

Ec. 162. Reg; Anti-trust; Instus

Mgt. Econ.

LA Times, 6/25/81

Anti-trust guidelines by Justice Dept.,
established in '68 by A.G. Ramsey Clark.

Re Clayton Act

1. If 4 largest firms (by sales) control less than 75% of sales, Justice will challenge acqu. of a 5% or more firm by same.
2. If more than 75%, then 4% + 4%.

Now, A.G. Wm. French Smith is easing guidelines & overruled his attys. who argued that CBS, owner of Popular Lib. shd. have expanded it rather than buy competitor, Fawcett. French overruled.

Mgal. Shows importance of a head start. Once the land is given away, the interests control legisl.

Source of political contributions, Cal. Senate + Assy.
From Cal. J., 8/81.

1. "United for Cal." an assoc. of large bus. enterprises gets around

2. "Agriculture",

3. Land div.

4. Truckers

5. Labor

6. S + L

7. Insurance

8. Banks

9. Doctors

10. Dentists

11. Trial lawyers

12. Mortgage brokers

13. Horse racing

14. Contractors

15. Oil

16. Real Estate

17. Gun owners

18. Alcoholic bev.

19. Wood + Lumber

20. Automobile

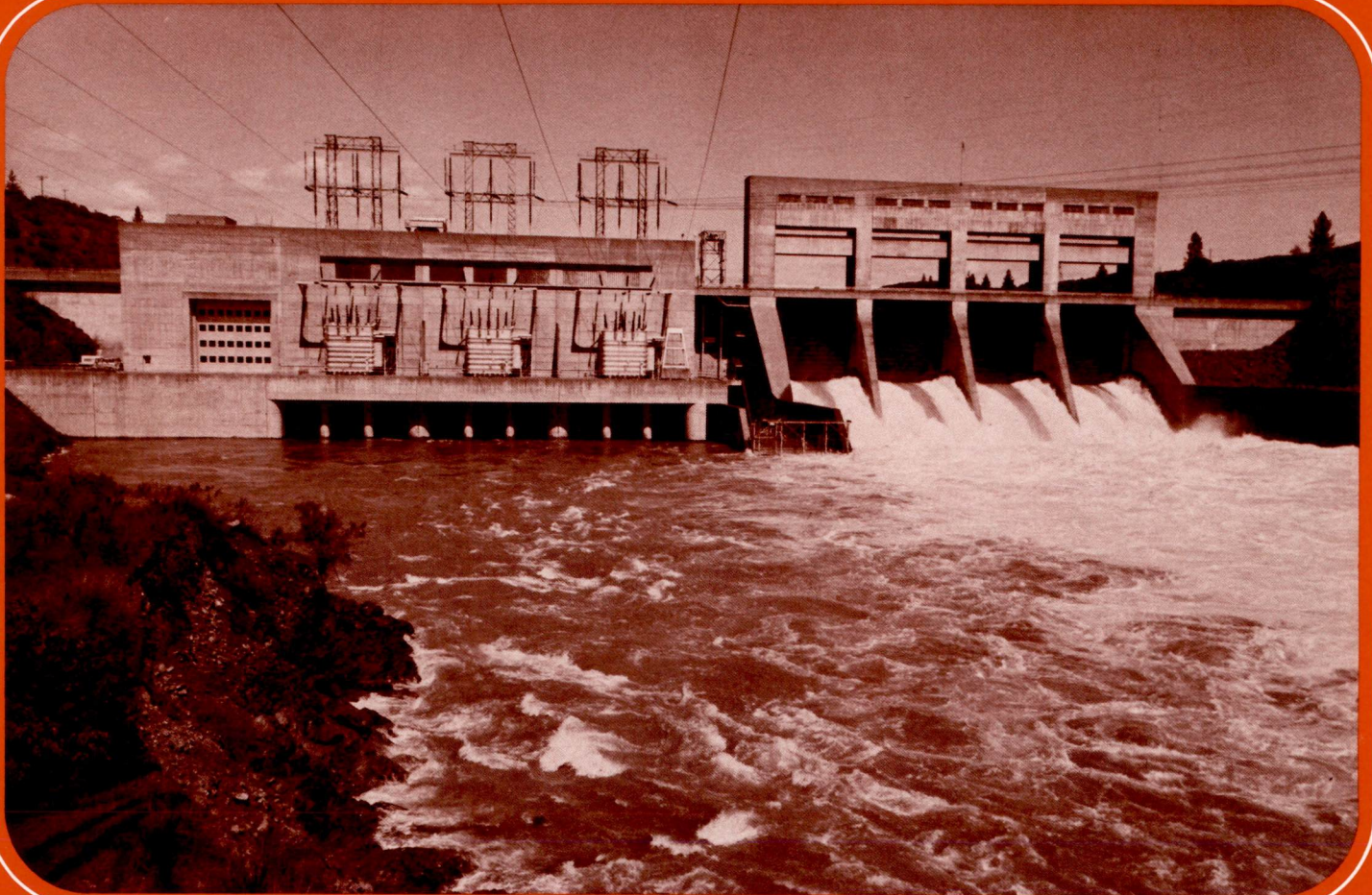
Agul.

"Considered cost" > utility ave. cost.

E.g., Am B. Westside CDC has a
big photovoltaic station. They sell to SCE
for 7¢; buy retail at 6¢!

WESTERN WATER

SEPTEMBER/OCTOBER 1981



HYDROMANIA



Published by Western Water Education Foundation

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ON THE COVER

Bureau of Reclamation's Keswick Dam and Powerplant on the Sacramento River nine miles downstream from Shasta Dam and a few miles north of Redding, California. The powerplant has three generating units with a total capacity of 75,000 kilowatts.

