MesquitePower

ACC Siting Committee Hearing
September 6, 2000

EXHIBIT
A-4
admitted

Sempra Energy™
Resources

0000005520

MesquitePower

Sempra Energy Resources

Topics - Presenters

- Introduction to Sempra Energy – Bill Keller
  - *Vice President, Project Development*
- Project Description – Joe Rowley
  - *Director, Project Development*
- Water Study – Peter Mock, PhD
  - *President & Principal Hydrologist/Geologist*
- Environmental Studies – Marty Swartz
  - *Project Manager, Mesquite Power Project*
- Market & Transmission – William Engelbrecht
  - *Director, Asset Portfolio Management*

MesquitePower

Sempra Energy™ Resources

Introduction to Sempra Energy

- Parent company of two utilities:
  - *Southern California Gas Company*
  - *San Diego Gas & Electric Company*
- Parent company of non-utility subsidiaries:
  - *Sempra Energy Resources (SER)*
  - *Several others*
- Sempra Energy Resources is responsible for the development, construction, and operation of non-utility power generation projects

MesquitePower

Sempra Energy Resources

SER Power Generation Projects

- El Dorado Energy – 500 MW combined cycle
  - *In-service May 2000, 1st new merchant plant in US*
  - *Boulder City, Nevada*
  - *Permit applications in preparation for 2nd 500 MW*
- Elk Hills Power – 500 MW combined cycle
  - *Calif. Energy Comm. permitting nearly complete*
  - *Vicinity of Bakersfield, California*
- Mesquite Power – 1000 MW combined cycle
  - *Subject of this ACC Siting Committee hearing*
- Other projects in development – 3000 MW
  - *Texas, Louisiana, Mexico*

MesquitePower

Sempra Energy Resources

Mesquite Power: Site Selection

- Focus on the Arizona market
  - *Arizona is experiencing phenomenal growth*
  - *PV is the most liquid trading hub in the Southwest*
- Avoid the need for new transmission lines
  - *Site contiguous with the new PV Satellite Switchyard*
- Locate near interstate gas pipelines
  - *Site is within 4 miles of EPNG high pressure lines*
- Secure a reliable water supply
  - *Consistent with water resource management reg's*
- Use same air emission std's as CA projects
  - *Regardless of the site's remote location*

MesquitePower

Sempra Energy Resources

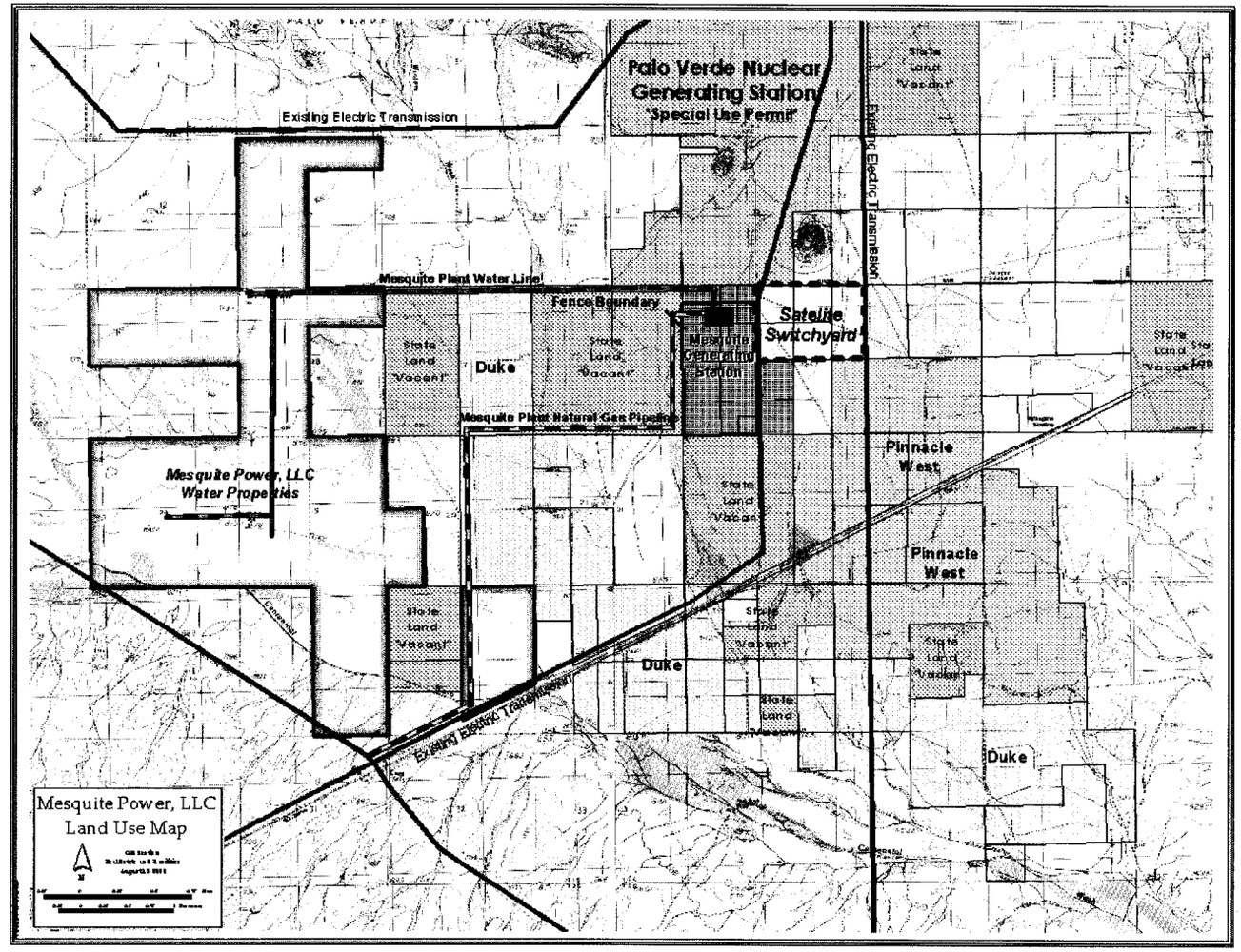
Mesquite Power: Project Description

- Nominal 1,000 MW power plant:
  - *Natural gas-fired*
  - *Highly efficient combined cycle technology*
  - *Peak output of 1,250 MW*
- 400-acre power plant site contiguous with the new Palo Verde Satellite Switchyard:
  - *No new transmission lines*
  - *40 acres for the power generating facilities*
  - *Two evaporation ponds of 90 acres each*
- 3,000-acre water property:
  - *To be designated as Open Space*

