

Integrated Resource Plan

AHA MACAV POWER SERVICES

December 2006

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I Company Profile Data

- **Background**

Aha Macav Power Service (AMPS) is an electric and gas utility chartered by a 1992 Fort Mojave Indian Tribe (FMIT) council resolution. AMPS provides electric and gas service to *both the tribal and non-tribal inhabitants of FMIT lands*¹. AMPS charter provides for a board of directors that is separate and distinct from the tribal council. The board of directors of AMPS determines enterprise policies, approves operating budgets and provides the strategic direction for this FMIT enterprise to follow.

AMPS owns, operates and maintains transmission and distribution facilities. AMPS owns no generation facilities and as a result, is required to purchase all of its capacity, energy and ancillary service requirements from others. AMPS total customer count is approximately 950 customers and has an all time peak of 10.1 MW that occurred on August 24, 2006. Total annual energy requirements for calendar year 2006 are expected to be approximately 44,000,000 KWH.

The Fort Mojave Reservation was authorized by Executive Order on September 19, 1880. Subsequent orders have modified the original Executive Order resulting in the current reservation lands. The reservation land is held in trust by the federal government and tribal members own undivided shares of land. This arrangement prohibits the ownership of reservation lands by non-Indians and even individual members of the tribe.

The Fort Mojave Reservation spans the Colorado River north of Needles, California and consists of approximately 33,000 acres within San Bernardino County, California; Mohave County, Arizona; and Clark County, Nevada. (Refer to Figure 1-1 for a map of the Fort Mojave Indian Reservation and significant features of the Aha Macav Power Service distribution/transmission system.) The terrain within the reservation is desert, except for the floodplain in California and Arizona which is very rich and suitable for agriculture.

The reservation east of the river is entirely within Arizona. The reservation west of the river is split between California and Nevada. Geographically, the reservation lands include the following areas in each of the three states:

Arizona The Arizona portion of the reservation extends from the Colorado River at Needles southeast to a point six miles east of the river in Arizona, then north approximately 17 miles back to the river. Most of the Arizona reservation land is characterized by a checkerboard pattern with alternating sections belonging

¹ The Fort Mojave Indian Reservation is home to both tribal and non-tribal residents. The Fort Mojave Indian Reservation welcomes non-native Americans both as individual residents and as business entities.

to the tribe. This checker board pattern results in AMPS providing service to one side of the road while the local cooperative, Mohave Electric Cooperative (MEC), provides service on the other side of the road.

California In California the reservation consists of three separate sections. Each of the sections within California are integral. The three sections are:

1. An area of several square blocks within the city limits of Needles within which the Fort Mojave tribal headquarters and a tribal "village" are located;
2. An area of approximately one-half square mile in California along Interstate 40 located five miles northwest of Needles; and
3. An area of approximately 10 square miles in California bordering the river six miles north of Needles and two miles south of the Nevada border. This land is very productive farming land and has no developments on it.

Nevada There are approximately six square miles of scrub land bordering on the river in the extreme southern tip of the state of Nevada. Like the California lands, the Nevada land is integral.



Figure 1-1. Fort Mojave Indian Reservation/AMPS System²

² Contact AMPS for current distribution/transmission system maps.

The FMIR is located in the center of one of the most exciting recreational areas in the United States. Reservation lands are bounded by Bullhead City, AZ and Laughlin, NV to the north and by Needles, CA to the south. This area is geographically known as Mohave Valley and has a current population of approximately 50,000 and is expected to swell to over 150,000 within the next 10 years. This growth rate is in part due to a large influx of southern Californians who are looking to purchase attractively priced secondary or retirement homes. Small commercial development is expanding constantly, especially along State Highway 95, north and south. Commingled with new residential development are large blocks of irrigated farmland. Water for farming comes directly from the Colorado River, which bisects the reservation. Because of water pumping requirements, farming is one of the major electricity consumers. AMPS will most certainly experience significant load growth over the next decade as the population in this area expands.

