
Source of data ❑ utility ❑ participant ■ other **_Powerit software records reports of load control actions, and the user defined threshold level for control action.**

Contact for data __Ron Allen, Onsite Energy__ Ph# (925) 358-4264_ Email address Rallenonsite@aol.com

Spot meter readings taken ❑ yes ■ no

Component #1 readings _____ _____ _____ Notes__Equipment control actions were observed by Nexant on a PC equipped with a the Powerit software and graphical user interface

Component #2 readings _____ _____ _____ Notes__Lighting controls were verified during normal operations for areas that could not be controlled during a previous post-installation inspection at Frito Lay, Visalia.

Component #3 readings _____ _____ _____ Notes_____

Randy McCall, of Nexant, Inc., conducted a post-installation site inspection at Frito Lay, Visalia in Visalia, CA on June 30, 2003 in order to verify the installation of the Powerit load control equipment for the facility. In attendance for the inspection was Mr. McCall, Ron Allen from Onsite energy, and Mark facility engineering staff from Frito Lay, Visalia.

A stand along PC was set up in the engineering office with the Powerit software system. The software program is provided with pulse signals from the facility utility meter that are used to predict an average five-minute demand for the facility. If the predicted interval is likely to exceed the user-defined threshold for control action, the software sends signals to controllable loads to either turn off select motors, or reduce operations and run at part loads. The equipment to be controlled was previously identified during the pre-installation phase by Mathias Christelius, Powerit's field engineer for implementation, and includes loads that will not adversely affect the production at the food processing plant. Once the Powerit software decides it needs to take action to control a five minute average window for loads, it will send signals to individual pieces of equipment that have been equipped with communications gear and actuators that allow for the remote control. Equipment is listed by priority in the software, on a custom basis for each facility and customer.

At Frito Lay, Visalia, Onsite Energy and Powerit are expecting to control approximately 200 to 250 kW of peak load out of a total estimated 1265 kW of potential load from the controllable equipment. A list of the controllable equipment and their estimated loads are presented below in Table 1.

6.1 Table 1. List of Controllable Loads for Frito Lay, Visalia

Object Name	Quantity	Equipment Description	Unit kW	Total kW
Well Pump	1	Motor	20	20
Waste House HVAC	1	HVAC	5	5
Waste Press	1	Waste Press	20	20
Nitrogen	1	Nitrogen Generation	100	100
Unloading System	1	Truck unloading (incl. Manual override)	75	75
Chillers	3	with temperature constraints*	250	750
Cooling Tower Fans	3	with temperature constraints (20/5hp)	15	45
Oil Tank heaters	6	Current use uncertain	15	90
RTU X1-X16	16	The 16 largest & least sensitive RTU:s	10	160
Lighting	8	*I/O Capability for future lighting control*		0
				0
				0
				0
				0
				0
		Grand Total Controllable Load kW	>>>>>>>>	1265

In addition to the list of controllable equipment in Table 1 above, Onsite Energy forwarded a set of drawings for the Energy Director 3100 that includes an overview of the installation at the plant, and the specific connections to the Energy Director 3100. The installation overview is attached as a screen capture at the end of this report. The full set of drawings and connections for the

equipment is a separate electronic file attachment that cannot be inserted into this document, but will be included along with this report as an addendum.

Demand savings resulting from the Powerit control actions are not expected to be of long duration. The equipment is designed to analyze a short time window for the average peak, and reduce loads when the expected average for the 5minute window will exceed the user-defined threshold. Typical efficiency type projects in the APLRP create load reductions that are continuous throughout the peak period, however, demand savings resulting from the Powerit load controls should not be calculated on the same basis (i.e., total kWh saved during the summer peak period divided by the total number of hours in the summer peak period). With the short duration Powerit load management control actions, the overall savings level from a typical calculation of efficiency based load savings results in relatively small average demand savings that do not reflect the true value of the load management.

Onsite has proposed, and Nexant agrees with the approach, that load control actions will be evaluated as the difference documented by the Powerit data collection system, between the threshold for load control action, and the predicted interval peak demands resulting in equipment load control. While the calculation of peak period demand savings typically recognizes only sustained savings, the intermittent nature of the Powerit load control frees up grid capacity in that control actions guarantee that excursions above the user-defined threshold for peak load are avoided. The result is local and regional grid capacity that is freed up due to control of power spikes.

Onsite will provide electronic copies of the tracking data from the Powerit system that document facility meter loads, and control actions that have taken place to reduce the interval average loads. The documentation will cover both summer peak periods, as well as off peak periods. Final demand savings will be based on the monitored data recorded by the Powerit system.

In addition to the completion of the Powerit load control system, Onsite has completed work on rewiring of selected lighting circuits for a more aggressive lighting controls system. The additional work to provide more aggressive control of lighting circuits includes fluorescent and HID fixtures. Table 2 below shows the additional lighting control savings estimated from the new circuits.

6.2 **Table 2: Lighting circuit review for Frito lay Visalia**

Lighting Review

	HID	Total kW		Turned off			Total kW	
Plant Area	**Lights**	**Original**	**Turned Off**	**HID**	**T-12**	**T-8**	**Turned Off**	**Additional control change**
Warehouse	92	33.6	15.7	78			28.5	12.8
KD	105	38.3	32.9	96			35.0	2.2
Film Storage	77	31.6	0.0	60	72		24.8	24.8
Old Isida	40	26.8	0.0	0	0		0.0	0.0
Old 32	20	7.3	2.9	8			2.9	0.0
Old Tort	60	22.3	18.3	50	0		18.3	0.0
Old pretzel	28	10.2	7.7	21			7.7	0.0
Old S Dock	23	9.2	6.6	16	8		6.6	0.0
Tubar	11	4.0	0.4	1			0.4	0.0
Season Storage	6	2.2	0.7	2			0.7	0.0
Salting room	16	6.5	0.0	0	0	0	0.0	0.0
Season Hallway	16	5.8	0.0	0			0.0	0.0
Maint Hallway	7	3.9	0.0	0	0	0	0.0	0.0
Maintenance		1.5	0.0			0	0.0	0.0
QC Hallway	5	2.5	0.0	0	0		0.0	0.0
Battery Room	3	1.1	0.0	0			0.0	0.0
Front Office		3.8	2.3		0	72	2.3	0.0
Totals:	509	210.7	87.4	332	80	72	127.2	39.7

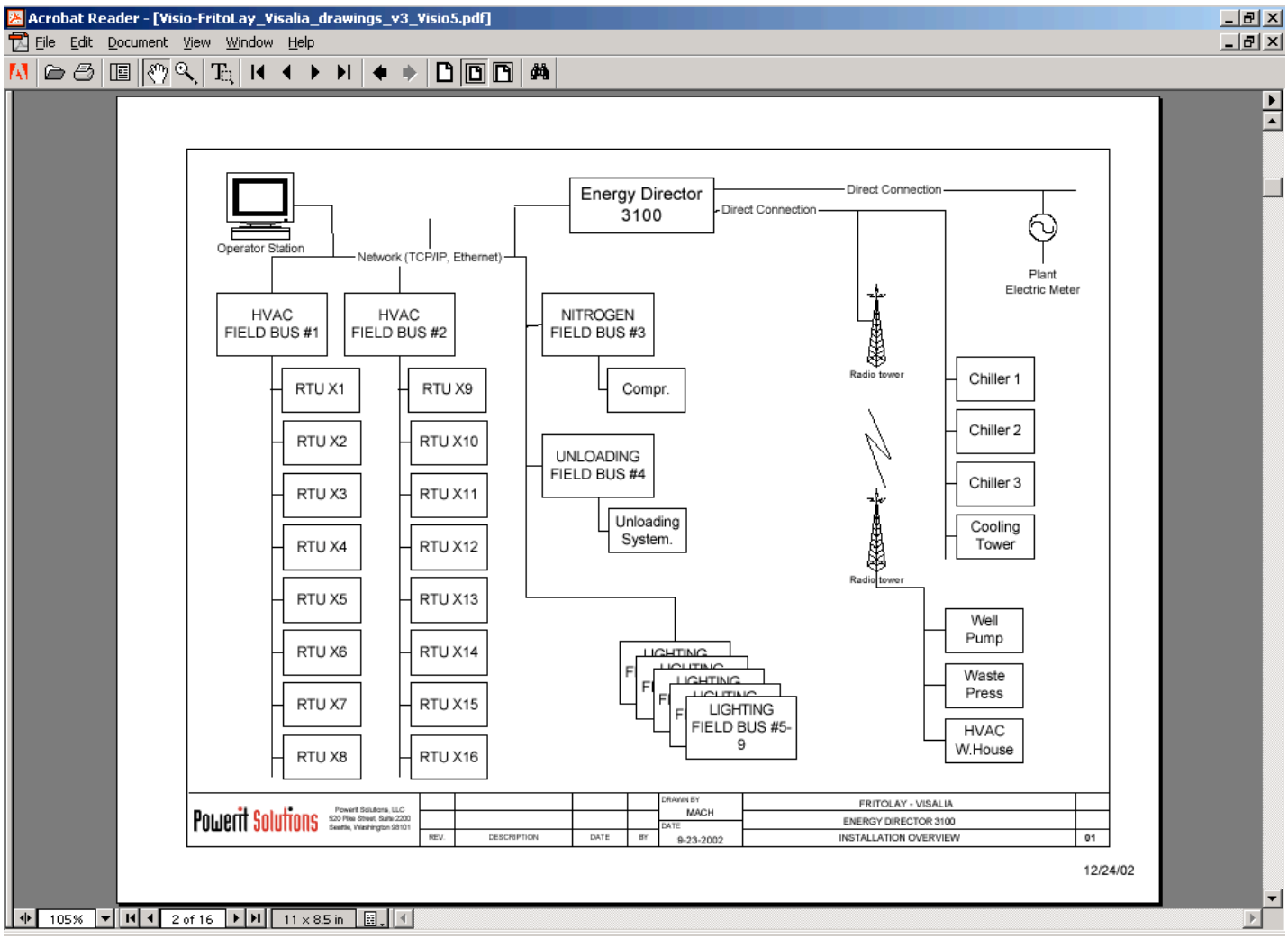

Figure 1: Installation overview of Powerit Energy Director 3100 and control points for Frito Lay, Visalia

SB5X Agriculture Inspection Form

Project Name: Onsite Energy projects, APLRP
Date: 9/24/03
Address: Frito Lay, Modesto
City: 600 Garner Road
Contact: Modesto, CA 95357
Zip:
Inspected by: Ron Allen, Onsite Energy; Dave Cox, Frito Lay Modesto
Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Powerit load controls	■ completed installed ❑ being ❑ not installed	■ yes ❑ no	Load control hardware and software to limit peak demands of facility through unloading or turning off selected equipment in response to predicted 15 minute average peak loads from monitoring of utility meters.
Additional Lighting Controls, Skylight installations	❑ completed installed ❑ being ■ not installed	❑ yes ■ no	Installation of additional skylighting for production areas and some office areas. Addition of lighting controls to function with skylights.
VFD's for Boiler Feedwater and DeAeartor Pumps	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Installation of Allen Bradley VFDs for 50hp primary feedwater pump and backup, as well as 10hp Deaerator pumps and backup.
SR Power correction Controls	■ completed installed ❑ being ❑ not installed	■ yes ❑ no	Power factor correction equipment on three feeder lines for plant power – little demand savings expected beyond I2R savings for reduced reactive power from power factor correction.
Mytec bilevel HID controls	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Installation of motion sensor based Bi-level lighting controls for production floor HID lighting. Installation complete.
100 hp VFD Air Compressor for trim unit	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Compressor is installed and operating,

Meter data

Component(s) is metered separately ❑ yes ■ no **If yes, by:** ■ utility ■ participant ❑ other **_Powerit System____**

Data available ❑ yes ■ no

Type of data ❑ TOU ❑ 15min ❑ run time ■ other **__15minute interval data for facility peak loads and control actions through Powerit software.**
Source of data ❑ utility ❑ participant ■ other **_Powerit software records reports of load control actions, and the user defined threshold level for control action.**

Contact for data __Ron Allen, Onsite Energy__ Ph# (925) 358-4264_ Email address Rallenonsite@aol.com

Section 7 Spot meter

Spot meter readings taken ❑ yes ■ no

Component #1 readings _____ _____ _____ Notes__Equipment control actions were observed by Nexant on a PC equipped with a the Powerit software and graphical user interface . Control points and magnitude of controls action faxed to Nexant at later date.

Component #2 readings _____ _____ _____ Notes__Lighting controls were verified during normal operations; warehouse lighting controls associated with skylights have not been completed and are just getting started for installation.

Component #3 readings _____ _____ _____ Notes__VFD operations were observed from digital displays at each VFD. 50hp VFD was operating in expected range at approximately 40hz; Deaerator VFD was operating at a similar frequency.

Component # readings _____ _____ _____ Notes__SR controllers are providing power factor correction for facility, with near unity Power Factor for plant. Based on other similar project monitoring, little demand savings are expected from this measure. Plant Engineering to investigate with internal monitoring.

A post-installation site inspection was conducted on September 24, 2003 along with Ron Allen of Onsite Energy Corporation, at the Frito Lay, Modesto facility. Randy McCall, of Nexant, Inc. verified that the Powerit Solutions load control system had been installed, and was in the process of calibration to develop a satisfactory load control set point. The system operations were observed in the control room on one of the computer monitors. The equipment that is under control by the Powerit system was shown to be primarily Roof Top Unit (RTU's) air conditioning systems and evaporative cooler units. Mr. Allen explained that there were difficulties in controlling some central chiller equipment at the plant, and other equipment that had been proposed for control had been removed from the list.

Other equipment that are part of the project were previously verified for installation, including the first and second phase of the bi-level HID lighting controls. A new project to install skylights in the warehouse and some office areas has not started as of yet. No skylights were observed for the proposed areas.

The SR controllers are installed and operating, however, based on other studies conducted by Nexant, the savings estimate of 350kW for the three sets of controllers is not approved. To date no monitoring of the equipment has been completed that shows savings for the SR controllers. Plant personnel may conduct some monitoring of power correction and possible demand savings as per conversation with engineering dept. No follow up to date.

The boiler feedwater pump VFDs are installed and operating as proposed. Spot measurements were not recorded, however, the digital displays for the Allen Bradley drives indicated that both the feedwater pump and the de-aerator pumps were operating in the expected frequency ranges.

Onsite Project: Dreisbach Cold Storage Facilities

Site Specific M&V Plan
for
Driesbach Cold Storage Facilities
HID Lighting Controls Retrofit

Project Description:
This project involves converting 400W Metal Halide and High Pressure Sodium lighting fixtures in -10°F storage freezers to tri-level control with occupancy control on each fixture. This is to be accomplished at three facilities owned by Driesbach Enterprises.

The table below summarizes the three facilities and the scope of the retrofit at each facility.

Facility	Address	Warehouse Size	# 400W Fixtures
Oakland	2530 East Eleventh Street, Oakland, CA 94601	150,000	132
Richmond	900 Marina Bay Parkway, Richmond, CA 94804	250,000	133
Hilltop/Moss Landing /Watsonville	1276 Highway 1 Moss Landing, CA 95039	157,000	166

In this project, energy use and summer peak demands are reduced as a portion of the fixtures in the -10°F freezers are operated at either a low power setting due to a short period of inactivity or turned off due to an extended period of inactivity. At full power each 400 W fixture consumes 460 Watts of electric energy. At the reduced power setting, this drops to 255 Watts.

Interactive Effect on Demand Reduction:
All electric energy for lighting produces sensible heat load in the freezer, which must be removed by the refrigeration system to maintain freezer temperatures. Reducing the amount of heat added to the freezers during summer on-peak periods will reduce refrigeration loads in these periods. This effect was studied and results were published as an abstract "Calculating lighting and HVAC interactions" in ASHRAE Journal November 1993 for lighting and HVAC interactions. Cooling savings average impact has been given as 0.23 in this abstract. Therefore interactive demand savings for this project will be calculated using the formula:

Interactive Savings (kW) = [0.23 x **Cooling System Efficiency** (kW/TR)] x **Direct Lighting Savings** (kW)

In this equation interactive effect has a dimension of (TR/kW). By multiplying interactive effect ratio and cooling system efficiency we get a dimensionless factor, which gives the interactive cooling system savings per direct lighting savings. Since cooling efficiency of the refrigeration systems in Driesbach facilities is estimated to be 3-bhp/TR (3 x 0.746 "conversion factor" / 0.94 "electric motor efficiency" = 2.38 kW/TR), we can calculate that interactive savings will be 0.23 x 2.38 = 0.547 kW. This means it will be possible to get 0.547 kW refrigeration system demand savings per 1 kW lighting savings.

This interactive effect is a significant savings due to the energy intensive nature of supplying this refrigeration. Since the lighting equipment is directly in contact with the air inside the warehouse, cooling load coming from the lighting is directly transferred to the evaporators. Therefore the savings coming from the lighting load will affect the amount of evaporation and working conditions of refrigeration compressors, causing demand reduction in the refrigeration system.

Dimming System:
The following excerpt is taken from the manufacturer's (Controlled Lighting Corporation) web page to describe the dimming system. It summarizes functional and energy benefits of the dimming system.

When the H.I.D. lamp is illuminated:

- Power is reduced 50% to 60% when area is unoccupied
- Lamp switches to full power when motion is detected
- Lamp returns to reduced power when no motion has been detected for a selectable period of time. You can select an additional amount of time after which the lamp will be switched off completely, and will restart when motion is detected.
- Smart, Durable, User-Friendly, Customizable

Proven smart chip technology for the most control

- Ballast/igniter protection that switches off lamp and igniter if the lamp continuously cycles on and off
- Enclosures made of lightweight, high-impact plastic
- Unique free-hanging design to help avoid collision damage
- Self-leveling control that restores accurate sensing even when bumped
- Ability to link lights to respond as a group or lighting zone, create a Tri-Level™ lighting schedule, and add daylight detection
- Additional Features of the Ultimate Series High or Low Bay Fixtures:

Options

- Optional Quartz Halogen lamp for instant, temporary light when motion is detected and HID lamp is powering up
- Available in High Pressure Sodium, standard Metal Halide, and Pulse-Start Metal Halide

- Lamp shade assemblies available with acrylic prismatic or spun aluminum reflectors

Verification Approach

Demand savings during summer peak periods will be verified for this project through post-retrofit short term monitoring of amperage to selected lighting circuits at each of the three Driesbach facilities.