MesquitePower

Sempra Energy Resources

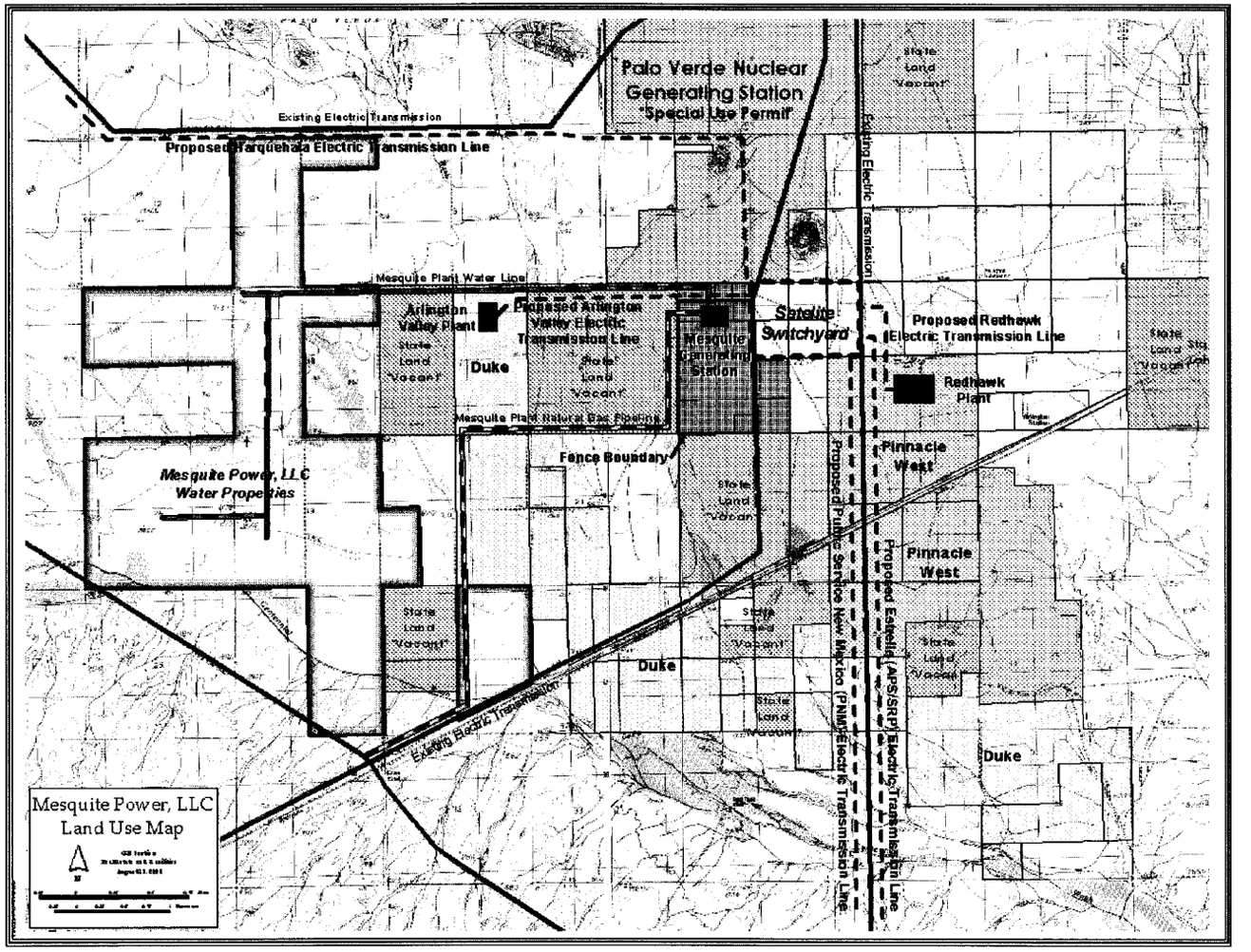
Natural Gas & Water Pipelines



MesquitePower

Sempra Energy Resources

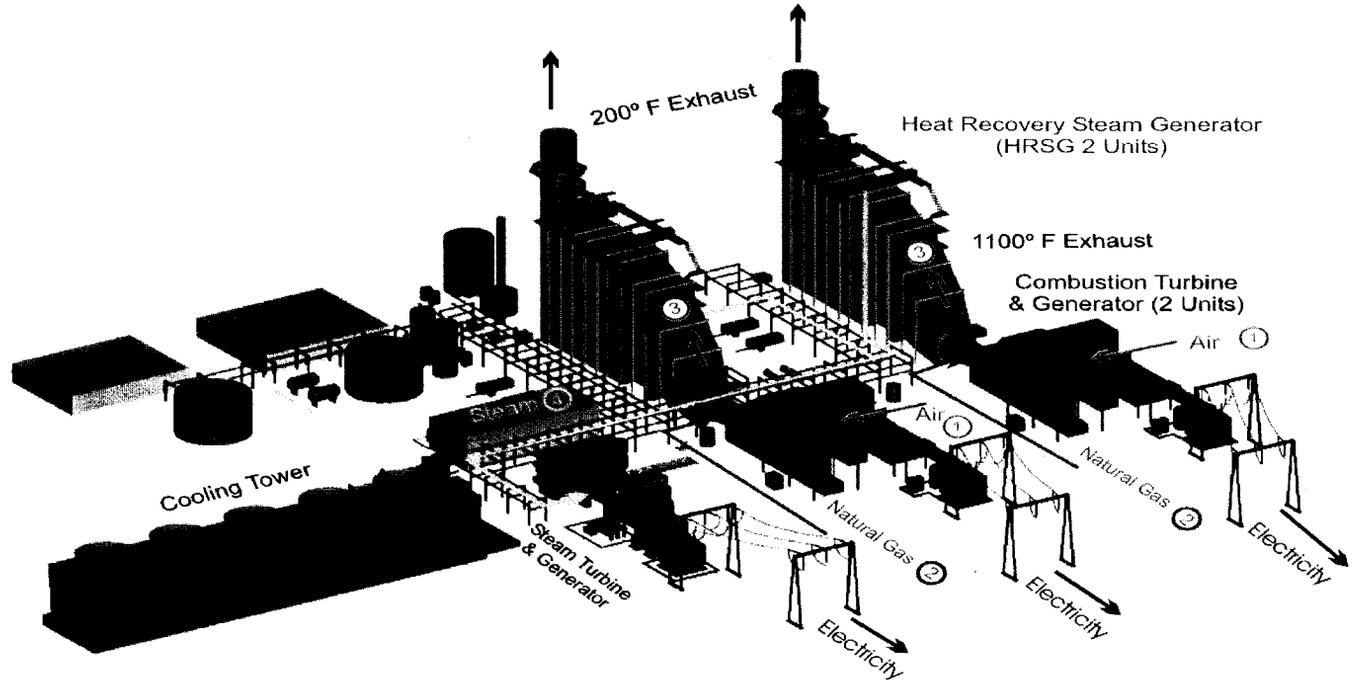
Other Projects in the Vicinity



MesquitePower

Sempra Energy Resources

Process Description



1. Air is filtered, cooled by adding moisture, and then compressed to over 200 psi in the compressor of each combustion turbine generator (CTG).
2. Natural gas is mixed with the high pressure air and ignited, producing high pressure combustion gases at over 2300°F. The hot gases expand through and drive the turbine section of each CTG. The turbine section drives both the compressor and generator of each of the two CTG's.
3. The hot gases leave the CTG's at over 1100°F and may be reheated to over 1400°F using duct burners. The hot gases are used in the HRSG's to make steam.
4. Steam from the HRSG's is piped to a steam turbine. The steam expands through and drives the steam turbine, is condensed to water, and is then pumped back to the HRSG's. The steam turbine drives a third generator.

MesquitePower

Sempra Energy Resources

Management of Water Resources

- Four alternative water supplies evaluated:
  - *Effluent from 91st Avenue Treatment Plant*
  - *Water from the Central Arizona Project (CAP)*
  - *Drainage water from irrigation district dewatering*
  - *Groundwater*
- Use of Effluent from 91st Avenue impacts the Gila River riparian habitat and reduces water available to Buckeye Irrigation District
- CAP water is higher quality than needed, can be put to more beneficial use, and has uncertain availability (year-by-year basis only)

Management of Water Resources (continued)

- Drainage water from irrigation district dewatering cannot be committed to long-term industrial use
