

**INTEGRATED RESOURCE PLAN (IRP)**

Date:

8/15/08

IRPs shall consider all reasonable opportunities to meet future energy resource requirements using Demand Side Management techniques, new renewable resources and other programs that will provide retail consumers with electricity at the lowest possible costs, and minimize, to the extent practicable, adverse environmental effects.

To meet your Integrated Resource Planning reporting requirement, complete the following. Unaddressed items will be deemed incomplete and not eligible for approval. Western reserves the right to require customers to provide any supporting back-up data used to support and develop this report.

**Customer Contact Information:**

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

<b>Customer Name:</b>	<b>Turlock Irrigation District</b>
<b>Address:</b>	<b>Post Office Box 949, Turlock, CA 95381-0949</b>
<b>Contact Person:</b>	<b>Willie G. Manuel</b>
<b>Title:</b>	<b>Resource Planning Manager</b>
<b>Phone Number:</b>	<b>(209) 883-8348</b>
<b>E-Mail Address:</b>	<b>wgmanuel@tid.org</b>
<b>Website:</b>	<b>www.tid.org</b>

**Type of Customer:**

(Check one as applicable)

<input type="checkbox"/>	<b>Municipal</b>
<input type="checkbox"/>	<b>State</b>
<input type="checkbox"/>	<b>Federal</b>
<input checked="" type="checkbox"/>	<b>Irrigation District</b>
<input type="checkbox"/>	<b>Water District</b>
<input type="checkbox"/>	<b>Other (Specify) _____</b>

**Capacity and Energy Data for Previous 5 Years:**

(Provide peak demand and total energy for past 5 years. Western can assist with obtaining this data if needed)

<b>Calendar Year</b>	<b>Peak Demand (kW)</b>	<b>Total Energy (kWh)</b>
<b>2003</b>	<b>406,314</b>	<b>1,673,362,455</b>
<b>2004</b>	<b>437,126</b>	<b>1,881,841,066</b>
<b>2005</b>	<b>476,110</b>	<b>1,945,820,487</b>
<b>2006</b>	<b>533,846</b>	<b>2,037,172,993</b>
<b>2007</b>	<b>516,200</b>	<b>2,091,013,575</b>

**Identification of Resource Options (considerations that may be used to develop potential options include cost, market potential, consumer preferences, environmental impacts, demand or energy impacts, implementation issues, revenue impacts, and commercial availability):**

Supply-side options:

(Including, but not limited to: purchase power contracts and conventional and renewable generation)

<b>List existing supply-side options:</b>	<b>List future supply-side resource options considered and evaluated:</b>
<b>See Attachment A – Supply-Side Options</b>	

Demand-side options:

<b>List existing demand-side options:</b>	<b>List future demand-side resource options considered and evaluated:</b>
<b>See Attachment B – Demand-Side Options</b>	

Resource options chosen:

(Provide a narrative statement that describes the option chosen and clearly demonstrates that decisions were based on a reasonable analysis of the options)

**When evaluating resource and demand side options, TID considers several factors such as cost, operating flexibility, the type of technology (i.e. whether it is proven and commercially available resource or technology) environmental impacts, TID policies affecting power supply (i.e. TID’s Renewable Portfolio Standard), applicable NERC and WECC requirements, and applicable state and federal mandates (i.e. AB 2021, SB 1368, AB 32). This approach has ensured that TID complies with all applicable mandates and still maintain the lowest electric rates in California.**

**TID has chosen to employ demand-side programs that are determined to be cost effective and that would yield substantial demand and energy savings determined using widely used methodologies.**

**In order to help reduce its greenhouse gas emissions and meet its renewable resource requirements, TID is in the process of installing a 1.2 MW fuel cell project and is in the process of acquiring approximately 100 MW of power from a wind generation facility. Both these resources are expected to be relatively cost competitive.**

**Action Plan:**

**Specific Action Items to be Implemented Over the Next 5 Years:**

(Lists are not meant to be inclusive, complete and provide other action items as applicable)

**Energy Consumption Improvements:**

Proposed Items	Begin Date	End Date	Est. kW capacity savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Boiler, Furnace, air conditioning retrofits	<b>See Attachment B</b>				
Weatherization, insulation					
storm windows/doors					
Insulation of air ducts, boilers, pipes, etc.					
Clock thermostats and equipment system timers					
Heat pumps					
Energy audits					
Public education programs					
Loan arrangements or rebate program for energy efficient equipment					
Use of infrared heat detection equipment					
Energy efficient lighting					
Equipment inspection programs					
Electric motor replacements					
Upgrading of distribution lines/substation equipment					
Power factor improvement					
Other:					