The FMIT has been and plans on continuing to be an active participant in stimulating the growth of this area. Approximately fifteen years ago, the Tribal Council decided it was time to develop the Nevada land. In early 1995, the Fort Mojave Tribe completed the construction of a 301-room hotel-casino (AVI) next to the river on this land. In the ensuing 10 years the FMIT has developed or expanded the following business ventures;

- Development of a 250 + home residential complex in Arizona – Mesquite Creek
- Development of a 150 + home residential complex in Nevada – Desert Springs
- Added 200 + rooms and a state of the art 8 plex theater to the casino
- Alfalfa and cotton farming
- Developed a championship golf course, an outdoor events stadium and a wet and dry RV park
- Development of retail fuel supply business
- Development of a leased retail strip mall
- Development of various service industries (restaurant, laundry mat, car wash tire sales, boat rentals, tobacco sales, firework sales)
- Development of water, telecommunication, cable and trash collection utilities
- Leased land to non-tribal entities who engage in concrete sales, automobile racing, specialized aviation manufacturing, farming, crop dusting
- State of the art health care clinic
- Constructed a 5,000 + seat covered events center
- Developed a new Casino in Arizona
- Constructed a new gymnasium
- Further expansion of its existing casinos in Nevada and Arizona

The economic growth on the reservation is a vital aspect for the FMIT to sustain and enhance the sovereignty that it has been able to establish. AMPS must be able to continue to provide highly reliable power at the most economically attractive rate possible in order to support the continued economic development of the FMIR.

- **AMPS Staffing**

AMPS current staff consists of 13 employees consisting of

- General Manager
- Accountant
- Customer Service (2)
- Metering/Technical Service/ Purchasing (2)
- Linemen (6)
- Mechanic (1)

The utility's current Board and relevant contact person are detailed below.

- **Utility Board of Directors**

Del Wakimoto--Chair
Rudy Bryan—Vice Chair
Nora McDowell—Member (FMIT Chair)
Bonnie Jackson--Secretary
Amanda Mc Cord - Treasurer
John Algots--Member
Norvin McCord—Member

- **Contact Person**

William Cyr-General Manager
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II Aha Macav Goals and Objectives

- Own and Operate an Electric Utility that is Supportive of the FMIT Goal to Provide a Sovereign land for Fort Mojave Tribal Members.
- Provide a Safe, Challenging, and Rewarding Working Environment for All AMPS Employees.
- Provide Reliable Electric Power at Lowest Practicable Cost, Consistent With Sound Business Principles
- Continue to Participate with other Utilities in Mohave County to Provide Reliable Electric Service and Promote Reservation Economic Growth
- Enhance Fort Mojave Indian Tribe Financial Stability by Providing Services which Provide Long-Term Stability in Electric Power cost

III Competitive Situation

• Introduction

AMPS service territory is the Fort Mojave Indian Reservation. No competition for electric service exists within the boundaries of the FMIR. Although no direct competition for service occurs on the reservation AMPS must maintain a high quality of service and competitive rates to help promote continued development on the reservation. AMPS service territory is adjacent to other well established utilities, Uni-Source, Mohave Electric Co-op, Needles and Nevada Power. If AMPS does not remain competitive then development will occur off the reservation in these adjacent service territories. AMPS must deliver a level of customer service and system reliability that is at a minimum on par with electric industry service standards expected in the rest of the United States of America.

AMPS total peak load and energy usage has almost doubled in the last 5 years. This amount of load growth has placed upward price pressure on the rates charged by AMPS. Most of the energy required to meet this increased usage has been purchased on the open market. As a result AMPS applied for and received a 10% rate increase from the fort Mojave Public utilities commission. This rate increase will become effective for all sales after December 1, 2006. Aha Macav Power Service current rate schedules are available upon request AMPS is in the process of securing additional energy supplies. This process is detailed in the next section.

As mentioned above, the FMIR is sovereign land and there is no competition for electric load within reservation boundaries. It is the goal of AMPS to offer rates that are competitive with rates offered by the other utilities operating in the southwest region. In

FY – 2005/2006 the utility's top ten customers accounted for approximately 57% of the utility's total revenues. These top 10 customers are detailed below.

Top Ten Revenues for FY 2006

ACCT #:	ACCT. NAME:	DOLLARS:	%
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FOR TWELVE MONTHS:

1	1-88	AVI - MAIN CASINO	\$1,008,575.00	23.715%
2	1-508	AVI-SOUTH TOWER	\$ 313,489.00	7.371%
3	1-649	SMITH'S FOOD & DRUG	\$ 214,525.00	5.044%
4	105-110	FMTUA-SEWER LIFT-AZ	\$ 84,167.00	1.979%
5	103-220	AVI KWA AME FARMS-7 PUMPS	\$ 80,322.00	1.889%
6	103-8	SPIRIT MOUNTAIN CASINO-MAIN CAS.	\$ 78,478.00	1.845%
7	1-511	FT. MOJAVE RESORT GOLF COURSE	\$ 66,994.25	1.575%
8	1-184	MOHAVE FARMS - IRRIGATION	\$ 58,895.00	1.385%
9	1-83	FMTUA - AVI	\$ 51,154.00	1.203%
10	1-86	MOHAVE FARMS - IRRIGATION	\$ 49,632.00	1.167%