- Groundwater was selected because of the large size of the aquifer, and because the water is suitable for use in cooling towers despite its relatively poor quality
  - *Hydrology study encompassed all existing and future water uses in the potentially affected area*
  - *The study shows that no adverse impacts on neighboring wells are expected*

MesquitePower

Sempra Energy Resources

Management of Water Resources (continued)

- Existing agricultural groundwater rights:
  - *15,000 acre-ft per year*
- Discounted rights after conversion to Type 1:
  - *8,000 acre-ft per year*
- Maximum water usage by the project:
  - *7,490 acre-ft per year*
- The project's Groundwater Development Plan was approved by the Arizona Department of Water Resources (ADWR) on April 13, 2000

MesquitePower

Sempra Energy Resources

Management of Water Resources (continued)

- Water Conservation – side-stream softening:
  - *Enables high amount of cooling tower evaporation*
  - *Leftover water has TDS of 30,000 mg/l*
- Water Conservation – storage tanks:
  - *Instead of large ponds which lose fresh water to evaporation*
- Water Conservation – the result:
  - *The Mesquite Power Project will use less water per MW than other proposed projects in the Palo Verde vicinity*

MesquitePower

Sempra Energy Resources

Management of Water Resources (continued)

- Water Disposal – brine concentrators:
  - *Evaluated as an alternative to evaporation ponds*
  - *The 30,000 mg/l water leftover from the cooling towers is as salty as seawater*
  - *Using brine concentrators to recover fresh water from such salty water is not cost-effective*
  - *Brine concentrators would produce up to 100 tons per day of solid waste*
- Water Disposal – evaporation ponds:
  - *The final step in the project's water conservation systems – all beneficial use has been "wrung out"*
  - *Will incorporate design and operational features recommended by Arizona Game and Fish*