Duration of Metering

Post-retrofit metering will be completed for a period of at least three weeks (21 days).

Determination of Baseline Demand.
To determine the baseline kW at each facility, it will be assumed that in the pre-retrofit case, all fixtures will be on during the summer peak hours. Therefore, the baseline kW demand for each facility is equal to the sum of the fixture wattages for all fixtures retrofit with the dimming and occupancy control. Assuming all retrofitted fixtures are 400W metal halide fixtures, the baseline demand is calculated as:

Baseline Facility Lighting Demand = # Fixtures x 460 W/Fixture

Onsite will seek to obtain from the lighting contractor or from Dreisbach, if available, a reflected ceiling plan which describes the lighting circuits for each of the three facilities. This plan will be used to identify for each circuit to be monitored, the number of fixtures located on the circuit.

Determination of Post-Retrofit Demand
It is recognized that different functional areas of the cold storage warehouses experience different activity levels. The population of lighting circuits will therefore be broken into usage groups based on the functional area each serves. The expected functional areas in each warehouse may include:

- Warehouse – All freezer, cooler, and ice cream and dry storage areas.
- Dock – Shipping and receiving docks.
- Maintenance – Include all maintenance, storage, and battery charging areas.
- Production – Would include any space dedicated to processing or mixing frozen items for repackaging and distribution.

If other special types of areas are identified for these facilities, these will be addressed on a case-by-case basis.

For each usage group, Onsite will install portable amperage recording devices at each facility to verify the average post-retrofit demand at each facility. Selected lighting circuits for each usage group will be identified for monitoring. Onsite will seek to capture through measurement as much of the total lighting load in each usage group as is practical given the nature and configuration of the lighting circuits.

For each lighting circuit, or group of circuits, identified for monitoring, Onsite will determine the total number of fixtures located on each circuit and the fixture wattage associated with each fixture. The sum of the fixture wattages is the pre-retrofit or baseline kW for each circuit. The post-retrofit measured demand will be determined by measurement of the amperage for each circuit or group of circuits and converting this amperage to a kW through a calculation of amps multiplied by the appropriate voltage assuming a unity power factor.

The baseline kW for each measured lighting circuit and the verified post-retrofit average demand during summer peak hours will be used to calculate a weighted average facility demand reduction as a percentage. This percentage will then be multiplied times the total lighting demand of the retrofitted fixtures to determine the summer peak demand savings for each of the three facilities.

The equations to be used for each usage group at each facility are as follows:

For each measured lighting circuit(s):

$$Circuit_i \ Baseline\ Demand = \sum Fixture\ Wattages$$

$$Circuit_i \ Post-retrofitDemand = AVG(Circuit_i kW)_{Noon-6\,pm}$$

$$Circuit_i \ \%Demand\ \mathrm{Re}duction = \left(\frac{Baseline\ Demand}{Post-retrofit\ Demand}\right)_{Circuit_i}$$

$$Weighted\ Average\%\ Demand\ \mathrm{Re}duction = \frac{\sum (BaselineDemand * \%Dmd\ \mathrm{Re}duction)_{Circuit_i}}{\sum (BaselineDemand)_{Circuit_i}}$$

Using the above calculations, a table of results similar to that given below will be completed for each facility.

Usage Group	Group Baseline KW	Group Measured Average Post-Retrofit Demand	Demand Savings	Interactive Savings (IF*Demand Savings)	Total Demand Savings
Warehouse					
Dock					
Maintenance					
Production					

Note: IF stands for Interactive factor. This factor will be determined for each usage group and will depend on the temperatures normally maintained for the specific functional area. These will be calculated by Onsite and submitted for review by the CEC and its technical review contractor.

Onsite Final Report, Dreisbach Lighting Controls

SB5X Agriculture Inspection Form

Project Name	Onsite Energy – Dreisbach Cold Storage Facilities	Date	7/26/02
Address	Dreisbach : Richmond, Oakland, Moss Landing.		
City	Meeker Ave, Richmond, 2530 E. 11th, Oakland, Hwy 1, M.L.		various
Contact	Richmond, Oakland, Moss Landing		
Inspected by	Don Hladun, Onsite Energy, Randy Ivie – Driesbach Rich. John Haas – Moss Landing, not recorded - Oakland	Zip	
	Randy McCall		

Equipment

Component	Status	Meter	Nameplate data and notes
Installation of Controlled Lighting HID lighting controls at Richmond	❑ completed installed ■ being ❑ not installed	❑ yes ■ no	Lighting fixtures were found to be a mix of 400W MH and 400 W HPS fixtures. Significant number of non-op fixtures. – 132 fixtures proposed for retrofit.
Installation of Controlled Lighting HID lighting controls at Oakland	❑ completed installed ■ being ❑ not installed	❑ yes ■ no	Lighting fixtures were found to be predominantly 400W MH fixtures except annex building with 400W HPS. 133 fixtures proposed for retrofit.
Installation of Controlled Lighting HID lighting controls at Moss Landing	❑ completed installed ■ being ❑ not installed	❑ yes ■ no	Lighting fixtures were found to be 400W HPS. 166 fixtures proposed for retrofit.

Meter data

Component(s) is metered separately ❑ yes ■ no **If yes, by:** ❑ utility ❑ participant ❑ other **_Post installation monitoring of circuit demand proposed in M&V plan: Baseline usage for Peak Period is full usage.**

Data available ❑ yes ■ no

Type of data ❑ TOU ■ 15min ❑ run time ❑ other **Post installation monitoring to be provided by Onsite.**

Source of data ❑ utility ❑ participant ❑ other **Monitoring data to be provided for sample of circuits after installation**

Contact for data: Eric Nyenhuis, Onsite Energy **Ph#** (760) 931-2400 **Email address** enyenhuis@onsitenergy.com

Notes:

Three Dreisbach Cold Storage Facilities were visited to verify the existing condition of the lighting fixtures and lighting controls. Each facility is discussed individually below.

Dreisbach Cold Storage – Richmond; 900 Marina Bay Parkway, Richmond, CA 94804

The Richmond facility has 12 rooms for cold storage, however only two of the rooms and Loading Dock #1 in the back of the building are proposed for the retrofit. According to Randy Ivie of Dreisbach, Room #1 is approximately 41,000 ft2, and Room 2 is approximately 59,000 ft2. The facility operates on a single shift basis, typically from 6am – 8 pm with some weekend shifts depending on product delivery schedules during the year. Much of the facility contains frozen turkeys, with approximately 21 million pounds of turkey shipped during the year. No estimate of current product on hand was provided, however the stacking rows appeared to be relatively full. Temperatures of Room 1 were set at –10 degF, with Room #2 set slightly higher at 0 deg F. During the inspection we attempted to verify the lighting circuit panels to determine the feasibility of monitoring a sample or all lighting circuits if applicable. Additional work will be required to identify dedicated lighting circuit panels and fixture counts for sampled circuits. Fixture counts were not recorded as the temperatures in the two cold storage rooms prevented us from staying inside for a sufficient amount of time to identify all fixtures. Of note, there were a mix of both 400W MH and 400W HPS fixtures in the two cold storage rooms and loading dock, as well as a significant number of inoperative fixtures. Onsite will need to account for any fixtures not operating for analysis of demand savings from the post-installation monitoring proposed in the M&V plan. Onsite Energy has proposed to include interactive savings from reduced internal heat loads in each of the facilities. The ammonia based refrigeration system included several individual compressors in the engine room at the front of the complex, however nameplate information was not recorded for the compressors. Of note, at each of the facilities visited, the retrofit of the lighting controls had been started. None of the installations inspected were complete, but equipment at Richmond was hung next to each fixture throughout the facility. One section of Room #2 is leased to an outside vendor and fenced off from the Dreisbach portion of the room. The retrofit is proposed for the entire room, however, monitoring of the fixture circuits should provide information on the operations and lighting hours for the outside vendor as well as Dreisbach.
Representative photographs of the Richmond warehouse are attached below.

z

Figure 1: Loading dock area at Richmond – 400W MH fixtures with individual controls at each fixture.

Figure 2: Stacking rows and mixture of fixture types in cold storage room.

Dreisbach Cold Storage – Oakland; 2530 E. 11th, Oakland, CA 94601

The Oakland facility includes cold storage rooms, cooler rooms, and unconditioned rooms in the proposal for lighting controls retrofits. The 133 fixtures proposed for retrofit at the facility were not individually counted due to extremely cold conditions and the number of rooms to verify. Similar to the Richmond facility, many of the lighting controls were hung in place next to the fixtures, but not activated

or completed. Fixtures at Oakland included 400W HPS in Room 12, and 400W MH fixtures for the rest of the facility. Total area covered by the retrofit for the Oakland facility was reported to be approximately 110,000 ft2 including the loading docks. Temperatures of the various rooms ranged from ambient in the loading dock area, 34 deg F in the cooler, and 0 deg F, or –10 deg F in individual cold storage rooms. A total of 12 rooms were inspected, with Room 12 across the street from the main facility in an annex building. Lighting hours for the facility were reported by the staff to include the entire summer peak period. The typical single shift operation runs 5 days per week from 7:00am to 6:00pm. All lights are turned off at the lighting contractors after the shift ends. Representative pictures of the Oakland facility are attached below.

Figure 3: 400W MH fixtures in stacking rows.

Figure 4: 400W MH fixture with inactive Controlled Lighting Corporation equipment to right of fixture (typical installation).

Figure 5: Lighting circuit panel for post installation mon-Itoring at right of picture.

Figure 6: -10 deg F cold storage room with 400W MH fixture Note lighting control equipment (inactive) near fixture.

Dreisbach Cold Storage – Moss Landing; 1276 Highway 1, Moss Landing, CA 95039

The Moss Landing facility is equipped entirely with 400W HPS fixtures, and the retrofit is proposed for all cold storage areas, the packing area, and the IQF freezer room. The packing area is at ambient temperatures, with other areas at either 0 deg F, or –10 deg F. The overall size of the cold storage rooms was reported to be approximately 120,000 ft2, according to John Haas, the facility representative. As found at both the Richmond and Oakland facilities, lighting control equipment was hung next to fixtures in some of

the areas to be retrofit. Hours of operation for the facility are reported to be 6 days per week, approximately 16 hours pre day during the summer peak period. All fixtures are therefore assumed to be in operation during the entire summer peak period. None of the lighting controls were active at the time of the inspection, and Mr. Haas reported that the retrofit was held up pending the results of the pre-installation inspection. Completion for the project is projected for the first week in August, 2002. Pictures of the cold storage areas at the Moss Landing facility are attached below.

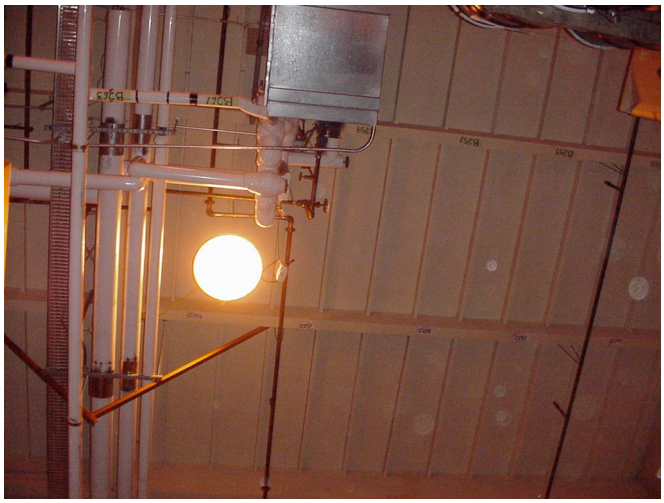

Figure 7: 400W HPS fixture inside cold storage room at Moss Landing. Note controls equipment near fixture.

Figure 8: Stacking rows of frozen berries in 0 deg F room. Note lighting controls illuminated by fixtures (inactive).

Summary of inspections: At each of the three facilities inspected, lighting controls had been physically installed, but not activated. Fixture counts were not verified due to extreme cold conditions preventing the inspector from spending an adequate time to count all fixtures. The lighting fixtures observed were all of either 400W MH or 400W HPS type, with little difference between baseline fixture wattage (HPS400/1 = 465W, MH400/1 = 458 W according to Table of Standard Fixture Wattages from Nexant).

Inoperative fixtures noted at the Richmond facility must be accounted for in a detailed inventory of fixtures and fixture types. Post-installation monitoring of circuit demand will include all fixtures on a sampled circuit, and inoperative fixtures can range from 0 Watts demand for fully failed fixtures to slightly less than full power for fixtures near failure by still providing light. Calculating an average demand of all fixtures including any inoperative fixtures will result in artificially high demand savings per fixture from the retrofit project. Baseline monitoring was waived for the project due to short installation deadlines, and fixtures are assumed to be operating at full power during the entire peak demand period. Additional comments on the post-installation monitoring approach, and determination of any interactive effects on demand will be forwarded to Onsite.

Savings estimates for this project have not been provided to date. With the variable nature of the lighting levels throughout each facility solely dependent on the traffic patterns, an accurate assessment of the demand savings is difficult to predict with any accuracy. A similar project for a large distribution warehouse has resulted in measured demand savings of 55% of baseline demand. A second grocery distribution warehouse reviewed by Nexant resulted in measured savings of roughly 38% of connected load. Based on Onsite Energy's proposed M&V plan, and from observations during the pre-inspections, Nexant believes the peak demand savings should meet or exceed the demand savings as a percentage of connected load listed above. On that basis, the demand savings should be in excess of 80kW. Onsite Energy has also proposed to track interactive savings from reduced refrigeration loads and has proposed that for every kW of reduced lighting, 0.85kW of refrigeration compressor savings can be achieved. The total savings then may exceed approximately 150kW for the three facilities.

Onsite Project: Gatorade

SB5X Agriculture Inspection Form

Project Name: Onsite Energy – Gatorade Demand Reduction Project — Date: 3/18/02

Address: Gatorade

City: Oakland, CA — Zip: _____

Contact: Ron Allen

Inspected by: Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Air Compressor Replacement	❑ completed ■ being installed ❑ not installed	❑ yes ❑ no	Removed Atlas CopCo CAU 807 compressor, install new Variable speed Atlas Copco GA-90 rotary screw compressor.
Air Compressor Optimization	❑ completed ■ being installed ❑ not installed	❑ yes ❑ no	Reconfigure piping loop for compressed air header, install low pressure blower with air knives for blow off of bottles on lines, add controls and photo eye sensors for time-out of air nozzles.
Condenser Fan VFDs	❑ completed ❑ being installed ■ not installed	❑ yes ❑ no	Install 4 VFD's to control 25 hp condenser fans in three existing cooling towers along with sump temperature controls loop.
Boiler combustion air fan VFD	❑ completed ❑ being installed ■ not installed	❑ yes ❑ no	Install VFD to control 50 hp boiler combustion air fan.

Meter data

Component(s) is metered separately ❑ yes ❑ no **If yes, by:** ❑ utility ❑ participant ❑ other **_Unknown_____**

Data available ■ yes ❑ no Note: Some pre-installation monitoring data provided in air compressor study. Other info unavailable.

Type of data ❑ TOU ❑ 15min ❑ run time ❑ other **Monitored power data in air compressor study**

Source of data ❑ utility ❑ participant ■ other **Previous study conducted by ESCO_____**

Contact for data __Onsite Representative Is Ron Allen **Ph#** (925) 358-4264 **Email address rallenonsite@aol.com**

Notes on Gatorade:

The air compressor project is nearing completion with installation of the new Copco variable speed screw compressor close to complete. The existing constant speed Copco compressor will be retained as a backup compressor in case of primary screw compressor failure according to Ron Allen, Onsite's representative for the project. A previously completed air compressor study of the plant (according to Ron) has listed savings of approximately 400,000kWh, and approximately 83kW of demand reduction. Additional documentation from Onsite lists air compressor savings at 67kW.

The compressed air optimization program has been largely completed, with the compressed air header loop to be completed along with the new compressor installation. The air knives and dedicated low pressure blower have been installed and were functioning during the inspection. The 10 @ 30CFM air nozzles have been replaced, and the photo sensor controls have been installed.

The VFD installation for the condensers has not been started, and all condenser fans for the three cooling towers were operating at full speed during our inspection (morning hours, mid to low 70's temperature). The documentation lists 4 VFDs to be installed for the three cooling towers, however Ron Allen indicated that all four fan motors on the West Tower would receive VFD's, with the East tower receiving two VFD's for the four fan motors. The total 6 VFD's indicated by Ron Allen is not consistent with the documentation. Follow up on actual planned number of VFD's is needed.

The boiler combustion air retrofit had not been started prior to the inspection. Ron Allen's spreadsheet for the plant improvements indicates that pre-installation monitoring and post-retrofit monitoring would be used to establish the actual load reductions for peak period usage. The savings would typically only occur during low fire rate operations.

In addition to the other items listed above, a minor lighting retrofit is contemplated for office areas and some work floor areas. The listed peak load reduction for the lighting retrofit is 20kW from the spreadsheet dated 3/11 (17kW from the lighting inventory sheets). Nexant believes some of the lighting savings will not be coincident with the peak period. Lighting usage hours must be specified for various locations listed on the inventory sheets.

Based on the visual inspection of project status, documentation of measure baselines, and savings analysis, Nexant recommends approval of the project. Additional documentation is required to approve final savings estimates as shown in Onsite's savings spreadsheets of 165kW peak demand reduction.

Photographs of select equipment below:

Figure 1: Existing Copco compressor – will become backup compressor for plant.

Figure 2. New VSD screw type rotary compressor - not currently operational.

Figure 3: New air knives for blow off of bottles on line.

Figure 4: Blow-off for bottles and new blower.

