Unocal Corporation
Geothermal & Power Operations
1300 North Dutton Avenue
Santa Rosa, California 95401
Telephone (707) 521-7600
Facsimile (707) 521-7603

UNOCAL 76

CITY OF SANTA ROSA
P.O. Box 1678
Santa Rosa, CA 95402

OCT 07 1996

DEPARTMENT OF
COMMUNITY DEVELOPMENT

January 11, 1996

Douglas. S. Hackley
Project Manager

Marie Meredith
City of Santa Rosa
Community Development Department
P.O. Box 1678
Santa Rosa, CA 95402-1678

Draft EIR/EIS, July 1996 -- Comments

Dear Ms. Meredith:

Unocal Geothermal has reviewed the Draft EIR/EIS, July 30, 1996, of the Santa Rosa Subregional Long-Term Wastewater Project. Enclosed are our comments on the Draft EIR/EIS. We appreciate the opportunity to express our opinions on the issues relating to the Santa Rosa Wastewater Project. 001

We emphasize the necessity to provide further information on the Geysers Recharge Alternative. The additional information should include a range of river discharge from one to five percent. The evaluation and analysis should also include the effects of optimizing irrigation with existing storage capacity. The additional information would provide a range of design flows to The Geysers that are viable project solutions.

The missing part of the puzzle, mentioned above, is essential to allow equitable comparisons of the project alternatives. We are eager to work with the City of Santa Rosa and their consultants towards a modified Geysers Recharge that meets the needs and objectives of the project. We believe a modified Geysers Recharge that minimizes flow to the Russian River is the "Best Solution" for Santa Rosa's Wastewater Project.

Sincerely,

DOUGLAS S. HACKLEY
Project Manager

Attachments (4)

Draft EIR/EIS JULY 1996 -- Comments

Santa Rosa Subregional Long-Term Wastewater Project

#	Chpt-Page	ID Fig/Tbl	Comment	
1	1-13, 1-62	Table 1-1, Table 1-15	The "Monthly Average Discharge" values shown in Table 1-1 do not correlate with the "Average Volume of Reclaimed Water Discharged to Laguna" in Table 1-15 on page 1-62. Should the "Average" values compare? The values in Table 1-15 actually calculate to a much lower percentage than shown in Table 1-1. What is the explanation?	002
2	1-21		By limiting the evaluation for Geysers Recharge to a Russian River discharge at essentially zero, much less than one percent on average, may have misrepresented the competitiveness of Alternative 4. The Geysers Recharge Alternative should be evaluated for Russian River discharges from one-half to five percent.	003
3	1-21		There is no additional storage considered for Alternative 4. Geysers Recharge could benefit greatly by considering even small amounts of increased storage, such as the acquifer storage being considered for the sports field. The benefit of downsizing the transport pipeline design size and thus reducing the capital cost should be evaluated. Alternative 4 may be more sensitive to small amounts of incremental storage.	004
4	1-25		The second paragraph states the Geysers Recharge transport pipeline would be 35 miles long, from Delta Pond to The Geysers area northeast of Healdsburg. If Geysers Recharge was selected, then the actual routing is expected to be at least 2 miles less than the 35 mile basis used in the DEIR. The EIR consultants recommendations for pipeline alignment are stated in Volume V of Appendix D-24, Conclusion And Recommendation, C3. The consultants said that, "...prudent, experienced civil engineering practice and judgment dictate that a pipeline of this size, length and pressure class, in particular, should be built cross-country in as straight an alignment as can be found. It should not follow the circuitous route of Pine Flat Road. We acknowledge the direction the BPU has provided and note our concerns expressed in this memo." We agree with your consultants. We propose using a more likely design length of 33 miles or less for EIR/EIS estimates throughout the DEIR document. Additionally, unnecessary inflation factors attributed to Pine Flat Road should be eliminated from all cost estimates.	005 006

