

INTEGRATED RESOURCE PLAN – ANNUAL REPORT

Date: 6-4-08

Customers who qualify to submit a Integrated Resource Plan (IRP) to fulfill their IRP requirement must provide an annual update report. Such report shall provide a status update comparing customer achievements to the targeted action items set forth in the initial Plan. Measured values are preferred, but reasonable estimates are acceptable.

To meet your IRP annual reporting requirement, please complete the following:

Customer Contact Information:

(Please provide contact information for your organization. Contact person should be able to answer questions concerning the plan)

Customer Name:	Power and Water Resources Pooling Authority (PWRPA)
Address:	P.O. Box 299, Tracy, CA 95378
Contact Person:	Kent Palmerton, GM of PWRPA; Stuart Robertson, Robertson-Bryan, Inc. (RBI) Cori Pritchard, Robertson-Bryan, Inc. (RBI)
Title:	Kent Palmerton, General Manager of PWRPA Stuart Robertson, PE, President of RBI Cori Pritchard, Operations Analyst, RBI
Phone Number:	Kent Palmerton, 916-483-5368 Stuart Robertson, 916-687-7799 Cori Pritchard, 916-405-8923
E-Mail Address:	Kent Palmerton, kent@wkpalmerton.com Stuart Robertson, stuart@robertson-bryan.com Cori Pritchard, cori@robertson-bryan.com
Website:	www.pwrpa.org

Initial IRP – Submission Date:	6/10/08
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Capacity and Energy Data for Previous 5 Years:

District	2003 kWh	2004 kWh	2005 kWh	2006 kWh	2007 kWh
Arvin-Edison WSD	111,376,858	154,494,062	98,071,983	99,552,770	170,485,749
Banta-Carbona ID	11,425,582	12,046,560	10,804,037	9,783,252	12,953,530
Byron-Bethany ID	2,851,669	2,635,762	2,542,663	2,250,808	3,292,044
Cawelo WD	27,899,877	25,487,661	29,804,652	36,140,869	22,805,336
Glenn-Colusa ID	9,407,367	9,950,754	9,884,037	10,847,837	12,470,271
James ID	3,460,031	3,714,067	2,115,487	1,768,755	3,405,138
Lower Tule River ID	4,017,801	2,912,214	10,648,978	10,728,942	1,752,705
Provident/Princeton ID	4,548,222	4,708,338	4,231,859	4,106,925	4,938,545
Reclamation District 108	5,576,593	5,491,324	4,818,984	5,059,659	3,821,505
Santa Clara Valley WD	15,311,580	13,420,038	14,742,612	15,167,482	18,982,003
Sonoma County WA	81,819,542	66,596,693	60,672,944	56,704,113	49,982,003
The West Side ID	4,492,091	4,621,729	3,869,962	3,986,134	5,599,740
West Stanislaus ID	9,528,378	13,037,759	8,001,822	8,323,134	13,101,408
Westlands WD	104,641,748	113,274,005	39,752,612	14,464,527	116,017,444
PWRPA	396,357,339	432,390,966	299,962,632	278,885,207	439,607,421

*A Meter Data Management system was established in 2005 called SAMBA to track kWh and kW for each hour in the year.

District	2005 kW	2006 kW	2007 kW
Arvin-Edison WSD	23,966	25,703	32,227
Banta-Carbona ID	3,495	3,581	3,512
Byron-Bethany ID	1,499	1,185	1,223
Cawelo WD	8,549	12,582	14,420
Glenn-Colusa ID	3,111	3,600	3,600
James ID	1,012	1,145	1,026
Lower Tule River ID	2,242	2,379	1,741
Provident/Princeton	1,764	1,636	1,598
Reclamation District 108	4,753	2,405	2,931
Santa Clara Valley WD	4,018	3,829	9,928
Sonoma County WA	12,505	13,519	11,600
The West Side ID	1,507	1,579	1,726
West Stanislaus ID	3,927	3,402	4,715
Westlands WD	18,783	6,065	32,393
PWRPA	71,208	61,809	96,916
Coincidence Peak			

* Prior to 2005, information was less reliable to track the peak kW, therefore, we are showing the peak kW for 2005 and onward.