OTHERS LESS THAN TWELVE MONTHS

	1-725	MOJAVE CROSSING EVENT CTR-8 MOS	\$ 165,110.24	5.824%
	1-769	AVI - POOL TRANSFORMER - 5 MOS.	\$ 21,089.07	1.190%
	1-803	AVI - CHILLER - 2 MOS	\$ 28,175.18	3.975%
	1-805	AVI - NEW ADD. NORTH SIDE-2 MOS	\$ 19,941.09	2.813%

- Regulations Applicable to Aha Macav Power Service

As discussed above AMPS is chartered by the FMIT and is subject to all tribal regulations.

AMPS is subject to the Fort Mojave Public Utilities Commission.

Aha Macav Power strives to adhere to all applicable rules and regulations that prudent electric utility practice would dictate.

Energy Planning and Management Program (EPAMP '00)

- **Regulations Applicable to Aha Macav Customers**

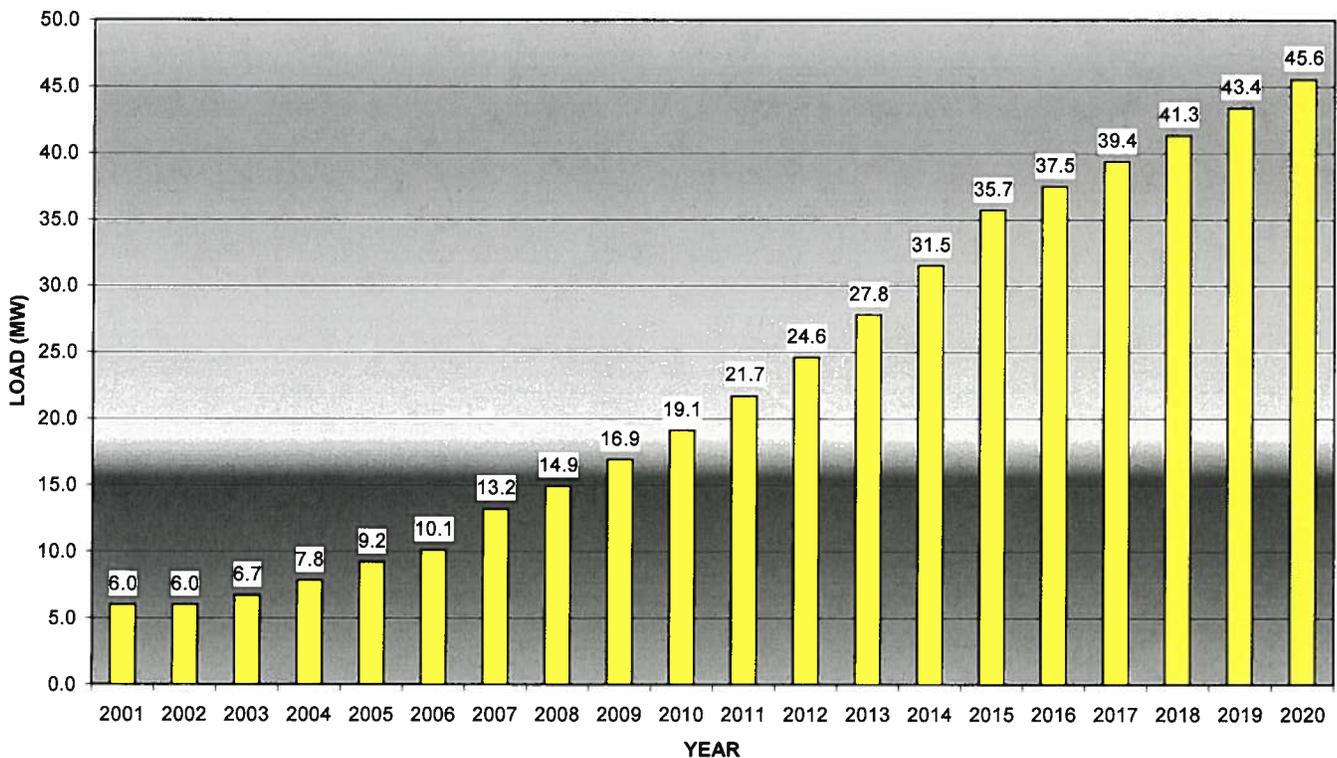
Aha Macav customers are subject to AMPS terms and conditions for electric service

AMPS rates are subject to review and approval by the Fort Mojave Public Utilities commission.