CREDITS

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U.S. Bureau of Reclamation

ARTWORK

Cathy Clark-Ryll



WESTERN WATER

EDUCATION FOUNDATION

The Foundation is a non-profit, non-political organization dedicated to the development and implementation of public information and education programs on water resources conservation, reclamation, reuse and development.

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Editor — Rita Schmidt Sudman
Editorial Assistant — Jo Schock

LETTERS

Dear Editor:

We recently received a copy of the July/August issue of your magazine. After thoroughly poring over it myself, I shared it with other members of our staff.

Many of our staff members are avid boating enthusiasts and we all agreed your magazine had put together one of the best sources of information regarding recreational activities we had ever seen.

We look forward to future issues of the magazine, not only for the information regarding recreational activities, but for enlightening

us all concerning the impact on our lifestyles of water.

Judy Metzger
Gestetner Corporation
Sacramento, CA

Dear Editor:

Your July/August issue was an excellent consumer guide to recreation on the waterways of California. It contained useful information to keep at hand here at the magazine. I'm sure the staff will make use of it as a reference for a long time.

Margo Fox, Senior Editor
Palm Springs Life magazine
Palm Springs, CA

Dear Editor:

Materials contained in your publication, WESTERN WATER, I find to be excellent sources of information and background. Being an outdoor writer, it is particularly crucial to have access to facts about our state's water system and the recreation uses that go along with it.

Thank you for sending complimentary copies of the May/June and July/August, 1981 issues.

I'd appreciate being placed on your permanent mailing list.

Peter J. Ottesen
Stockton, CA

WHAT'S NEW

A small-scale Hydro Workshop is being sponsored by the California Department of Water Resources/U. S. Department of Energy, Cooperative Small Hydro Outreach Program on September 24, 1981, at the Holiday Inn in Redding, California, from 8:30 a.m. - 4:00 p.m.

The Small-Scale Hydro Workshop is to encourage and facilitate the rapid growth of small hydroelectric facilities, particularly those at existing hydraulic structures. Over 300 of these potential projects have been identified in California. About 75 percent of these have not been filed with the Federal Energy Regulatory Commission (FERC). Over 200 MW of capacity remains to be developed.

The workshop is designed

as a "nuts and bolts" session aimed at the dam owner, public and private utilities, engineers, public officials, and private individuals interested in small hydro.

The workshop is free. No preregistration is required. If you have any questions, contact Nancy Quan at DWR at (916) 323-0103.

Kern County's largest user of State Water Project water reports that it has just officially documented the fact that its water importation during the past ten years has successfully reversed the trend toward depletion of the area's basin.

A groundwater report from the 146,000-acre Wheeler

Ridge-Maricopa Water Storage District says the serious overdraft of its underground water resources has been eliminated, and reports water levels are now actually higher in most wells than they were prior to initiation of the district's importation/distribution project back in 1971.

Some water levels are 50 to 100 feet higher than a decade ago when crops depended entirely on wells. This contrasts with 1970 when an annual groundwater overdraft of 120,000 acre-feet existed.

Water from the Aqueduct was then brought into the district as a part of a plan to remove sufficient lands from dependence on groundwater pumping to get a hydrologic balance.

HYDROMANIA

By Rita Schmidt Sudman

There's gold in those hills where water is being converted into expensive energy and along the way bringing wealth to developers. Under a federal regulation, utilities are being forced to buy alternative energy at "avoided costs," defined as their costs to purchase power from another source, which is generally what the company would pay for oil. Several federal regulations give hydro developers a guaranteed market for electricity plus additional tax credits. These regulations are the "icing on the cake" which makes hydro the talk of wealthy investors at cocktail parties. Investment companies have organized because of the 21 percent tax credit the hydro developer-investor receives. It is estimated that a one megawatt (MW) plant which costs \$2-1/2 million to produce will return about \$300,000 per year, plus tax credits investors receive. However, there are a few dark clouds on the horizon. The California Department of Fish and Game is concerned about environmental problems. Specifically, it wants enough water for fish left in streams where hydro projects are developed. Also, there is a possibility the U.S. Supreme Court will strike down the avoided cost provisions of federal legislation.

In the years before the recent small hydro boom, about four hydro applications were filed a year with the Federal Energy Regulatory Commission (FERC). In 1978 there were 36 preliminary applications filed with the Federal Energy Regulation Commission. This year, FERC expects to receive more than 1,800 applications to develop hydro sites in the United States. By July FERC had given preliminary approval to 500 of these applications. So many claims have been filed that an Alaskan Senator claims people are filing with FERC just to tie up sites for speculation and claim jumping. Under federal law a private individual can file on sites owned by the Federal Government and those owned by other people. If a developer doesn't show