Future Energy Service Projections (Revise as necessary):

(Please provide a load forecast to show expected growth or expansion; or a narrative statement concerning expected future growth)

Load Forecast:

PWRPA:

Year	Peak Demand (kW)	Total Energy (kWh)
2009	99,000	423,623,400
2010	101,000	432,180,000
2011	103,000	441,000,000
2012	104,000	450,000,000
2013	106,000	459,183,673

Assumptions: Current estimates are assuming dry hydro-year conditions. Peak demands (kW) and energy (kWh) would likely be significantly less during average and wet hydro-year conditions.

or Narrative Statement:

PWRPA: is a Joint Power Authority serving 14 California Water purveyors from Willows in the Northern Sacramento Valley to the Bakersfield area in the Southern San Joaquin Valley. Annual energy use and peak demands are inversely related to California’s rainfall and the type of hydropower production year. In addition, microclimates and hydrology differ greatly with the various Water Agencies throughout Western’s Sierra Nevada Region. In a wet year, like 2006, power use is reduced due to lower power demands for water pumping. Conversely, in a dry year like 2007, demands are much higher. At this point, PWRPA is endeavoring to provide accurate forecasting for wet, normal and dry years, based on a model that uses the 78-year historical CVP water data.

Load growth of PWRPA and its participants is principally due to water source changes forced by regulatory actions and is generally not due to increased service demands.

District Specific:

- **Arvin Edison:** The District anticipates increasing its connected load slightly over the next three years, possibly by as much as 3MW, but the utilization of peak loads in aggregate areas not expected to increase proportionately. In other words, new facilities will be used often in lieu of other existing facilities rather than additively.
- **Banta Carbona’s** demand is anticipated to stay flat for the next four years. No future growth is anticipated at this time.
- **Glenn-Colusa’s** future energy projection increases are due to the increased operation of ground water wells to meet irrigation demands.
- **Provident/Princeton** anticipates that energy needs for the 2009-2012 time period will remain fairly constant in the 4,500,000 kWh energy range due to the fact that District acreage totals and cropping patterns will not change. Soil types in the Districts are such that only certain crops can be grown on the land. This being the case, water and energy usage will remain fairly constant.
- **Santa Clara Valley’s** peak demand in this table is the estimated sum of all the non-coincidental maximum peak demand in the respective years at each individual District facility. The forecasted peak demand includes 3,250 kW demand for Coyote Pumping Plant that may or may not occur based on the operational needs derived from the raw water contractual supply and demand.
- **The West Side ID** forecasts an annual increase of approximately 10% due to a slow growth measure for the City of Tracy, cropping pattern changes, and farm acreage increases due to improved farm commodity prices.

- **West Stanislaus ID** energy use is tied to weather patterns and environmental actions which governs our federal irrigation water supply. Decreases in federal irrigation water forces them to pump more river irrigation water.
- **WWD** continues its Water Conservation Program, which began in 1972. In 1999 the District updated its Water Conservation Plan, and currently has a USBR approved Water Conservation Plan. The Objectives of the plan are to:
 - Increase seasonal application efficiency
 - Increase distribution uniformity
 - Increase crop yields
 - Decrease deep percolation
 - Decrease the effects of soil salinity

Included in the Program is a pump test program, which is designed to keep pumps and motors at peak efficiency in terms of electric power consumption and maximum delivery capacity. Under the pump test program, pumps are selected for overhaul if the efficiency is declining toward 60% efficiency or less. Increases in efficiency average approximately 10%. In 2007 the District overhauled 52 pumps representing 6,385 H.P (4,761 kW).

Future Resource Planning (Revise as necessary):

(Please provide a narrative statement that addresses how your organization plans to meet its future requirements using Demand Side Management techniques, new renewable resources or other programs that will provide it with electricity in the most efficient and environmentally sound manner)

PWRPA: PWRPA is participating in a 5 MW share of the proposed 250 MW Lodi gas power plant expansion targeted for completion in 2010. It has an option to continue 6 MW of on-going renewable production at the Sonoma County Landfill and has incorporated 1 MW of photovoltaic solar. The Authority has a demand side-management program to meet resource adequacy with up to 15 percent demand curtailment in extreme events. PWRPA recently initiated investigation of solar resources development throughout its region in compliance with its renewable portfolio standard.