IV Load and Resource Information

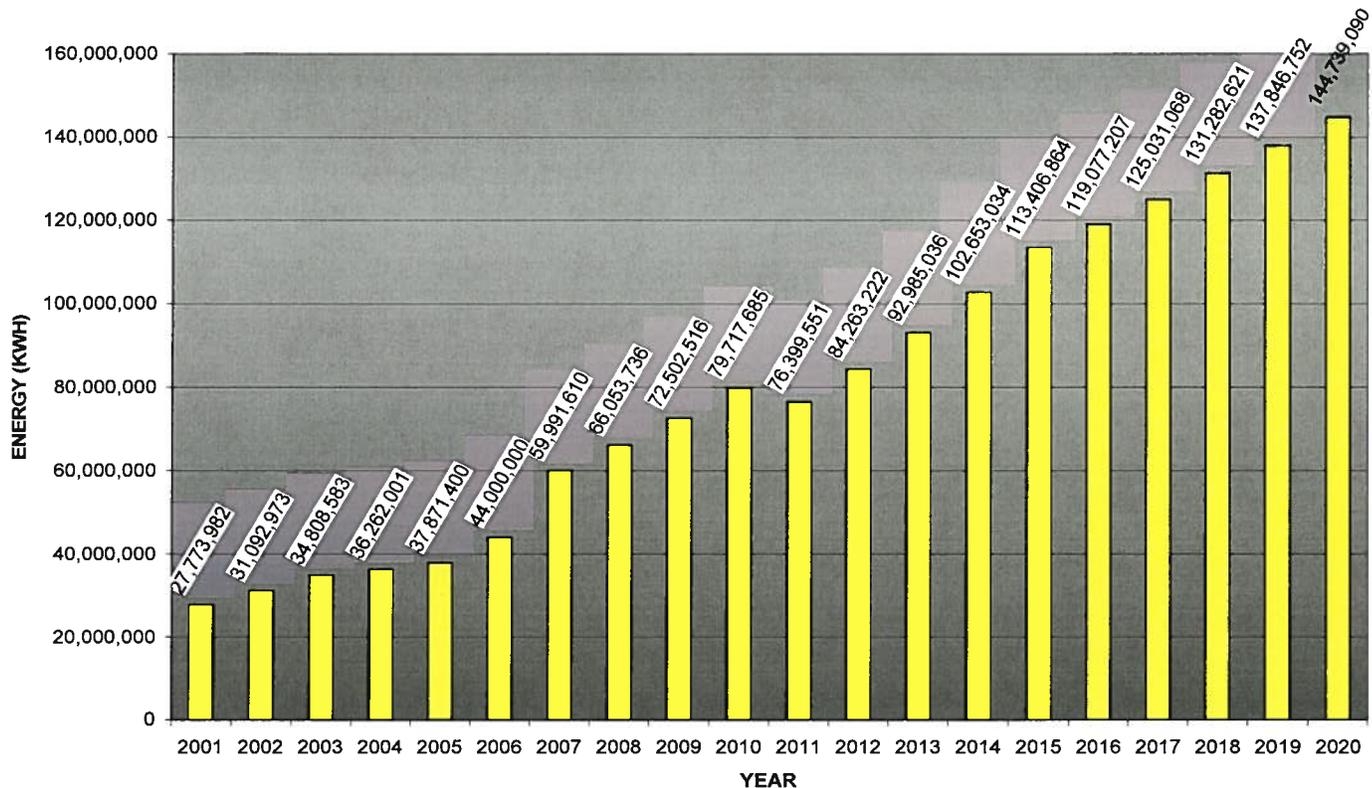
AMPS peak load and energy usage has almost doubled in the last 5 years. In light of this fact, AMPS has developed a detailed short, intermediate and long range forecast of load and resource requirements for the next 5, 10, 15, 20 and 25 year periods. The results of this work were relied upon to assist in developing this Integrated Resource Plan.³ The load and resource forecast was developed by evaluating the last five years of actual load data as provided by WAPA DSW load/resource specialists working in the Phoenix office. Load growth trends were established for each hour of the forward looking forecast by analyzing the actual load growth that occurred in each hour for the proceeding five years. These trends were then applied to the most current year of data available to determine the expected loads in the forecast period.