MesquitePower

Sempra Energy Resources

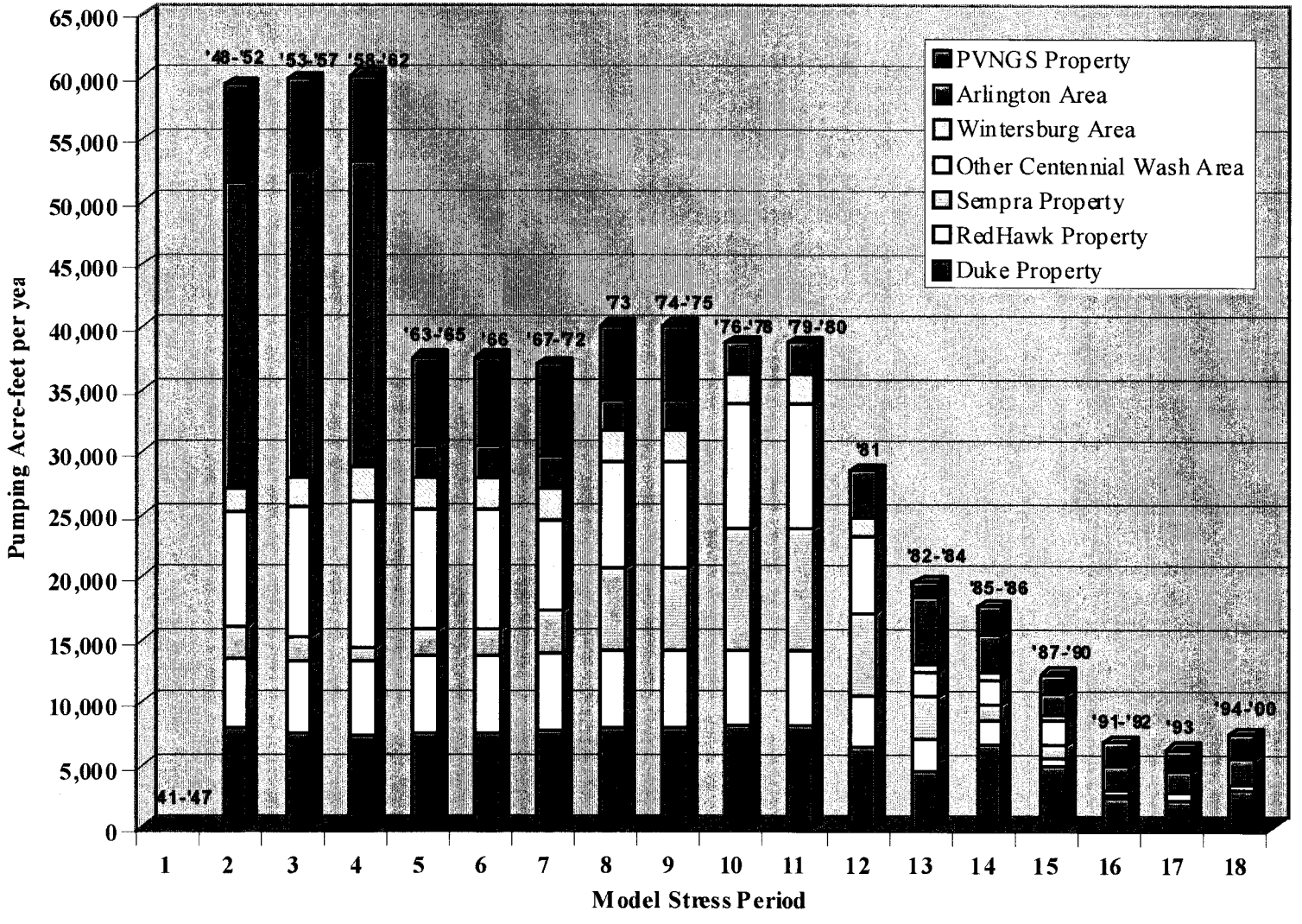
Cumulative Water Study

- Completed in Steps:
  - *Compiled and reviewed existing data and studies with Technical Group*
  - *Interpreted the characteristics of the groundwater system from data*
  - *Built and tested a computer simulation model*
  - *Identified and simulated the responses to different scenarios of future water uses*