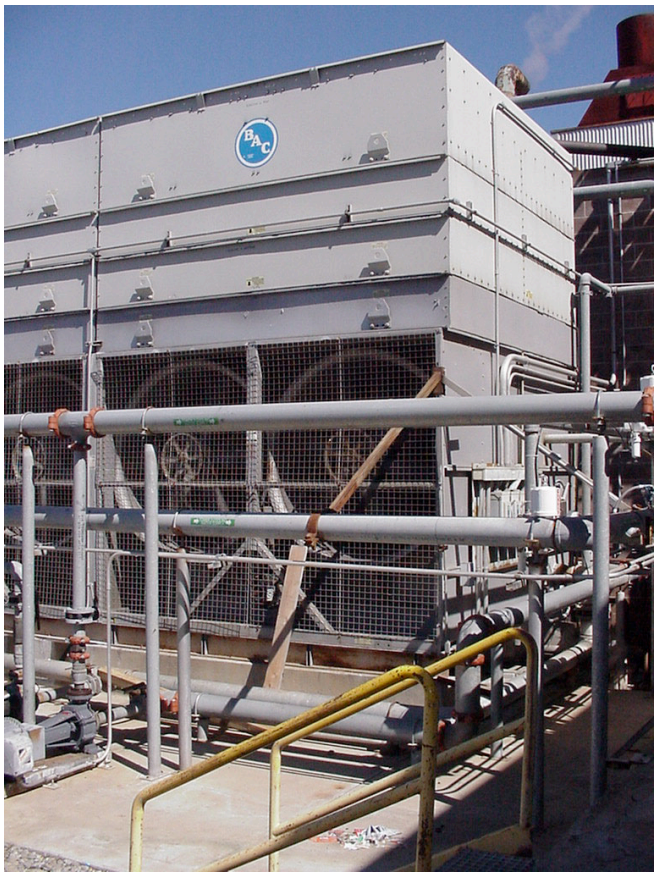

Figure 5: East cooling tower with four 25hp constant speed fans.

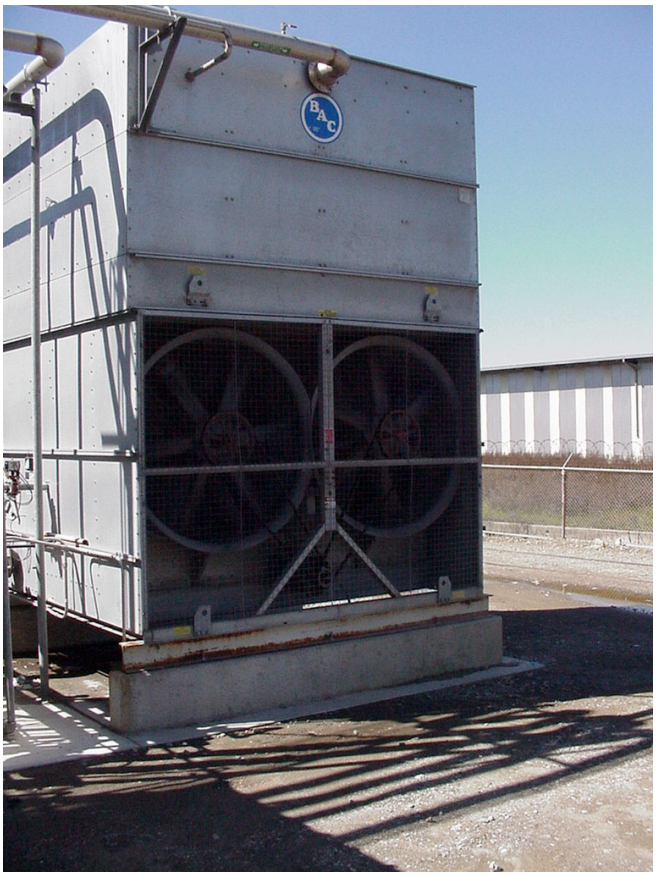

Figure 6: West cooling tower with two 25hp constant speed fans.

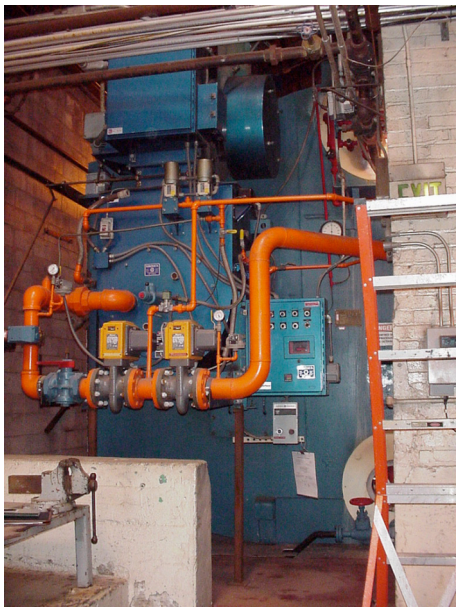

Figure 7: Existing boiler with 50hp FD fan.

Figure 8: 50hp FD fan motor for boiler.

Onsite Project: Leprino Foods

SB5X Agriculture Inspection Form

Project Name: Onsite Energy – Leprino Foods
Date: 5/9/02
Address: Leprino Foods Refrigeration and Freezer Improvements
City: Leprino Foods
Zip: _____
Contact: Tracy
Inspected by: Ron Allen, Onsite Energy, Reed Azevedo, Leprino Foods
Randy McCall, Nexant, Inc.

Equipment

Component	Status	Meter	Nameplate data and notes
Mozzarella Cheese brine bath cooling system improvements –split system, new extrusion equipment, belt conveyer, air spray system for cooling cheese.	❑ completed installed ❑ being ■ not installed	❑ yes ■ no	Process change for cooling extruded cheese with brine bath system; move brine cooling to high side of ammonia compressors at 22psig suction, rest of system allowed to float resulting in lower suction pressures and discharge pressures. Redesign and retrofit allow for overall reduction in BHP/ton for brine system. Baseline data from SPC project previously incented by PG&E.
Install 2 new condensers for refrigeration system. 5 existing condensers.	❑ completed installed ■ being ❑ not installed	❑ yes ■ no	System improvements include increase to design capacity by removing bottleneck in cooling cheese. 2 additional Evapco condensers for higher efficiency on refrigeration system BHP/ton and process rate increase.
Install 4 HCR doors for freezer and 2 Rytec doors	❑ completed installed ❑ being ■ not installed	❑ yes ■ no	Improvements to freezer envelope by reducing infiltration, and managing door defrost cycles in more efficient manner. HCR doors are double-envelope, Rytec's are high speed roll up doors.
Refrigeration controls for Freezer flywheeling	❑ completed installed ❑ being ■ not installed	❑ yes ■ no	Improvements to control of ammonia compressors, addition of infiltration doors result in ability to flywheel freezers during peak hours.

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ❑ utility ❑ participant ■ other **Onsite has monitored compressors for previous SPC project with PG&E.**

Data available ■ yes ❑ no Baseline data is reportedly available from previous SPC project for refrigeration compressors.

Type of data ❑ TOU ■ 15min ❑ run time ❑ other _____

Source of data ❑ utility ❑ participant ■ other **SPC monitoring data**

Contact for data **Eric Nyenhuis** **Ph#** 760) 931-2400 **Email address** **ENyenhuis@Onsitenergy.com**

Notes:

Ron Allen of Onsite Energy and Reed Azevedo of Leprino Foods were in attendance for the pre-installation inspection on May 9, 2002 at Leprino Foods in Tracy, CA.

The inspection was visual in nature, and no spot measurements of compressor power or condenser demand were recorded during the inspection. According to Ron Allen, Onsite Energy has access to two years of continuous monitoring data for the ammonia refrigeration system collected for a previous PG&E incented SPC project. As the demand savings for the project are all related to improvements to the refrigeration system, or envelope of the freezer, demand reductions will be evident at the ammonia compressors and condenser systems.

The measures proposed for the project include a redesign of the brine cooling system and move from the suction side of the ammonia compressor system to the high side, installation of fast roll-up doors for the freezer to control infiltration and reduce defrost heating of the doors, installation of two additional evaporative condensers to the condenser loop, and installation of controls to allow flywheeling of the freezer for additional compressor savings.

The Leprino plant was under construction at the time of the site inspection, and some of the measures were already underway. The two new Frigid Coil evaporative condensers were installed on the rooftop, however, they were not functioning. According to Mr. Azevedo, all construction for the process change will be completed including the installation of the new cheese cooling system before the actual changeover to the new system occurs. The actual switch of the brine cooling system will take place over a one day interval. The completion of the project was predicted for the end of July, and possibly later.

Photographs of the brine tank and heat exchangers are attached below.

Figure 1: New heat exchangers on roof for brine system. Note construction equipment in foreground–construction area was not accessible for inspection.

Figure 2: Existing immersion type brine bath system. Brine Existing brine bath measures approximately 120' long, and Is maintained at approximately 4 deg F for rapid cheese chilling.

SB5X Agriculture Inspection Form

Project Name: Leprino Foods — Date: 10/2/02

Address: Leprino Foods Refrigeration and Freezer Improvements

City: Macarthur Boulevard

Contact: Tracy, CA — Zip: _____

Inspected by: Don Hladun, Onsite Energy

Randy McCall, Nexant, Inc.

Equipment

Component	Status	Meter	Nameplate data and notes
Install 2 new evaporative condensers for ammonia refrigeration system.	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Evapco, Model # ATC 755B and Evapco, Model # ATC 473B. Additional existing condensers for ammonia plant not documented for nameplates. Two existing condensers planned for replacement due to failing condition. Existing condenser fans are monitored for power consumption, new condensers are planned for monitoring installation by Onsite-Energy in coming weeks.
Install heat exchangers for new cheese cooling line using brine spray at increased temperature.	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Installed two new heat exchangers between ammonia refrigeration system and brine cooling system for cheese manufacturing. Brine cooling system has been moved from the low temp ammonia system at –8 deg F to medium temp side at approx. 16 deg F. Refrigeration system reset to 0 deg F on low side when system split completed for freezer operations.
Install new brine bath cheese cooling system. Existing immersion bath system replaced with spray type allowing for warmer brine temperature and move of brine chilling to high side of ammonia refrigeration system.	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Install brine cooling system to cool extruded mozzarella cheese and provide for salt uptake. New cooling tank uses spray system for brine instead of bath system of existing tank. Combined motor power of new system is not determined, but thought to be less for lower brine pumping requirements, and similar belt power requirements. New brine system allows for higher brine temps, therefore the brine system moved to medium side ammonia compressors at higher temperatures.

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ❑ utility ❑ participant ■ other **Onsite Energy_**

Data available ■ yes ❑ no Pre-installation data available for low side compressors and existing condenser fans. Additional monitoring to be installed for new condenser fans and high side compressors.

Type of data ❑ TOU ■ 15min ❑ run time ❑ other _____

Source of data ❑ utility ❑ participant ❑ other **_Onsite Energy monitoring**

Contact for data __Eric Nyenhuis, Onsite Energy Ph# 760-931-2400 Email address: ENyenhuis@Onsitenergy.com

A post installation inspection was conducted at Leprino Foods plant in Tracy on October 2, 2002. In attendance were Don Hladun, Onsite Energy, Steve Azevedo, Leprino Foods, and Randy McCall, Nexant, Inc. The full scope of the project with Leprino Foods includes refrigeration measures related to the cheese cooling, increases in condenser capacity for the ammonia refrigeration system, installation of heat exchangers for the brine cooling system, and installation of infiltration reduction measures for the freezer doors to improve flywheeling potential of the freezer refrigeration system. The measures completed at this time include all but the freezer infiltration measures. Installation of the infiltration measures is anticipated for 2003.

Changes to the refrigeration system revolve around the installation of the new brine spray based cheese cooling system installed as part of the retrofit. Photographs of the new equipment were not permitted, however a brief description of the new system follows. Warm mozzarella cheese is extruded in a wide continuous band approximately 8-feet by 1-inch thickness. The continuous cheese band is fed by conveyor belt through a stainless steel vessel roughly 100' long, equipped with rows of spray nozzles that spray the cheese from top and bottom with a chilled brine solution. The brine, at 18 deg F temperature, serves to both cool the cheese prior to processing and storage, and provide salt for uptake by the cheese. After traveling through the brine spray vessel, the continuous belt of cheese is sliced into smaller slabs of roughly 1-foot by 2-foot dimensions, and moved into processing or freezer storage lines. Further processing includes grating and packaging in bulk for use by Pizza restaurants, or slicing into smaller sizes. After the minimal processing, the cheese is either moved into the freezer storage area or direct shipped to customers.

The existing brine bath system is still on the site, however, has been disconnected and appears to be abandoned in place. All lighting for the previous brine bath is still in place and operating, and new lighting was installed in the area holding the new brine-spray tank. Lighting power was not included in Onsite's previous estimates of demand savings, and must be accounted for in the final analysis of savings.

Refrigeration system improvements included increased condensing capacity through installation two additional Evapco cooling towers. The approximately 225 Tr capacity towers were installed alongside the existing 5 evaporative condensers. Combined with the changeover from brine bath cooling supplied by the low side compressors (previous tank temperature was approx. 4 deg F) to a higher temperature brine spray system (new system is at approx. 18 deg F) supplied by the high side ammonia compressors, the discharge pressures have decreased significantly for the entire system. Reed Azevedo, of Leprino Foods, estimated maximum discharge pressures will consistently average approximately 125-135 psig vs. the previous 160 psig or greater. For the baseline configuration, the condenser capacity was insufficient and the lower temperatures required by the brine bath system (-8 deg F suction temperatures) resulted in excessive discharge pressures and higher compressor power demands. The addition of additional condenser capacity, raising of the low side suction temperature to 0 deg F from –8 deg F for freezer only operations, and moving the brine cooling to the medium side at 18 deg F brine has dramatically lowered the compressor power requirements.

An additional component of the retrofit is the installation of two high efficiency heat exchangers for the new brine cooling system. The heat exchangers were both operating during the inspection, and temperature drop between the brine cooling tank and the compressor was only approximately 2 deg F.

At the conclusion of the inspection, a conference call was originated that included Don Hladun and Eric Nyenhuis of Onsite Energy, and Randy McCall of Nexant, Inc. to discuss M&V methods and monitoring equipment. A previous refrigeration project at Leprino by Onsite required extensive monitoring of the refrigeration system on a continuous basis. The monitoring equipment installed to measure post-installation energy use in the previous project serve to establish baseline conditions for the latest project. Changes to the refrigeration system, installation of the two condensers, and the switch in brine cooling necessitate additional monitoring of the two Frick ammonia compressors, and the new condenser fans and pumps. Onsite anticipates installation of the new monitoring equipment in the next two weeks.

Photographs of the some of the new equipment installations at Leprino Foods are attached below.

Figure 1. One of two Evapco condensers,

Figure 2. Evapco condenser nameplate, Model ATC755B

Figure 3. Brine bath cheese cooling system now disabled – photographs of new system not permitted. Note brine spray on top of extruded cheese belt; replacement equipment includes top and bottom spray

Figure 4. Frick ammonia compressor for new brine cooling system.

in enclosed tank.

Figure 5. Low temperature ammonia compressors – new cooling system moved to medium temp compressors in Figure 4.

Figure 6. Brine system heat exchangers mounted on roof; heat exchangers now supplied by medium temp ammonia compressors at 16 deg F. Leprino plans to insulate lines At left edge of photograph.

Onsite Project: Pacific Coast Producers

Pre-M&V Evaluation REPORT

Prepared for Pacific Coast Producers, Onsite Energy Corporation, and the California Energy Commission

Prepared by Robert Mowris & Associates

SITE SUMMARY INFORMATION

Company Name:	**Pacific Coast Producers**		
Site Name:	**Pacific Coast Producers**		
Site Address:	**1376 Lemen Avenue, Woodland, CA 95776**		
Principal Site Contact:	**Rich Freitas**	**Telephone:**	**(530) 661-7611**
Plant Engineer:	**Robin Dodson**	**Telephone:**	**(530) 661-7634**
OnSite Energy Contact:	**Ron Allen**	**Telephone:**	**(925) 358-4264**
Assigned Lead Engineer:	**Robert Mowris, P.E.**	**Telephone:**	**(800) 786-4130**

Site: Pacific Coast Producers, Woodland, CA

PROJECTS AS PROPOSED

Project	Account Number	End Use	Utility	Program	Project Type
PCP Project	CPYT219203	Tomato Processing	PG&E	Ag. Peak kW Reduction	Custom

MEASURES FOR EACH PROJECT

		Ex Ante Savings Estimate			
Item No.	Efficiency Measure	(kW)	(kWh/yr)	(therms)	Rebate ($)
1	Process Efficiency Upgrade	1,085	1,953,362	n/a	$217,000

PROGRAM MEASUREMENT AND VERIFICATION SAVINGS ESTIMATE

		M&V Evaluation Savings		
Item No.	Efficiency Measure	(kW)	(kWh/yr)	(therms)
1	Process Efficiency Upgrade			n/a

Introduction

The PCP tomato processing facility was previously located in the City of Lodi. It has been moved to Woodland and upgraded to increase production, improve efficiency, and be closer to where the tomatoes are grown. PCP is upgrading the production and efficiency of their tomato processing facility including new equipment and controls as part of the move. They applied for a grant to defer part of the cost of the efficiency upgrades through the CEC-Sponsored Onsite Energy Corporation Agricultural Peak kW Reduction Program. Based on our analysis the grant application will be $217,000 (i.e., 1,085 kW times $200/kw). The old site received electricity from the City of Lodi Electric Utility and historical electrical billing data for the old facility was obtained from the City of Lodi. PG&E will be providing electricity and natural gas to the new site. PCP is preparing an equipment list of motors, VFD drives, helical drives, and controls to assist with the M&V effort. Preliminary information is provided in this report and will be updated later. Historical billing data for PCP is provided in **Attachment 1**.

Business Description

The PCP has been located in Lodi for 31 years and is a grower-owned cooperative founded in 1971. Today, PCP is the largest grower-owned tomato and fruit canning operation in the United States. Pacific Coast Produces employs over 1,000 people at peak season and is one of the City of Lodi Electric Utility's largest energy users. PCP decided to relocate their tomato processing facility in 2000 to be closer to where the tomatoes are grown in order to improve processing quality and reduce transportation costs. PCP purchased the Woodland facility in 2001 and started relocating their tomato facility from Lodi to Woodland in late 2001. The PCP tomato processing facility is used during the tomato harvest season that runs from June through September. The plant will process approximately 525,000 tons of tomatoes per season or 5,850 tons per day during the harvest season. Tomatoes arrive on trucks carrying approximately 20 tons of tomatoes per truck. The Woodland facility will eventually include 24 production lines. Only 18 production lines are considered in this report in order to compare to the Lodi facility that previously included 18 production lines.