**Renewable Energy Activities:**

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Solar thermal/photovoltaic projects	<b>See Attachment A &amp; Attachment B</b>				
Day lighting technologies					
Active solar installations					
Active solar installations					
Biomass/refuse-derived fuels					
Geothermal projects					
Small-scale hydro projects					
Other:					

**Load Management Techniques:**

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Load management devices/systems					
Demand control techniques and equipment					
Smart meters or automated equipment					
Time-of-use meters	TID has used TOU meters on certain rate classes for several years, but does not measure savings resulting from the use of TOU meters.				
Other:					

**Rate Design Improvements:**

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Cost-of-service pricing	TID rates are based on cost-of-service principles, but does not measure savings based on such rates.				
Elimination of declining block rates					
Time-of-day rates	TID has had TOD rates on several rate classes for several years, but does not measure savings based on these rates.				
Seasonal rates	TID has had seasonal rates on most rate classes for several years, but does not measure savings based on these rates.				
Interruptible rates					
Other:					

**Agricultural Improvements:**

Proposed Items	Begin Date	End Date	Est. kW savings per year	Est. kWh savings per year	Milestones to evaluate accomplishments
Irrigation pump utilization/scheduling	<b>See Attachment B</b>				
Irrigation pump testing or efficiency improvements					
Electric motor replacement					
Photovoltaic pumping systems					
Ditch lining or piping					
Laser land leveling					
Pumpback systems					
Water conservation programs					
Other:					

**Environmental Effects:**

(Provide a narrative statement that sets forth the efforts taken to minimize adverse environmental effects of new resource acquisitions)

**As discussed in the narrative on Resource options chosen and Attachment A, TID considers several factors in evaluating resource options, including environmental impacts of a resource option, and how the resource will help TID achieve its Renewable Portfolio Standard (RPS), Energy Efficiency Targets, and other environmentally related state and federal mandates such as AB2021, SB1368, and AB32. For example, in order to meet its RPS and reduce greenhouse gas emissions, TID is in the process of installing a 1.2 megawatt (MW) fuel cell project and is in the process of acquiring approximately 100 MW of power from a wind generation facility. These are in addition to TID's existing renewable and/or environmentally friendly resources consisting of small hydro, large hydro, and geothermal generation, and from power contracts sourced from renewable and/or environmentally friendly resources.**

**TID has also adopted aggressive efficiency goals and provides some of the highest rebate levels in California for the installation solar photovoltaic systems, both of which reduce peak load and help reduce the need for additional supply-side resources (see Attachment B for more details).**

**TID's Solar Rebate Program to date has resulted in 21 customer solar pv installations totaling 105 kW.**

**Public Participation:**

(Customers must provide ample opportunity for full public participation in preparing and developing an IRP. Provide a brief description of public involvement activities, including how information was gathered from the public, how public concerns were identified, how information was shared with the public, and how it responded to the public comments)

**Significant new resource additions are generally approved by TID's Board of Directors during regularly scheduled public meeting that allows for public participation. Furthermore, for new generation additions, those additions go through applicable state and local permitting processes that allow for public participation. Turlock Irrigation District's Energy Efficiency Goals were also adopted by the TID Board of Directors at a regularly scheduled public board meeting.**

**Future Energy Service Projections:**

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

<b>Calendar Year</b>	<b>Peak Demand (kW)</b>	<b>Total Energy (kWh)</b>
<b>2009</b>	<b>544,900</b>	<b>2,227,491,510</b>
<b>2010</b>	<b>557,141</b>	<b>2,279,561,606</b>
<b>2011</b>	<b>572,796</b>	<b>2,357,849,202</b>
<b>2012</b>	<b>585,161</b>	<b>2,409,670,721</b>
<b>2013</b>	<b>597,543</b>	<b>2,461,175,123</b>

or Narrative Statement:

N/A

**Measurement Strategies:**

(Provide a brief description of measurement strategies for options identified in the IRP to determine whether the IRP's objectives are being met. These validation methods must include identification of the baseline from which a customer will measure the benefits of its IRP implementation)

**TID regularly measures its actual energy efficiency savings using widely used methodologies (such as utility staff pre- and post-installation inspections, third party engineering estimates of energy savings, and random sampling/audits of small commercial and residential program for verification of installation and energy savings) to monitor its progress toward meeting its energy efficiency goals. TID's 2007 savings from energy efficiency programs was approximately 9.2 million kilowatt hours. The savings achieved, program cost effectiveness and expenditures are reported periodically to TID's Board and state agencies. Beginning in 2008, this report will also include an independent, third party evaluation that measures and verifies the reported energy efficiency savings. TID plans to revisit the adopted goals on a periodic basis and make adjustment to future goals as necessary.**