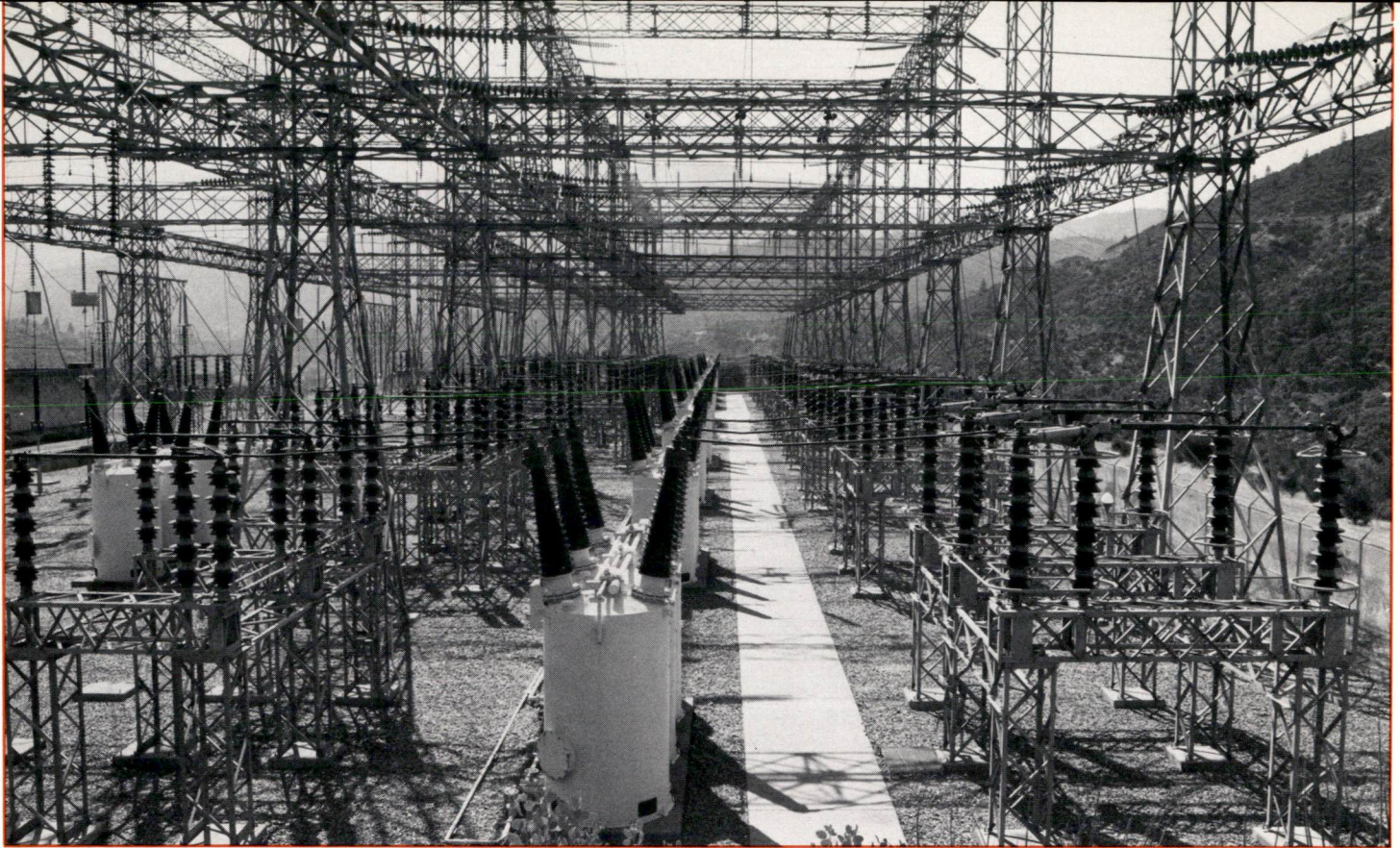
he is developing the site, other people can file for the site.

In fact the lure of the boom in hydropower is so strong that several key government workers who drafted the 1978 federal legislation have quit the government to work in the emerging field. One of these is Granville J. Smith, formerly with the Senate Energy Committee where he helped draft the hydropower sections of the 1978 bill. Smith says he can understand the fact that he might get some criticism for switching hats, but these days he's busy with his Washington, D.C. based private hydro company, Energenics. "Thanks to hydropower," Smith says, "I plan to be a millionaire within three years."

Generally most development in the field of hydro are being done by water districts and private individuals. Most individuals are involved with private investment companies like Consolidated Hydroelectric Inc. of Houston, Texas. This company, through its California headquarters in Redding, files most of the hydro applications in the state, 74 to date. Consolidated expects to invest an initial \$25 million in developing 100 out of the 500 Northern California sites they have investigated. Some state officials say Consolidated started the rush in hydro when the volume of its filings with state and federal agencies was noticed.

FEDERAL AND STATE LEGISLATION

To make the production of hydroelectric power attractive, in 1978 a federal Public Utilities Regulatory Policies Act (PURPA), required utilities to buy energy produced by the hydro developers at favorable prices. The California Public Utilities Commission followed suit by authorizing utilities to pay up to avoided cost for power and cogeneration. FERC issued rules to comply with PURPA requiring that electric utilities offer to purchase energy from such facilities at "avoided cost," that is, costs reflecting savings by the utility not having to buy energy or build new capacity.



The flurry of interest in hydro was increased when the Crude Oil Windfall Profits Tax Act of 1980 contained a provision which allowed an 11 percent business energy credit for qualifying hydroelectric properties. The credit can be applied to generating equipment such as turbines, generators, penstocks, and fish passageways. This credit is in addition to the long-standing 10 percent investment tax credit. The 11 percent tax credit is available both at sites where there is existing generating capacity and at "run-of-the-river" sites where there is none. It is available at existing dams which were completed before October 18, 1979, and at new or existing natural or created water flows (such as rivers, conduits, or irrigation ditches) which are not at the site of a dam. This credit is available to all tax paying investors.

The second provision of the 1980 tax act provides authorization for tax-exempt status for industrial development bonds issued to provide hydropower facilities at existing dams. Although these loans have not been given since the Reagan Administration took office, the provision applies to projects with up to 125 MW capacity, enough electricity year-round for more than 6,000 homes (18,000 people). On bigger projects only a portion of the project's costs may be provided by tax-exempt bonds.

