

Attachments:

- 7a Recent Groundwater Banking Program Proposal
- 7b PG&E Technical Audit for Kings County W.D.
- 7c Bakman WC Well Pumping Costs



Madera Irrigation District
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Madera, California 93637-9199
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Memorandum

To: Interested Parties
From: Madera Irrigation District
Date: July 9, 2010

Re: MID Water Supply Enhancement Project Term Sheet for 3rd Party Water Bank Participation

The Madera Irrigation District (MID) is undertaking a Water Supply Enhancement Project ("the Project") to increase the reliability of regional water supplies. MID owns a 13,646 acre property known as Madera Ranch located southwest of the intersection of Avenue 12 and Road 21 in Madera County. MID purchased the ranch to develop a water bank that will have a total banking capacity of 250,000 acre-feet (AF) and an annual recharge/recovery capacity of 55,000 AF/year. Project capacity has been allocated into "shares". **One Project share is equal to: 1 AF/year of recharge capacity; 1 AF/year of recovery capacity; and 3 AF of storage space.**

MID has acquired and performed numerous hydrogeologic investigations, engineering evaluations, environmental studies and pilot tests and has certified a California Environmental Quality Act (CEQA) Environmental Impact Report (EIR). The Project is fully described in the EIR, which is available for review at the District's offices. Project operations will be monitored by the Madera Ranch Oversight Committee, which includes surrounding landowners, Gravelly Ford Water District and the County. MID is currently obtaining permits required by the Bureau of Reclamation with initial recharge operations using existing delivery facilities anticipated to commence during the spring 2010

The primary purpose of the Project is to maintain the reliability and affordability of water in the region in the face of increasing water shortages. However, the MID board has also reserved 27,200 shares for other participants with other in-county and out-of-county water needs.

The attached Term Sheet defines the conditions under which MID is offering Project shares to qualified potential participants. MID will enter into a Letter of Intent (LOI) with a potential participant that defines terms and conditions that are generally summarized here. Following execution of the LOI, the potential participant will have 90 days to enter into an Agreement with MID.

If after reviewing the term sheet you wish to further explore potential participation in this program, you are invited to contact Lance Johnson, General Manager of MID at (559) 673-3514.

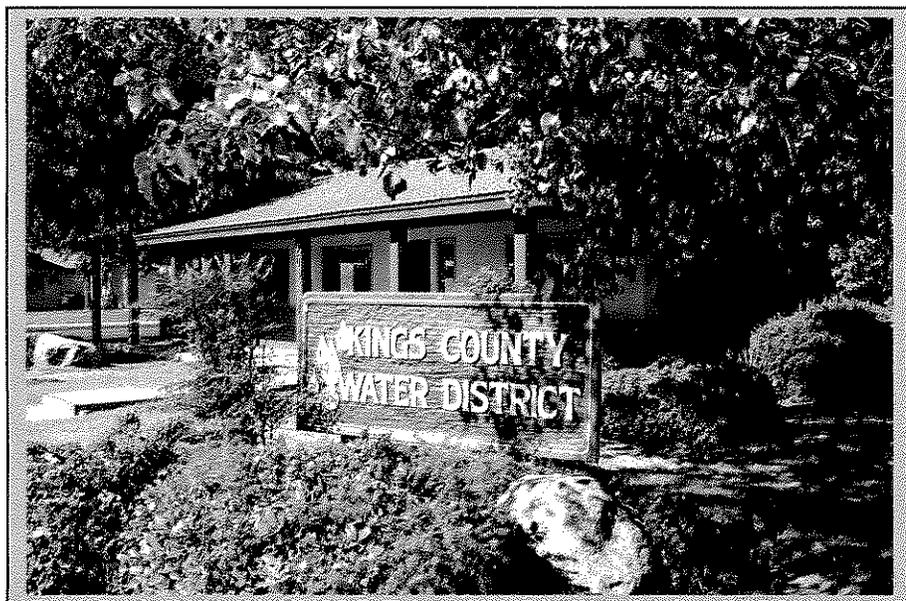
MID Water Supply Enhancement Project: Draft 3rd Party Participant Term Sheet

Item	Terms
Eligibility	This offering is being made to entities that are seeking water banking capacity for use in the San Joaquin Valley region.
Available capacity	Up to 27,200 shares (49.45% of Project Capacity) 1 share = 1 AF/year of recharge, 1 AF/year of recovery, 3 AF of storage space
Buy In and Operation fees	<p>•</p> <p>Buy in fees will be used by MID for construction, permitting engineering, etc.:</p> <p>Buy In fee: \$1,500/share to be paid over period of 5 years Quarterly calls on funds to investor representatives and MID Board members</p> <p><u>Annual maintenance fee:</u> \$20 per purchased share/year <u>Wheeling Fee:</u> Annual MID and Madera Canal O&M cost plus \$10/AF <u>Recharge fee:</u> \$25 per net AF received for recharge <u>Recovery fee:</u> \$80 per net recovered AF plus actual energy costs <u>Escalation:</u> All fees are based on 2010 dollars and will be escalated annually according to the Consumer Price Index (CPI) for western cities.</p>
Financing	MID cannot offer financing or extended payment plans, but will cooperate with potential participants by providing Project information to 3 rd parties with whom they are seeking financing.
Water costs and source(s)	In years when there is surplus water available to MID the District will offer water to participants after the District needs have been met, contingent on MID compliance with limitations imposed by MID's water rights, water contracts and compliance with County, State and Federal regulations. The cost for such offered MID water shall be the District's annual water rate plus \$10/AF escalated for the CPI. Participants may also provide their own source(s) of water to be banked. Only waters from the San Joaquin and Fresno Rivers may be recharged by the Project. The Project may not receive water from Mendota Pool. MID will aid participants in their efforts to perform exchanges and transfers to the degree that these exchanges and transfers do not interfere with normal MID operations.
Recharge schedule	<u>General:</u> Water will be conveyed through the MID system when capacity is available above that required to serve MID farmers and when the system is not off-line for normal maintenance. MID anticipates that there will be wheeling capacity to recharge water during most months of the year with the exception of approximately 60 days per year when MID must perform canal maintenance.
Water accounting and banked water losses	10% of all water recharged at Madera Ranch will be left behind to help reduce pre-existing aquifer overdraft.
Recovery schedule	<p><u>General:</u> Water will be recovered through an exchange whereby MID will use wells and pumps to deliver banked water to MID farmers near Madera Ranch in-lieu of normal surface water deliveries. This operation will make an equal volume of water available in Millerton Reservoir for delivery to participants. Water may not be withdrawn until an equal or greater quantity has been banked.</p> <p><u>Schedule:</u> MID will make contracted recovery capacity available within 12 months of receiving exercise payments and required regulatory approvals.</p>
Regulatory compliance	MID is responsible for finalizing regulatory compliance relating to Project operations. Participants will be responsible for regulatory compliance that may be required to procure and convey water to MID. MID will support potential participant entitlement efforts.
Recovered water use	Water may be used within the San Joaquin Valley. MID will assist 3 rd party

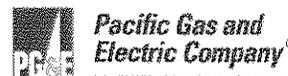
Item	Terms
and transferability limitations	participants with completing water transfers and/or exchanges providing such transactions do not interfere with otherwise normal MID operations
Transferability of shares and taxes	Participation in the Project will be a contractual relationship with MID that will be tied to specific locations and uses. MID reserves the right to approve or deny requests for transfers of shares to other parties, uses or locations. Participant contracts will be considered arms length transactions and will not be an incident of ownership of real property.
Ownership of facilities	MID will own, operate, manage and maintain all Project facilities.
Ownership of banked water	MID will hold banked water in trust for participants who will retain ownership of the water.
Default	<p><u>Participant Default</u>: Contracts will include clauses that define the conditions under which MID will have the right to cancel such contracts upon failure of participants to make payments. In these circumstances, MID will value any banked water at the price charged in that year by MID for regular service water and MID will take ownership of the volume of water that equals the amount of delinquent payments plus late charges. The remaining balance of the banked water, if any, will be offered to other participants at the same price.</p> <p><u>MID Default</u>: Likewise, contracts will include clauses that define the conditions under which MID will be obliged to refund participants for payments and banked water in the event that MID fails to perform.</p>
Term	<u>Water banking agreements</u> : 30 years with a first right to extend under commercial terms that will be determined at the time of renewal.