MesquitePower

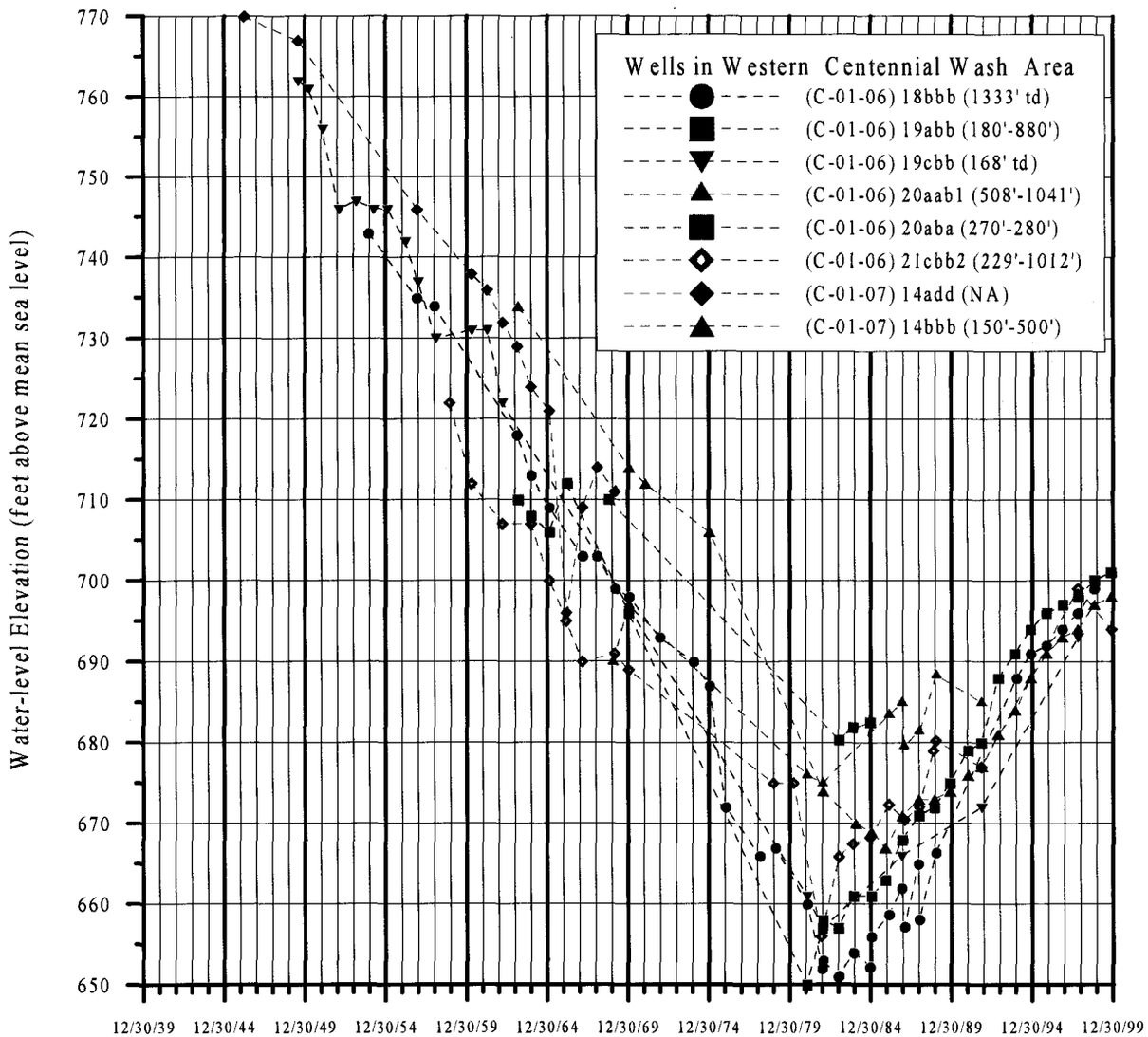
Sempra Energy Resources

Reconstructed Historical Pumping for the Centennial Wash Area



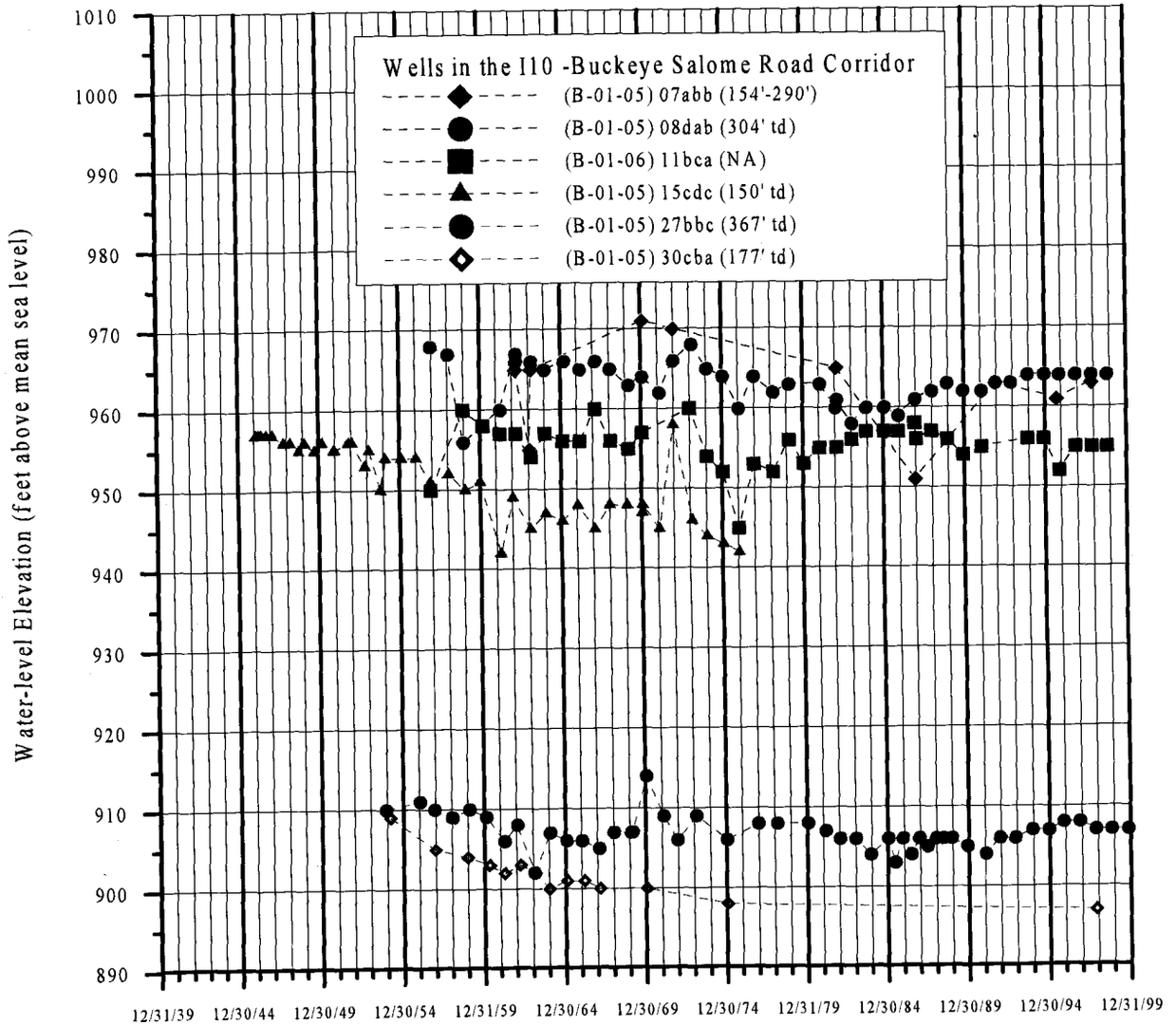
MesquitePower

Sempra Energy Resources



MesquitePower

Sempra Energy Resources



MesquitePower

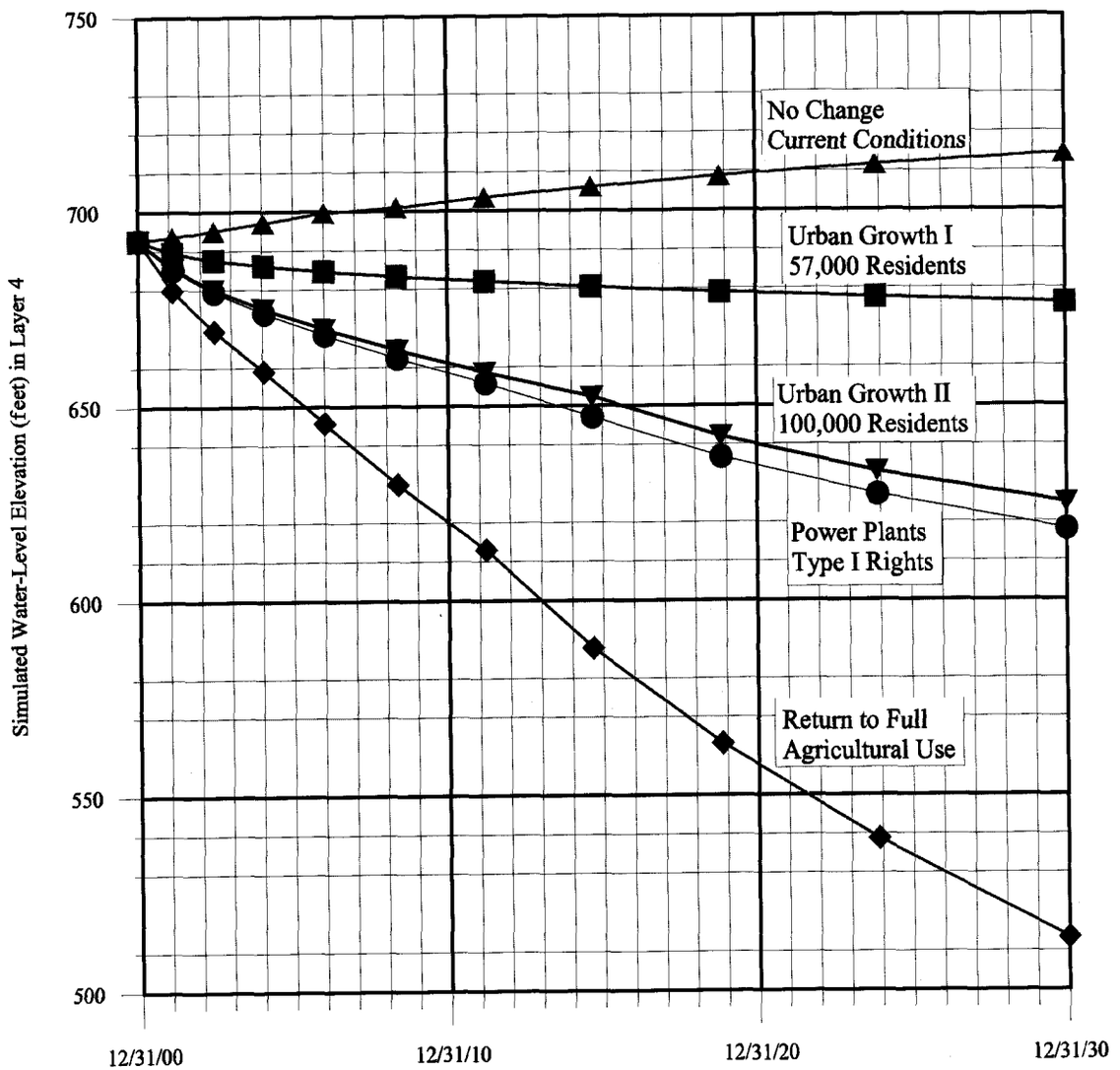
Sempra Energy Resources

Future Water Use Impact Scenarios

- Power Plants Type I Water Rights
  - *Purchased farm land and associated irrigation rights*
  - *Irrigation water rights converted under state law to use for electrical power generation*
  - *Water rights substantially reduced in conversion*
- Return to Agricultural Production
  - *Remaining irrigation rights as defined by ADWR*
  - *Less than what was historically pumped*
- Urban Growth
  - *A city of 100,000 people under ADWR rules*
  - *A city of 57,000 people under ADWR rules*

MesquitePower

Sempra Energy Resources



Computer Simulation Results

- The drawdowns from power plant pumping will be much less than occurred due to agricultural production between 1950 and 1980
- Largest estimated drawdowns after 30 years of power plant operation are less than 10% of the aquifer system thickness, identified to date, along Centennial Wash
- Drawdowns of groundwater levels will be largest at deep pumping wells and decrease with distance from the deep wells
- Drawdowns (from power plant pumping) in shallow domestic wells where the Palo Verde Clay is present may be too small to measure