Scope of Project and Efficiency Improvements

The old Lodi facility consisted of 4 evaporators and 18 production lines with over-sized standard inefficient constant-speed motors, manual controls, 50% efficient "right-angle" gear drives; and inefficient lighting. Once completed in June, PCP Woodland will have a "state-of-the-art" tomato processing facility. The Woodland facility includes the following efficiency improvements:

1. Computer controls to increase production and improve processing efficiency;
2. Eliminating unnecessary motors;
3. High-efficiency motors (approximately one hundred 1/2 hp to 20 hp motors);
4. Properly-sized motors (the old motors were often oversized);
5. Variable frequency drives (VFDs);
6. High efficiency helical drives (96% efficient); and
7. Reduced lighting levels and Day Lighting.

The move to Woodland will also save transportation fuel since most of the tomatoes processed by PCP are grown in the Woodland area. The most important efficiency upgrade is the drastic

improvement in product throughput. Lodi had annual production of 325,000 tons of tomatoes per year. The Woodland facility will have annual production of 525,000 tons of tomatoes per year (i.e., 62% increase). The net peak load reduction savings of 1,085 kW are based on the overall efficiency upgrade in equipment and throughput. This report provides both a "bottom up" and "top down" analysis of the savings.[2] In addition, transportation fuel and highway congestion savings will be realized. A summary of kW savings based on the two approaches is shown in **Table 1**.

Table 1. Summary of kW Savings

Section	Description	Quantity of Motors	kW Savings
1	Bulk Dump	7	22
2	Caustic Applicator	14	137
3	Cord Peeler	7	31
4a	Product Staging	41	64
4b	Reduced Lighting & Day Lighting		51
5a	Manual Sorter and Hot Break	16	107
5b	Automatic Sorter	7	5
6a	Evaporator/PFT	52	198
6b	Kitchen Mixing Tank	17	23
6c	Kitchen Pump	17	22
7	De-Palletizing	45	16
8a	Product Fill and Close	21	TBD
8b	Paste Fill and Close	21	22
8c	Rotel	18	11
9	Cooker	21	43
10	Cooler	19	38
11	Palletizing and Warehouse	28	26
	"Bottom Up" kW Savings	**351**	**1,085**
	Lodi kW = 6,634 kW		
	Lodi Facility at Woodland Efficiency = 5,549 kW		
	"Top Down" kW Savings		**1,085**

[2] The "bottom up" analysis of savings is in progress and is based on analysis of each section of the facility in terms of reducing the number of unnecessary motors, properly sized high efficiency motors, VFDs, lighting level reduction, and new computer controls that increase production and improve efficiency.

Overview of Woodland Tomato Processing Facility and Energy Efficiency Improvements
The PCP Woodland Tomato Processing Facility consists of eleven (11) processing sections. Each section is described below with an indication of the number of energy efficiency measures installed and estimated savings.

1) Bulk Dump Section. Trucks carry tomatoes into the processing facility where they are bulk dumped from the trucks and then lifted up to the peeler and sorter sections. **Figure 1** shows one of five lifts being retrofitted with a properly sized high efficiency 5-hp VFD motor with helical drive. Previously the lift had an inefficient 20-hp hydraulic motor. **Figure 2** shows new computer (PLC) controls to allow motors to operate at increased speed to maintain optimum product throughput and efficiency. Product throughput has been increased by 60% compared to Lodi with new computer (PLC) controls. Overall peak demand and energy savings are 16.4% compared to Lodi due to computer PLC controls, high efficiency VFD motors, properly sized motors, improved design to eliminate unnecessary motors and other improvements.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	1	13
Computer VFD Controls	1	4
Computer Controls	7	5
Subtotal Savings		22

Figure 1. Tomato Lift

Figure 2. Computer (PLC) Controls

2) Caustic Applicator Section. Tomatoes first go through the caustic peelers to loosen the skin (**Figure 3**). There are seven state-of-the-art caustic peelers with one per production line. Each caustic peeler includes properly sized high efficiency 3-hp motors with 96% efficient helical gear drives to replace old right angle gear drives that were 50% efficient. The old motors were 5-hp. The new motors also have computer controlled VFDs to ensure that they operate at optimal speed/efficiency. Seven caustic recirculating pumps have been changed from 30-hp to high efficiency 20-hp motors.

Measure Description	Qty.	KW Savings
Efficient 3-hp Motors w/VFD	7	21
Efficient 20-hp Motors w/VFD	7	114
Computer VFD Controls	14	2
Subtotal Savings		137

Figure 3. Caustic Peeler

3) Cord Peeler Section. Tomatoes go through the cord peelers where the skin is removed (**Figure 4**). There are 7 state-of-the-art cord peelers with one per production line. Each cord peeler includes properly sized high efficiency motors and computer controlled VFDs. The cord peelers have 96% efficient helical gear drives to replace old right angle gear drives that were 50% efficient. Computer controls maintain optimal production speed and efficiency.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	7	5
Helical Drives	7	19
Computer VFD Controls	7	7
Subtotal Savings		31

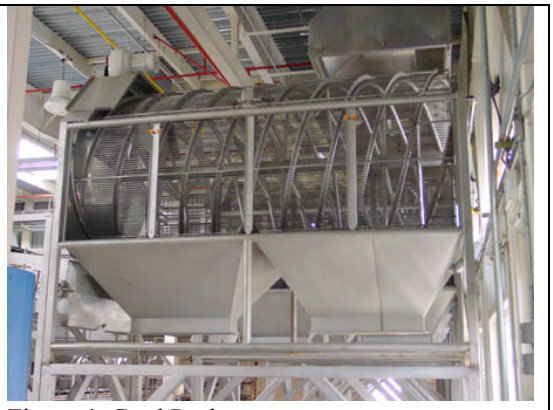
Figure 4. Cord Peeler

4a) Product Staging Section. Tomatoes are routed to product staging conveyor belts prior to sorting. This section includes properly sized energy efficient motors with helical gear drives and computer controls as shown in **Figure 5** (motors and drives are painted white). Helical gear drives are 96% efficient and replace old right angle gear drives that were 50% efficient. Computer controls maintain optimal production speed and efficiency.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	16	4
Helical Drives	41	42
Computer VFD Controls	41	18
Subtotal Savings		64

Figure 5. Product Staging Section

4b) Reduced Lighting Levels and Day Lighting. Reduced lighting levels along with skylights are installed throughout the facility. The installed lighting intensity is approximately 1.1 W/sf. The old facility lighting intensity was 1.71 W/sf. With approximately 85,500 square feet of production area the total savings from lighting are estimated at 51 kW.

Measure Description	Qty.	KW Savings
Energy Efficient Lighting		51
Subtotal Savings		51

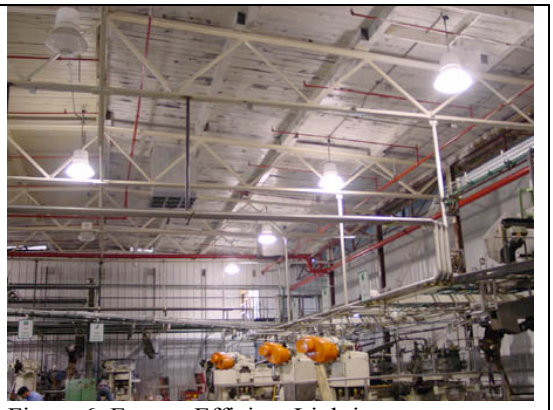

Figure 6. Energy Efficient Lighting

5a) Manual Sorter and Hot Break Section. There are eight manual sorters that that receive tomatoes from the bulk dump section and send tomatoes to the hot breaks (which have six new 25-hp motors at 93.6% efficiency replacing six old 30-hp motors). There are a total of eight 25-hp and eight 15-hp motors in the hot break section. Figure 7 shows the manual sorter which bypass sections 2 through. Computer controlled flow of the tomatoes reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	6	70
Computer Controls	16	37
Subtotal Savings		107

Figure 7. Manual Sorters

5b) Automatic Sorter Section. From the product staging section tomatoes go to the automatic sorter section that sorts tomatoes by color and size. (Figure 8). There are seven state-of-the-art automatic sorters. Each automatic sorter includes properly sized high efficiency motors and computer controlled VFDs. Computer controlled flow of the tomatoes reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	7	3
Computer VFD Controls	7	2
Subtotal Savings		5

Figure 8. Automatic Sorter

6a) Evaporator/PFT Section. Tomatoes go from the sorters to the hot breaks, to the pulper feed tanks (PFT), to the pulp/finishers, to the evaporator feed tanks, and then to evaporators (**Figure 9**). From the evaporators the tomato paste goes to either the kitchen mixing tanks or the flash cooler-paste box fill section. There are 7 PFTs, 6 evaporators and 14 pulper systems. **Figure 10** shows four PFTs and 8 pumping motors. High efficiency motors are used to move tomato products through this section and back to the kitchen section. The boiler was moved from Lodi, but the old 300-hp 88% efficient supply air motor was replaced with a 250-hp 96.2% efficient motor and the old 50-hp 84% efficient exhaust air motor was replaced with a 30-hp 90.2% efficient motor.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	50	48
Computer VFD Controls	50	43
Boiler Motor Upgrade	2	107
Subtotal Savings		198

Figure 9. Evaporator Section

Figure 10. PFT Section

6b) Kitchen Mixing Tank Section. Tomato product goes from the evaporator section to one of fourteen kitchen mix systems where it is combined with herbs and spices and mixed into sauce, paste, and juice. (**Figure 11**). There are 32 tanks and 15 mixing tanks in the kitchen. Four 4 motors were upgraded to high efficiency motors used to mix tomato products in the kitchen (i.e., 2 10-hp and 2 15-hp motors). All seventeen motors in the kitchen are computer controlled to increase production and efficiency.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	4	7
Computer Controls	17	15
Subtotal Savings		23

Figure 11. Kitchen Mixing Tanks

6c) Kitchen Pump Section. There are 32 tanks and 17 are supply tanks as shown in **Figure 12**. There are 17 pumps (15 are VFD motors). This section was upgraded to computer controls and VFD motors used to pump processed tomato product from the kitchen to the production lines. Computer controlled flow of the tomatoes reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Computer VFD Controls	17	22
Subtotal Savings		22

Figure 12. Kitchen Pumps

7) De-palletizer Section. Tin cans are supplied to the facility in the de-palletizer section. The de-palletizer section sends cans to the product fill bowl sections. There are 12 de-palletizers as shown in **Figure 13**. This section has fifteen 1-hp and thirty 1.5-hp conveying motors. High efficiency motors and controls are installed on each de-palletizer. Savings are based on new design/layout and computer controlled flow of cans that reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	45	9
Computer Controls	45	7
Subtotal Savings		16

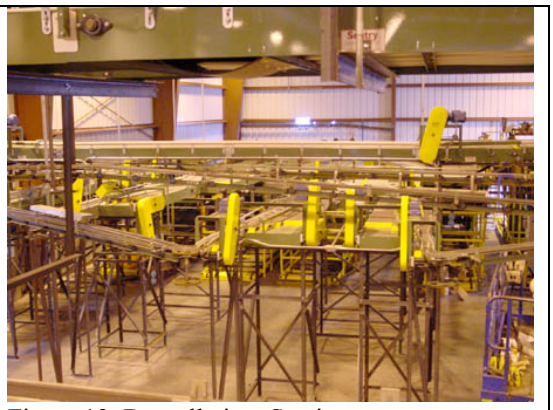

Figure 13. De-palletizer Section

8a) Product Fill and Close Section. Tomatoes go from the automatic sorter section to the product fill and close section. There are seven product fill and close production lines in this section. Six of them have been improved from 250 cans/minute to 400 cans/minute. The seventh is a high-speed canning line that has been improved to 1,000 cans per minute (see **Figure 14**). Computer controlled flow of the tomatoes reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	21	TBD
Computer Controls	21	TBD
Subtotal Savings		TBD

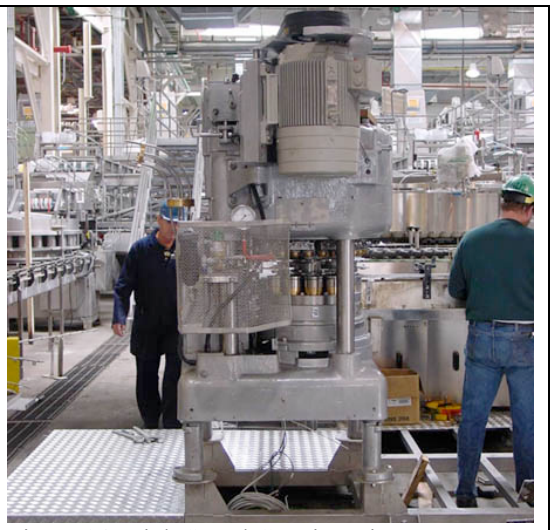

Figure 14. High Speed Canning Line.

8b) Paste Fill and Closed Section. Tomato product (i.e., sauce, paste, juice) goes from the kitchen to the paste fill and closed section as shown in **Figure 15**. There are 12 product lines. Efficiency has been increased from 250 cans/minute to 400 cans/minute. Savings are based on the new computer controls, shorter conveyor sections (reducing installed hp by 16%), and new high efficiency motors.

Measure Description	Qty.	KW Savings
Efficient Motors	21	6
Computer Controls	21	16
Subtotal Savings		22

Figure 15. Product Fill and Close Section

8c) Rotel Section. Tomatoes or tomato products enter the Rotel section from either the automatic sorter or the kitchen. There are two Rotel lines. Two feed elevators were upgraded to high-efficiency The Rotel section was redesigned to reduce the number and size of motors. New efficient heaters were installed and new computer controls allow increased production and improved efficiency.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	2	3
Computer Controls	18	8
Subtotal Savings		11

Figure 16. Rotel Section

9) Cooker Section. Processed or canned tomatoes finally enter the cooker section where they are cooked. There are 21 cookers and properly sized high efficiency VFD motors and controls are installed on each cooker. Computer controlled flow of the tomatoes reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	21	39
Computer Controls	21	4
Subtotal Savings		43

Figure 17. Cooker Section

10) Cooler Section. Once cooked the canned tomatoes enter the cooler section. There are 19 coolers and properly sized high efficiency VFD motors and controls are installed on each cooler. Computer controlled flow of the tomatoes reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Efficient Motors w/VFD	19	35
Computer Controls	19	3
Subtotal Savings		38

Figure 19. Cooler Section

11) Palletizing and Warehouse Section. Once cool canned tomatoes are palletized and then sent to warehouse storage. Efficiency and design improvements at Woodland allowed the removal of five 1-hp motors and five 1.5-hp motors. Computer controlled flow of the tomatoes reduces energy use and increases efficiency and throughput.

Measure Description	Qty.	KW Savings
Removed Motors	10	16
Computer Controls	28	10
Subtotal Savings		26

Figure 20. Palletizing and Warehouse Section

Schedule of Key Dates
Full implementation of the project will be completed by July 2002.

Variability in Schedule and Production: The facility operates four months per year during the tomato harvest season with maintenance operations during the remainder of the year.

Square Footage of Affected Area: The affected production area is 85,500 square feet.

Historical Energy Use and Savings
In 2001, Pacific Coast Producers processed 29,320,474 cases of tomatoes with 18 production lines and electrical consumption was 6,634 kW and 11,944,410 kWh (see **Table 2**, 2001 Lodi kWh and kW).

Table 2. Historical Billing Data for Lodi in 2001[3]

Month	Account 16488-9 kWh	Account 16487 kWh	Account 32243-8 kWh	Account 16488-9 kW	Account 16487 kW	Account 32243-8 kW	2001 Lodi kWh	2001 Lodi kW
June	638,400	91,920	17,520	1,579	482	50	747,840	2,111
July	1,368,000	253,530	220,080	3,934	1,698	752	1,841,610	6,384
August	2,800,800	1,154,640	542,640	4,097	1,738	799	4,498,080	6,634
September	2,071,200	1,100,160	545,520	3,972	1,725	807	3,716,880	6,504
October	760,800	258,480	120,720	2,287	1,613	782	1,140,000	4,682
Total							**11,944,410**	**6,634**

Estimated Savings ("Bottom Up" Engineering Analysis)

"Bottom Up" Savings are based on comparing each section of the old Lodi facility to the new Woodland facility in terms of number of measures installed at each section (i.e., motors, motor efficiencies, motor drives, controls, and other measures). An overview of the "bottom up" analysis is described above. A detailed spreadsheet is being developed and will be provided at a later date.

Estimated Savings ("Top Down" Engineering Analysis)

In 2002, Pacific Coast Producers plans to process 41,200,00 cases of tomatoes at Woodland using 21 production lines. PCP Plant Engineer, Robin Dodson, has estimated that the Woodland facility will use 0.34075 kWh/case compared to 0.40737 kWh/case at Lodi in 2001.[4] This represents a 16.4 percent efficiency improvement that is also applied to peak demand based on the measures that are being installed (i.e., high efficiency VFD motors, helical gear drives, computer controls, and efficient lighting. Assuming the Woodland production efficiency for the 18 lines at Lodi provides the estimated 2002 usage of 5,549 kW and 9,991,048 kWh (see **Table 3**, column E and F). Estimated savings are 1,085 kW and 1,953,362 kWh (see **Table 3**, column G and H).

[3] Historical electricity use is based on actual 2001 billing data from City of Lodi Electric Utility, revised 5-20-02, Bill Schmer, Lodi Electric.

[4] Mr. Dodson's estimated energy intensity for Woodland of 0.34075 kWh/case is based on engineering estimates of the annual energy use of 14,039,036 kWh/yr for the as-built production equipment and product throughput of 41,200,000 cases/yr.