Demand Response Technical Audit for:

Kings County Water District



Pacific Gas and Electric Company



Prepared by:



Quality Assurance Check by:



*Pacific Gas and
Electric Company.*

Mailing Address:
Pacific Gas and Electric Company
705 "P" Street
Fresno, CA 93760

October 16, 2007

Don Mills
Kings County Water District
200 Campus Drive
Hanford, CA 93230

RE: Demand Response Audit

Dear Don Mills,

I am pleased to enclose PG&E's Demand Response Audit report on Kings County Water District. The report identifies Demand Response Measures that would allow you to participate in PG&E's Demand Response Programs. Because California energy policy encourages customers like Kings County Water District to reduce electricity consumption during periods of peak demand, PG&E offers several Demand Response programs that fit our customers varied business operations.

Participation in PG&E's Demand Response programs can save you money on your electricity bills, provide incentives to reduce the capital cost of new equipment investments and safeguard the statewide electricity grid during periods of high peak demand, thereby avoiding widespread outages.

- Participation in demand response program is recommended in this report. PG&E could pay you as much as \$21,096 per year for reducing energy consumption in response to demand reduction requests. (See Appendix 1, Section 5.1 for the assumptions and calculations)
- Your facility could be eligible for up to \$76,180 in cash incentives through PG&E's Technology Incentive program if you implement the Demand Response recommendation in this report. (See Appendix 1, Section 5.2 for the assumptions and calculations)

I encourage you to carefully evaluate the technical and financial aspects described in section 1.1, and to act on those that meet the fiscal and operational requirements of your facility. To turn the recommendations of this report into actual projects, PG&E offers turnkey support through the Technical Incentive program. We provide seasoned technical specialists to manage the Demand Response (DR) implementation process.

I am available to discuss any aspect of this report, as well as the details of PG&E's Demand Response programs. Thank you for participating in the Demand Response Audit! I look forward to help you act on the results.

Sincerely,

Harold Harris
Senior Account Manager



*Pacific Gas and
Electric Company™*

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The work described in this report is a service of the Pacific Gas and Electric Company (PG&E) to its large commercial, institutional, and industrial customers under its Customer Energy Efficiency (CEE) Program. This Demand Response (DR) Audit Report for Kings County Water District is part of PG&E’s efforts to enlist PG&E customers to manage peak period electric demand. Limiting peak period demand ensures stability for the California-wide electric grid and displaces expensive peaking power plants that can adversely affect the environment.

Where applicable, PG&E incentives are identified in the report and included in the financial analysis of demand response opportunities.

1.1 YOUR DEMAND REDUCTION OPPORTUNITIES

Demand response measures, which could reduce your peak electric demand by more than 590 kW, are summarized in Table 1.1; detailed descriptions of each measure can be found in Section 2, “Demand Response Opportunities.”

Table 1.1: summary of Demand Response Opportunity Savings and Costs

Measure Number	Demand Response Description	Potential Demand Reduction (kW)	Potential Energy Savings (kWh/yr)	Potential Demand Response Incentive One(\$/yr)
DR-1	Turn off Pump1 thru 3	586	42,192	\$ 21,096
DR-2				\$
DR-3				\$
Total Demand Reduction		590		
Total Energy Saving			42,192	
Total Potential Demand Response Incentive				\$21,096

Demand Response measures listed in the table above require detailed analysis of your facility’s business needs to determine their effects on the primary goals for the facility. It is not always possible for you to curtail a process for each demand response event or for the duration of an event. Your PG&E account representative can help you choose the optimum Demand Response program for your facility. PG&E offers a Technical Incentive program to support further development of the recommendations above.

As demonstrated in the energy use table 4.2 the pumps operate when called for therefore they are either on or off. The tables below also demonstrate the pumps have the potential to save costs while participating in the DR program. The dispatchable kW available for demand reduction is based on which pumps are operating when the demand response is called for. When the pumps operate it is usually for 24 hours a day at full volume. There is not a need at this time to install a variable speed drive because the pumps discharge into an open canal.

Demand Reduction Program comparative potential annual cost and savings													
Well Number	HP	Average Summer kW	Average On Pk cost/kWh	Average cost/hour On PK opeation	Avoided cost If 12 DR calls & off for 6 hours savings	DBP DR incentive of \$.50/kWh 6 hrs@12 days/yr	Metered Gallons of water pumped per minute	Hours to pump an acre foot of water	Cost per acre foot of water pumped WO maintenance	Acre foot of water not pumped during 6 hr. DR event	Price/acre foot to growers	Revenue lost during 12 - 6 Hr Dr events	3RD Party Potential DR Payment
1	250	154	0.16411	\$25	\$1,820	\$5,544	2600	2.09	\$52.73	35	\$125	\$4,313	\$ 8,162
2	250	178	0.16411	\$29	\$2,103	\$6,408	3500	1.55	\$45.28	46	\$125	\$5,806	\$ 9,434
3	350	254	0.16411	\$42	\$3,001	\$9,144	5200	1.04	\$43.49	69	\$125	\$8,627	\$ 13,462
					\$6,924	\$21,096		Avg \$/AC FT	\$47.17			\$18,747	\$ 31,058

1.2 IMPLEMENTATION PLANNING

We encourage you to seriously consider the recommendations contained within this report. Demand response projects identified in this report will bring a significant benefit to your bottom line. Once you have completed a careful review of the technical and financial aspects of the recommendations, PG&E can assist you by facilitating an implementation planning meeting that will help you act on those measures that meet the fiscal and operational requirements of your facility. In addition, and as a component to the implementation plan, PG&E will help you take full advantage of the financial incentives and technical services that are available to you as a valued customer of PG&E.

- In order to participate in the PG&E Technical Incentive Program funding a test of all control and monitoring equipment will need to be completed by March 2008. PG&E will need to be notified when the project is ready for testing. At that time an agreed date will be selected for the testing and monitoring equipment. After the testing Kings County Water District will need to choose a PG&E Demand Reduction Program for their participation. Then the remaining 50% of the incentive will be made available for payment from PG&E.
- The budget for the project is based on Kings County Water District participating with all the pumps in the PG&E Demand Reduction Program. The PG&E Technical Incentive Program amount is based on \$250 per average reduced kW of created demand per pump site when the DR testing is complete. Any additional project cost will need to be paid for by KCWD. If KCWD cost is covered by the TI Program and the district chooses not to enroll a pump in the DR program the funding will be reduced by \$250 per kW of average created demand. An example of this is would be if KCWD choose not to enroll Well 2 at an average 178 kW the participation level would be reduced by as much as \$23,140.

Section 2 Demand Response Opportunities

2.1 DEMAND RESPONSE

Demand response and reliability programs—also known as load shifting, load curtailment, peak load reduction, peak shaving, or load shedding—are similar, but not exactly the same. Both provide incentives for reducing or shifting electricity use out of peak demand hours (the 80 to 100 highest demand hours out of 8,760 hours a year). All of these programs ask or cause participating customers to respond to a signal to reduce demand in return for a variety of financial incentives that reflect the value of what the customer is providing: response time and surety of delivery.