PUBLIC UTILITIES COMMISSION

According to M. J. Purcell, Research Analyst with the California Public Utilities Commission, the PUC looks at the standard contracts the utilities are offering for hydro, and the amount of hydro purchase and development in the utilities' long-range plans. The PUC implements the FERC regulation of 1980, which gave the state one year to develop plans for implementing the rule. They have held workshops, issued a draft plan of key issues, and sought public input. The final report will be out in the next few months. "FERC is now proposing that if a project at an existing dam site is under 100 kilowatts, (enough electricity to power 100 hair-dryers) any developer may just send FERC a letter of intent, but still will be subject to all state requirements. "There is an effort by the federal government to streamline the license process wherever possible because FERC is swamped with applications.

In 1979, FERC issued a rule to streamline general procedures for preliminary permits and license applications. The preliminary permit is used by FERC to give priority of application for a license and to submit supporting information. Municipalities (including state and federal districts and water districts) have priority over individual developers. If the

plan of the municipality is not appropriate, FERC must inform the municipality and give specific reasons why its plan is not as good a plan as competing entities, and give the municipality time to develop its plan as good as the other plan. If this is done, the Commission will favor the municipality. Between competing private developers or competing municipalities, it's on a first come first come basis. Small scale hydro (under 5 MW) at existing dams and 15 MW in existing pipelines is exempted from licensing by FERC requirements. Five MW is enough electricity year round for 250 homes or 750 people.

"FERC is licensing the water of the U.S."

Bill Kopfler, Chief of the Hydro Power Licensing Branch, FERC, says 90 percent of the projects require a license from FERC, but, in 1978 state legislation was passed which enabled some water agencies and irrigation districts producing power up to 15 MW to be exempt from formal licensing. But these agencies are still under FERC jurisdiction because they must file an application. For example, Metropolitan Water District of Southern California put five hydro units on points of its pipeline. They saved time by applying for an exemption but not for a license.

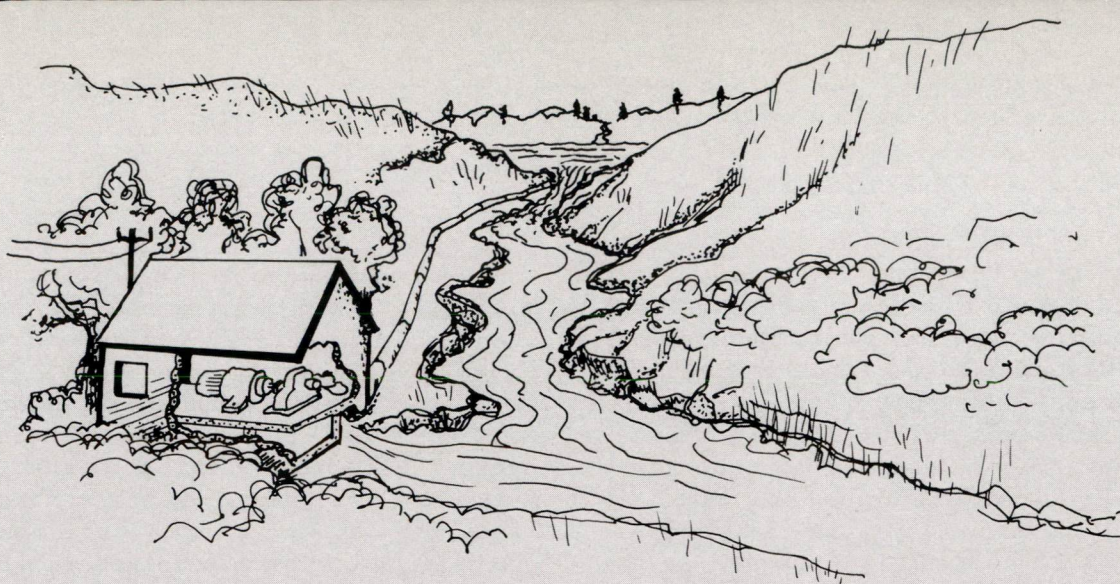
Kopfler explains, "FERC is licensing the water of the United States. The law doesn't say anything about local rights. Municipalities (including water districts) are given priority when applying to FERC, but a district 500 miles away can apply within another district's area, and if project plans are equal, 'first in line—first in right'. If private property is involved, companies, individuals, or municipalities can still file on the site, but they still have to work out rights with private owners or condemn the land, and they still have to get a state water right permit from the State Water Resources Control Board."

RULES & REGULATIONS

Terry O'Rourke heads Consolidated Hydro-electric and says the rule which allows municipalities to have priority over private developers is unfair since he believes in most cases the municipality has no intention of developing the sites and is only speculating to sell permits.

Since applications are public record, municipalities can xerox a developer's application and receive a FERC permit ahead of a private developer. "Some are genuine, but most will just auction off their permits," says O'Rourke. "It can't be logical for Modesto Irrigation District (MID) to file on a 4 megawatt (MW) site over 300 miles from Modesto; so I'm attempting to defeat every municipality that is xeroxing our permits." O'Rourke says it takes municipalities longer to write feasibility studies and get municipal financing. "In the short and long run, the local governments will cost rate payers more money if they develop the hydro rather than private investors. It just hurts the American public which is trying to get away from using foreign oil," says O'Rourke.

Lee De Lano, Civil Engineer at MID denies that MID intends to auction off any of their permits. De Lano says, "The permits that we receive we will proceed with, at least the feasibility studies, with the intent of developing. If it's not feasible we won't develop the sites and someone else can get them." He frankly admits xeroxing the permits, but added FERC allows this procedure and MID adds their own material to the application. De Lano says the PURPA rule that allows private developers to sell every kilowatt at "avoided cost" and make high profits, does not apply to an electric utility like MID since, "Modesto I.D. is not allowed to take advantage of another utility's avoided cost. We're applying for the permits because we need the energy, because we have a deficit." Besides De Lano says there is no guarantee that Consolidated will develop all their permits, and he believes the preference rule for public



Water is removed from a natural stream or dam and is conveyed by pipeline to a downstream turbine and generator.

agencies exists so that public agencies can develop power on public lands.