Table 3. Estimated kWh and kW Savings in 2002[5]

	A	B	C	D	E	F	G = E - A	H = F - B
Month	**Lodi kWh**	**Lodi kW**	**2001 Lodi Cases**	**2002 Woodland Cases**	**2002 Lodi Assuming Woodland Efficiency kWh**	**2002 Lodi Assuming Woodland Efficiency kW**	**2002 Savings kWh**	**2002 Savings kW**
June	747,840	2,111	1,835,756	0	0	0	1,835,756	2,111
July	1,841,610	6,384	4,520,682	8,931,822	2,165,977	5,340	-324,367	1,044
August	4,498,080	6,634	11,041,637	15,515,283	3,762,474	5,549	735,606	1,085
September	3,716,880	6,504	9,123,991	12,820,680	3,109,030	5,440	607,850	1,064
October	1,140,000	4,682	2,798,409	3,932,216	953,567	3,916	186,433	766
Total	**11,944,410**	**6,634**	**29,320,474**	**41,200,000**	**9,991,048**	**5,549**	**1,953,362**	**1,085**

"Top Down" Algorithms for Estimating Energy Savings for Paid Measure

Estimated savings are based on the overall electricity use per case (EUPC) of 0.34075 kWh/case at Woodland compared to 0.40737 kWh/case at Lodi in 2001. This represents a 16.4 percent efficiency improvement that is also applied to peak demand based on the measures that are being installed (i.e., high efficiency VFD motors, helical gear drives, computer controls, and efficient lighting). The EUPC of each facility is calculated as follows.

$$\text{EUPC}_{\text{Lodi}} = \frac{11{,}944{,}410\ \text{kWh}}{29{,}320{,}474\ \text{cases}} = 0.40737\ \text{kWh/case}$$

$$\text{EUPC}_{\text{Woodland}} = \frac{14{,}039{,}036\ \text{kWh}}{41{,}200{,}000\ \text{cases}} = 0.34075\ \text{kWh/case}$$

The ratio of these energy use indices provides the efficiency improvement of 16.4 percent.

$$\text{Efficiency Improvement} = 1 - \left[\frac{0.34075\ \text{kWh/case}}{0.40737\ \text{kWh/case}}\right] = 16.3537\ \text{percent}$$

The efficiency improvement of 16.4 percent at Woodland is applied to the historical billing data for Lodi in year 2001 to estimate the normalized kWh and kW savings as follows.

$$\text{kWh Savings} = 11{,}944{,}410\ \text{kWh/yr} \times 0.163537 = 1{,}953{,}362\ \text{kWh/yr}$$

$$\text{kW Savings} = 6{,}634\ \text{kW} \times 0.163537 = 1{,}085\ \text{kW}$$

[5] Estimated savings are based on actual 2001 billing and production data and estimated 2002 billing and production data for Woodland assuming 18 production lines (same as Lodi). Woodland is installing 21 production lines. The estimated production is 41.2 million cases of tomatoes at Woodland in 2002.

M&V Plan

The proposed M&V plan includes two options as per the International Performance Measurement & Verification (IPMVP) Protocols.[6]

1. "Bottom up" M&V Plan

The "bottom up" M&V plan will be based on IPMVP Option A. Savings will be determined by short-term or continuous field measurements of measure-specific energy use, separate from facility energy use. Partial measurement means that some parameters will be stipulated (i.e., hours of operation). Measurement and verification of the design and installation of the measures will ensure that stipulated values fairly represent probable actual values. Savings will be based on comparing the old Lodi facility to the new Woodland facility in terms of number of motors, motor efficiencies, motor drives, controls, and other measures installed at each section of both facilities.

2. "Top Down" M&V Plan

The "top down" M&V plan will be based on IPMVP Option C – Whole Facility analysis will be used to determine savings by measuring production and energy use at the whole facility level. Short-term or continuous measurements will be taken throughout the post-retrofit period and savings will be based on total production (i.e., cases of tomatoes) and total electricity use and peak demand for the 2002 harvest and canning season (i.e., months of July through September).

Savings Persistence

The expected lifetime for the new production facility is 20 years.

[6] See *International Performance Measurement & Verification Protocols*, DOE/GO-102000-1132, October 2000.

ATTACHMENTS

1. City of Lodi Electric Utility Department 2001 Historical Billing Data for PCP

CITY COUNCIL

ALAN S. NAKANISHI,
Mayor

PHILLIP A. PENNINO,
Mayor Pro Tempore

SUSAN HITCHCOCK

EMILY HOWARD

KEITH LAND

CITY OF LODI

ELECTRIC UTILITY DEPARTMENT

ALAN N. VALLOW, DIRECTOR

1331 S HAM LANE

LODI, CALIFORNIA 95242-3995

(209) 333-6762

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H. DIXON FLYNN,
City Manager

RANDALL A. HAYS
City Attorney

SUSAN J. BLACKSTON,
City Clerk

2001 Historical Billing Data for Pacific Coast Producers Lodi Tomato Processing Facility

Month	Account 16488-9 kWh	Account 16487 kWh	Account 32243-8 kWh	Account 16488-9 kW	Account 16487 kW	Account 32243-8 kW	2001 Lodi kWh	2001 Lodi kW
June	638,400	91,920	17,520	1,579	482	50	747,840	2,111
July	1,368,000	253,530	220,080	3,934	1,698	752	1,841,610	6,384
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October	760,800	258,480	120,720	2,287	1,613	782	1,140,000	4,682
Total							**11,944,410**	**6,634**

SB5X Agriculture Inspection Form

Project Name: Onsite Energy – Pacific Coast Producers (PCP)
Date: 5/10/02
Address: Pacific Coast Producers
City: 1376 Lemen Ave.
Zip: 95776
Contact: Woodland, CA
Inspected by: Ron Allen, Onsite Energy, Robert Mowris, Robert Mowris Ass.
Randy McCall, Nexant, Inc.

Equipment

Component	Status	Meter	Nameplate data and notes
Complete overhaul of existing, but shut - down tomato processing plant. High efficiency equipment, controls, VFDs, right sized motors, new more efficient motors, elimination of hydraulic drive systems, daylighting, and daylighting controls. See Pre-M&V Evaluation Report from Robert Mowris and Associates for details of specific measures.	■ completed ■ being installed ■ not installed	❑ yes ■ no	This project is a comprehensive retrofit of an existing tomato processing plant in Woodland that has been shut down for a number of years. Pacific Coast Producers is shutting down their facility in Lodi and refurbishing the Woodland facility for various reasons. Demand savings for this project are the result of more efficient electrical equipment, right sizing of equipment motors, reductions in hydraulically powered equipment, increased use of daylighting for the production floor along with daylight controls, and installation of VFDs for various process loads where appropriate. The Woodland plant will have a higher capacity for tomato processing, with a reported increase of approximately 62%. The case for demand savings at the newly refurbished Woodland plant is based on the energy use and demand required for production of a unit of product. Overall demand savings are calculated on the basis of the Lodi plant's historical production rate.

Meter data

Component(s) is metered separately ❑ yes ■ no **If yes, by:** ❑ utility ❑ participant ❑ other _____

Data available ■ yes ❑ no

Type of data ■ TOU ❑ 15min ❑ run time ■ other **Utility billing data from Lodi Electric (three accounts)**

Source of data ■ utility ❑ participant ❑ other _____

Contact for data: Rich Freitas, PCP Woodland Ph# 530-661-7611 Email address n/a

Notes:

A site inspection for the new PCP Woodland facility was conducted on May 10, 2002 along with Robert Mowris, PE of Robert Mowris & Associates, and Ron Allen, representative for Onsite Energy. The plant engineer, Robin Dodson accompanied the group through the plant for much of the inspection. The inspection included visual inspections of all affected parts of the plant, however much of the plant was still under construction, and spot measurements of new equipment was not possible.

The inspection was conducted in the order of the Pre-M&V Evaluation report prepared by Robert Mowris for PCP. At each portion of the process, the various components to be installed were discussed along with the current status of the construction. Various pictures of the facility and current status of the project are attached below.

Figure 1: Control room and computers for optimization of plant processes.

Figure 2: Worker installing Toshiba VFD for kitchen Section process motor.

Figure 3: Kitchen tank and new high Efficiency motor for mixers

Figure 4: Todd Boiler – VFD control for FD fan.

Figure 5: Palletizing section will have lighting controls/high efficiency motors.

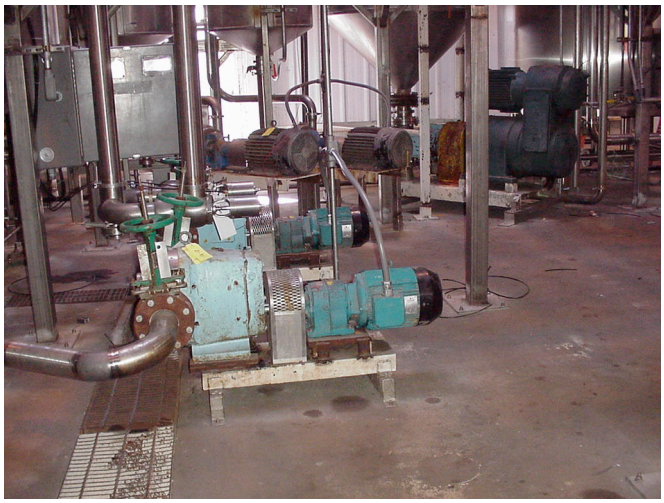


Figure 6: Kitchen pumps with VFD controls.

Figure 7: High-speed product close and fill section.

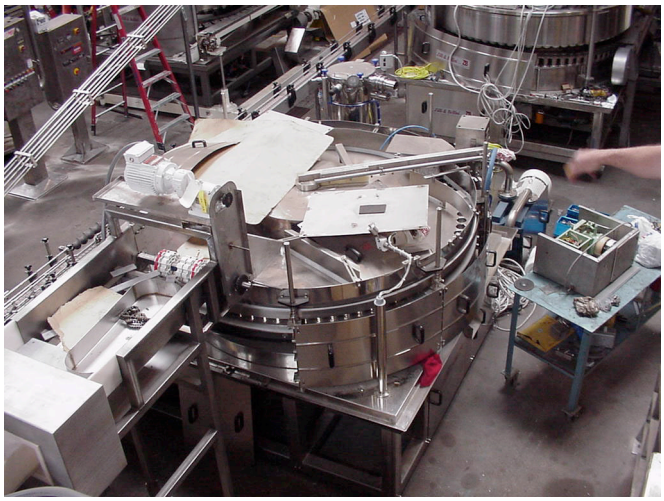


Figure 8: High speed canning machine.

Figure 9: Computer controls for kitchen section drives, motors, and tanks.

Figure 10: Can cooker – VFD controlled.

Figure 11: Can Cooler – VFD controlled.

Onsite Project: Bonita Packing Company

SB5X Agriculture Inspection Form

Project Name: Onsite Energy projects, APLRP — Date: 5/22/03
Address: Bonita Pak Foods
City: Santa Maria, CA — Zip: _____
Contact: Don Hladun
Inspected by: Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Powerit load controls	❑ completed installed ❑ being installed ■ not installed	■ yes ❑ no	Load control hardware and software to limit peak demands of facility through unloading or turning off selected equipment in response to predicted 5 minute average peak loads from monitoring of facility meters.
Cooling tunnel fan VFDs	❑ completed installed ❑ being installed ■ not installed	❑ yes ■ no	There are 16 separate cooling tunnel fans for cooling produce with air. Fresh vegetables are lined up on pallets in the cooling tunnel area, tented over the top with a fabric, after which cool air from the evaporators are drawn through the built up stack of produce. The proposed measure is to install VFDs on each of the 16 cooling tunnel fan motors to lower the air velocity as the cooling process is completed. Eight of the existing ducted fans has a 20 hp motor, and the second set are equipped with 25 hp motors, however none could be verified due to lack of operations during the morning inspection, and need to dismantle shrouds to examine the nameplate data for the motors.

Meter data

Component(s) is metered separately ❑ yes ■ no **If yes, by:** ❑ utility ❑ participant ❑ other _____

Data available ■ yes ❑ no

Type of data ❑ TOU ■ 15min ❑ run time ❑ other **__15minute interval data from utility meters**

Source of data ■ utility ❑ participant ❑ other _

Contact for data __Don Hladun, Onsite Energy__ Ph# 925 - 358 - 4270_ **Email address dgHladun@aol.com**

Spot meter readings taken ❑ yes ■ no

Component #1 readings _____ _____ _____ Notes__ Potentially controllable loads were verified during inspection for nameplate information. Load data will be gathered from post-installation Powerit reports.

Component #2 readings _____ _____ _____ Notes_ Cooling tunnels could not be dismantled for visual verification, and all tunnels were idle during inspection.

Component #3 readings _____ _____ _____ Notes_____

Randy McCall, of Nexant, Inc., conducted a post-installation site inspection at Bonita Pak Foods in Santa Maria, CA on May 22, 2003 in order to verify the baseline conditions for installation of the Powerit load control equipment at the facility. In attendance for the inspection were Mr. McCall, Don Hladun from Onsite energy, Mathias Christelius from Powerit, and facility engineering staff from Del Mar Foods.

A stand along PC will be set up in the engineering office to control the Powerit software system. The software program is provided with pulse signals from the facility utility meter that are used to predict an average five-minute demand for the facility. If the predicted interval is likely to exceed the user-defined threshold for control action, the software sends signals to controllable loads to either turn off select motors, run at part loads. The equipment to be controlled was previously identified during the pre-installation phase by Mathias Christelius, Powerit's field engineer for implementation, and includes loads that will not adversely affect the production at the food processing plant. Once the Powerit software decides it needs to take action to control a five minute average window for loads, it will send signals to individual pieces of equipment that have been equipped with communications gear and actuators that allow for the remote control. Equipment is listed by priority in the software, on a custom basis for each facility and customer.

At Bonita Packing, Inc., Onsite Energy and Powerit are expecting to control approximately 150 to 200 kW of peak load out of a total estimated 989 kW of potential load from the controllable equipment in the cold storage side of the facility. Similarly, approximately 200 kW of load control savings are expected from the 1234 kW of controllable loads on the processing side of the plant. Photographs of the facility are shown below.

Figure 1: Typical pressure cooling tunnel proposed for VFDs

Figure 2: Engine room and ammonia compressors

Figure 3: Evaporative towers at Bonita Pack.

Figure 4: Pressure Cooling Tunnels.

SB5X Agriculture Inspection Form

Project Name: Onsite Energy projects, APLRP — Date: 3/3/04
Address: Bonita Pak Foods
City: Santa Maria, CA — Zip: _____
Contact: Don Hladun
Inspected by: Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Powerit load controls	■ completed installed ❑ being installed ❑ not installed	■ yes ❑ no	Load control hardware and software to limit peak demands of facility through unloading or turning off selected equipment in response to predicted 5 minute average peak loads from monitoring of facility meters. Loads under control include refrigeration compressors, ice making equipment, VSD controlled pressure cooling tunnels, vacuum tube cooler
Bi-level and Tri-level HID lighting Controls	■ completed installed ❑ being installed ❑ not installed	❑ yes ■ no	Occupancy lighting controls have been installed for HID lighting throughout the cold storage areas and the loading dock. Baseline equipment consisted of a combination of 400W and 350W Metal Halide fixtures; a total of 152 fixtures were either replaced (48 350W MH fixtures were retrofit, 104 400W MH fixtures were replaced with 320W Pulse Start MH), or equipped with capacitors and bi- or tri- level lighting controls. In addition to the lighting controls savings, the new fixtures have been changed to use 320W pulse start lamps that are more compatible with the lighting controls, and provide efficiency savings .

Meter data

Component(s) is metered separately ❑ yes ■ no **If yes, by:** ❑ utility ❑ participant ❑ other _____

Data available ■ yes ❑ no

Type of data ❑ TOU ❑ 15min ❑ run time ■ other **__30minute interval data from utility meters, Powerit reports of control actions.**

Source of data ■ utility ❑ participant ❑ other _

Contact for data __Don Hladun, Onsite Energy__ Ph# 925 - 358 - 4270_ **Email address dgHladun@aol.com**

Spot meter readings taken ❑ yes ■ no

Component #1 readings _____ _____ _____ Notes__ Powerit load control equipment was verified during inspection. Load savings will be determined from Powerit load control reports, and historical utility billing data.

Component #2 readings _____ _____ _____ Notes_ HID lighting controls were verified as complete. Circuit monitoring data will be basis for demand savings from controls; lighting efficiency demand savings approved for 400W to 320W fixture replacement.
Component #3 readings _____ _____ _____ Notes_____

Randy McCall, of Nexant, Inc., conducted a post-installation site inspection at Bonita Packing Company in Santa Maria, CA on March 3, 2004. The inspector verified the installation of the Powerit load control equipment at the facility, and bi- or tri-level HID lighting controls. In attendance for the inspection were Mr. McCall, Don Hladun from Onsite Energy Corporation, and facility engineering staff from Bonita Packing Company.

A stand along PC has been set up in the engineering office to control the Powerit software system. The software program is provided with pulse signals from the facility utility meter that are used to predict an average five-minute demand for the facility. If the predicted interval load is likely to exceed the user-defined threshold for control action, the software sends signals to either turn off select motors, or run equipment at part loads. The equipment to be controlled was previously identified during the pre-installation phase by Mathias Christelius, Powerit's field engineer for implementation, and includes loads that should not adversely affect the production at the produce processing facility. Once the Powerit software decides it needs to take action, it will send signals to individual pieces of equipment that have been equipped with communications gear and actuators that allow for the automated remote control. Equipment is listed by priority in the software, on a custom basis for each facility and customer.

During the inspection, various relay boxes to control the refrigeration and motor loads were noted as installed and functioning. The facility was operating at a very low level of activity during the inspection, therefore, no control actions were observed outside of facility staff driven tests of system response that were demonstrated for the inspector on the Powerit graphical user interface.

The lighting controls were also observed to be complete, with new fixture installations in the loading dock area, and retrofits of the existing fixtures throughout the remaining cold storage areas. No details were provided on the locations of bi-level vs. tri-level lighting controls (bi-level refers to half power and full power, tri- level refers to off, half power, and full power to an individual fixture). Two types of fixture retrofits were completed for the project. In the loading dock area, all 48 of the existing 350W fixtures were equipped with only the lighting controls. Throughout the cool storage and pressure tunnel areas, the 104 existing 400 W MH fixtures were replaced with 320 W Pulse Start Metal Halide fixtures equipped with lighting controls.