Demand response programs address supply or price concerns that can be forecasted the day ahead, enabling you to initiate solutions to be carried out on the critical day. By contrast, reliability programs are designed for response on very short notice, usually just minutes, to mitigate unpredictable power plant or electric grid emergencies.

Current demand response options include:

- *Demand Bidding Program (DBP)*—DBP asks you to bid a load reduction quantity based on day-ahead Alert Notices from the California Independent System Operator (CAISO). Participants receive payment equivalent to the day-ahead market price plus a premium (up to a certain cap) for their demand reductions.
- *Critical Peak Pricing (CPP) Tariff* -- CPP operates on up to 12 critical peak days a year by issuing day-ahead notices to reduce or shift load. It offers lower rates on electricity used during non-critical periods, and higher peak rates during critical periods.
- *Capacity Bidding Program (CBP)* — The program, a successor to the CPA-DRP, treats your load like a generation resource and pays for both committed capacity every month and for actual load reductions on critical days. This is a PG&E owned program. This program operates from May 1st to October 31st. The program enables aggregators, as well directly enrolled PG&E customers, to participate.
- *Technology Incentive (TI)*—financial incentives may be available for installing demand reduction technologies. Examples include, but are not limited to, smart thermostats, dual-level lighting, and remote control points. The incentive payment is \$250/kW for reductions verified by PG&E and \$300/kW if Automation Demand Response is used (incentive not to exceed the total cost of the equipment).

Current reliability options include:

- *Base Interruptible Program*—You receive monthly incentives for your commitment to reduce demand to a predetermined level on short notice, and pay penalties if you do not reduce demand to your committed firm service level.

-
- *Optional Binding Mandatory Curtailment Program*—This curtailment program exempts you from rotating outages in return for reducing a portion of the demand on the circuit that serves you to agreed-upon levels with 15 minutes' notice.
 - *Scheduled Load Reduction Program*—This summer-only program pays you for qualifying load that you reduce on a schedule that you set in advance.
 - *Third Party Demand Reduction offerings*—Third Party DR providers offer as much as \$53/kW of dispatchable load reduction. It is recommended that KCWD acquire a listing of third party providers of DR programs in order to compare the different program offerings.

For the recommended measures, the credits and/or incentives are based on PG&E's day-ahead Demand Bidding Program, assuming a four-hour event that takes place ten times per year. It is also possible to participate in a day-of Demand Bidding Program, which offers a significantly larger credit. *The minimum required demand reduction for participation in the Demand Bidding program is 50 kW.*

2.1.1 DR-1: Defer Operation Deep Well Water Pumping Plants

Observations

The deep well water pumps that are in the Kings County Water District's Apex Ranch Project are potentially used 24 hours a day 7 days a week for the 6 summer months. The pumps supply irrigation water delivered directly to various irrigation districts and grower members. The pumps operate on an as needed basis depending on either the sale or need of individual growers. Given a 24 hour notice 3 pumps could be curtailed during a Demand Response Program event. The potential combined reduction is about 586 kW. An additional 520 kW may be available in 2008 when the new pumps are on PG&E service.

Recommendation:

Install the recommended control and monitoring equipment so that water users would not be impacted during the Demand Reduction Program events.

Savings Summary	
Peak-Period [kW] (as much as)	586
Electric Bill Savings [\$]	6,924
Based on non operation of pumps during DR Events	

Cost Impacts

The capital cost of the project is about \$222,593. (Please see attached SCADA cost and installation report for complete details.) Under PG&E's Technical Incentive Program for Demand Response the district is eligible for as much as \$76,180 using the average 586 kW currently connected. **The final Technical Incentive payment will be based on the average kW created during the 6 summer months when the Demand Reduction Program is in effect.** The incentive funding will be used for the installation of remote monitoring and pump operation control equipment that enables participation in the Demand Reduction program. The remote control system will be operated by radio from a computer server located in the district office in Hanford California. It will allow complete two-way communication with the pump's operating system and monitor canal levels. There will also lower labor and fuel costs by being able to remotely monitor water levels and pump operations. With the two-way monitoring there is a built-in safety factor that will prevent an overdraft the canals during a Demand Reduction event.

Section 3

Project Team and Facility Information

3.1 PROJECT CONTACTS

This section of the report identifies the project team members and includes contact information.

Table 2.1: Integrated Audit Contacts

Name	Role	Organization	Contact Information
Don Mills	District Manager	Kings County Water District	200 N Campus Drive Hanford, CA 93230 (559) 584-6412 (559) 584-6412 (fax) Kcwdh2o@sbcglobal.net
Gary Wiens	Energy Specialist	Provost & Pritchard Engineering Group	286 W Cromwell Fresno, CA 93711 (559) 449-2700 (559) 449-2715 (fax) gwiens@ppeng.com
Harold Harris	Senior Account Manager	PG&E	705 P St Fresno, CA 93760 (559) 263-5539 (559) 263-5583 Hdh1@pge.com
Charlie Middleton	Audit Program Coordinator	PG&E	Mail Code N6G P.O Box 770000 San Francisco, CA 94177 (415) 973-4008 (415) 973-1234 fax TA-TI@pge.com
Sam Boushakra	TA/TI Program Manager	PG&E	Mail Code B7B P.O. Box 770000 San Francisco, CA 94177 (415) 973-4422 (415) 973-1234 fax TA-TI@pge.com

3.2 THE DEEP WELL PUMPING FACILITY DESCRIPTION

Kings County Water District serves the agricultural water needs in the PG&E service area of Kings County. The KCWD receives water from the Kings River Conservation District canal system and stores the water thru a ground water management storage plan. This water is then pumped and sold to the participating irrigation districts and growers. Due to the lack of rain fall and snow pack for the past two years water shortages have increased the water needs in the district. The district has been forced to drill new wells and install additional deep well pumps. The district currently has 3 pumps on line and will be adding 2 new pumps projected to be available in early 2008. The demand has increased so rapidly that the current pumps can operate 24 hours-a-day 7 days per week during the growing season. The district pumps water into the main canal where it is delivered to the individual growers fields. The pumping plants that are being addressed in this audit are used to supply the additional needed water. With proper notification and monitoring the district will be able to shut-down the pumps during a Demand Response event without jeopardizing the delivery system's integrity.

They have not been able to participate in any Demand Response Programs in the past because the district did not have a way to monitor canal levels and control the pumping plants remotely. By using PG&E's Technical Incentive Program they will be able to install a computer system in their Hanford office that will support a two-way remote communication between the pump controls and monitor canal water levels. This will allow the district office to safely shut-down the pumps during a Demand Reduction event. As in the past, irrigation district has participated in the pump testing and repair programs to assure that their pumps are operating at peak efficiency.