O'Rourke says Consolidated is backed by a parent company, a Texas oil company, which has revenues in excess of half a billion a year and is intent on developing these sites as soon as possible.

Owners of hydro sites don't have to get approval from their local irrigation district. The case of Adrian Haemmig in Grass Valley who bypassed Nevada Irrigation District (NID), part of whose water he was planning to use, and applied for a water rights permit from the State Water Resources Control Board (SWRCB), is an example. Although Haemmig plans to use NID water releases in the summer months to create power, he could receive a permit from SWRCB if he is not depleting the quality or quantity of the water. His project would simply use the water and then return it to the stream. Of course, he must still meet any requirements of the state Department of Fish and Game. As long as he does not interfere with NID's water deliveries, according to Archie Chesler at SWRCB, "he apparently could use the water. But if the flows get too low, he's just out of luck. NID doesn't have to release the water in that stream. At any rate, he would have a good flow of water in the winter." If Nevada Irrigation District were involved in the project, there would be an insurance liability for the district, according Ed Bickmore of the district's insurance carrier, Joint Powers Insurance Authority. But since it will not be involved in this particular project, potential insurance liability against the district does not exist.

HYDRO DEVELOPMENT

Everyone is interested in hydro these days according to Bill Kopfler of FERC. "These days utilities are interested; for example, East Bay Municipal Utility District negotiated with DWR, Sacramento Municipal Utility District, Pacific Gas & Electric Company, and No. Ca. Power Agency, finally picking PG&E because it offered the best rate for the Camanche-Pardee power project. Banks and insurance companies are interested. Bank of America, E F Hutton, and Continental Hydro of Boston have set up general partnerships, and investors who are seeking tax shelters get involved in setting up limited partnerships."

Fred G. Castagna, a general partner of Resource Investments, says his company was formed with several real estate brokers after Castagna accidentally discovered from a friend about new federal regulations. The company is hoping to build its first plant by next summer. The Redding-based company has received seven preliminary permits in Shasta and Trinity Counties and has filed for more than 12. It forms an investment company for each site, and then gets investors, or it may consider getting loans. An investor would have to spend a minimum of \$50,000 to get involved in a project which is worth \$2 to \$3 million. These investment syndicates can involve groups of professionals like doctors and dentists. It is significant that the investment company doesn't have to buy the land. A company, municipality, or individual can file on federal or state land, just like a resort owner on a reservoir.

But Castagna noted Resource Investments doesn't file on land where private land is involved, fearing eventual court battles. Even though Castagna says, "Once you're granted a license, you have right of imminent domain, but it's conceivable that before or during the preliminary period, the owner can file for exemption." His biggest concern, Castagna says, is the preference FERC gives to municipalities, including water agencies. "I feel that irrigation districts will file on everything from here on out so I'll probably just lose preference to them when it comes to licensing. Before this, the irrigation districts were asleep, but no longer."

“. . . so I'll probably just lose preference to them (I.D.'s) when it comes to licensing. Before this, the irrigation districts were asleep, but no longer."

Last year the Turlock Irrigation District connected hydro equipment to its biggest irrigation canal. It will provide enough electricity to serve 1,000 homes during the eight-month irrigation season and save 8,000 barrels of oil in the process.

Norm Brazelton, manager of the Sacramento office of engineering firm CH2M Hill, Inc. says the majority of CH2M Hill's clients are water agencies which ask the firm to do preliminary studies to check out the economics of the project and then do the engineering. However, CH2M Hill is not a financing company like the many investments firms involved in the field. The firm does preliminary work, including the design, but it doesn't do the actual construction. Brazelton says the engineering firm's work on small hydro "has gone up ten fold recently, and we even have trouble keeping track. Across the country the firm has 50 to 100 projects under consideration. The majority of

these already have their preliminary permit and are approaching the licensing stage. Some are even under construction." Joe Keating of Keating Associates in Placerville is both an engineer and a developer who strongly believes in small hydro. He's been working in the Sierras more than two years. Keating says, "I believe the capital is available for viable projects which have received licenses, and in December I will apply for five licenses to FERC and hope they (FERC) will issue the licenses in three months."

STATE TASK FORCE

With private developers, water districts, and engineering firms entering the field, some statewide coordination was needed. In January 1980 Governor Brown established a task force, headed by the state Department of Water Resources (DWR) and comprised of representatives from nine state agencies, to encourage construction of powerplants at existing dams, canals, and pipelines, and to streamline the permit process. DWR and the U.S. Department of Energy (DOE) have also established an "Outreach Program" to assist developers with procedures and provide loan information for small projects. Also DWR has scheduled construction of 15 small hydroelectric powerplants at sites on the State Water Project. This will help DWR meet its goal of 70 percent of the State Water Project's energy needs from renewable resources.

According to DWR enough energy to serve the residential needs of one million people could be generated in California and 4 million barrels of oil saved a year if existing hydraulic structures were retrofitted with hydroelectric facilities. DWR's Bulletin 211 which only discusses the potential at existing sites, is the result of a study with technical assistance from DOE. The bulletin said 85 percent of the existing facilities studied are cost effective to develop hydropower. Some 285 dams, canals, and pipelines owned by water districts and utilities were studied for hydro potential. Only 40 were not considered cost effective. DWR says



Slate Creek, north of Lake Shasta, a tributary to the Sacramento River where Resource Investments has received a preliminary permit from FERC for a 450-kilowatt run-of-the-river hydro plant.

the results of this study should be of use nationwide to all small hydro developers. The two-volume report discussed the engineering, environmental, and social issues, utility purchase prices for hydro equipment, the permit process, project financing, and manufacturers of small hydroelectric equipment. Copies of Bulletin 211 may be ordered from DWR for \$15.00 plus sales tax. DWR and DOE also publish a bimonthly newsletter to encourage and promote the development of hydro through the dissemination of information to developers. The "Outreach Program" headed by Nancy Quan of DWR will hold a small hydro workshop in Redding on September 24 (See What's New, page 3).