Photographs of the lighting fixtures, and Powerit controls equipment are attached below:

Figure 1: Loading dock area with new 350W pulse start Metal Halide fixtures and bi-level controls.

Figure 2: Powerit load control box located in trailer next to vacuum tube cooler (voluntary permissive control).

Figure 3: Powerit Controls for icemaking Equipment.

Onsite Project: P&O Cold Storage

Nexant

POST INSTALLATION INSPECTION

101 Second Street, 11th Floor. • San Francisco, CA 94105-3672

To: Randy McCall
From: Joseph Lee Ong
Date: April 9, 2004
Re: 2004 CEC Peak Load Demand Reduction Program: P&O Cold Logistics

The purpose of the inspection conducted April 8, 2004 at the P&O Cold Logistics facilities in Anaheim and Brea was to verify the operational conditions and equipment status of the newly installed *Powerit Solutions*™ Energy Director processor/controller used to supervise site power demand levels and execute load reduction actions during peak utility intervals to ensure peaks are managed within user defined limits.

Present during the inspection process were:

Ron Allen	Onsite Energy
Mattias Christelius	Powerit Solutions
Joseph Lee Ong	Nexant, Inc.

During the inspection, the inspector was shown the Energy Director unit at each site, as well as the PLC panel which controls the refrigeration compressors and evaporators. In addition, banks of battery chargers were hooked up to the system as well. The current kWh set points at Anaheim and Brea at the time were 580 kWh per 30 minutes and 120 kWh per 15 minutes intervals, respectively. However, the final set point for both sites are still being fine tuned since those points are apparently still too high and further reduction is possible without disruption of plant operation. Each control point can be remotely monitored in real-time, on site through a laptop or a PC hooked up to the internal network, or directly interfaced with the Energy Director in the panel. Test action was initiated at both sites and the resulting drop in demand can be clearly observed (see Figure 5 below) as the system compensates for the drop in kWh set point and a number of control points were turned off until the calculated average kW in that 30 or 15 minute interval drops below the defined limit.

Pictures

Figure 1 - Field bus unit (Energy Director and relay switches) at Anaheim.

Figure 2 - PLC which controls various refrigeration components at Anaheim.

Figure 3 - Battery charger relays (top) and PLC panel at Anaheim.

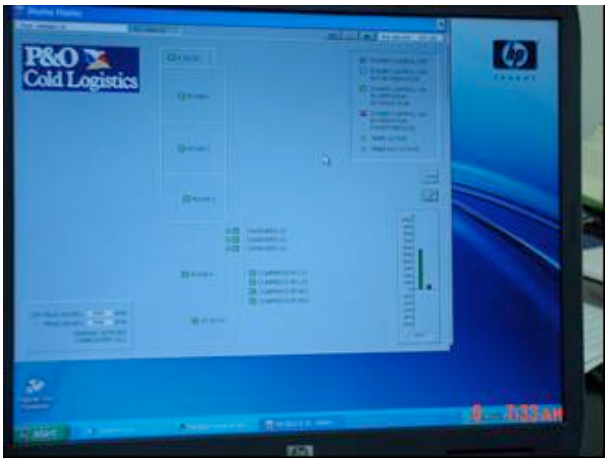


Figure 4 - Screen shot of the control points and the demand control status of each at Anaheim.

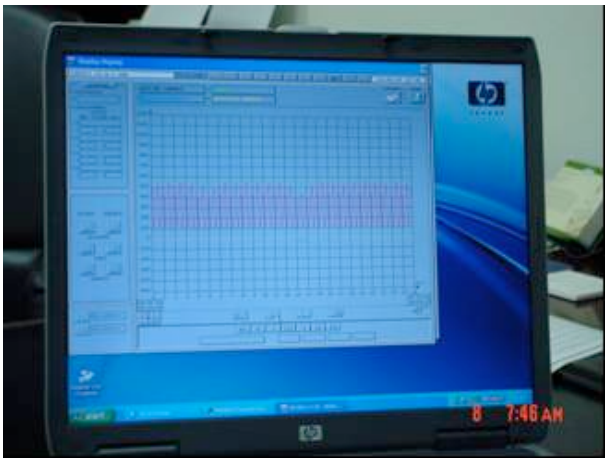


Figure 5 - 24-hour snapshot of the kW demand profile and set point at the Anaheim site.

Figure 6 - Field bus unit controlling the high and low stages of each compressors at Brea.

Figure 7 - Brea site relays and communication port for the evaporator air units at 4 zones.

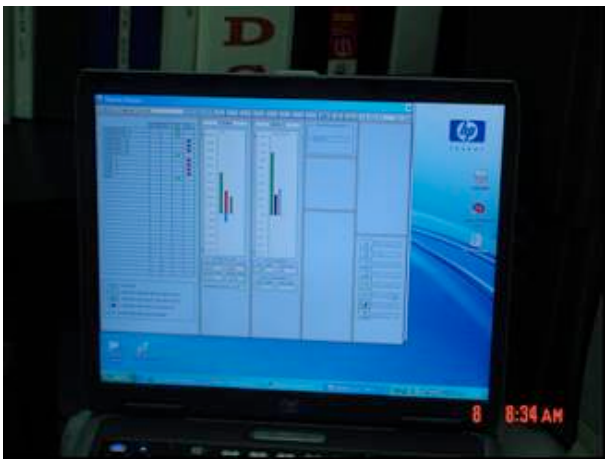


Figure 8 - Screen shot of the status screen for the entire P&O facility at Brea.

Nexant

POST INSTALLATION INSPECTION

101 Second Street, 11th Floor. • San Francisco, CA 94105-3672

To: Randy McCall
From: Joseph Lee Ong
Date: May 19, 2004
Re: 2004 CEC Peak Load Demand Reduction Program: P&O Cold Logistics - La Habra

The purpose of the inspection conducted May 19, 2004 at the P&O Cold Logistics in La Habra was to verify the operational conditions and equipment status of the newly installed *Powerit Solutions*™ Energy Director processor/controller used to supervise site power demand levels and execute load reduction actions during peak utility intervals to ensure peaks are managed within user defined limits.

Present during the inspection process were:

Ron Allen	Onsite Energy
Joseph Lee Ong	Nexant, Inc.

During the inspection, the inspector was shown the Energy Director unit as well as the relay panel from which all the controlled equipments are hardwired into. There were a total of 10 control points for this site which includes three (3) boosters, two (2) air compressors, three (3) freezer zones, cooler and the front dock. Each control point can be remotely monitored in real-time, on site through a laptop or a PC hooked up to the internal network, or directly interfaced with the Energy Director in the panel. All points were active at the time of the inspection.

The current set point was 65 kWh per 15 minute interval. No test actions to determine the system response to changes in the setpoint have been initiated to date.

Pictures

Figure 9 - Refrigeration compressor (engine) room.

Figure 10 - Powerrit Energy Director and communication ports.

Figure 11 - Relay box where all equipment controlled zre hardwired into.

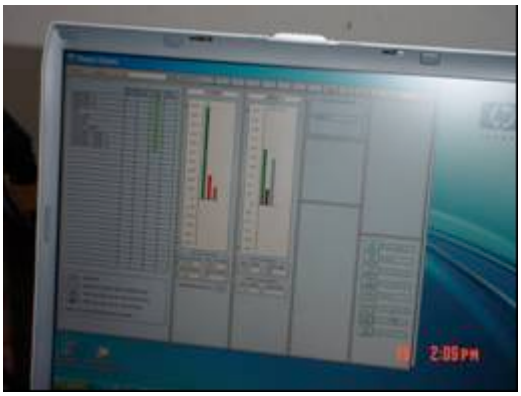


Figure 12 - Screen shot of the active control points and the current set point.

Nexant

POST INSTALLATION INSPECTION

101 Second Street, 11th Floor • San Francisco, CA

Onsite Energy – P & O Cold Logistics

Date: 5-20-04
To: Shawn Espinoza
From: Ken Gonzales
Re: Post Installation Inspection of Vernon Facilities

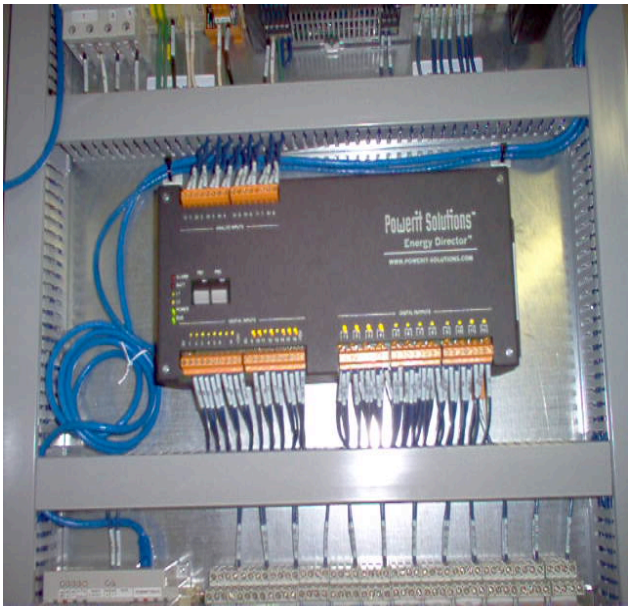
The purpose of the inspections conducted on May 19, 2004 was to verify the installation of the PowerIt Energy Director load management systems at two of P & O Cold Logistics Southern California sites. The P & O Cold Logistics sites were both within in the City of Vernon. The addresses for the two facilities were 2851 44th St. (Plant #1) and 3420 East Vernon (Plant #2).

2851 44th St.: Present for the inspection was Ron Allen of Onsite Energy, Elizabeth Lowe of Onsite Energy, Robert Bogataj of PowerIt Solutions, Bob Johnson of P & O Cold Logistics and Ken Gonzales of Nexant. The load management system has been installed and the computer interface is active. Mr. Bogataj gave a quick presentation of how the system is designed and showed that it is operating. Mr. Bogataj stated that the load management system has been operating for approximately two weeks. Based on the dates shown on the 'history' screen of the system, the system has been operating at for at least two weeks.

3420 East Vernon St.: Present for the inspection was Ron Allen of Onsite Energy, Elizabeth Lowe of Onsite Energy, Robert Bogataj of PowerIt Solutions, Bob Johnson of P & O Cold Logistics and Ken Gonzales of Nexant. The load management system has been installed and the computer interface is active. Mr. Bogataj gave a quick presentation of how the system is designed and showed that it is operating. Mr. Bogataj stated that the load management system has been operating for approximately three (3) days.

Please refer to the attached photos for supporting evidence of the installation.

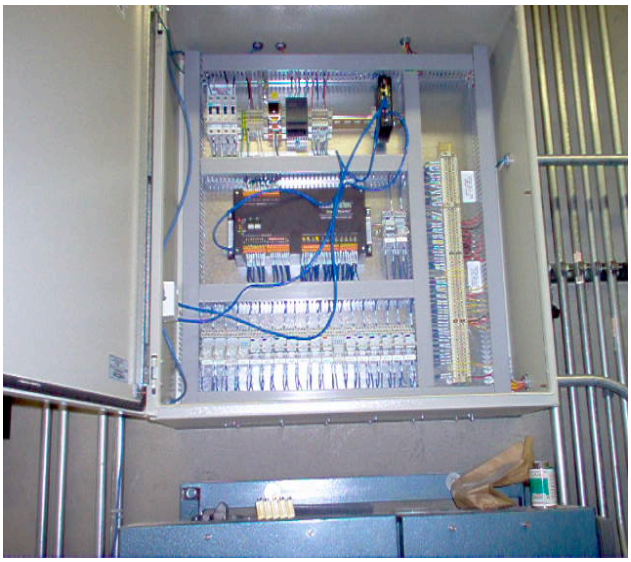
Based on the results of the inspection, the project passed the post installation inspection.



2851 44th St. (West Bldg.)

2851 44th St. (West Bldg.)

2851 44th St. (East Bldg.)



3420 East Vernon

Nexant

POST-INSTALLATION INSPECTION

101 Second Street, 11th Floor • San Francisco, CA

Southern California Edison NSPC 2004

Onsite Energy – P & O Cold Logistics

Date: 4-8-04
To: Shawn Espinoza
From: Ken Gonzales
Re: Post Installation Inspection of Dominguez Hills and Carson sites

The purpose of the inspection conducted on April 8, 2004 was to verify the installation of the Poweritt Energy Director load management systems at two of P & O Cold Logistics Southern California sites. The P & O Cold Logistics sites that were visited for these inspections were: 19840 Rancho Way, Compton (Dominguez Hills) and 1610 E. Sepulveda Blvd., Carson.

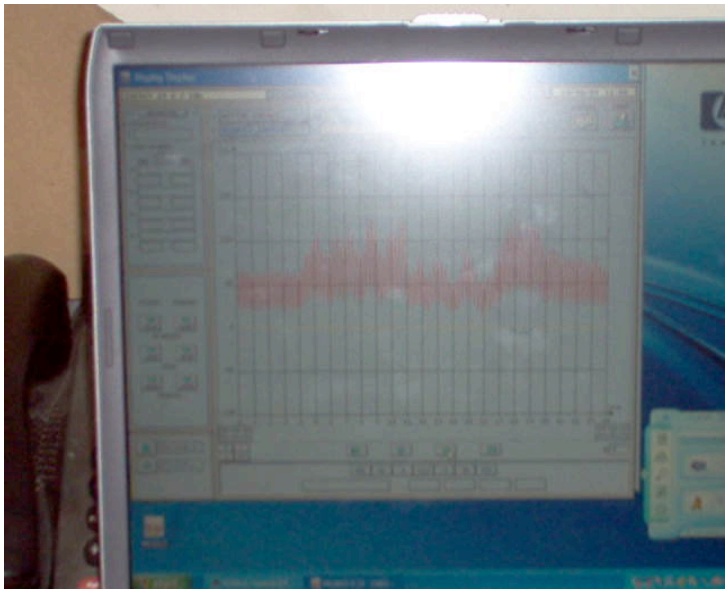
19840 Rancho Way: Present for the inspection was Ron Allen of Onsite Energy, Mattias Christelius of Powerit Solutions and Ken Gonzales of Nexant. The load management system has been installed and the computer interface is active. Mr. Christelius gave a quick presentation of how the system is designed and showed that it is operating. Mr. Christelius had two computers operating at the time of inspection. One computer was designated for the Dominguez Hills site, while the other was designated for the Carson site. Mr. Christelius was able to control/make changes for the Carson site from this computer.

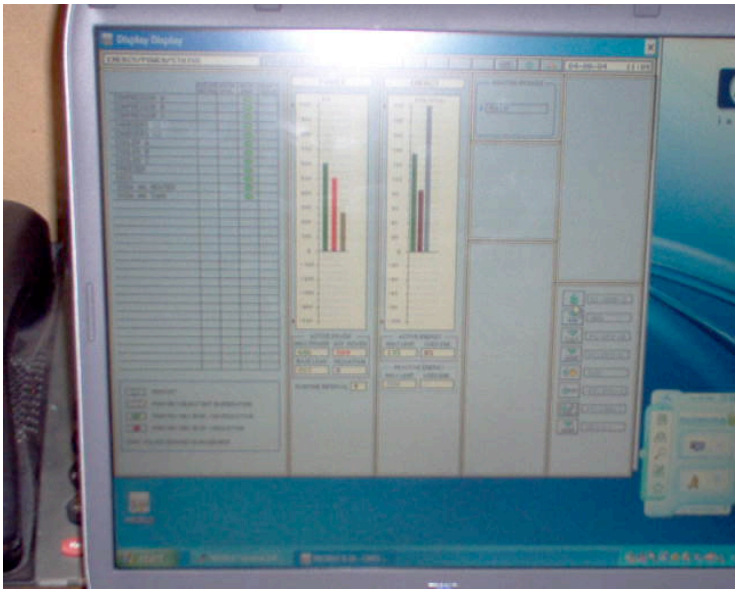
1610 E. Sepulveda Blvd.: Present for the inspection was Ron Allen of Onsite Energy and Ken Gonzales of Nexant. The load management system has been installed and the computer interface is active.

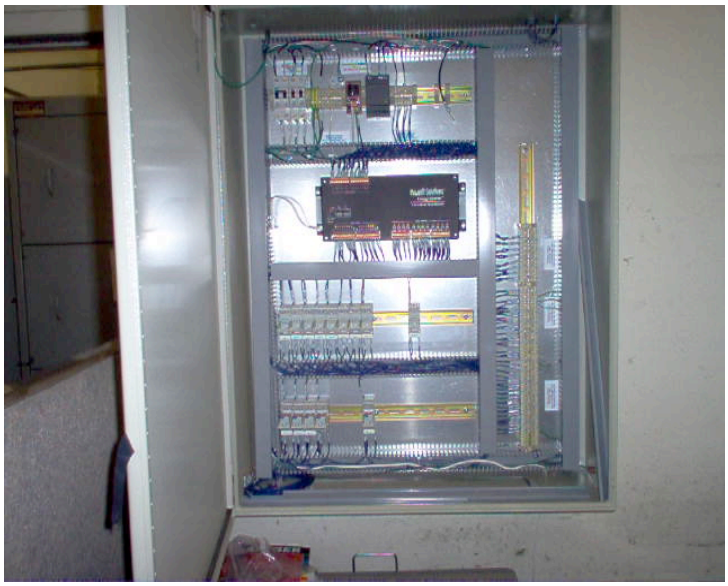
Please refer to the attached photos for supporting evidence of the installation.

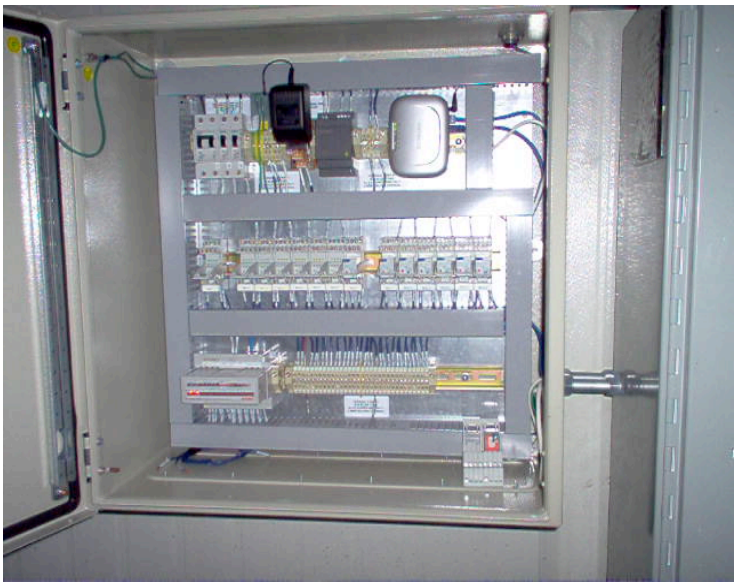
Based on the results of the inspection, the project passed the post installation inspection.