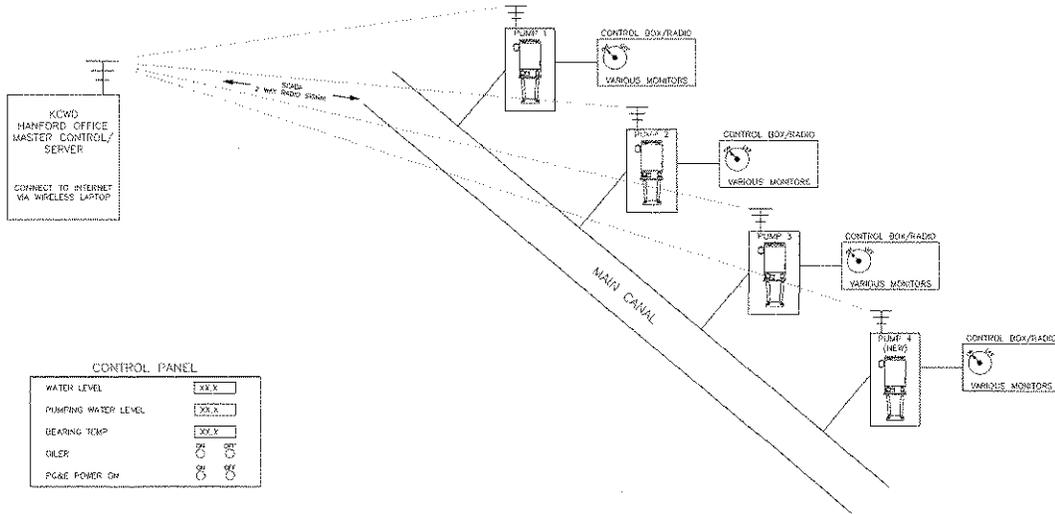


Figure 2.1: A simplified illustration of the pumping plant 2 way radio communications

3.3 ELECTRICITY CONSUMING SYSTEMS

3.3.1 Deep Well Pump # 1, 2 and 3

Pump # 1 electric meter number 44R862 is a 250 Horse power deep well pump.

Pump # 2 electric meter number 44R934 is a 250 Horse Power deep well pump.

Pump #3 electric meter number 35M951 is a 350 Horse Power deep well pump.

Pump #4 & 5 are being installed now and will be a 350 HP each

3.3.2 Deep Well Pumps # 4 & 5

Pumps # 4 & 5 are projected to be a 350 HP each and it will be in operation early 2008. They will be operating under the same parameters the current pumps. The pumping plants will need the same remote control and monitoring equipment as the other pumps in order to make them compatible with the rest of the system. They will be included in the Demand Reduction Program once they are on line. Under the current crop water demand status the pumps are critically needed in order to support the greater amount of permanent plantings by growers.

3.3.3 Summary of End Use Electric Loads

Table 2.2: Major Equipment Summary

Equipment	Fuel	Usage KWH/Yr	Average kW	Location
Pump # 1	Electricity	422,560	154	700 4 ½ Ave
Pump # 2	Electricity	477,120	178	NW NW 13-17-22
Pump # 3	Electricity	683,200	254	1500 4 ½ Ave
Pump # 4 & 5	Electricity	+ - 800,000	520*	*TBD

4.1 KINGS COUNTY WATER DISTRICT ELECTRICITY USAGE

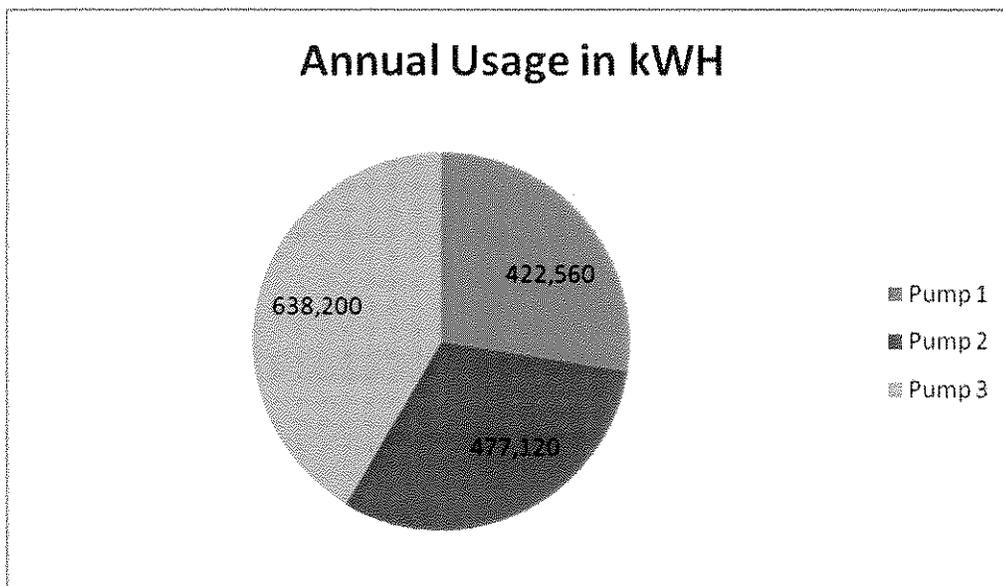
During a 12-month period ending in April 2007, the annual cost for energy at Kings County Water District was \$153,747 with electricity accounting for 100%. During this period, Kings County Water District consumed 1,537,880 kWh of electricity, with a summer peak demand of 586 kW.

The usage by all pumps is during the highest energy demands on the PG&E system. If Kings County Water District participates in the PG&E Demand Reduction Program’s Technical Incentive program there will be enhanced flexibility and reliability. By using remote control and monitoring of the pumping operation will also produce an unmeasured value in labor cost savings. This savings will be passed on to the growers in the form of lower operating costs to the growers in the district.

All electricity of purchased from PG&E under the bundled rate AG5B.

The distribution of energy consumption among the various pumps is diagramed in Figure 4.1.

Figure 4.1: Breakdown of Electricity Consumption



4.2 ELECTRICITY CONSUMPTION

Table 4.1: Detail of Monthly Electric Demand, Consumption, and Cost

Pump 1 Percentage of on Peak Hours for 6 Summer Months					Meter # 44R862							
Read Date	Days in Read	Energy Cost	kW	Total kWh	Peak kW	Part Pk kW	PK kW	Pk kWh	Operating Hrs On Pk	Total On Peak Hrs/Mo	% of On Pk Hrs/Mo	Off Peak Kwh
"Oct 2007										0	0%	
9/19/2007	32	\$ 5,383.17	154	43,200	153	0	154	8,160	53	114	46%	35,040
8/18/2007	30	\$ 10,410.58	154	110,320	154	0	154	20,160	131	138	95%	90,160
7/19/2007	29	\$ 9,975.18	154	106,240	154	0	154	18,240	118	126	94%	88,000
6/20/2007	32	\$ 9,153.16	154	96,400	154	0	154	15,680	102	126	81%	80,720
5/19/2007	30	\$ 16.95	0	-						0	0%	
4/19/2007	29	\$ 16.38	0	-						% On Pk Hrs	53%	
3/21/2007	32	\$ 4,304.45	155	54,640	0	155	155	-			17920	36,720
2/17/2007	30	\$ 2,013.53	154	11,760	0	154	154	-			6000	5,760
1/18/2007	31	\$ 17.51	0	-								
12/18/2006	32	\$ 18.08	0	-								
11/16/2006	29	\$ 16.38	0	-								
10/18/2006	28	\$ 15.82	0	-								
		\$ 41,341.19	154	422,560								

Pump 2 Percentage of On Peak Hours for 6 Summer Months					Meter # 44R934							
Read Date	Days in Read	Energy Cost	kW	Total kWh	Peak kW	Part Pk kW	Pk kW	Pk kWh	Operating Hrs On Pk	Total On Peak Hrs/Mo	% of On Pk Hrs/Mo	Off Peak Kwh
"Oct 2007									0	138	0%	
9/19/2007	32	\$ 6,023.51	179	46,880	176	0	179	9,120	51	114	45%	37,760
8/18/2007	30	\$ 11,577.98	173	122,560	172	0	173	22,320	129	138	93%	100,240
7/19/2007	29	\$ 11,211.40	181	118,080	180	0	181	20,240	112	126	89%	97,840
6/20/2007	32	\$ 10,602.20	180	111,600	178	0	180	18,080	100	126	80%	93,520
5/19/2007	30	\$ 16.95	0	-					0	132	0%	
4/19/2007	29	\$ 16.38	0	-						% On Pk Hrs	51%	
3/21/2007	33	\$ 5,826.91	182	78,000	0	182	182	-			28080	49,920
2/16/2007	29	\$ 16.38	0	-								
1/18/2007	31	\$ 17.51	0	-								
12/18/2006	32	\$ 18.08	0	-								
11/16/2006	29	\$ 16.38	0	-								
10/18/2006	28	\$ 15.82	0	-								
		\$ 45,359.50	178	477,120								