“. . .enough energy to serve the needs of one million people if existing structures were retrofitted.”

The California Energy Commission has played a major role in promoting higher purchase price offerings from the state's utilities, says Jim Helmich, Small Hydro Manager of the commission. The California Energy Commission provided a number of grants for feasibility studies in which the applicant shared the costs of the study. Helmich says, "We looked at 50 sites and sent out opportunity notices to water districts. The commission has spent about a quarter of a million dollars

(\$270,000) and the money was matched by hydro developers and private agencies. A major amount of our time was spent on these feasibility studies." The commission also put together an environmental guide for hydro developers which tells what to look for when doing environmental reports. It saves the developer's time and money by discussing what to consider if an environmental study is necessary. A key part of the guide tells how to mitigate environmental impacts and work with the Department of Fish and Game so the developer can get the issues clarified. The Energy Commission has also written a manual for hydro development which deals with technical, economic, and regulatory issues of development. Both guides are available from the Energy Commission in Sacramento.

ENVIRONMENTAL REVIEW PROCESS

An environmental review process is usually necessary in addition to seeking a permit from DWR, SWRCB, and perhaps other state agencies. If the initial study shows there may be significant environmental impacts, a study must be prepared. An environmental report must be done after getting the preliminary permit and before a license is granted. This study may not be too lengthy in certain cases. For example, usually there is little environmental danger involved in retrofit, attaching hydro equipment to existing dams, canals, and pipelines.

Chuck Fisher, Associate Fisheries Biologist of the California Department of Fish and Game says, "We don't have too many problems with retrofit as long as they don't pull water from the upper layer of

the reservoir, which may adversely affect trout. The project may have to include some screening to keep fish from being sucked into the pipes, and there might be some dissolved oxygen problems, but basically we don't have many problems with retrofit." He added Fish and Game is also concerned about erosion and the siltation effect on any aquatic downstream life from site preparation where they put in structures such as power lines, transformers, and access roads.

There is usually more environmental danger in "run-of-the-river" projects. These projects involve the upstream removal of water from a natural stream into a ditch or pipe for conveyance to the downstream water turbine and generator. Essentially, the Department of Fish and Game wants enough water left in the natural stream to support fish throughout the year. Fisher says, "California's typical streams, composed of snowmelt, normally can't stand a reduction in their normal fall and summer flows, or fishlife will suffer." Basically, Fisher says, the California Department of Fish and Game is opposed to any diversion at low flow parts of the year, which is roughly from July through October. Even though streams are only usable part of the year, lots of applications have been filed. Fish and Game believes these projects could potentially impact the whole riparian system.

Fred Castagna of Resource Investments, a Redding real estate group now promoting hydro, believes that Fish and Game's concerns are the single largest obstacle to summer hydroelectric power. "Personally," Castagna says, "I think that it is unreasonable to be concerned about a poor fishing stream where only two to three good fish per mile travel. We're not talking about salmon or steelhead on these streams, but trout. We made our own study, but we're worried that our recommendation (a proposal for streamflows) will not be what Fish and Game wants because they want more water in the stream. Then there is a conflict, and if FERC goes with Fish and Game, it reduces energy in

some cases and makes the project totally unfeasible. Hopefully, Castagna says, "We can negotiate these fish releases before FERC makes a decision,"

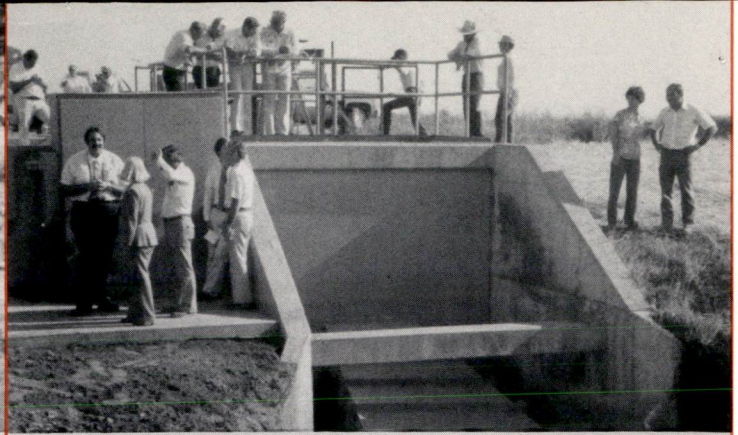
But Norm Brazelton of CH2M Hill says his firm is optimistic about working out difficulties with the Department of Fish and Game. Brazelton says his firm has not run into too many environmental problems because they are mostly working with fitting equipment to existing structures such as small dams and canals. Run-of-the-river natural sites have more environmental problems, although he says, "I think Fish and Game has been more cooperative on this than they have been in years. We (the engineering community) met with the Governor when he formed his task force on small hydro, and I suspect the message has come from Governor Brown to Fish and Game to help facilitate these projects."

Engineer-Developer Joe Keating is developing projects in the Sierras from Placerville to Mariposa County. He, too, has had good cooperation with state and federal agencies, including Fish and Game. Keating has 13 preliminary permits on a mixture of project types, including some streams that are snowmelt streams. He agreed with others in the field that, "The critical element in small scale hydro is the fishery study. During the summer, snowmelt is even higher than needed and critical times are fall and winter."