Dominguez Hills Facility

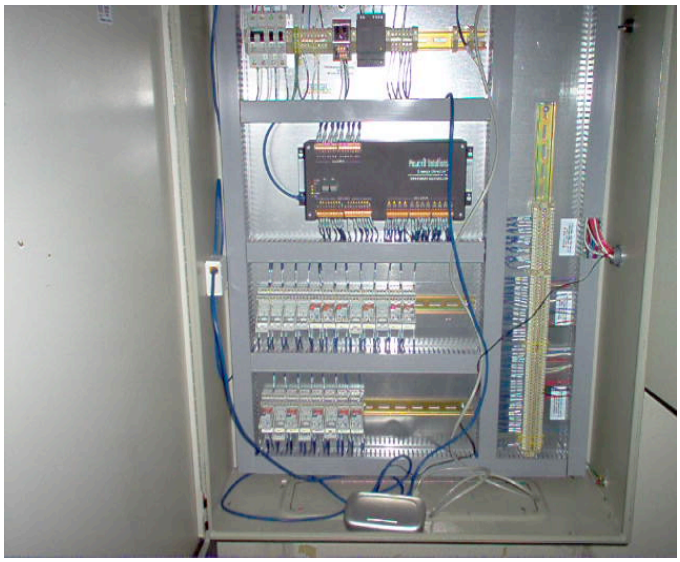


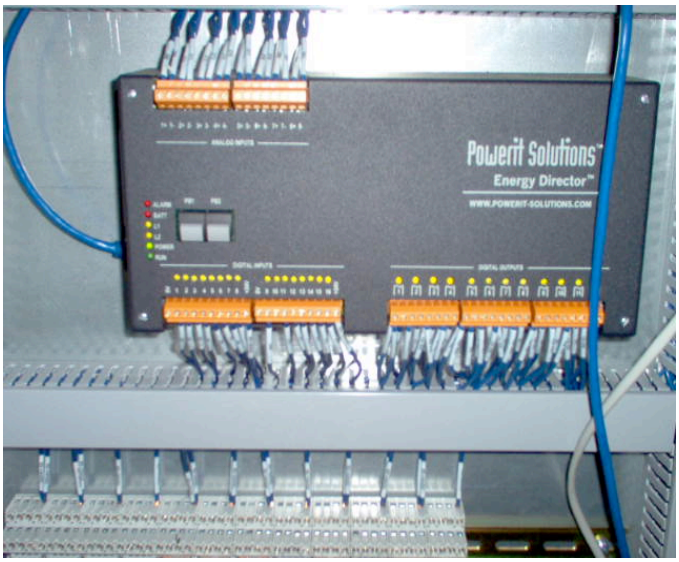


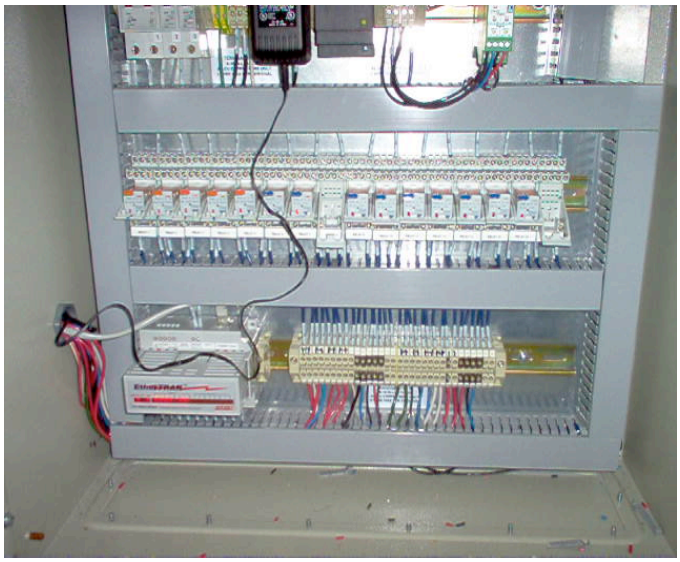




Carson Facility







Onsite Project: Del Monte, Hanford

Nexant

POST INSTALLATION INSPECTION

101 Second Street, 11th Floor. • San Francisco, CA 94105-3672

To: Randy McCall
From: Joseph Lee Ong
Date: April 28, 2004
Re: 2004 CEC Peak Load Demand Reduction Program: P&O Cold Logistics & Frito-Lay - Rancho Cucamonga

The purpose of the inspection conducted April 28, 2004 at the P&O Cold Logistics facilities (Buildings 14840 and 14890 Procter) in City of Industry and Frito-Lay in Rancho Cucamonga was to verify the operational conditions and equipment status of the newly installed *Powerit Solutions*™ Energy Director processor/controller used to supervise site power demand levels and execute load reduction actions during peak utility intervals to ensure peaks are managed within user defined limits.

Present during the inspection process were:

Ron Allen	Onsite Energy
Mattias Christelius	Powerit Solutions
Joseph Lee Ong	Nexant, Inc.

P&O Cold Logistics - Industry

During the inspection, the inspector was shown the Energy Director unit at each site, as well as the PLC panel which controls the refrigeration compressors and evaporative coolers at the P&O Industry sites. There are four (4) compressors, 1 dock and 1 room with 4 zones controlled at the 14890 Proctor, while there are nine (9) compressors, four (4) freezers, and three (3) cooler rooms controlled at 14840 Proctor. In addition, four (4) groups of battery chargers consisting of about 30 to 40 stations were hooked up to the system at the P&O 14840 Proctor as well. Each control point can be remotely monitored in real-time, on site through a laptop or a PC hooked up to the internal network, or directly interfaced with the Energy Director in the panel.

The kWh set points at the P&O sites have not yet been set at the time of the inspection and the systems were still undergoing testing and tune ups. The peak demand at the 14890 and 14840 Proctor for the past 24 hours have been 75 kWh and 200 kWh per 15 minute interval, respectively. No test actions have been initiated at both sites to date.

Frito Lay - Rancho Cucamonga

The inspector was shown the Energy Director unit, remote I/O panels, and the motor control centers that control various rooftop units and evaporative coolers at Frito-Lay. Demand setpoint is currently set at 475 kWh per 15 minute interval. There are a total of about 13 roof top package units and 24 evaporative coolers that are being controlled in the facility.

P&O Pictures

Figure 13 - Field bus unit (Energy Director and relay switches) at P&O Cold Logistics - 14890 Proctor.

Figure 14 - Screen shot of kW demand profile at P&O - 14890 Proctor.

Figure 15 - Screen shot of the control points and the demand control status of each at 14890 Proctor.

Figure 16 - Remote I/O unit and relays at 14840 Proctor.

Figure 17 - Ethernet hub, wireless link, remote I/O unit and relays at 14840 Proctor compressor room.

Figure 18 - Compressor room at 14840 Proctor.

Figure 19 - New high frequency battery chargers at 14840 Proctor.

Figure 20 - Old battery charging stations at 14840 Proctor.

Figure 21 - Field bus unit (Energy Director and relay switches) at P&O Cold Logistics - 14840 Proctor.

Figure 22 - Screen shot of kW demand profile at P&O - 14840 Proctor.

Figure 23 - Screen shot of the control points and the demand control status of each at 14840 Proctor.

Frito Lay Pictures

Figure 24 - Field bus unit (Energy Director and relay switches) at Frito lay

Figure 25 - Motor control center at Frito Lay.

Figure 26 - Screen shot of kW demand profile and kWh set point at Frito Lay.

Figure 27 - Screen shot of the control points and the demand control status of each at Frito Lay.

Nexant

POST-INSTALLATION INSPECTION

101 Second Street, 11th Floor • San Francisco, CA

Onsite Energy – P&O Cold Logistics, Modesto and Salinas

Date: June 1, 2004
To: Onsite Energy Corporation
From: Randy McCall
Re: Post Installation Inspection of P&O Cold Logistics Powerit Installations at Modesto and Salinas facilities

The purpose of the inspections conducted on May 24 and May 27, 2004 was to verify the installation of the Powerit Energy Director load management systems at the three Dreisbach facilities located in Richmond, Oakland, and Watsonville. Present for the inspections were Don Hladun from Onsite Energy Corporation. At all three facilities, the computer interfaces were installed on a local computer, and were active. At each facility the computer interface was accessed to demonstrate its functionality, and relay and control equipment were verified as installed.

P&O Cold Logistics - Salinas: The load management system has been installed and the computer interface is active. The load control objects shown on the computer interface include compressor controls for Fuller #1, Fuller #2, FES Low, FES High, York 1 and York 2, evaporator fans for cold rooms 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and Rooms F, 1, and 2. In addition, the Freon refrigeration systems #1 and 2 are also control load objects on the Powerit interface. At this time all but the FES High stage, York 1 and York 2 are active control points.

The Energy Director had been adjusted to a maximum load of 2000kW for Active Power during off peak hours, and 1350 kW during on peak hours. There are two utility meters that are interfaced with the Powerit equipment, both of which provide a signal in 30-minute windows.

A recorded set of kWh data from May 24 shows that the energy use per 30-minute window. No load control actions were evident as the overall kWh per 30-minute interval was significantly below the initial set point for load control action. Note that the facility was undergoing some maintenance activities in the yard and very low activity was observed at the facility during the inspection.

P&O Cold Logistics - Modesto The load management system was installed and the computer interface is active, however, training for the staff at the facility had not been completed, and Bob Zack from Powerit was configuring the system during the inspection. Load control set points at this time were 3600kW; Mr. Zack anticipated that the limit would drop as the more experience was gained for the system operations. The control system for P&O Cold Logistics, Modesto, is set up to control a number of control points spread out over a large area with seven separate warehouses. The facility has been converted to its current configuration from a previous plant that also supplied ice to another co-located facility. That facility was physically removed, consequently, there is a significantly oversized chilling

plant for the existing warehouse operations. The facility was originally built in the 1940's, and much of the equipment still in place dates from the early part of the facility operations.

The load points shown on the computer interface are not present in this report as the digital photographs of the facility and interface screens have been corrupted. There are seven separate rooms at the facility, some of which are controlled by the Powerit Energy Director through a combination of engine room compressor controls and evaporator fan controls; other areas are reportedly controlled only through evaporator fan controls as the facility staff are not sure that compressors can be brought back on line if the Powerit system puts them offline. Engine Room A has a Powerit Energy Director 4100 installed that controls engine rooms for 4 other rooms. The Evaporator fan controls were active during the inspection, however compressor loads controls were not turned on.

The Energy Director had been adjusted to a maximum load of 3600 kW for Active Power currently, however Mr. Zack indicated that the limits would be lowered as the facility became familiar with the limitations of the system and how it interacts with the different engine rooms.

The site inspection passed for both the Modesto and Salinas P&O Cold Logistics facilities. The digital photographs for Modesto and Salinas were corrupted and cannot be furnished in this report.

Onsite Project: Cool Pacific

SB5X Agriculture Inspection Form

Project Name: Onsite Energy projects, APLRP — Date: 7/24/03

Address: Cool Pacific Packing

City: 1160 Terven

Contact: Salinas, CA — Zip: 93901

Inspected by: Don Hladun

Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Powerit load controls	■ completed installed ❑ being installed ❑ not installed	■ yes ❑ no	Load control hardware and software to limit peak demands of facility through unloading or turning off selected equipment in response to predicted 5 minute average peak loads from monitoring of facility meters.

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ■ utility ■ participant ❑ other _____

Data available ■ yes ❑ no

Type of data ❑ TOU ❑ 15min ❑ run time ■ other **__5minute interval data for facility peak loads and control actions_____**

Source of data ❑ utility ❑ participant ■ other **_Andover software reports of load control actions**

Contact for data __Don Hladun, Onsite Energy__ Ph# 925 - 358 - 4270_ **Email address dgHladun@aol.com**

Spot meter readings taken ❑ yes ■ no

Component #1 readings _____ _____ _____ **Notes__Equipment control actions observed on graphical user interface for dedicated PC.**

Component #2 readings _____ _____ _____ **Notes**_____

Component #3 readings _____ _____ _____ **Notes**_____

Randy McCall, of Nexant, Inc., conducted a pre-installation site inspection at Cool Pacific Foods in Salinas, CA on July 24, 2003 in order to verify the baseline conditions for installation of an Andover EMS system that will provide load controls for flexible loads at the fruit and produce packing facility. In attendance for the inspection were Mr. McCall, Don Hladun from Onsite energy, and Chris Stubblefield from Cool Pacific.

None of the controls equipment had been installed prior to the inspection, and the purpose of the inspection was to verify nameplate information and loads likely to be included in the list of control points. Total load of the facility is reported to be approximately 1400 kW, with a peak billing of 1460 kW during summer peak period. Onsite Energy Corporation has indicated they are applying for approximately 300kW of load reduction through the project installations. No measurements of existing equipment were recorded during the inspection, as the Andover EMS system will be capable of providing reports on total load and controlled load once installation is complete.

While the final list of controllable loads has not yet been determined, the preliminary list of loads proposed for the Andover control system include evaporators and fans for seven cold storage rooms and the refrigeration compressors that serve them, a 200 ton capacity ice-making system and the associated 700 hp of reciprocating ammonia compressors, 11 battery chargers in a charging room, pressure cooling tunnels and their evaporator fans and coils, and a vacuum tube cooler. All load controls discussed with Chris Stubblefield and Don Hladun involve reductions in refrigeration system compressor use through relaxation of temperature controls for cold rooms, unloading of ice-making during peak periods, or shutting down of evaporators and evaporator fans for the cold rooms. While reductions in fan motors for evaporators will result in small savings, the majority of the savings for the project will result from unloading of ammonia system compressors, condensers, and associated pumps.

Figure 1: Trailer mounted engine room with 4 Mycom 150 Hp recips and one Vilters 100hp compressor.

Figure 2: Second trailer with Mycom and Vilters refrigeration compressors. Note cooling tower on rear of trailers.

SB5X Agriculture Inspection Form

Project Name: Onsite Energy projects, APLRP
Date: 1/13/04
Address: Cool Pacific Packing
City: 1160 Terven
Zip: 93901
Contact: Salinas, CA
Inspected by: Don Hladun, Onsite Energy
Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Andover; Infinity CMX240 EMS system for load controls	■ completed ❑ being installed ❑ not installed	■ yes ❑ no	Load control hardware and software to limit peak demands of facility through unloading or turning off selected equipment in response to predicted 3-minute average peak loads from monitoring of facility utility meters.

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ■ utility ■ participant ❑ other **Andover system uses utility meter data to predict peak kW for the facility.**

Data available ■ yes ❑ no

Type of data ❑ TOU ❑ 15min ❑ run time ■ other **__1 minute interval data for facility peak loads and control actions_____**

Source of data ■ utility ❑ participant ■ other **_Andover software reports of load control actions in response to Utility meter monitoring; Andover reports of peak demands on 3-minute and 15-minute average intervals.**

Contact for data __Don Hladun, Onsite Energy__ Ph# 925 - 358 - 4270_ **Email address dgHladun@aol.com**

Spot meter readings taken ❑ yes ■ no

Component #1 readings _____ _____ _____ **Notes__Andover EMS system equipment control actions observed on graphical user interface for dedicated PC. Current operations are too low to show control of peak loads.**

Component #2 readings _____ _____ _____ **Notes**_____

Component #3 readings _____ _____ _____ **Notes**_____

Randy McCall, of Nexant, Inc., conducted a post-installation site inspection at Cool Pacific Foods in Salinas, CA on January 13, 2004. In attendance for the inspection in addition to Mr. McCall, was Don Hladun from Onsite Energy Corporation, and Chris Stubblefield from Cool Pacific. The purpose for the inspection was to verify installation of the Andover load management system for the Cool Pacific facility.

The Infinity, CMX240 control module, manufactured by Andover Controls, was installed and functioning in the engineering office of the Cool Pacific facility. A software program, including a graphical user interface, has been installed on a PC that allows the facility personnel to assess the plant load conditions, change set points and control strategies, and record the facility load data for equipment throughout the plant.

The inspector was shown a page of control points for the system, the equipment set points and current conditions at the time of the inspection, as well as a report on kW demand for the plant on a 3-minute and 15-minute interval compared with the target demand. A copy of the overview screen is attached at the end of this report (a hard copy screen print was scanned for this report; data on the hard copy report is legible and consistent with expected results).

Equipment that is indicated on the overview screen includes the following:

Ice Machine: Screw Compressor 1, Screw Compressor 2, Condenser Fan 1 and Condenser Fan 2, Auger 1 & 2, Auger 3 and Auger 4; The Andover system is designed to unload the two 350 hp screw compressors for approximately 300kW in potential load control for the ice making system at Cool Pacific. The two screw compressors are currently dedicated to the ice making system, with the other compressor systems (listed below) providing liquid ammonia to the cold rooms and other process loads.

Cold Rooms: Trailer mounted Compressors R1-C1, R1-C2, R2-C1, R2-C2, R2-C3, and Compressor 1 and Compressor 2 (DX units); Evap fans for R-1 through R5, Evap fans for Zone 1 and Zone 2 in Room 6, and Evap fans for Room 7; Condenser fans R1-1, R1-2, R1-3, R2-1, R2-2, R2-3; Ammonia pump 1, Ammonia pump 2: Seven cold rooms are controlled by the Andover system. When called for, the temperature set points are raised, shutting down the evaporators and fans for approximately 100kW of potential load control action. Included in the calculation for cold rooms is the installation of VFDs for pressure cooling tunnels. The demand savings for the VFD's will be recognized under the PG&E Standard Performance Program, and will be subtracted from incentives paid under the CEC APLRP.