#	Chpt-Page	ID Fig/Tbl	Comment	
5	1-25		The design for two 1,000,000 gallon storage tanks and 10 to 15 injection wells was intended for the design criteria of 20,000 gpm (28.8 Mg/d). The storage tanks are likely to be 500,000 gallons or less with the maximum design criteria of 16,000 gpm (23.0 Mg/d). Ten or fewer injection wells are expected for the 16,000 gpm design.	007 008
6	1-41, 1-57	Table 1-9, Table 1-13: impact 18.1	The Service Charge estimated at $74.40 for Alt. 4 is overstated. It appears the value used to calculate power requirement was the pipeline design flow. The design flow overstates the actual power required. The energy required should be calculated using the actual average water flow, not the peak design flow.	009
7	1-41	Table 1-10	The Demand Fee of $3,900 is overstated. The design flow is inflated due to not considering some river discharge (1%). This has increased the capital cost unnecessarily.	010
8	1-41		The DEIR states that "No feasible mitigation has been identified" for the service charge increase for Alternative 4, Geysers Recharge. This ignores the opportunities of private and public funding that have been discussed with HBA and the City of Santa Rosa. Please refer to the attached letter to Mr. Brauner dated January 30, 1996. Potential funding sources exist, such as Department of Energy, State Lands Commission, Unocal, Calpine, and PG&E to name a few. Therefore, mitigation is feasible and recognition of this should appropriately be included in the Socio-Economic evaluation.	011
9	1-44	Table 1-13	Impact 2.6.1 indicates there is "no feasible mitigation...identified" for the loss of farmland. This appears to ignore the opportunity for trading or purchasing of land to offset the minor amount of land required for the pump stations.	012
10	1-44, 2-65	Table 1-13	Impact 3.4.1 identifies some stabilization mitigation for the potential unstable slope conditions. If the pipeline were rerouted to avoid the Pine Flat Road right-of-way, then the situation would probably not exist. Avoiding Pine Flat Road could be the best mitigation of this item.	013
11	1-44	Table 1-13	Impact 7.8.2 The routing of the pipeline could avoid any significant impact and thereby making mitigation unnecessary.	014
12	1-44	Table 1-13	Impact 8.4C Shows that Geysers Recharge is the only alternative with no loss of sensitive terrestrial wildlife habitat when river discharge is 1% or less. This is a critical issue that deserves being highlighted in the summary statements.	015

#	Chpt-Page	ID Fig/Tbl	Comment	
13	1-53	Table 1-13	Impact 14.4.5 indicates there may be a significant impact after mitigation from the pipeline affecting foreground or middleground views from a high volume travelway, recreation use area, or other public use area. It is unclear how the buried pipeline will create the problem described. This impact should be reconsidered for a finding of "not significant" impact. Construction techniques used in the building of the Lake County pipeline have prevented problems on this issue.	016
14	1-59		The first paragraph identifies the "Environmentally superior Alternative" as the one with the "least significant effect on the environment." The relative perspective of the "Environment" is critical to this evaluation. The conclusion identifying Alternative 5B, the Laguna Discharge Alternative, as the environmentally superior has not focused on the "River environment." The environment of the river is the driving force for having the EIR. Should more weight be given to consideration of the least impact on the river? If a value assessment was done to look at the impacts to the environment where water is disposed by each alternative, then would the Geysers Recharge have the least potential environmental impact?	017
15	1-59		The Lake County EIR found the South East Geysers Effluent Project (SEGEP) to be the environmentally superior alternative as compared to a river discharge. Could the same analogy apply to the Santa Rosa Wastewater Project?	018
16	2-62	p 2.3.1	Here replacement of land for pump stations is less than significant and this seems inconsistent with the statement identified in comment 9 of this submittal (refer 1-44, Table 1-13).	019
17	2-71	p 2.3.7	A slope monitoring system may be unnecessary if the pipeline routing avoided the difficulties of Pine Flat Road.	020
18	2-105	p 2.4.6	The pump stations and their associated tanks could become "not significant" if consideration were given to allowing a 1% river discharge with the Geysers Recharge. This could reduce size requirements and directionally move towards a finding of "not significant" with some screening.	021
19	2-134	p 2.5.8	There is a discussion regarding the "shunting" of water to "other well sites that produce fewer seismic events." Practically all induced seismicity resulting from injection is "not felt" and therefore the number of events is not the correct indicator for evaluating redistribution of injection water. The emphasis should be on events from injection that actually correlate to felt events as monitored by the improved accelerograph stations.	022