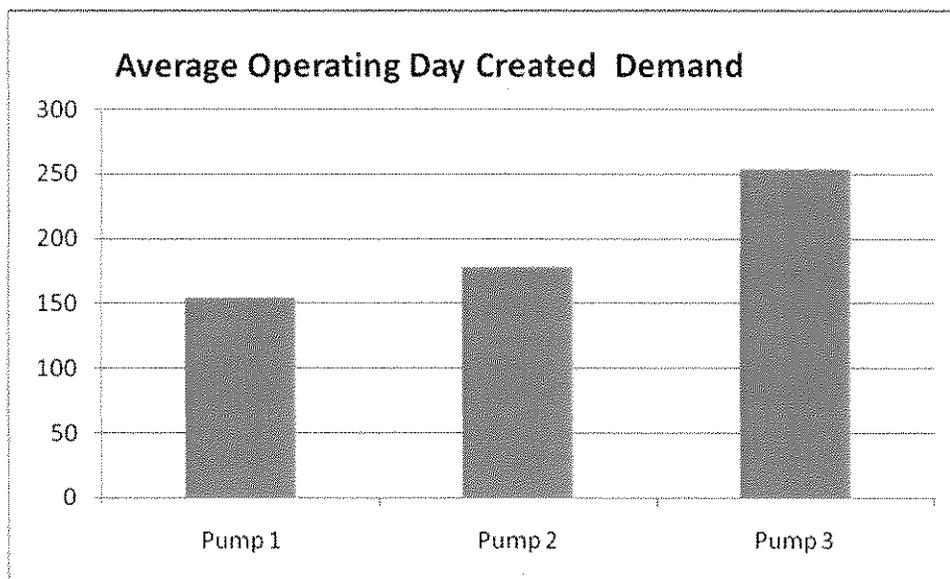
Pump 3 Percentage of On Peak Hours for the 6 Summer Months										Meter # 35M951			
Read Date	Days in Read	Energy Cost	kW	Total kWh	Peak kW	Part Pk kW	Pk kW	Pk kWh	Operating Hrs On Pk	Total On Peak Hrs/Mo	% of On Pk Hrs/Mo	Part Pk kWh	Off Peak kWh
"Oct 2007											0%		
9/19/2007	32	\$ 8,620.19	252	67,600	251	0	252	13,280	53	114	46%	0	54320
8/18/2007	30	\$ 16,997.62	254	179,760	254	0	254	32,880	129	138	94%	0	146880
7/19/2007	29	\$ 15,927.48	252	168,640	252	0	252	28,960	115	126	91%	0	139680
6/20/2007	32	\$ 15,029.25	256	157,920	255	0	256	25,680	101	126	80%	0	132240
5/19/2007	31	\$ 17.52	0	0							0%		
4/18/2007	28	\$ 15.82	0	0						Avg On Pk	52%		
3/21/2007	32	\$ 7,068.03	254	90,000	0	254	254	0				29,600	60400
2/17/2007	30	\$ 3,303.61	254	19,280	0	254	254	0				9,840	9440
1/18/2007	31	\$ 17.51	0	0									
12/18/2006	32	\$ 18.08	0	0									
11/16/2006	29	\$ 16.38	0	0									
10/18/2006	28	\$ 15.82	0	0									
		\$ 67,047.31	254	683,200									

Some usage patterns shown above are from 2006 and 2007. 2006 was a "wet" year compared to 2007. The demand for water in 2007 has increased significantly since it is a water short year therefore the pumps have been operated continuously since May 2007 and will discontinue operation in October

Hourly Electric Profile

These figures show a typical usage is at full load when the pumps are operated. The only changes in load may occur when the pumps are operating in the cooler night temperature. Otherwise the pumps are either operating or shutdown as indicated by the chart below.

Figure 4.2: One-Day Electric Profile When Pumps



4.2.1 Seasonal Electric Profile

The weeks the pumps operate they normally are in operation 24 hours a day 7 days a week as shown by the chart below.