AMPS DEMAND PROJECTIONS FOR FMIR



³ AMPS load and resource forecast is available for review upon request. All demand and energy values utilized in this plan are taken directly from the detailed load and resource forecast.

AMPS ENERGY PROJECTIONS FOR FMIR



- Load Profile Information**

Revenue Class	# of Customers	%	Energy (MWH)	%
Commercial	194	20.55%	27,688,427.00	65.73%
Residential	613	64.94%	7,287,904.00	17.30%
Irrigation	22	2.33%	5,758,209.00	13.67%
Lighting	33	3.50%	74,262.00	0.18%
Seasonal	37	3.92%	1,050,246.00	2.49%
Temporary	45	4.77%	267,849.00	0.64%
TOTAL:	944	100.00%	42,126,897.00	100.00%

- **Current Supply Side Resource Contracts**

Arizona Public Service (Firm Power) delivery at Mead Substation

- APS Capacity & Energy
2000 kW, 7x24, All months throughout Term, and
1000 kW, 7x24, (June – October Only, each year of Term), and
1000 kW, 7x16, all months throughout the Term
- Expires December 31, 2007

PD-P Power (Firm Power) delivery at Davis Substation

- Summer Season: 1970 kW Capacity 6706611 kWh
- Winter Season: 1200 kW Capacity 2115759 kWh
- Expires October 1, 2028

PD-P Power Post 2008 Allocation (Firm Power) delivery at Davis Substation

- Summer Season: 2000 kW Capacity 6706611 kWh
- Winter Season: 0 kW Capacity 0 kWh
- Expires October 1, 2028

CRSP Power at Pinnacle Peak

- Summer Season: 282 kW Capacity 465008 kWh
- Winter Season: 272 kW Capacity 479448 kWh
- Expires October 1, 2024

Resource Management Service (Pooling Agreement)

- **Demand Side Resources (Efforts)**

In August and September of 2005 AMPS, in cooperation with the Council of Energy Resource Tribes CERT, conducted detailed energy audits⁴ on the Tribal Administration Building, two representative single-family dwellings and the Avi Resort and Casino. AMPS is working with the housing department to address the concerns raised in these audits. The Avi, as part of a recent expansion, installed a state of the art chiller with sufficient capacity to be used to replace older less efficient roof top air conditioning units that are presently used to cool the original Casino structure.

AMPS hopes to develop DSM programs over the next several years. Areas to be investigated include

Sales of energy efficient lighting

Distribution of conservation information in monthly billing statements

Load Management of Air Conditioners

⁴ A copy of this comprehensive energy audit is available from AMPS upon request or can be directly downloaded from the CERT web site.

V Identification and Comparison of Resource Options

The identification of options for additional resources within this Integrated Resource Plan is coordinated through an examination of the costs and benefits for each resource. AMPS examined a variety of resource options utilizing HOMER⁵. Most of the options studied were for relatively small scale generation stations sized to meet AMPS near term load requirements. In all cases, except for stored solar, the cost of building small generating units, regardless of fuel source, was more expensive than fixed energy supply contracts that are still available in today's market. Based on these study results and the comprehensive load forecast AMPS is focusing on three primary resource options

- Generation From Renewable Energy Resources
- New Long Term Purchased Power Contracts
- Partnering with other Utilities
- **Generation From Renewable Energy Resources**

In early 2003 the FMIT (AMPS) was awarded a \$ 275,000 grant for the identification of renewable resource options available on the FMIR. The results of this study indicate that both solar and wind are options for consideration.

In studying the wind option AMPS, in early 2004, set up two different wind monitoring stations at two separate locations on the reservation. These two sites continue to collect data today. Over the last several years AMPS has formed a relationship with Northern Arizona University (NAU) and have assisted NAU with the installation and monitoring of a third site adjacent to Tribal lands. The wind option is viable to AMPS only if a reasonable priced firming source is made available. AMPS can not afford to pay for the capital cost of a wind turbine installation and then be subject to significant additional costs associated with purchasing energy for the times when the wind does not blow. AMPS has met with representatives of WAPA, APA and NAU to discuss the possibility of utilizing Hoover as a means of storing excess FMIT water/energy during those times when AMPS wind generation would exceed AMPS load. The water would then be released through the generators when the wind was not blowing thus allowing AMPS to have a very low cost supply of firming power. Unfortunately, although all

⁵ HOMER is a computer model developed by NREL that simplifies the task of evaluating design options for both off-grid and grid-connected power systems for remote, stand-alone, and distributed generation (DG) applications. HOMER's optimization and sensitivity analysis algorithms allow you to evaluate the economic and technical feasibility of a large number of technology options and to account for variation in technology costs and energy resource availability. HOMER models both conventional and renewable energy technologies. More information about HOMER is available @ <http://www.nrel.gov/homer/>. A copy of AMPS specific study results is available upon request.

parties seem very interested in the idea, very little progress has been made in implementing this idea.