#	Chpt-Page	ID Fig/Tbl	Comment	
20	2-138	Table 2.6-1	The table summarizes all mitigation measures. The decision making process may be improved if the mitigation was separated as to those required by the relatively short term construction and those required by long term operation. This could be a significant factor in the decision making process to identify the permanent operational mitigation measures required.	023
21	3.1-15		The fourth paragraph states, "Thus, alternatives 2 through 5 represent the impacts associated with the range of potential discharge rates between 1% and 20% of river flow." The Geysers Recharge Alternative was not evaluated for a range of flows. Water flow for reclaimed water allocation should be calculated for the Geysers Recharge in the range of 1/2% to 5% of river flow. This information could greatly change the power requirements, facilities sizing, and the capital & operation costs. This flow information is necessary to be able to evaluate Geysers Recharge in conjunction with some minimal river discharge and irrigation. By allowing a 1% river discharge and maintaining more of the existing irrigation the costs and power requirements of Geysers Recharge may be drastically reduced. This information is key to showing the Geysers Recharge may be the next most cost effective compared to 20% river discharge.	024
22	3.1-19	Table 3.1-6	The Reclaimed Water Allocation for Alternative 4 -- Geysers Recharge should include calculations showing the possibility of 1% river discharge and irrigation rates up to maintaining existing irrigation. A 1% discharge to the river (similar to Alt. 3 & 4) would be about 600 MG/yr. This alone would reduce the water flow to The Geysers by about 10% and would likely decrease design flow requirements by 10%. This could decrease the pipeline size by at least 6 inches in diameter. Capital cost should correspond to this 10% reduction.	025
23	3.1-19	Table 3.1-6	If irrigation was optimized with existing storage, then this may allow an additional 700 MG/yr to go to irrigation. This could reduce the flow design required by over 10%. This alone would reduce the water flow to The Geysers by about 10% and would likely decrease design flow requirements by 10%. This could decrease the pipeline size by at least 6 inches in diameter. Capital cost should correspond to this 10% reduction.	026
24	3.1-19	Table 3.1-6	The prior two comments regarding optimizing irrigation and allowing a 1% river discharge could combine to decrease design flow requirements by about 20%. These items combined could decrease pipeline size requirements by 12 inches in diameter corresponding to 20% reduction in capital cost for pipeline construction. Additionally, there would be a corresponding 20% savings in electrical energy required for pumping. Other benefits would include a substantial reduction in the surge tank size from 1,000,000 gallons to a 500,000 gallons size. The visual impacts would be substantially diminished with tanks only one-half as large. The 500,000 gallon size is scaled from the design size actually used in the Lake County Wastewater Project.	027

#	Chpt-Page	ID Fig/Tbl	Comment	
25	3.1-26		The description of Alternative 4 - Geysers Recharge should allow for river discharges from 1/2% to 5% and an ability to vary irrigation from the 25% to 50% of the remaining allocation.	028
26	3.1-29	Figure 3.1-7	The routing of the Geysers Recharge transport pipeline excessively inflates construction costs. A design with a more direct right-of-way should be considered. This should significantly lower costs and avoid unnecessary mitigation requirements for unstable slopes along Pine Flat Road.	029
27	3.3-3	Table 3.3-1	Item 9. Discharge: Prior publications of this table indicated project substitution for partial Geysers Recharge with 1% to 5% river discharge (see row 9). Geysers Recharge design should also be evaluated for design flows of 1/2% to 5% of river discharge.	030
28	3.3-3	Table 3.3-1	Item 7: Agricultural Irrigation shows a reduction of 2,000 acres of irrigation lands. A scenario that is feasible, and possibly more practical, is to allow optimizing existing irrigation with existing storage, allow a 1% river discharge and then calculate the design flow to The Geysers. This approach should optimize the pipeline size and greatly reduce the capital cost required for construction. Power cost will also be reduced. This scenario is necessary to make a comparison of alternatives on a similar basis within the Socio-Economics section.	031
29	3.3-6		There is a discussion of the volume of water that could leak from a pipeline if there were a rupture. The 1.7 million gallons may be double the amount expected if a modified Geysers Recharge scenario was considered that allowed 1% river discharge and optimization of irrigation with existing storage.	032
			Additionally, there should be a comparison of the calculation for water that would leak should a dam rupture due to a seismic event.	033
30	3.3-6		Isolation valves are designed for at 5 mile intervals, except on Pine Flat Road where they are designed for at 1.25 mile intervals. Selecting an improved routing other than Pine Flat Road would decrease the costs for the pipeline.	034
31	3.3-35		Considering a design that allows a 1% river discharge, optimizing irrigation with existing storage, and a diminished flow to The Geysers along an alternate routing (not Pine Flat Road) could change the pump station description as follows: 33 miles or less of pipeline length (not 35 miles); two 500,000 million gallon storage tanks (not 1 million gallons); 10 or less injection wells (not 10 to 15); 250,000 gallon capacity pump station tanks (not 500,000). These potential changes in the design are possible by just a little adjustment to the Geysers Recharge water flow allowed within the stated basis. This change in design basis may significantly decrease the costs, power requirements, visual impacts, environmental impacts, and especially the Socio-Economic impacts	035