Figure 4.3: One-Week Electric Profile

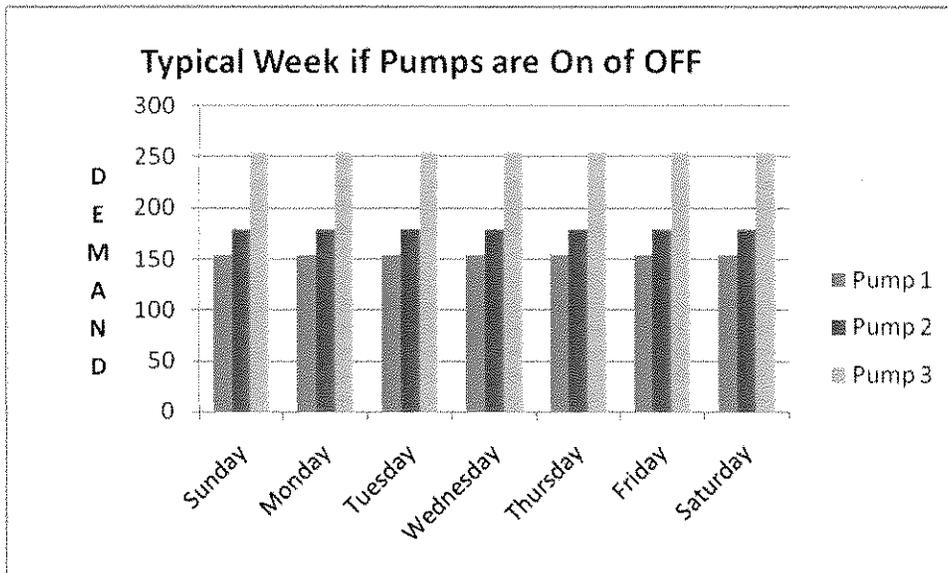


Figure 4.4: Monthly Electricity Consumption

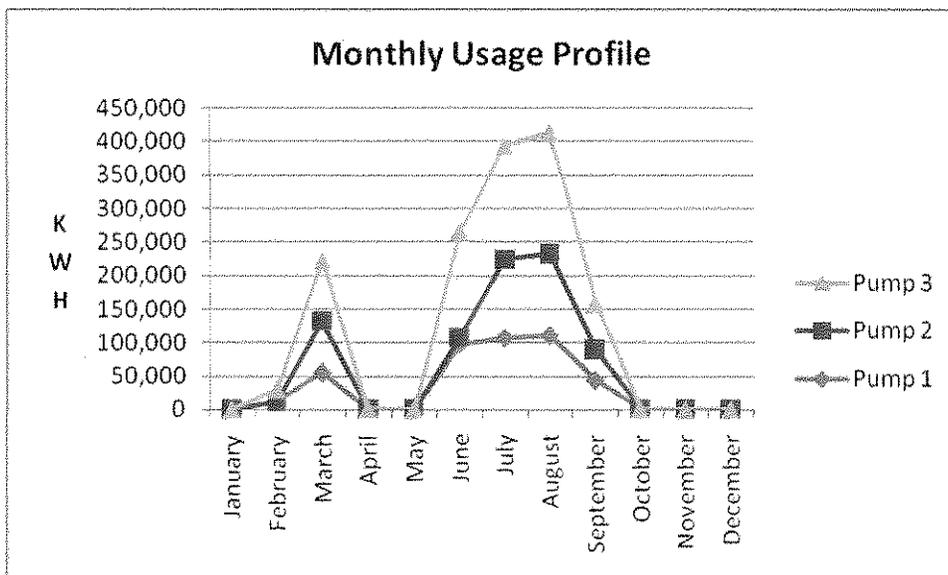
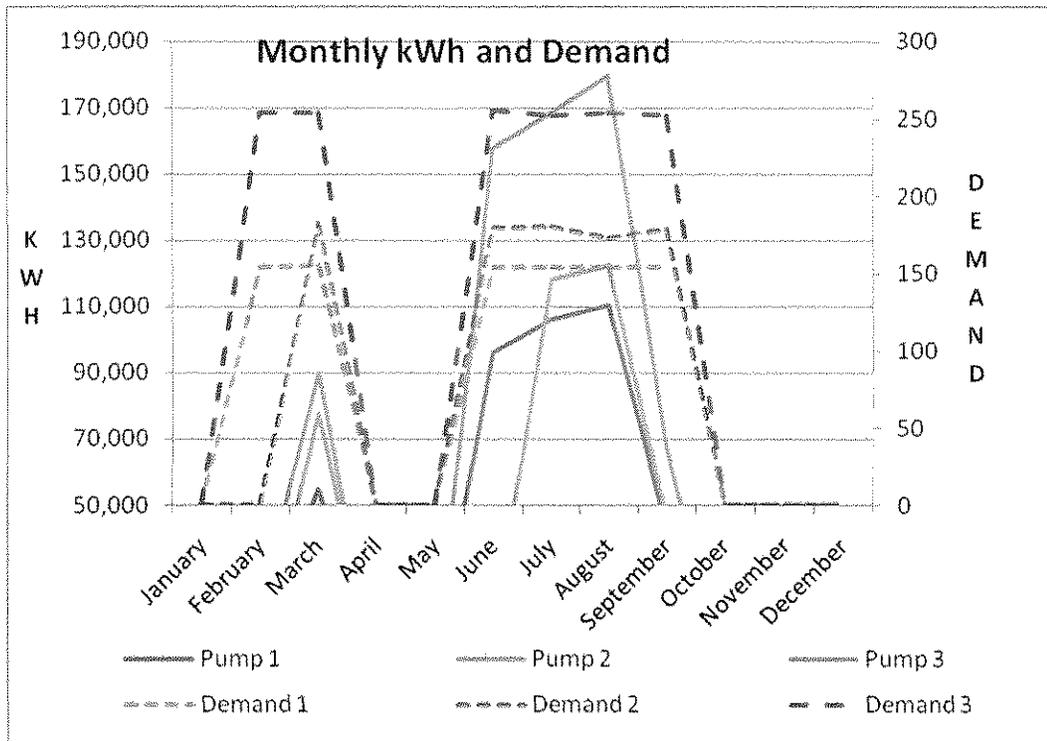


Figure 4.4 illustrates the trends associated with monthly electricity usage and demand.



The trends in Figure 3.3 are indicative of the district's operation of the pumping plants. It indicates that the individual pumps are either on or off. The water demand and canal levels are the criteria used to determine when and how the pumps will operate. This consistently ties back to the need to monitor the canal levels and the number of pumps needed to fulfill the grower water demand. On very wet years as in 2006 the pumps operated fewer hours because of the abundance of water. As shown in figure 4.2 there increase of energy usage because in 2007 the increase sales of water have come from irrigation district shortages. The operating hours will continue to increase until there is a larger than normal rain fall. At that point the district will again use the additional water to recharge the well field.

4.2.2 Time of Use Electric Rates

Kings County Water District is not the only energy consumer with energy consumption patterns that vary seasonally. In fact, most end-users in California require more electricity during the hottest hours of mid-summer days. As a result of peak demand periods like this, PG&E is required to provide excess capacity in its generation and transmission systems. Charging consumers a variable price for electricity, with a higher charge for peak periods, can offset the cost associated with providing this added capacity. Kings County Water District is enrolled in the PG&E rate program known as the agricultural rate AG5B a Time-of-use rate. Table 3.2 shows the rate structure for 2007.

Table 4.2: 2005 PG&E AG-5C Tariff Rate Structure Rate Schedule	Rate Design	Customer Charge	Season	Time-of-Use Period	Demand Charge (\$ / kW)	Energy Charge (\$ / kWh)	Average Total Rate (per kWh)
AG-5B	Two-Period TOU Rate	\$.52567/day plus meter charge of \$0.19713/day	Summer	On-Peak	\$10.18	\$0.16411	\$0.09125
				Part-Peak		\$0.0	
				Off-Peak	-	\$0.05544	
				Maximum	\$3.37	-	
			Winter	Part-Peak	\$8.42	\$0.06153	
				Off-Peak	-	\$0.05138	
				Maximum		-	

Definitions

Summer Season: May through October

On-Peak: 12:00 noon to 6:00 p.m., weekdays (except holidays)

Part-Peak: 8:30 a.m. to 12:00 noon and 6:00 p.m. to 9:30 p.m., weekdays (except holidays)

Off-Peak: 9:30 p.m. to 8:30 a.m., weekdays, and all day on Saturday, Sunday, and holidays

Winter Season: November through April

Part-Peak: 8:30 a.m. to 9:30 p.m., weekdays (except holidays)

Off-Peak: 9:30 p.m. to 8:30 a.m., weekdays, and all day on Saturday, Sunday, and holidays

5.1 DEMAND RESPONSE PAYMENTS

The potential annual payment from PG&E to each customer for participation in demand response events is calculated based on the parameters of the specific demand response program the customer selects. For the illustration in the executive summary and Table 1.1, the general equation for the Demand Bidding Program (DBP) is as follows:

$$\text{Payment} = \text{Measured load reduction} \times \text{payment per kWh saved} \times \text{number of Demand Response events called} \times \text{hours per demand response event.}$$

The actual maximum payment, assuming full participation by the customer and maximum requests by PG&E during the summer peak demand season (both number of events and duration per event in hours) yields the following:

$$\text{Payment} = 586 \text{ kW} \times \$.50 / \text{kWh} \times 12 \text{ events} \times 6 \text{ hour/event} = \$21,096$$

5.2 TECHNICAL INCENTIVE CALCULATION

The maximum potential Technical Incentive (TI) if based on all pumps operating 24 hours a day for the 6 summer months could be \$146,500. KCWD pumps operate an average of 52% of the On Peak summer hours therefore the incentive available from PG&E to assist you in implementing the recommendations of this report, as illustrated in the executive summary and Table 1.1, is calculated as follows:

$$\$76,180 = \text{Technical Incentive Payment in } \$130 \text{ per kW} \times \text{estimated projected } 586 \text{ kW}$$

The actual maximum incentive is limited to the actual cost of the project to implement Demand Response capability and the dispatchable demand reduction.

In the TA & TI Programs, the dispatchable kW demand reduction must be averaged over the May through October, Summer Electric Season, peak-period hours, noon to 6 pm weekdays except holidays. The maximum TA or TI incentive is limited to the actual, measured & verified, dispatchable kW demand reduction.