The FMIR lands are an excellent location for locating a large scale project. The amount of solar radiation falling on the FMIR is one of the highest in world. The FMIR has very few cloudy days making it suitable for generation year round. Unfortunately solar presents some of the same problems, although more predictable, the lack of generation in the evening means that AMPS would need to seek additional energy to meet its nightly summer cooling load. The poor load factor associated with present day large scale solar plants drives the cost of energy higher than today's market prices. AMPS and the FMIT continue to meet with various developers on this type of development however no construction dates have been set. AMPS is hopeful that technologies that utilize some type of thermal storage are further developed that will allow plant availability to increase significantly and drive the cost per KWH down.

- **New Long Term Purchased Power Contracts**

AMPS has utilized the information from its detailed load and resource study to develop a request for proposal. AMPS will evaluate the proposal submitted and hopefully enter into new contracts as early as the first quarter of 2007.

- **Partnering with other Utilities**

AMPS lacks sufficient scale to attract significant interest from the major energy market suppliers. For that reason AMPS has joined forces with 38 other smaller entities located throughout the region to form the Southwest Public Power Resource Group (SPPR). SPPR is looking at the most economical means so provide power to all entities on an aggregated basis. SPPR is looking at both long term energy contracts from third parties and the construction of its own generating plant(s). The group is hopeful that this aggregation will produce economies of scale that would not be available to smaller individual organizations.

VI Designation of Options

Once additional resources are more accurately defined, the least cost option is identified from a cost benefit analysis. This information is considered by the utility's Board of Directors in public meetings and combined with other information to select an Action Plan for the utility which conforms to the regulations and guidelines of the Energy Planning and Management Program. The selection of the utility's Action Plan also includes consideration for reliability of service, economics, rate impacts, price elasticity, environmental effects, regulatory impacts, legal considerations, competitive impacts, social acceptance, public considerations, and any other factors which may be identified from time-to-time which may be pertinent in selecting or implementing an Action Plan.

VII Action Plan

- **Resource Action Plan**

The time period covered by this specific Action Plan is the five-year period beginning in 2007 ending in January 2012. Circumstances may arise which will allow AMPS to expand the time frame for this action plan beyond 2012.

AMPS would like to have 90 to 95% of its forecasted energy requirements under a long range contract by the end of the first quarter of 2007. AMPS will consider terms of 3 years to 10 years or more. In addition, AMPS plans to continue to work with SPPR over the next several years to develop an aggregated approach to meeting all of the groups short and long term energy needs. The development of generation from renewable resources will also be pursued, but on a less ridged schedule.

In the event the loads of the utility are projected to materially increase above those levels represented in the Load and Resource information, other than normal deviations due to weather impacts, the utility will review its forecast, evaluate the need for modifying its IRP, and notify Western accordingly. In accordance with Western's regulations AMPS will revise its load forecast and resource information in detail every five years.

- **Conservation Action Plan**

While not required, the utility has decided to evaluate the conservation measures outlined in the demand side management section.

AMPS hopes to provide updated conservation literature and "Energy Tips" to its customers. The ability of the utility to stabilize its rates and power supply costs relies upon economically feasible conservation of every resource.

VII Environmental Effects

The utility is required, to the extent practicable, to minimize adverse environmental effects of new resource acquisitions and document these efforts in the IRP. Under AMPS' current resource plan, the utility utilizes hydro resources to meet much of its electric loads. To the extent AMPS utilizes the Integrated Resource Scheduling procedures to exchange and better utilize the hydro resources of the utility and other similarly situated utilities, such efforts should be environmentally beneficial since such increased utilization would offset non-hydro generation purchases. In addition, to the extent the utility sponsors conservation activities and information activities with its customers; the conservation of energy is the fundamental achievement, which is environmentally beneficial and economically sound.

IX Public Participation

AMPS holds monthly Board of Director meetings..