#	Chpt-Page	ID Fig/Tbl	Comment	
32	3.3-40		Considering 1% river discharge and optimizing irrigation with existing storage, the two 1,000,000 gallon storage tanks at the end of the transmission pipeline (80 feet in diameter and 30 feet high) could diminish in size to 500,000 gallons (80 feet diameter and about 21 feet high). This height change could lead to a decreased visual impact evaluation. It certainly would lead to a lower construction cost.	036
33	3.3-41		Considering a 1% river discharge and optimizing irrigation with existing storage, the distribution pipeline at The Geysers may range from 6 to 24 inches in diameter (not 12 to 36 inches). This may decrease the visual impact analysis and certainly lead to a lower construction cost.	037
34	3.3-41		Considering 1% river discharge and optimizing irrigation with existing storage, there may only need to be 10 or fewer injection wells (not 10 to 15). This could lead to a lower construction and operating cost.	038
35	3.4-2	Table 3.4-1	The total cost for Alt. 4 - Geysers Recharge is excessively high at $208,252,000. Following are cost reductions to the estimate that should be considered for inclusion in the DEIR. 1. Avoid Pine Flat Road (alternate routing) and eliminate the 10% compounding inflation factor on piping, as the pipe estimates were already 10% high per Loren Weinbrenner's letter to Rich Mauer in the "Alternative Projects Construction Cost Estimate Appendix." This would decrease total project capital cost by $20,000,000.	039
			2. Allow a 1% river discharge, decrease design flow and pipe size 10%, decrease injection distribution system 10%, and decrease pump station equipment 10%. This could correlate to a $14,000,000 reduction in total project capital cost.	040
			3. Reducing the design flow may decrease the "New Electrical Service" fee from $15,000,000 to $5,000,000. This would decrease total project capital cost by $16,000,000. This is more than the $10,000,000 as there is 161% markup on all piping and pumping facilities included.	041
			These capital cost reductions add to $50,000,000 of total project capital costs. The capital cost for Alt. 4 - Geysers Recharge has been overstated by 24%!	042

#	Chpt-Page	ID Fig/Tbl	Comment	
36			These potential reductions of capital cost mentioned in the prior comment are especially important and greatly effect the results summarized in the Socio-Economics section of the DEIR. We understand the project selection will be a separate process that will evaluate the varied economics of component mixing. Our concern is that the information has not been made available to adequately evaluate the component mixing reasonably available with Geysers Recharge. The Socio-Economics section of the DEIR is considered as part of the overall environmental evaluation. Therefore, the basis of the Socio-Economics section should be based on reasonable values and not worst case scenario. In other words, the economics should be based on how the project may actually be built and not on a scenario that excessively overstates impacts and costs, with no consideration for a 1% river discharge. Geysers Recharge has been based on essentially no river discharge and the results are not directly comparable with the other alternatives.	043
37	3.4-2	Table 3.4-1	The Total projects costs have 3 overall escalation factors, (contingency 25%, Overhead 15%, and Engineering, Admin, Legal 15%). The 25% contingency appears high when the costs used for calculation have been identified as already 10%, such as piping costs. We recommend using a maximum of a 20% contingency. Additionally, the 15% Engineering, Admin, Legal factor has been compounded on top of the other escalation factors and this seems excessive as it results in an overall markup of 161% on all cost estimates. We recommend using a 10% factor for Engineering, Admin, Legal (or move this line item above the subtotal line to avoid compounding it on top of the other escalation factors). This could change total project capital markup to 150% (not 161%). This represents a $14,000,000 reduction from the $208,000,000 estimated.	044
38	3.4-2	Table 3.4-1	The $6,683,000 annual operation and maintenance costs are overstated. The electrical rates provided by PG&E indicate the Geysers Recharge to have at least a one cent per kWh lower cost potential compared to the power costs for other alternatives. (The rates are included by reference and attached is the letter to Mr. Rich Maurer, Parsons Engineering and Science, from Craig Kennedy, Pacific Gas and Electric Company, dated March 11, 1996.) A reduction of $0.01 per kWh would mean buildout year total power costs could be $5,467,900 (not $6,683,949). The O&M cost overstatement here is greatly exaggerated and this results in exaggeration of its effects in the Socio-Economics section. Re-calculation of the power costs is recommended.	045