Hydrocooler: Controls for the two hydrocoolers are projected to provide approximately 50kW of potential load control. Compressors for the hydrocooler are described above.

Vacuum Tube: Vacuum pump 1 and Vacuum pump 2; Scheduling of the vacuum tube cooler is projected to provide up to 500kW of potential load control, although once the system is started, no control actions are anticipated until completion of a cycle.

Satellite Freon based refrigeration system: A small DX refrigeration system will be unloaded through temperature setpoint increases to provide a small potential when required. This system serves Cold Room 6 described above.

Battery Chargers: The controls are not implemented at this time to control battery-charging operations, but are planned for a future expansion of the Andover system.

An evaluation of the potentially controllable loads now connected to and controlled by the Andover system shows that there are in excess of 1MW of load that could potentially be controlled. The goal set by Cool Pacific for load control during the summer peak period is currently approximately 300kW. Cool Pacific does not anticipate an aggressive program that cuts into production at the plant, but feels that the 300 kW is achievable in comparison to previous peak period billing periods through use of the Andover system.

Nexant was unable to verify any recent load control actions at the plant as the overall plant activity level is low compared to the summer agricultural season. A photograph of the computer report for the previous day's (January 12, 2004) ice making is attached below. Note that the 1-minute interval average peak demand during the time period was approximately 650kW, below the target for the plant for load control actions.

Figure 1: Photograph of the facility demand on January 12, 2004 as reported by the Andover EMS system.

Onsite Project: Del Mar Foods

SB5X Agriculture Inspection Form

Project Name: Onsite Energy projects, APLRP
Date: 7/1/03
Address: Del Mar Foods
City: 1720 Beach Road
Zip: 95076
Contact: Watsonville, CA
Inspected by: Don Hladun
Randy McCall

Equipment

Component	Status	Meter	Nameplate data and notes
Powerit load controls	■ completed ❑ being installed ❑ not installed	■ yes ❑ no	Energy Director 3100; Load control hardware and software to limit peak demands of facility through unloading or turning off selected equipment in response to predicted 5 minute average peak loads derived through monitoring of facility electric meters.

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ■ utility ■ participant ❑ other _____

Data available ■ yes ❑ no

Type of data ❑ TOU ❑ 15min ❑ run time ■ other **__5minute interval data for facility peak loads and control actions**_____

Source of data ❑ utility ❑ participant ■ other **_Powerit reports of load control actions, and threshold levels**

Contact for data __Don Hladun, Onsite Energy__ Ph# 925 - 358 - 4270_ **Email address dgHladun@aol.com**

Spot meter readings taken ❑ yes ■ no

Component #1 readings _____ _____ _____ **Notes__Equipment control actions observed on graphical user interface for dedicated PC.**

Component #2 readings _____ _____ _____ **Notes**_____

Component #3 readings _____ _____ _____ **Notes**_____

Randy McCall, of Nexant, Inc., conducted a post-installation site inspection at Del Mar Foods in Watsonville, CA on July 1, 2003 in order to verify the installation of the Powerit load control equipment for the facility. In attendance for the inspection were Mr. McCall, Don Hladun from Onsite energy, Mathias Christelius from Powerit, and facility engineering staff from Del Mar Foods.

A PC was set up in the engineering office with the Powerit software system installed. The software program is provided with pulse signals from the facility utility meter(s) that are used to predict an average five-minute demand for each of the two sides of the facility. If a predicted average peak for a 5minute interval is likely to exceed the user-defined threshold for control action, the software sends signals to controllable loads to either turn off select motors, or run at reduced loads. The equipment to be controlled was previously identified during the pre-installation phase through consultations between Mathias Christelius, Powerit's field engineer for implementation, and plant engineering staff. The list of equipment includes flexible loads that will not adversely affect the production at the food processing plant. Once the Powerit software evaluates a five minute average window that is predicted to exceed the threshold, the software sends signals to individual pieces of equipment that have been equipped with communications equipment that allows for remote control for unloading or shutting down. Equipment is listed by priority in the software, on a custom basis for each facility and customer.

At Del Mar Foods, Onsite Energy and Powerit are expecting to control approximately 150 to 200 kW of peak load out of a total estimated 989 kW of potential load from the controllable equipment in the cold storage side of the facility. Similarly, approximately 200 kW of load control savings are expected from the 1234 kW of controllable loads on the processing side of the plant. A list of the controllable equipment and their estimated loads are presented below in Tables 1 and Table 2.

7.1 Table 1: Del Mar Foods, Cold Storage Controllable Loads

Estimated peakload savings: 150-200 kW

Object Name	Quantity	Equipment Description	Unit kW	Total kW
Compressor V1/V2/V7	3		150	450
Compressor V3/V6	2		56	112
Compressor V4/V5	2		38	76
Compressor F1/F3	2		75	150
Compressor F2	1		56	56
Cold Storage 1	1	3*3hp Fans, Offloads ammonia loop	7	7
Cold Storage 2	1	1*3hp Fans, Offloads ammonia loop	3	3
Cold Storage 3	1	2*3hp Fans, Offloads ammonia loop	5	5
Cold Storage 4	1	2*3hp Fans, Offloads ammonia loop	5	5
Cold Storage 5	1	2*3hp Fans, Offloads ammonia loop	5	5
Tunnel 1	1	Offloads ammonia loop, max 1/2 fans off	15	15
Tunnel 2	1	Offloads ammonia loop, max 1/2 fans	15	15
Tunnel 3	1	Offloads ammonia loop, max 1/2 fans	15	15
Tunnel 4	1	Offloads ammonia loop, max 1/2 fans	15	15
Tunnel 5	1	Offloads ammonia loop, max 1/2 fans	15	15
Tunnel 6	1	Offloads ammonia loop, max 1/2 fans	15	15
Tunnel 7	1	Offloads ammonia loop, max 1/2 fans	15	15
Tunnel 8	1	Offloads ammonia loop, max 1/2 fans	15	15
		Grand Total Controllable Load kW	>>>>>>>>	989

7.2

7.3 Table 2: Del Mar Foods, Food Processing Controllable Loads

Estimated Savings 150-200 kW

Onsite Project: Richmond Wholesale Meats

Nexant

POST-INSTALLATION INSPECTION

101 Second Street, 11th Floor • San Francisco, CA

Onsite Energy – Richmond Wholesale

Date: May 8, 2004
To: Onsite Energy Corporation
From: Randy McCall
Re: Post Installation Inspection of Richmond Wholesale Powerit Installation

The purpose of the inspection conducted on May 7, 2004 was to verify the installation of the Powerit Energy Director load management systems at the Richmond Wholesale facility. Present for the inspection was Don Hladun and Eric Nyenhuis from Onsite Energy Corporation. The Richmond Wholesale refrigerated warehouse facility where the Powerit equipment was installed is located at 2401 Factory Street, Richmond.

The load management system has been installed and the computer interface is active. The load points shown on the computer interface included evaporator fans, truck cooling plugs, two sets of truck battery charging stations, and a separate satellite package unit cooled freezer for ice cream storage. Load control of the refrigeration compressors at the facility is accomplished through the evaporator fan controls. Mr. Hladun described the system setup as safer for the compressors as the compressors will unload quickly when the evaporator fans are shut down.

The Energy Director uses the existing internal Ethernet to communicate with the various control points. The existing Ethernet was previously used with the freezer unit fork lifts, and eliminated the need to hard wire controls to each control point. The PG&E 15-minute interval meter data from the meter on the northeast corner of the building is used by the Energy Director to determine the correct load management strategy if required. System tests of the load controls have begun, however, to date no significant load management activity has been implemented. Onsite Energy Corporation estimates 400 kW of potential load management from the facility.

Based on the results of the inspection, the project passed the post installation inspection. Digital photographs of the Powerit computer interface, and other control equipment and relay are attached below.

Figure 1: Energy Director Control Module.

Figure 2: Refrigeration control system.

Figure 3: Engine room refrigeration compressors.

Figure 4: Satellite Freezer equipment.

Figure 5: Utility meter equipment and tie-in for Powerit energy usage signal.

Figure 6: Battery charger station control cabinet.

Project 04-0003A: Central Valley Cooperative

Inspection Report

SB 5X Agricultural Program Element

Category 4 – Central Valley Cooperative

Date of Inspection: August 31, 2001
Inspection Conducted By: Richard Green, Nexant
Grantee Representatives: Pat Noland
The purpose of this report is to verify completion of the participants alternative fuel system and witness actual use of system on alternative fuel or collect data to assure that the system is capable of burning an accepted alternate fuel. The following are field notes taken for field verification (page 2).

This project retrofitted an existing natural gas system to burn propane as an alternate fuel. Propane is an acceptable alternate fuel under the program guidelines.

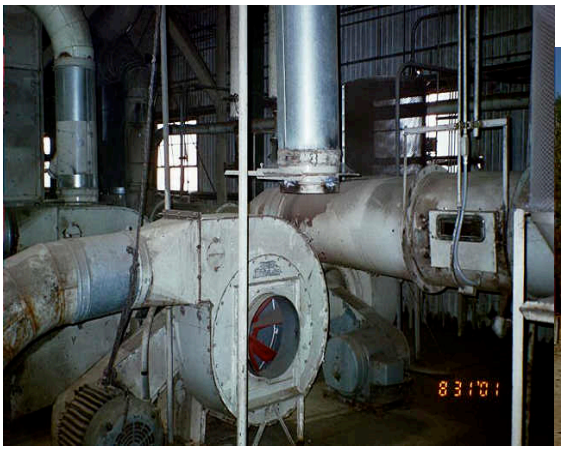


Figure-1 Gin Dryer (Burners)

Figure-2 Propane Tank

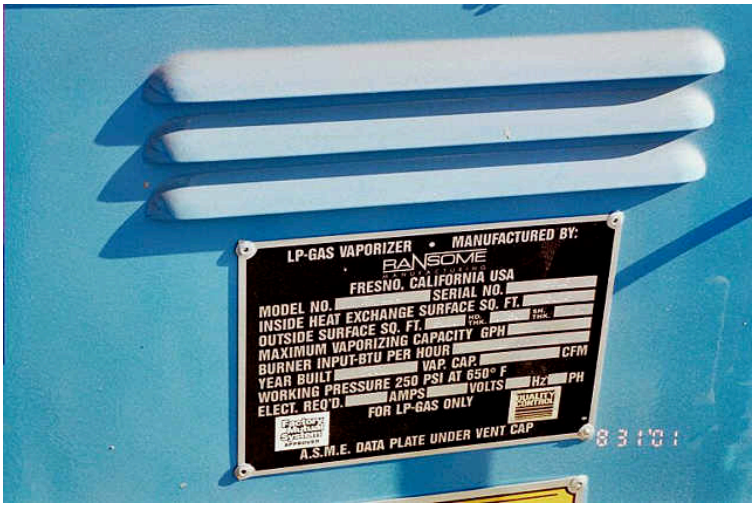


Figure-3 System propane vaproizer

Agricultural Peak Load Reduction Program

Category 4 - Natural Gas-powered Equipment Retrofit using a qualified alternate fuel

Inspection / Verification of Installation

Application name/Designation: Central Valley Coop		Number of Individual Projects in this Application: 1
Individual/Organization/Company: Central Valley Coop		
Business Type: Cotton Ginning	Phone: 559.582.0321	
Business Address: 9845 Hanford-Armona Rd.		
City: Hanford	State: CA	Zip Code: 93230
Contact Name: Leroy Gobel		
Street Address: Same as business		
City:	State:	Zip Code:

Contact Phone: 559.582.0321	Alt. Contact: Alt. Phone:	Inspection Date: 08/ 31/ 01 Time: 08:45 am
Alternate fuel used: PROPANE	Photos taken of equipment (yes/no): Yes- Tank, vaporizer, burners	
Project equipment description (e.g. alternative propane system consists of storage tank, vaporizer, pipelines, burners.). Plant will start ginning operation in late September, early October. Have purchased propane (approximately a 26,000 gallon tank).		

I certify all information provided and in any attachments is true and correct to the best of my knowledge and that this system has operated or is capable of operating on a qualified alternate fuel.

Inspected by (print name): Richard Green Phone: 916.397.2202	Signature of Responsible Party : Original signed Title: Office Mgr. Printed name: Pat Noland
Date: 08/31/01	Date: 08/31/01

For Grant Administrator Use :

APLRP Application #: 04-0003-A Administrator: Fresno

Project Verification by: Date:

Project Accepted: YES

Actual Payment: $ Date: **Pending Verification**

Project 04-0012A: Lone Star Dehydrator

Inspection Report

SB 5X Agricultural Program Element

Category 4 – Lone Star Dehydrator

Date of Inspection: August 31, 2001
Inspection Conducted By: Richard Green, Nexant
Grantee Representatives: Douglas Malkonian, V.P.
The purpose of this report is to verify completion of the participants alternative fuel system and witness actual use of system on alternative fuel or collect data to assure that the system is capable of burning an accepted alternate fuel. The following are field notes taken for field verification (page 2).

This project retrofitted an existing natural gas system to burn propane as an alternate fuel. Propane is an acceptable alternate fuel under the program guidelines.

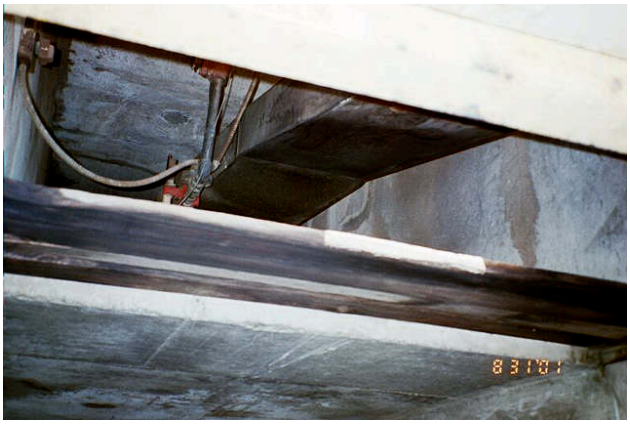


Figure-1 Gin Dryer (Burners)

Figure-2 Propane Tank

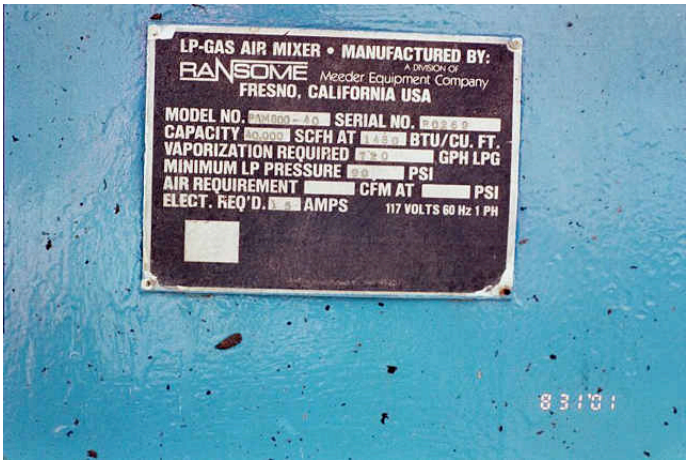


Figure-3 System propane vaporizer

- **Agricultural Peak Load Reduction Program**

Category 4 - Natural Gas-powered Equipment Retrofit using a qualified alternate fuel
Inspection / Verification of Installation

Application name/Designation: Lone Star Dehydrator	Number of Individual Projects in this Application: 1	
Individual/Organization/Company/: Lone Star Dehydrator		
Business Type: Fruit and Nut Dehydrator	Phone: 559.582.0321	
Business Address: 2730 S. De Wolf		
City: Sanger	State: CA	Zip Code: 93630
Contact Name: Doug or Mark Melkonian		
Street Address: Same as business		
City:	State:	Zip Code:

Contact Phone: 559.485.6191	Alt. Contact: Walter King Alt. Phone: 559.250.2881	Inspection Date: 08/ 31/ 01 Time: 10:00 am

Alternate fuel used: PROPANE	Photos taken of equipment (yes/no): Yes; Vaporizer, burner, tank
Project equipment description (e.g. alternative propane system consists of storage tank, vaporizer, pipelines, burners.) : Approximately a 26,000 gallon propane tank. Witnessed system operating on propane.	

I certify all information provided and in any attachments is true and correct to the best of my knowledge and that this system has operated or is capable of operating on a qualified alternate fuel.

Inspected by (print name): Richard Green Phone: 916.397.2202	Signature of Responsible Party : Signature on original Title: Vice President Printed name: Douglas Melkonian
Date: 08/31/01	Date: 08/31/01
For Grant Administrator Use : APLRP Application #: 04-0012-A Administrator: Fresno	
Project Verification by Richard Green Date: 08/31/01	
Project Accepted: Yes	
Actual Payment: $ Payment made. Date: 09/18/01	

Project 04-034-A: Six Jewels Ag Fruit Dehydrator Converted from Natural Gas

SB5X Agriculture Inspection Form

Project Name 04-0034 –A Ag. Fruit Dehydrator Retrofitted from Natural Gas

Date 11/12/04

Address 6692 S. Peach Ave.

City Fresno, CA

Zip 93725

Contact Jeff Jue (559) 456-4900

Inspected by Mark Galicia

Equipment

Component	Status	Meter	Nameplate data and notes
Propane Tanks	■ completed installed ❑ being ❑ not installed	❑ yes ■ no	Two large propane tanks were located at the facility
Vaporizer	■ completed installed ❑ being ❑ not installed	■ yes ❑ no	One vaporizer was identified at the facility. The vaporizer has its own designated meter for Natural Gas use.

Meter data

Component(s) is metered separately ■ yes ❑ no **If yes, by:** ■ utility ❑ participant ❑ other _____

Data available ❑ yes ❷ no

Type of data ❑ TOU ❑ 15min ❑ run time ❑ other _____

Source of data ❑ utility ❑ participant ❑ other _____

Contact for data _____ **Ph#** _____ **Email address**

Mark Galicia of Nexant, Inc. met with Jeff Jue at the Six Jewels facility were he verified the two propane tanks and vaporizer were still installed. The piping for the vaporizer is designed so that the vaporizer could run on either propane of Natural Gas, however the propane system is used only as a back up.

Figure 1 Two Propane storage tanks at the Six Jewels facility.

Figure 2 Vaporizer at the Six Jewels facility.