MesquitePower

Sempra Energy Resources

Permitting Status

- Air permit application to Maricopa County:
  - *Filed on 2/15/00*
  - *Administrative Completeness on 4/18/00*
  - *Draft permit expected by 9/30/00*
- Special Use Permit / Area Plan Amendment:
  - *Filed on May 15, 2000*
  - *Hearing before Commissioners scheduled for 10/05/00*
- APP application to ADEQ:
  - *Filed on 7/31/00*
  - *Administrative Completeness expected by 8/31/00*
- Groundwater Development Plan to ADWR:
  - *Approved 4/13/00*

MesquitePower

Sempra Energy Resources

Permitting Status (continued)

- NO_x emissions of 2.5 ppm (vs. 3.0 ppm)
  - *Selective Catalytic Reduction (SCR)*
- Reduced CO and VOC emissions
  - *Only project with oxidation catalyst*
- Reduced PM10 emissions from cooling towers
  - *High efficiency drift eliminators*
- Reduced NO_x and VOC emissions and the project's distance from Phoenix result in insignificant contribution to ozone formation

MesquitePower

Sempra Energy Resources

Other Environmental Studies & Plans

- Project studies show that any potential impacts will be insignificant:
  - *Biological resources study*
  - *Cultural resources study*
  - *Visual impact analysis*
  - *Noise study*
  - *Traffic study*
- Plans for the 3,000-acre water property:
  - *Open Space land use designation*
  - *Re-vegetate with native species*
  - *Discussions w/Phoenix Zoo*
  - *Input from Game & Fish, local communities*