#	Chpt-Page	ID Fig/Tbl	Comment	
39	3.4-2	Table 3.4-1	We are concerned that the power cost calculation is based on the design flow and not on the actual average flow. New power requirement calculations should be made based on the actual average flow for the existing design and also for the 1% river discharge and optimized irrigation scenario. These values should then be used as input for the Socio-Economics section calculations. Our calculations show annual power cost could be $4,997,443 at buildout year with power costing $0.045 per kWh and design flow with 1% river discharge.	046
40	3.4-2	Table 3.4-1	The Total Present Worth calculation indicates a $73,647,140 cost for 20 years of pumping costs. This is incorrect for the first 20 years of actual average water flow as shown in DEIR. The design flow was apparently used for the first 20 years of the project and this inflated the Geysers Recharge "Total Present Worth" substantially. This also affected the Geysers Recharge Alternative disproportionately more than any other alternative due to the O&M being 90% power for pumping of water. The actual average flow for each of the first 20 years should be used to calculate the "Total Present Worth." The first years average flow is about 80% of the average flow for the buildout year. A correction of this error could decrease the "Total Project Present Worth Cost" by about $15,000,000. Additional reductions of about $5,000,000 could be realized by considering a 1% river discharge. Optimizing the existing irrigation with existing storage could reduce the present worth another $5,000,000. The total reduction in present worth value could be $25,000,000. This is a 33% reduction! The reduction in monthly service fees would be substantially reduced. This calculation should be revised in the Final EIR.	047
41	3.4-2	Table 3.4-1	The $208 million capital construction cost of Geysers Recharge is excessively overstated as seen by comparing the costs of a similar project, Lake County's SouthEast Geysers Effluent Pipeline (SEGEP.) The SEGEP project is currently on budget at $34 million for a pipeline that is designed for an average flow of 5,400 gpm. Other specifics include a lift of about 1900 feet, a 20 inch diameter pipeline, 29 miles of transport pipeline, and safe injection of Secondary Treated Wastewater. This compares to the Santa Rosa project with a design flow of about 12,800 gpm, 3300 feet of lift, 48 to 42 inch diameter pipe, 35 miles of transport pipeline, and safe injection of Tertiary Treated Wastewater. The project specifications may support a cost of two or three times more, when comparing Santa Rosa's project to Lake County's, though it does not support a cost estimate of six times more!	048

#	Chpt-Page	ID Fig/Tbl	Comment	
42	3.4-4		The statement "Alternative 4 is more expensive than any 10% or 15% project" may not be valid if the 1% river discharge was included in the analysis. Irrigation and river discharge alternatives have been evaluated on a range of possibilities. The Geysers Recharge Alternative should have the same consideration to be evaluated on a range of flows reasonably possible (i.e., 0.5% to 5%).	049
43	4.11-34		Impact 11.4.4. There is a significant finding for affects to public or private roadbeds for the Geysers Recharge Alternative. A cross-country routing would easily mitigate this issue by avoiding Pine Flat Road. An alternate routing to Pine Flat Road should be evaluated.	050
44	4.11 - 49		Impact 11.8.1. Will the Geysers steamfield component cause traffic congestion along access roads? A significant impact finding is stated for Geysers Recharge and congestion will occur. This particular road could easily handle 195 additional trips per day without causing congestion. Yes, the local traffic may be increased by 10% or more, though this may not lead to any congestion. Traffic on this particular road is so sparse that even an increase of 20 trips per day could be above the cutoff criteria. We disagree with the use of the term congestion as it implies substantial delay would occur. Is it likely that the additional 195 projected trips per day could actually cause no delays in existing sparse traffic patterns?	051
45	4.14-93,94	Figures 4.14-19,20	The surge tanks shown are for a Geysers Recharge with design flow a 16,000 gpm. Considering 1% river discharge and optimization of existing irrigation could lead to a design flow of 10,000 gpm or less. The tanks could end up designed at half the height shown. This aspect of the variability of the Geysers Recharge Alternative needs to be presented.	052
46	4.14-105	Table 4.14-10	Impact 14.4.5: Adverse pipeline views may be affected. The level of significance may not be found to be significant if mitigation was based on a 1% river discharge. The decreased design flow may decrease impacts and mitigation may result in less than significant findings.	053
47	4.14-105	Table 4.14-10	Impacts 14.6.2, 14.6.3, 14.6.4, 14.6.5, 14.6.6 may all be found to result in a finding of "Less than significant" if design flow reductions are allowed to be considered, such as the 10% to 20% discussed in prior comments. In the 1% river discharge scenario there is a 10%-20% reduction, depending on irrigation amounts.	054
48	4.18-24	Table 4.18-10	The project cost data for Alt. 4 Geysers Recharge is overstated. The Socio-Economics are based on the Disposal Cost of $208,252,000 and an O&M Cost of $6,683,000. These costs could easily be $150,000,000 for Disposal Cost and $5,000,000 for O&M Cost just by making the adjustments in prior comments. These new lower values, if used, may drastically change the results of the Socio-Economics section and also the DEIR conclusions.	055