Keating is using a new study promoted by the U.S. Fish and Wildlife Service in cooperation with the U.S. Environmental Protection Agency's Heritage Conservation and Recreation Service, and the U.S. Bureau of Reclamation called "Cooperative Instream Service Group" which is a scientific approach that measures quantities of flows and determines what fishlife the stream will sustain over a year's period of time. "There is concern because in the eastern Sierras the bulk of revenue comes from recreation, but I believe we have selected sites where the fishery is not as good, for example, on steep portions versus on flatter portions of the stream."



Lower Hell Hole Dam on the Rubicon River is owned by the Placer County Water Agency. A 400-kilowatt plant at this site could generate 3 million kilowatthours of electricity annually.



Hydropower on the Richvale Canal in Butte County. This 100-kilowatt plant, owned by the Richvale Irrigation District, generates enough electricity to meet the needs of 190 people annually.

SUPREME COURT DECISION

The boom in hydro could go bust if the Supreme Court agrees with a recent lower court decision which struck down the portion of the 1978 federal act (PURPA) that forced utilities to buy locally produced hydro power, thus providing a captive market. A District Court judge in Mississippi ruled in February that this section of the law was an unconstitutional intrusion on the rights of states to regulate utilities. But, even if this scenario occurred, would it mean the end of hydro development?

WESTERN WATER put this question to a number of those involved in hydro. Resource Investment's Fred Castagna was asked if the Supreme Court throws out PURPA's avoided cost rule, would hydro still be a good investment. "Absolutely not," Castagna said. "If PURPA is thrown out, it is so marginal it's not feasible. But, even though our own PUC has passed laws to conform with PURPA, I think there would be an attempt by the various public utilities to strike down the California law." Joe Keating disagrees with Castagna. "If PURPA is struck down, I still believe that the PUC will see the benefits of equitable rate structures rather than purchasing foreign oil. We're just taking the Arab's money." In addition, Keating says, "Tax credits are the carrot that brings the rabbit, and are necessary for the construction and long-term financing of the projects."

Even FERC officials aren't sure what would happen if this key provision of PURPA were struck down, according to Bill Kopfler of FERC. "If part of PURPA is

successfully challenged, that will be the moment of truth to see if the utilities are really interested in power from these sources, or are they just putting up with federal regulations which have been crammed down their throats. Maybe it's a true market place transaction. I just really don't know." M. J. Purcell of the PUC says even they cannot say what will happen. "It's speculative, but the PUC would probably continue to authorize, encourage, and penalize the utilities for not availing themselves of this alternate source of energy, but it would be hard to force them to purchase every bit of hydro. So there would still probably be some activity, but more limited."

THE FUTURE

But, barring this legal problem which might take a little glitter off the gold, the future looks good for small hydro. Brazelton of CH2M Hill jokes that a hydro project is better than a gold mine because gold runs out and hydro keeps producing revenue as long as the water keeps flowing. Castagna of Resources Investments says, "If you look at future projects sold at avoided cost to the utilities, there is profit, and we'll keep going."

Most authorities don't believe that all the sites applied for will be developed; however, construction of some would significantly lessen the use of oil in large regions of the United States. CH2M Hill's Brazelton says he thinks the time is ripe for small hydroelectric development. "The sixties were a time of building the big projects. In the seventies, next to nothing, especially on hydro, was done. But the eighties are the time of small projects—especially small hydro."

Mono Lake:

By Rita Schmidt Sudman

What started out as a good year for the California Gulls ended sadly. Some environmentalists had predicted less gulls would return to breed at the dwindling lake this year, where coyotes in 1979 had been able to cross a newly formed land bridge to a former island, attack and drive away the nesting gulls. However, the number of returning gulls seemed to be about the same as last year although it was a bad year for the chicks. During the winter of 1981, it was expected that millions of brine shrimp were hatching in the lake as food for the thousands of migrating gulls returning to Mono Lake. But the summer's first crop of shrimp did not hatch and this may have been a factor causing the death of most of the gull chicks.

This year there were less chicks hatched at Mono Lake than in previous years. A three member census team including a wildlife specialist from the Los Angeles Department of Water and Power (L.A. DWP) counted about 5,000 gull chicks during a July 6 census, less than half the 12,400 chicks counted during 1980. Apparently most of this year's crop of chicks died after the July census.

According to University of California ornithologist David Winkler, 95 to 97 percent of the gulls died based on his counts on two islands. The L.A. DWP disputed this high mortality rate but agreed the death rate was up at least 90 percent, according to David Babb, DWP biologist. David Winkler says that the natural mortality rate of the California gulls is "somewhere around 50 percent," and believes this high death rate is abnormal. He says the gulls died of either starvation or from disease brought on by starvation. Winkler claims that accurate studies by a U.C. graduate biologist, taken at

ten lake locations of late winter and early spring brine shrimp populations in the lake, show only 5 to 15 percent of normal brine shrimp levels. Brine shrimp are the principal food for the nesting gulls and chicks. The Mono Lake Committee, an environmentalist organization, believes that the declining lake level may cause increasing salinity and other chemical changes which interfere with shrimp hatching, thus causing a low shrimp population. Committee Chairperson David Gaines says its irresponsible for Los Angeles to continue taking the lake's water while the lake is under study. "Why not give the lake a drink," says Gaines, "till we can figure out what's wrong."