**TID's adopted RPS requires meeting 20% of its power needs with renewable resources (excluding large hydro) by 2017 and includes target yearly additions. TID's 2007 energy mix included approximately 5% from renewable resources. TID reviews its actual power supply mix on an annual basis to determine how much came from renewable resources, and submits this information to the California Energy Commission as part of their Power Source Disclosure (SB 1305) Program.**

**Other Information:**

(Provide/attach additional information if necessary)

**IRP Approval:**

(Indicate that all of the IRP requirements have been met by having the responsible official sign below; or provide documentation that the IRP has been approved by the appropriate governing body)

**Tony Gonçalves**  
(Name - Print or type)

(Signature)

**Utility Analyst II (Resource Planning)**  
(Title)

August 15, 2008

(Date)

## Attachment A Supply-Side Options Turlock Irrigation District

### TID Peak Electric Load Resource Balance at Westley (MW)

Year	2009	2010	2011	2012	2013
<b>Hydro</b>					
Don Pedro <sup>1</sup>	133.5	133.5	133.5	133.5	133.5
La Grange <sup>1</sup>	1.7	1.7	1.7	1.7	1.7
Hickman <sup>1</sup>	1.1	1.1	1.1	1.1	1.1
Turlock Lake <sup>1</sup>	3.1	3.1	3.1	3.1	3.1
Upper Dawson <sup>1</sup>	5.7	5.7	5.7	5.7	5.7
<b>Total Hydro</b>	<b>145.0</b>	<b>145.0</b>	<b>145.0</b>	<b>145.0</b>	<b>145.0</b>
<b>Coal</b>					
Boardman	56.4	56.4	56.4	56.4	56.4
<b>Geothermal</b>					
NCPA	6.9	6.7	6.4	6.2	6.1
<b>Natural Gas</b>					
Walnut	51.6	51.6	51.6	51.6	51.6
Almond <sup>2</sup>	49.3	49.3	49.3	49.3	49.3
WEC <sup>2</sup>	238.1	238.1	238.1	238.1	238.1
<b>Total Natural Gas</b>	<b>339.0</b>	<b>339.0</b>	<b>339.0</b>	<b>339.0</b>	<b>339.0</b>
<b>Other/Renewable</b>					
CCSF Class 1	-	-	-	-	-
CCSF Excess	-	-	-	-	-
WAPA	-	-	-	-	-
Fuel Cell	1.1	1.1	1.1	1.1	1.1
<b>Total Other/Renewable<sup>3</sup></b>	<b>1.1</b>	<b>1.1</b>	<b>1.1</b>	<b>1.1</b>	<b>1.1</b>
<b>Total Resources<sup>3</sup></b>	<b>548.4</b>	<b>548.2</b>	<b>548.0</b>	<b>547.8</b>	<b>547.7</b>

<sup>1</sup> Based on average hydro year.

<sup>2</sup> Based on current emissions limitations and planned maintenance, Almond capacity factor of 75% and WEC capacity factor of 85%.

<sup>3</sup> Does not include over 100 MW of capacity from wind project that is expected to be online in 2009. The acquisition of this project is not complete and therefore excluded from the table above.

## Attachment A (cont.) Turlock Irrigation District

### TID Peak Electric Load Resource Balance at Westley (MWh)

Year	2009	2010	2011	2012	2013
<b>Hydro</b>					
Don Pedro <sup>1</sup>	447,879	447,879	447,879	447,879	447,879
La Grange <sup>1</sup>	27,945	27,945	27,945	27,945	27,945
Hickman <sup>1</sup>	3,705	3,705	3,705	3,705	3,705
Turlock Lake <sup>1</sup>	10,018	10,018	10,018	10,018	10,018
Upper Dawson <sup>1</sup>	10,677	10,677	10,677	10,677	10,677
<b>Total Hydro</b>	<b>500,224</b>	<b>500,224</b>	<b>500,224</b>	<b>500,224</b>	<b>500,224</b>
<b>Coal</b>					
Boardman	420,257	420,257	420,257	420,257	420,257
<b>Geothermal</b>					
NCPA	58,572	56,996	55,156	53,321	52,010
<b>Natural Gas</b>					
Walnut	-	-	-	-	-
Almond <sup>2</sup>	323,901	323,901	323,901	323,901	323,901
WEC <sup>2</sup>	1,870,250	1,870,250	1,870,250	1,870,250	1,870,250
<b>Total Natural Gas</b>	<b>2,194,151</b>	<b>2,194,151</b>	<b>2,194,151</b>	<b>2,194,151</b>	<b>2,194,151</b>
<b>Other/Renewable</b>					
CCSF Class 1	112,126	119,060	119,065	118,765	118,889
CCSF Excess	107,857	109,563	108,012	106,405	104,981
WAPA	9,114	9,114	9,114	9,114	9,114
Fuel Cell	9,154	9,154	9,154	9,154	9,154
<b>Total Other/Renewable<sup>3</sup></b>	<b>238,251</b>	<b>246,890</b>	<b>245,345</b>	<b>243,438</b>	<b>242,137</b>
<b>Total Resources<sup>3</sup></b>	<b>3,411,455</b>	<b>3,418,519</b>	<b>3,415,133</b>	<b>3,411,391</b>	<b>3,408,780</b>