District Specific:

- **Arvin Edison:** New groundwater wells are currently being completed, and the District has begun a project to increase reverse flow capabilities in its South Canal. Energy use benefits from source-switching to the South Canal in reverse flow are yet to be determined. The District intends to increase its efforts to evaluate and install VFDs at as many pumping plants as is feasible within the next four years. In the first quarter of 2008, the district will replace all six energy meters with interval meters. The new interval-metered sites are being added to those loads already monitored, and a web-based load monitoring system (expected completion in 2008) is being created to replace the near-real-time load monitoring program it has used over the last ten years. Existing on-canal balancing facilities have recently been expanded, and additional sites are being considered. The District is also presently conducting a survey of low head generation possibilities in its canal systems.
- **Byron-Bethany** continues to research opportunities for wind and solar power. The District performs ongoing maintenance and upgrades as necessary.

- **Banta-Carbona** continues to monitor the cost-effectiveness of adding more renewable generation. The District used 59% renewable energy (7,595,310 kWh) during 2007 and 41% conventional energy (5,358,220 kWh).
- **Cawelo** only installs high efficiency motors and controls all motors with SCADA. This operational program reduces unneeded pumping and allows complete control of the distribution system. All future construction will continue to use the most efficient equipment and controls that are available for these types of operations.
- **James ID** is planning to further expand an irrigation water regulation basin by an additional 35 acre-feet to reduce on-peak pumping of well pumps. The district is planning on repairing 5 deep-well pumps for increased operating efficiency. New deep well pumps that the district is planning to install will have premium efficient motors on the pumps.
- **Glenn-Colusa:** Received grant funds from United States Department of the Interior for a Water Conservation Field Services Program that will be used for canal level and flow control using irrigation training, and research center flap gates for automatic upstream water level control. The District also received funds from Proposition 50 in the form of a Water Use Efficiency Grant for GCID's Water Conservation and Management Project which will allow the District to update and upgrade current SCADA project.
- **Lower Tule:** While project future energy use is dependent on hydrologic and weather conditions, the Cross Valley Canal (CVC) should maintain current pumping demands for the foreseeable future. The CVC is an intricate part of both agricultural and urban water needs with both entities continually competing for space in the CVC. More efficient operations through the use of telemetry and efficiency programs have helped to reduce real-time energy demands and make the existing pumping more efficient. Staff will continue to monitor the energy used for water pumping operations. LTRID received a Proposition 13 Grant for Phase II of the CVC Pool 1 Liner raising project and an 800 cfs bi-directional intertie between the Cross Valley Canal and the Friant-Kern Canal was received in May, 2002. The benefits of this project include:
 - allows Pool 1 to float off Pool 28 of the California Aqueduct
 - provides gravity flow capacity from the CVC into the Aqueduct
 - reduced pumping costs
 - links the Cross Valley Canal with the Friant Kern Canal for more efficient use of the water and power. Work commenced on this project in 2007
- **Provident/Princeton** have consolidated three existing pumping plants on the Sacramento River into one new state of the art pumping plant with fish friendly fish screens and new pumps and motors. Two of the eight new pumps and motors are Variable Frequency Drive motors which help increase the Districts conservation of energy and water. The Districts have also begun installation of a Supervisory Control and Data Acquisition (SCADA) system to facilitate monitoring of canals and gates leading to increased efficiency and conservations.
- **Reclamation District 108:** Initiated a Water Conservation Program in 2007 to reduce drain water and subsequently the pumping to remove this water from the District. The program was very successful, reducing energy use by nearly 2,000,000 kWh. The program has been approved for 2008. The District has an ongoing relationship with the USBR Mid-Pacific region and has used their field conservation grants to improve system efficiency through automating much of our delivery system. Additionally, the District will complete a grant from Cal-Fed for \$300,000 to add long-crested weirs to 30 miles of concrete lined canals to reduce system spill and therefore pumping. The District has also sponsored the local Resource Conservation District's "mobile lab" which performs field distribution uniformity tests to help improve irrigation efficiency. RD108 recently consolidated three pumping plants under one new load for PWRPA service.