This increased lake salinity is disputed by L.A. DWP's Duane Georgeson, Aqueduct Engineer, who claims, "The salinity of the lake is still within one-half percent or so of where it was last year, and the reason it's the same is that the lake level was the same (in early summer) last year." The lake dropped about a foot between July and August due to evaporation and the end of snowmelt. Also biologists aren't ready to agree the increasing salinity has made the lake unable to support the brine shrimp population without more study. The second brine shrimp population which hatched this summer apparently increased, so there is enough food to feed the hundreds of thousands of other migratory birds which visit Mono Lake each year. In fact, the second crop may be up 200 percent over last year, according to an L.A. DWP spokesperson. There may be several other reasons for changes in the shrimp crop. This second group of brine shrimp has a different life cycle and its eggs do not have to endure the winter at deep lake levels as do the first shrimp hatch. Or it may have been the warm winter and the hottest June in five years which contributed to the brine shrimp decline, according to a spokesperson for

Agil.

1. Students want jobs.
Show that they must work for them not
just individually but socially. Public policy for
jobs. A new SOS needed.
2. ~~Qual.~~ Ind. promotion
Pick says small firms are parasites.
The export base mindset!

Wed, 11-2, P. Douglas final

Concn

1. Mkt. Structure

a) Degree of Concn.

b) Differentiation of products

c) Ease of entry

2. Aggreg. Concn. "in U.S. Economy"

a. Mfg. p. 510

Date

~~1948~~

% of all mfg. assets by top 200

By Top 200

By Top 100

1948

48%

40%

1912

60%

47%

b. They focus on Mfg. But it gets more than its share of atten. Some other sectors are

- Agri.

1950, Top 2.3% have --- % of land

1980, " " "

- Banking. Hierarchical
- Finance
- Communications
- Holding spec. land, in view of urban expansion & swp.

Measures of Concn.

Assets, empl., & value-added.

% of Top 200 :	1947 & '48	1972
V.a.	30	43
Assets	48	60

Source: Census of Mfg.

Why is v.a. low? Bcs. of fewer workers.
 p. 511 shows profits to be slightly more, but
 this may well be bcs. a) assets are understated.
 b) Lower debt/equity.

Msr. of Concn. thus tell us a lot about
 differing character of large & small firms.
 Large ones are less labor-intensive.

This in turn tells us effect of ~~of~~ mergers.
Udell rpt., Wise.

Also tells us effect of various public policy.
E.g., shift to personal taxes. Anti-trust is a
weak reed. ~~to~~ to stand up against such powerful
forces.

are also ex. of scale in spreading K over
land: larger bldgs; farm machines.
so large ones become more land-using.

Reasons for expansion

Horiz.

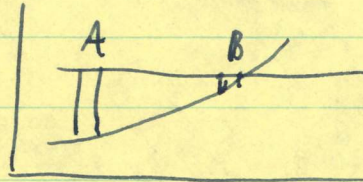
To A mkt. power. p. 514

Vertical

assure some mktol. in imperfect mktts.
The trouble is, the imperfection snowballs.
Becomes a fallacy of composition.
Public policy has not seen this, so
vert. inty. has been allowed to run wild.

Conglomerate

This shows the propensity to agglomerate in pure form. ~~Begin~~



A vs B. A plows back gains.

Mgmt. aggrandizement. Internalizing profits.
Tax bias.
Diversification motive.

Solution:

- a. Tax undistorted profits
- b. Make corp. inc. tax progressive.

Barriers to Entry

To make comp. work, open entry to as much as possible. E.g. utilities have cities, smaller firms.

If you want a life in business, be
aware of these problems, or you'll spend yr.
life under someone's thumb -
maybe Sheikh of Kuwait.

a.s. 162
March 2, '78

Conc. ex. power (McGuire this time; Merriam next)

1. Land scarcity, aggravated by unequal dist.
Labor power equally distrib. by defn.

Prop. very unequal.

Top 10% technique

Inc. 30%

Prop. 70%

2. Leads to conc. ex. power.

Property joins together

Corps; merges; cartels; banks

3. Larger ones are less labor-int.
Ok. data

4. Ag conc.

Farming. Every census, top 10% have more.

Irrelevance of ave. size.

Sugar firms. Lots of help from govt.

"Mfg." M & M p. 450

Note avoidance of regm. falling.

5. Larger ones use credit less. M & M p. 451

But use banks as means of coord'g price pol.

6. Horiz. intr. stopped.

Vert. intr. replaced it.

This means the most concd. stage ~~it~~ comes to ~~down~~ now whole indy.

7. Anti-trust, traditional tool.

Is too weak.

Problem is much greater. Inth. bias favoring larger firms b/c of ~~state~~ political power.
Like sugar, or Burton showed.

Supply & demand

Cost curves.

Entropy,

$$E = - \sum_{i=1}^n (s_i \log s_i)$$

where s = share of mkt. (or land income, etc.)

$$\frac{1}{10} \cdot -1 = -.1$$

~~1/10~~

<u>s</u>	<u>log s</u>	<u>s · log s</u>	<u>n</u>	<u>E</u>
1.0	0	0	1	0
0	-∞			
.1	-1	-.1	10	1.0
.01	-2	-.02	100	2.0
.001	-3	-.003	1000	3.0
.5	-.301	-.151	2	.301
.2	-.699	-.140	5	.699
.91	-.041	-.037		

Where mkt. shares are equal, $E = \log s$. The more firms, the higher is E

~~to the~~ Variation comes when shares are unequal, too, of course. Take 10 firms. 9 are equal, one is larger.

If all are equal, $E = 1.0$

If 9 ^{have 10% @} ~~are small~~ + one has ^{91%} ~~90%~~

$$E = \cancel{1} [9 \times .02 + .037] = .18 + .037 = .217$$

So, inequality lowers E
~~small~~ ^{small} nos. lower E

✓ So E is joint index to both aspects of conc.
 Higher E means more compn., wider distribn., etc.