There are two parts to the Technical Incentive payment – implementation and automated DR. The implementation incentive is \$130 / kW. The automated DR incentive is \$50 per kW.

$$\text{TI} = \$ (130 + 50) / \text{kW} \times 586 \text{ kW reduction} = \$105,480$$

5.3 CALCULATIONS AND SUPPORTING DATA

See attached SCADA study for complete breakdown of cost and equipment

5.4 GENERAL LIST OF DEMAND RESPONSE OPPORTUNITIES

General List of Demand Response Opportunities (*NOTE: Automation of the action is preferred much more than merely adopting a manual process*)

- 1 Turn off non-essential loads such as decorative and display lighting, common area lighting such as atriums, hallways, and conference rooms, and recreation facilities.
- 2 Turn off lamps in multi-lamp fixtures when the kW demand approaches predefined thresholds.
- 3 Dim fluorescent lamps if capability exists.
- 4 Turn off lighting fixtures where daylight is available.
- 5 Increase the temperature set points in conditioned rooms or areas that would not overheat in hot weather.
- 6 Turn off packaged HVAC units, air conditioners, fans, pumps, coolers, etc.
- 7 For rotating machinery with an adjustable speed drive (ASD), consider limiting the speed during a critical peak event.
- 8 Duty cycle a group of packaged air conditioners.
- 9 Duty cycle multiple fans serving a common area (minimum ventilation standards must be maintained).
- 10 Enhance the existing EMS control strategies by adding sensors and/or hardware to create flexibility and enhance demand responsiveness.
- 11 Consider software upgrades for added functionality.
- 12 Employ smart-thermostat technology.
- 13 Utilize remote switch technology to automatically control distributed loads.
- 14 Employ pre-cooling of office space during the off peak times.
- 15 Shift shop and maintenance work to non-critical periods as applicable.
- 16 Delay the start of larger energy-consuming equipment beyond a critical period.
- 17 Utilize water storage to reduce electric demand.
- 18 Pre-fill canals to capacity in order to “coast” through a critical peak period.
- 19 Pre-program two or three demand response strategies that include a variety of the measures noted above. Each strategy, activated by mouse click, would offer a more aggressive response.



Technical Assistance Incentive Application

IMPORTANT – THE CUSTOMER MUST PERFORM THESE STEPS BEFORE ENTERING INTO A CONTRACT WITH AN ENGINEER:

1. The customer must contact its assigned representative or PG&E's Business Customer Center at (800) 468-4743 to verify eligibility.
2. If the demand is greater than or equal to 500 kW at one or more of the facilities, then the customer must send PG&E a letter of intent.
3. PG&E must perform an assessment to determine if the customer's facility has potential to implement demand response.

Application Date:	
-------------------	--

PG&E ELECTRIC CUSTOMER INFORMATION				
Customer Name:				
Mailing Address:				
Mailing City:	Mailing State:		Mailing ZIP:	
Contact Name:	E-Mail:		Phone Number:	

TECHNICAL ASSISTANCE REPORT					
Engineering Firm:			CEC Certified:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address:					
Mailing City:	Mailing State:		Mailing ZIP:		
Name of Engineer:	P.E. License Number:				
E-Mail:	Phone Number:				
Study Date:	Study Cost:	\$ 0	Projected Reduction:	0 kW	P.E. Certification Stamp

TECHNICAL ASSISTANCE INCENTIVE PAYMENT INFORMATION		
Technical Assistance incentive check to be made payable and sent to the following: <input type="checkbox"/> PG&E Customer shown above, or <input type="checkbox"/> Engineering Firm shown above		
Fed Tax ID of party receiving payment:	Tax Status: (check one)	<input type="checkbox"/> Individual/Sole Prop. <input type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Exempt <input type="checkbox"/> Other _____

FACILITY INFORMATION – Location 1					
Facility Name:				PG&E Electric Service ID:	
Facility Address:				Facility City:	
Facility Contact Name:				Facility Contact Phone:	
Facility Type: (office, hospital, etc.)		Number of Floors:		Facility Age: (Years)	
Conditioned Space: (square feet)		Unconditioned Space: (square feet)			

FACILITY INFORMATION – Location 2					
Facility Name:				PG&E Electric Service ID:	
Facility Address:				Facility City:	
Facility Contact Name:				Facility Contact Phone:	
Facility Type: (office, hospital, etc.)		Number of Floors:		Facility Age: (Years)	
Conditioned Space: (square feet)		Unconditioned Space: (square feet)			

FACILITY INFORMATION – Location 3					
Facility Name:				PG&E Electric Service ID:	
Facility Address:				Facility City:	
Facility Contact Name:				Facility Contact Phone:	
Facility Type: (office, hospital, etc.)		Number of Floors:		Facility Age: (Years)	
Conditioned Space: (square feet)		Unconditioned Space: (square feet)			

FACILITY INFORMATION – Location 4					
Facility Name:				PG&E Electric Service ID:	
Facility Address:				Facility City:	
Facility Contact Name:				Facility Contact Phone:	
Facility Type: (office, hospital, etc.)		Number of Floors:		Facility Age: (Years)	
Conditioned Space: (square feet)		Unconditioned Space: (square feet)			

FACILITY INFORMATION – Location 5					
Facility Name:				PG&E Electric Service ID:	
Facility Address:				Facility City:	
Facility Contact Name:				Facility Contact Phone:	
Facility Type: (office, hospital, etc.)		Number of Floors:		Facility Age: (Years)	
Conditioned Space: (square feet)		Unconditioned Space: (square feet)			



Technical Assistance Incentive Application

Description of all measures recommended in study by Professional Technical Assistance Engineering Firm (use second sheet if necessary)

Measure	PG&E Electric Service ID	Measure Description	Type			Projected Reduction	Installed Cost of Measure
			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other		
1			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
2			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
3			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
4			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
5			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
6			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
7			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
8			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
9			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
10			<input type="checkbox"/> Lighting <input type="checkbox"/> Motor	<input type="checkbox"/> AC <input type="checkbox"/> Other	<input type="checkbox"/> AC <input type="checkbox"/> Other	kW	
Totals:						0 kW	\$0

- A. Technical Assistance Incentive based on Total Demand Reduction: \$ 0 (Total demand reduction (kW) x \$100.00/kW)
- B. Cost of Study: \$ 100,000
- C. Maximum Allowed Technical Assistance Incentive Amount \$ 0 (Technical Assistance incentive amount equal to the lesser of [A.] or [B.] or [C.]
- D. Estimated Technical Assistance Incentive Amount: \$ 0

Year Total per pump	\$4,247.14	\$123,103.62	\$563.06	\$2,337.13	\$103.37	\$274.56	\$12,724.29	\$4,186.25	\$510.66	\$3,650.32	\$36,596.57	\$4,038.60	\$53,823.05	
Total All pumps for Year 2006														\$246,158.62