- **Santa Clara Valley** is in the process of developing a written energy management plan that integrates its past successful practices, its Green Business practices and the recently developed Public Purpose Program of the Power and Water Resources Pooling Authority (PWRPA – PPP). It is projected that one of PWRPA’s PPP may be an energy audit of Santa Clara Valley Water District’s operational practices.
- **Sonoma County:** The Agency has undergone and continues to undergo significant changes. The Agency implemented a Sustainability Program in 2006. As part of the program, the Agency actively researches energy efficient technologies and innovative methods for carrying out Agency activities that will provide energy cost savings. The Agency will evaluate groundwater, recycled water, water conservation, and alternate sources of energy, such as bio-diesel, wind and solar.
 - In 2007, the Agency finished the construction of the two wastewater photovoltaic systems, and implemented a mandatory 15% water reduction for regulatory purposes. The Agency plans to purchase energy efficient transformers, motors, and electrical equipment that will help monitor energy consumption, install energy efficient ballasts and lamps at various sites and conduct pump efficiency testing.
 - In the next five years the Agency is planning to replace Agency vehicles with some form of “green” vehicle (electric, hybrid, bio-diesel, ethanol, or natural gas); construct a new 15 mile transmission line in 2011/12; install a UV disinfection system in Guernville in 2009/10; and install an irrigation system in Guernville.
 - The Agency will continue to replace collection systems and build pump stations as funds become available due to regulatory requirements and to help improve system efficiencies; build pipelines, tanks, pump stations, and develop wells to met water demands; and promote water conservation.
- **The West Side:** The District will continue to monitor the pumping plant including the pumps, motors, and electric service and make necessary repairs and adjustments. Both irrigation and pump efficiency tests are scheduled in 2008. Major projects for 2008 are:
 1. A comprehensive sediment control program will be in place in 2008 with penalties enforced for violations.
 2. The District will continue to work with its growers in order to educate them on the importance of advanced power scheduling.
- **West Stanislaus:** The Districts systems are operating efficiently. No increased service or system modifications are expected or needed.

Progress Report of Action Items Implemented Over the Last Year:

(Please provide an update of any Action Items set forth in the initial IRP which was implemented over the last year)

	Demand Side Management Activities	Capacity Savings per year (kW)	Energy Savings per year (kWh)	Planned Expenditure per year (\$)	Actual Expenditure per year (\$)
PWRPA	Nearing completion of replacing all energy meters with interval recording telemetered meters and implemented demand response criteria.	n/a	n/a	TBA	TBA
District Specific:					
Byron-Bethany	Canal Lining Project-2007 CIP	n/a	70,307	Unknown	170,817

	Pipeline Replacement	n/a	34,307	Unknown	71,000
	Pump/Motor Rehabilitation	n/a	5,500	Unknown	55,000
	Flow Meter Replacement	n/a		Unknown	10,000
	Electrical Switchgear Replacement	n/a	5,500	Unknown	55,000
	SCADA Upgrade	n/a	Unknown	Unknown	150,000
	VFD/MCC Installation				1,000,000
Cawelo	Replaced Pumping Unit	0	1,000	50,000	53,800
James	Irrigation Pump Retrofit	14	34,800	15,000	14,949
Glenn-Colusa	Continued water conservation practices	200	620,000	20,000	20,000
	Incentive Credits of 15% of water rate for converting to drip or micro-spray irrigation methods.	140	21,560	Unknown	Unknown
Santa Clara Valley	Energy Efficient Lights in the Maintenance Buildings	2	11,800	750	500
	Energy Efficient Lights and motion sensors in the Crest building parking garage.	3	11,800	1,350	250
Sonoma County	Continued to use a computerized predictive and preventive maintenance program to maximize equipment efficiencies throughout systems	n/a	Unknown	Unknown	Unknown
	Installed more water meters to assist in locating leaks	n/a	Unknown	Unknown	Unknown
	Continued to remove slit from water ponds to improve percolation for production pumps	n/a	Unknown	Unknown	Unknown
	Continued improvement of the telemetry control and monitoring systems for all water and wastewater sites to allow Agency system operators to manage the systems in a more efficient manner.	n/a	Unknown	Unknown	Unknown
	Purchased energy efficient pumps, motors, and transformers for our pumping facilities and booster stations	n/a	Unknown	Unknown	Unknown
	Install motion controlled lighting system in office	n/a	410		Installed in Dec 2007. Estimated 4,000 kWh savings.
	Purchased plug in hybrid	n/a	n/a	Unknown	Unknown
The West Side	Repairs to pump impellers	n/a	Unknown		10,000
	Leaking pipeline replaced	n/a	Unknown	Unknown	47,000
	Replace Suction pipe	n/a	Unknown	Unknown	65,300
	After efficiency tests ran on VFD pumps, improvements made	n/a	Unknown	Unknown	158,700