<sup>1</sup> Based on average hydro year.

<sup>2</sup> Based on current emissions limitations and planned maintenance, Almond capacity factor of 75% and WEC capacity factor of 85%.

<sup>3</sup> Does not include generation from over 100 MW wind project that is expected to be online in 2009. The acquisition of this project is not complete and therefore excluded from the table above.

**Attachment A (cont.)  
Turlock Irrigation District  
RPS Goals**

Year	Annual RPS Goals
2009	12.8%
2010	13.8%
2011	14.8%
2012	15.8%
2013	16.8%

TID's adopted RPS requires meeting 20% of its power needs with renewable resources (excluding large hydro) by 2017.

## **Attachment B Demand-Side Options Turlock Irrigation District**

For more than a decade, TID has offered rebates along with energy audits to educate customers about energy efficiency measures and help them reduce energy consumption. Existing successful programs will be continued and new and innovative programs will be added.

In September 2007, TID established, and the TID Board of Directors adopted an aggressive 10-year plan to promote energy conservation by assisting customers with energy efficiency projects. TID's 2007 energy efficiency programs saved approximately 9.2 million kilowatt hours, which exceeded the 2007 goal of 8.5 million kilowatt hours.

TID is continually evaluating the cost-effectiveness of existing and potential new energy efficiency programs, and plans to meet its energy efficiency goals for 2009 to 2013 through the use of existing programs and by adding new cost-effective programs. TID intends to acquire all available energy efficiency that is cost-effective, reliable, and feasible. Following is a list of TID's current energy efficiency programs:

### **Commercial, Industrial and Agricultural Customer Programs**

- Automated Energy - TID has implemented an on-line energy management tool for business customers who can log onto a website to monitor their energy usage and utilize that information to more efficiently manage their energy consumption.
- Energy Audits - TID offers free on-site energy audits to commercial, industrial and agricultural customers who have concerns, questions or an interest in implementing measures to manage their energy usage and reduce consumption.
- Commercial, Industrial, Agricultural Energy Efficiency Rebates - TID offers rebates along with comprehensive technical support for all commercial, industrial and agricultural customers to promote the purchase and installation of commercial equipment and systems that support and enhance load reduction.

### **Residential Customer Programs**

- Residential Energy Audits - TID provides free in-home energy audits to customers who would like to learn how to reduce their energy use.
- Residential Rebate Programs - TID offers customers rebates for purchasing and installing:
  - Energy Star Refrigerator
  - Energy Star Room AC
  - Energy Star Clothes Washer
  - Whole House Fan
  - Shade Screens

## Attachment B (cont.) Turlock Irrigation District

- Shade Tree Rebate - TID provides rebates for up to three trees per year that are planted to provide shade.
- CFL Rebate Program - TID provides a rebate for the purchase and installation of CFLs.
- New Construction Rebate - TID offers a rebate to home builders for exceeding Title 24 energy standards.
- “Energy Wise” Education Program - Provides energy saving education and kits to 6th grade students in the TID service territory.
- Education Specialist - Outreach education provided to schools and community groups.

### TID Energy Efficiency Goals for 2009 to 2013

Year	Annual Incremental Energy Savings Goal per year (kWh)	Estimated Annual Incremental Funding to meet Savings Goal *
2009	12,592,000	\$1,400,000
2010	18,491,000	\$2,100,000
2011	23,309,000	\$2,600,000
2012	24,142,000	\$2,700,000
2013	16,530,000	\$1,900,000

\* Funding estimates are based on historical expenditures adjusted to meet the Annual Incremental Energy Savings Goals. Funding is not limited to the estimates provided. TID intends to fund all eligible energy efficiency program activities, including those that provide savings beyond the annual incremental energy savings goals.