	Pump 2	Pump 4a	Pump 6	Pump 7	Pump 8	Pump 8a	Pump 9	Pump 10	Pump 11	Pump 12	Pump 13a	Pump 14	Pump 15a	Monthly Total
2007	18R432	26540R	2452R5	4637R3	2536T6	5481R1	9B4038	X13953	X05398	91788R	20P911	90779R	M19127	
Jan	\$231.68	\$8,683.13	\$21.21	\$231.50	\$25.54	\$29.33	\$1,029.37	\$1,414.22	\$31.35	\$148.59	\$866.24	\$426.48	\$1,255.99	\$14,394.63
Feb	\$230.47	\$9,293.68	\$19.25	\$150.59	\$11.43	\$20.65	\$979.96	\$1,375.04	\$20.26	\$88.80	\$1,651.26	\$38.53	\$733.45	\$14,613.37
Mar	\$233.81	\$10,066.35	\$19.90	\$237.12	\$11.83	\$19.53	\$1,072.06	\$1,338.05	\$21.29	\$277.10	\$1,677.09	\$23.05	\$978.51	\$15,975.69
April	\$281.09	\$11,999.34	\$19.45	\$304.03	\$12.22	\$25.14	\$1,125.63	\$1,405.19	\$20.88	\$345.24	\$4,186.28	\$47.22	\$1,444.88	\$21,216.59
May	\$879.30	\$15,828.04	\$18.79	\$126.08	\$12.22	\$25.85	\$1,025.34	\$1,585.35	\$24.14	\$137.94	\$7,359.27	\$28.22	\$8,238.85	\$35,289.39
June	\$528.32	\$11,576.19	\$18.79	\$668.71	\$11.44	\$135.49	\$1,484.23	\$1,711.62	\$443.15	\$1,882.07		\$2,417.73	\$11,441.88	\$32,319.62
July	\$1,254.08	\$15,848.24	\$20.02	\$315.10	\$12.22	\$106.50	\$1,352.50	\$1,631.40	\$23.93	\$1,994.25	\$7,380.67	\$428.94	\$10,007.34	\$40,375.19
August	\$955.99	\$15,652.57	\$19.43	\$216.14	\$11.83	\$25.48	\$1,355.53	\$1,647.94	\$20.36	\$2,062.04	\$7,556.40	\$25.50	\$9,906.26	\$39,455.47
September	\$818.64	\$12,000.22	\$20.45	\$183.81	\$11.43		\$1,357.99	\$1,487.84	\$382.56	\$906.55	\$6,995.05	\$23.03	\$8,745.19	\$32,932.76
October	\$564.25	\$12,575.60	\$21.38	\$99.56		\$66.94	\$7.72	\$1,488.70	\$25.67	\$38.31	\$6,687.31	\$24.40		\$21,599.84
November	\$241.66	\$9,822.65	\$20.07	\$179.04	\$27.54	\$25.52	\$7.88	\$1,399.80	\$21.04	\$19.38	\$3,375.19	\$24.63	\$1,337.45	\$16,501.85
December	\$233.72	\$8,872.20	\$20.00	\$121.25	\$12.02	\$20.66	\$8.52	\$1,362.31	\$23.08	\$17.73	\$1,035.89	\$29.91	\$609.56	\$12,366.85
Year Total per pump	\$6,453.01	\$142,218.21	\$238.74	\$2,832.93	\$159.72	\$501.09	\$10,806.73	\$17,847.46	\$1,057.71	\$7,918.00	\$48,770.65	\$3,537.64	\$54,699.36	
Total All pumps for Year 2007														\$297,041.25

	Pump 2	Pump 4a	Pump 6	Pump 7	Pump 8	Pump 8a	Pump 9	Pump 10	Pump 11	Pump 12	Pump 13a	Pump 14	Pump 15a	Pump 16	Monthly Total
2008	18R432	26540R	2452R5	4637R3	2536T6	5481R1	9B4038	X13953	X05398	91788R	20P911	90779R	M19127	1003644202	
Jan	\$235.16	\$7,478.33	\$19.15	\$196.52	\$13.72	\$21.18	\$9.25	\$1,243.00	\$18.51	\$19.25	\$752.19	\$25.38	\$1,273.97		\$11,305.61
Feb	\$260.23	\$8,385.68	\$21.71	\$134.93		\$20.03	\$8.58	\$1,416.61	\$25.48	\$20.22	\$466.69	\$23.16	\$1,118.81	\$1,150.08	\$11,902.13
Mar	\$260.77	\$7,757.49	\$20.02	\$229.42		\$24.43	\$9.47	\$1,279.89	\$21.13	\$129.32	\$442.95	\$28.35	\$3,700.35	\$1,108.73	\$13,903.59
April	\$274.08	\$10,540.76	\$22.38	\$136.60	\$13.75	\$23.79	\$9.65	\$1,348.23	\$23.15	\$21.01	\$412.34	\$29.46	\$7,733.06	\$1,161.05	\$20,588.26
May	\$530.69	\$15,226.72	\$19.79	\$139.89	\$17.83	\$57.80	\$13.45	\$1,902.85	\$26.24	\$58.30	\$139.73	\$35.74	\$10,991.11		\$29,160.14
June	\$731.54	\$14,644.90	\$20.44		\$12.42	\$67.91	\$9.46	\$1,647.68	\$25.17	\$35.56	\$129.86	\$35.76	\$13,032.16	\$4,938.91	\$30,392.86
July	\$2,382.32	\$11,478.43	\$22.34	\$261.12	\$13.75	\$734.47	\$9.24	\$1,628.11	\$216.09	\$462.50		\$1,333.75	\$11,286.90	\$2,087.77	\$29,829.02
August	\$1,647.54	\$14,331.75	\$20.62	\$160.63	\$14.92	\$28.78	\$8.58	\$1,780.95	\$33.69	\$62.74	\$143.87	\$154.14	\$14,380.40		\$32,768.61
September	\$408.40	\$13,704.15	\$19.79	\$121.35		\$30.84	\$10.00	\$1,532.59	\$23.23	\$20.66	\$131.97	\$33.76	\$14,257.88	\$9,161.43	\$30,294.62
October	\$353.81	\$5,612.13	\$19.85		\$25.29	\$30.37	\$9.52	\$1,788.21	\$23.48	\$21.12		\$33.38	\$13,281.61	\$1,227.21	\$21,198.77
November															\$0.00
December															\$0.00
Year Total per pump	\$7,084.54	\$109,160.34	\$206.09	\$1,380.46	\$111.68	\$1,039.60	\$97.20	\$15,568.12	\$436.17	\$850.68	\$2,619.60	\$1,732.88	\$91,056.25		
Total All pumps for Year 2008															\$231,343.61

	Pump 2	Pump 4a	Pump 6	Pump 7	Pump 8	Pump 8a	Pump 9	Pump 10	Pump 11	Pump 12	Pump 13a	Pump 14	Pump 15a	Pump 16	Monthly Total
2009	18R432	26540R	2452R5	4637R3	2536T6	5481R1	9B4038	X13953	X05398	91788R	20P911	90779R	M19127	1003644202	
Jan	\$754.34	\$932.77	\$19.84	\$239.45		\$21.67	\$1,066.75	\$1,349.71	\$21.23	\$19.95		\$28.40	\$433.87	\$6,456.70	\$11,344.68
Feb	\$269.95	\$1,603.18	\$22.41	\$257.69	\$14.64	\$23.83	\$1,023.01	\$1,510.59	\$23.79	\$23.92		\$30.78	\$323.49	\$7,204.99	\$12,332.27
Mar	\$429.30	\$13,921.98	\$20.51	\$372.88		\$34.11	\$1,238.92	\$1,667.52	\$25.47	\$2,270.97		\$998.92	\$5,489.40	\$6,952.31	\$33,422.29
April	\$332.51	\$8,806.53	\$20.64	\$380.09		\$28.01	\$902.45	\$1,197.56	\$24.85	\$1,018.95	\$332.27	\$739.60	\$1,731.08	\$6,613.13	\$22,127.67
May	\$232.87	\$1,283.30	\$41.98	\$161.61		\$20.45	\$1,015.84	\$1,164.29	\$23.24	\$23.97	\$158.07	\$28.14	\$391.39	\$11,151.97	\$15,697.12
June	\$424.37		\$28.89		\$13.75		\$1,544.22	\$948.75	\$145.41	\$270.69	\$224.26	\$354.73	\$6,666.16	\$10,626.86	\$21,248.09
July	\$151.36	\$35,544.42	\$24.13	\$621.36	\$16.35	\$35.14			\$6.29		\$272.40	\$873.17	\$9,308.69		\$46,853.31