MesquitePower

Sempra Energy Resources

Community Relations Program

- Assembled a community leaders group based on input from County Supervisors
- One-on-one meetings with local residents and community leaders
- Issues addressed based on community input:
  - *Open houses in Arlington and Tonopah were well attended*
  - *Water study planning and implementation*
  - *Water property disposition (land use, etc.)*
  - *Wastewater disposition (evaporation ponds)*

Economic Considerations

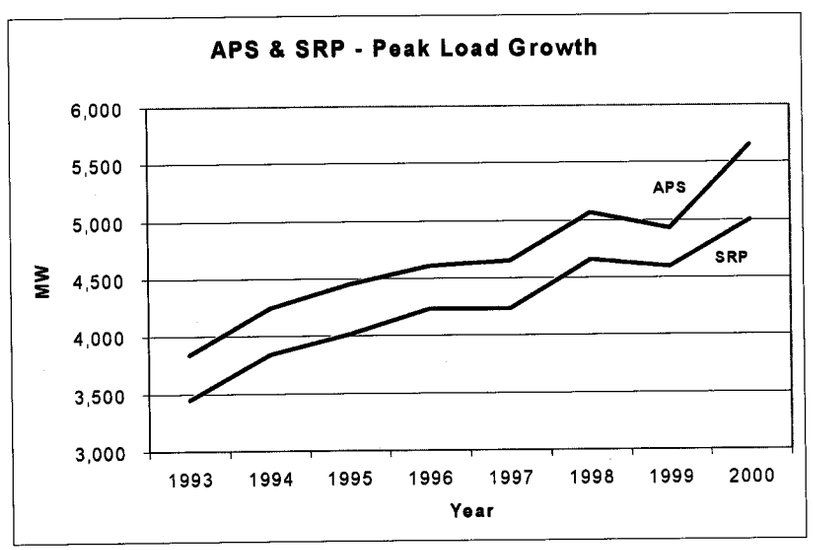
- Direct employment:
  - *300 construction jobs and 30 full-time jobs*
- Indirect employment:
  - *293 and 50 indirect jobs during construction and operation, respectively*
- Annual tax revenues:
  - *$10.5 million and $13.5 million during construction and operation, respectively*
- Annual spending:
  - *$94.7 million and $5.8 million during construction and operation, respectively*

MesquitePower

Sempra Energy Resources

Market

- Arizona is Mesquite's primary target Market
- Phoenix Valley is one of the fastest growing U.S. regions
  - *6.2%/5.5% annual growth rate over last 3/7 years*
  - *Only Las Vegas matches growth rate in last 3-7 years*
  - *APS & SRP both hit all-time system peaks in summer 2000*



Market (continued)

- Arizona Customers have a Need to access additional low-cost power
  - *Reliability Need*
    - *Minimum generation level required to reliably serve the load during all portions of the year, even on the hottest summer day*
      - 15% minimum Reserve Margin
    - *A recent example is California, where dwindling reserve margins in summer 2000 resulted in a number of California ISO Stage II alerts (a plea for reduced demand), and nearly caused a Stage III alert (i.e., probable rolling blackouts.)*

Market (continued)

- Arizona Customers have a Need to access additional low-cost power (continued)
  - *Competitive Market Need*
    - *The level of competitive generation supplies necessary for adequate market competition*
    - *Necessary for Arizona consumers to realize the full benefits of new low cost, highly efficient, environmentally beneficial generation*
    - *Absent a fully competitive liquid market, Arizona consumers would likely experience higher prices*
      - Recent example is California in summer 2000

MesquitePower

Sempra Energy Resources

Transmission Interconnection

- No transmission line required to interconnect
  - *Mesquite site is contiguous with the new Satellite Switchyard (now called Hassayampa) property*
  - *Direct connection with adjacent new Hassayampa Switchyard*
  - *Straight run from Mesquite 230/500-kV step-up transformer to termination position at Hassayampa (i.e., no turns or angles)*
- Hassayampa will be Mesquite's interconnection with the transmission grid
  - *Will use 5 existing and any future 500-kV lines out of Hassayampa/Palo Verde to move Mesquite power to market*

MesquitePower

Sempra Energy Resources

Transmission Outlet Capability

- SRP has been tasked with studying grid connection and outlet capability of Mesquite and other proposed plants
  - *From the Palo Verde/Hassayampa "common bus"*
  - *These studies have been proceeding for nearly a year, and are on-going*
- Preliminary SRP results as of 8/29/00
  - *All of the proposed generation can reliably connect to the electric grid in the Palo Verde area*
    - *With the addition of all proposed plants, all Western Systems Coordinating Council (WSCC), local utility and Palo Verde Nuclear Generating Station (PVNGS) criteria are satisfied*

Transmission Outlet Capability (continued)

- Preliminary SRP results (continued)
  - *Existing Capacity*
    - *ATC = 1,800 MW (Available Transmission Capacity)*
    - *TTC = 5,650 MW (Total Transmission Capacity)*
  - *With new generator additions*
    - *ATC = 3,455 MW*
    - *TTC = 7,305 MW*
  - *With transmission upgrades (APS/SRP Southwest Valley 500-kV line, PV-Westwing RAS, and minor upgrades on PV-North Gila & PV-Kyrene lines)*
    - *ATC = 6,050 MW*
    - *TTC = 9,900 MW*

MesquitePower

Sempra Energy Resources

Transmission Outlet Capability (continued)

- Given ATC of 6,050 MW (TTC = 9,900 MW)
  - *Accommodates all generation proposed by the new Hassayampa Switchyard participants*
- Further increases to ATC likely, such as:
  - *Other future lines out of Hassayampa/Palo Verde:*
    - *Additional lines to Phoenix*
    - *PNM's +/- 500-kV DC line to Mexico*
    - *NRG's 500-kV line to So. California / No. Baja Mexico*
    - *Palo Verde-So. California alternatives*

MesquitePower

Sempra Energy Resources

Transmission Outlet Capability (continued)

- An economic balance will be reached between any generation constructed and additional outlet capability
  - *In any given hour, if there is not enough outlet capability to support all desired transfers, congestion management protocols will dictate the use of available transmission capacity*
- Transmission constraints exist today throughout the U.S.