	Renewable Energy Activities	Capacity per year (kW)	Energy per year (kWh)	Actual Expenditure per year (\$)
District Specific:				
Arvin Edison	Began conducting a survey of low head generation possibilities in its North Canal in 2007, will finish in 2008	TBA	TBA	TBA
Santa Clara Valley	Solar System at Almaden HQ Campus	205	327,753	5,000
	Anderson hydro facility	460	523,937	15,000
Sonoma County	Completed construction of solar panels at office complex and two wastewater facilities. Avoided 1.4 million pounds of greenhouse gas CO2 in 2007 and generated over 2,600 MWh of solar energy	2,000	2,600,000	Unknown
	Use more bio-diesel fuel for Agency vehicles, researching alternatives ways to save energy	n/a	n/a	Unknown

Revisions to any Action Items to be Implemented Over the Next 5 Years:

(Please note any changes to Action Items if different from how they were reported in the initial IRP)

	Proposed Items	Begin Date	End Date	Est. Capacity savings per year (kW)	Est. Energy savings per year (kWh)	Est. Cost savings per year (\$)	Est. Cost to Implement
District Specific:							
Arvin Edison	Began a project to increase reverse flow capabilities in the South Canal	2008	TBA	Unknown	Unknown	Unknown	Unknown
Cawelo	Pump replacement when needed	Sept 2008	March 2009	0	1,000/ea	Minimal	53,000/ea
Santa Clara Valley	boiler, furnace, air conditioning retrofits	2009	2010	Unknown	Unknown	Unknown	Unknown
	Insulation of air ducts, boilers, pipes, etc.	2009	2009	Unknown	Unknown	Unknown	Unknown
	Energy Audits	2009	2009	Unknown	Unknown	Unknown	Unknown
	Use of infrared head detection equipment	2008	2010	Unknown	Unknown	Unknown	Unknown
	Energy Efficient Lighting	2008	2009	Unknown	Unknown	Unknown	Unknown
	Equipment inspection programs	2008	2009	Unknown	Unknown	Unknown	Unknown

Notes/Additional Information:

District Specific:

- **Cawelo:** Maintaining and repairing pumping units when energy use begins to change with no other conditions change our best method to identify if a pump is worn and need of repair or replacement.
- **Glenn-Colusa:** The District currently has 18 gravity diversions sites located throughout the District. Recaptured drain water reduces the amount of water diverted through the District's main pump station. The average drain water recaptured over the past five years is 91,722 acre feet of water. Cost to maintain and operate: \$12,000 annually, estimated energy saved is 1,072,147 kWh, and estimated dollar savings per year is \$47,695.
- **Santa Clara Valley:**
 - 2007 Accomplishments: The District received recognitions by Bay Area Breathe California Clean Air Award, the USEPA's Water efficiency Leader Award, Sustainable Silicon Valley and California Climate Registry Carrot CO2 reduction reporting, green business certification, and the initiation of development of a Climate Change Action Plan.
 - Climate Change – Green House Gases (GHG) Reporting/reduction: The District commenced the reporting of GHG in 2007 using 2006 data. The District board directed staff to develop a carbon neutrality plan that will include monitoring of GHG emissions due to generation of electrical power and future plans for reduction.
- **West Stanislaus:** Pumps along our lift canals are rebuilt on an as needed basis. In 2007 13 pumps were rebuilt along the main canal at a cost of \$110,000. In 2008 we have budgeted \$130,000 for on going maintenance.
- **Westlands** pump test and overhaul program was estimated to cost \$238,200 for 2007, but actually cost \$322,201. The District has budgeted an additional \$220,000 for overhauls.