Transmission Outlet Capability (continued)

- Congestion management in use throughout U.S. today
  - *California, PJM, New England, and NY*
  - *Allocates scarce transmission to those who value it the most (i.e., those willing to pay the most to move power though a constrained "toll gate")*
    - *Ensures that customers receive access to the lowest cost generation first*
    - *If there are periods of time requiring transmission congestion management, whether in actual practice or projected to occur, transmission investment will be made at an appropriate level, to either relieve or completely eliminate the constraint*

MesquitePower

Sempra Energy Resources

ACC Staff "Two-Connection" Criteria

- Mesquite's proposed interconnection plan has high reliability, and meets all WSCC, ANPP and local utility reliability criteria
  - *Adjoining direct connection to Hassayampa*
  - *Mesquite 230/500-kV step-up transformer has 4 single phase banks (3 in-service + 1 spare)*
    - *Spare bank is "hard-wired" and can be brought into service within minutes by simply operating some disconnect switches, greatly reducing downtime due to an improbable bank failure*

MesquitePower

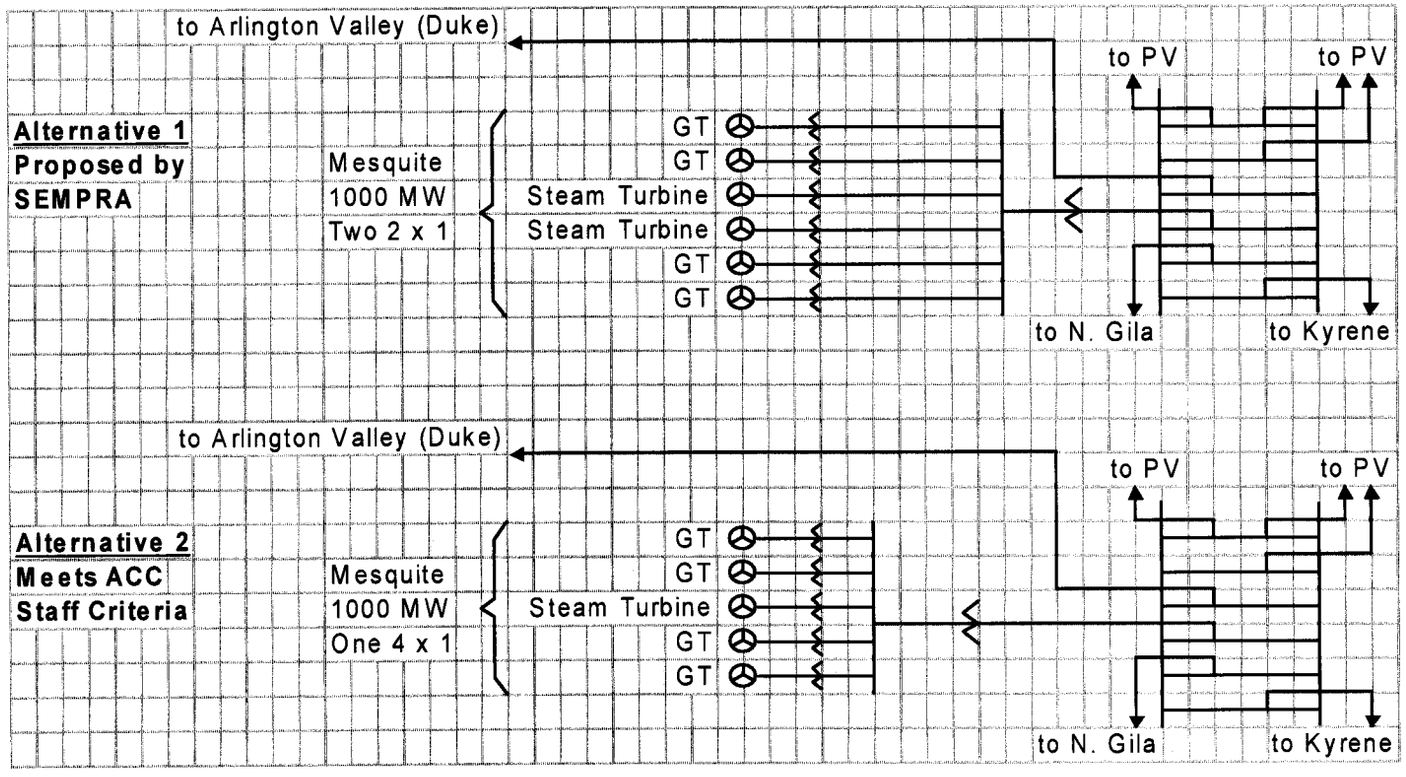
Sempra Energy Resources

ACC Staff "Two-Connection" Criteria

- ACC Staff's proposal is not universally applicable – specific circumstances must be taken into account
  - *Ignores the magnitude of the potential generation loss*
    - *For example, loss of one Palo Verde nuclear unit has larger impact than Mesquite*
  - *Does not recognize hazard exposure (or lack thereof)*
- Staff's "past practice" argument is unsupportable
  - *Is not consistent with NERC or WSCC Industry Standards*
  - *Ignores changes in the electric grid over time*
  - *Does not focus on Reliability as a goal*
- Staff's proposal would increase Mesquite's interconnection cost by $20 million
  - *Provides an insignificantly small reliability improvement*
  - *Extra cost would have to be passed on to consumers in form of higher power rates*

MesquitePower

Sempra Energy Resources

ACC Staff "Two-Connection" Criteria

- Staff has stated that proposed Alt. 1 was unacceptable, but that Alt. 2 was acceptable, and met their "criteria"
  - *Alt. 2 is less reliable than Alt. 1*