#	Chpt-Page	ID Fig/Tbl	Comment	
49	4.18-31	Table 4.18-12	Alt. 4 - Geysers Recharge indicates a "Significant impact before and after mitigation." This fails to recognize the realistic potential for contributions from public and private industry. We understand the cost estimate is based on an assumption that no off-setting revenues are included from the value of electrical power (as stated on page 3.4-1, fourth bullet item). Assuming "No revenues" does not mean they are "Not feasible," just not considered in the project costing. Contributions from potential private and public sources should be considered as realistic mitigation opportunities. Some sources have been identified for Santa Rosa and these could be included in the mitigation analysis. If the realistic potential sources for funding of capital and O&M were considered, then the impact after mitigation may be less than significant. This item needs further study for inclusion in the Final EIR. This one issue may have the greatest effect on the way the Geysers Recharge is presented in the Socio-Economic section.	056
50	4.18-34	Table 4.18-13	The values shown for Alt. 4 - Geysers Recharge for the estimated additional average monthly service charge should be adjusted per the comments included in this document. At the least, new values should be shown for a Geysers Recharge with 1% river discharge and a higher maintenance of irrigation optimized for existing storage. We recognize there will be a project selection process following the Final EIR. The dilemma is that if new calculations are not made for a modified Geysers Recharge, then a valid comparison can not be made. If there is not information supplied on Geysers Recharge at the modified design flows with accompanying costs, then there can not be an analysis of the environmental impacts of the Socio-Economics section. If there is not new information for a modified Geysers Recharge, then the selection process may be limited to the information at hand in the Final EIR. A false conclusion may be reached when limiting the information available. Reasonable and likely mitigation opportunities, by design modifications or economic contributions, should be examined and analyzed to avoid overstating impacts.	057

#	Chpt-Page	ID Fig/Tbl	Comment	
51	A-1		The "Range of Discharge Evaluation" appendix discusses the variability of design flows for all Alternatives, except Alternative 4. The lack of considering river discharge flow and variation for handling water storage have unfairly and inappropriately handicapped Geysers Recharge. Information was developed regarding various flow scenarios by consultants working on the EIR and is shown in Volume IV as appendix D-18, *Geysers Recharge Water Balance and Operations Considerations.* The range of flows to The Geysers identified in D-18 could have been included for analysis in Appendix A.	058
			The flows shown on Table 3, Option 2 of Appendix D-18 show the Geysers design flow to be held constant. This approach with a 1% river discharge and optimizing irrigation could work to meet the project needs and objectives. We recommend this scenario should be evaluated for costs and economics. Take note that even within D-18 the consultant memorandum states that the approach taken in Table 3, Option 2 is very "Cost-effective." What is the reason for not pursuing the "Cost-effective" solution for the Geysers Recharge?	059
52	App. A		Figure 2 of the *Alternative Projects Construction Cost Estimate, Supplement No. 1,* shows Alt. 4 with only a no discharge configuration. The construction cost of Alt. 4 with 1% river discharge and optimized irrigation and steady-flow to The Geysers may be less than $100,000,000. This would make Geysers Recharge at 1% discharge directly competitive with irrigation alternatives at 15% discharge. This is an important issue that should be examined, analyzed, and offered to decision makers as a choice.	060
53	Vol.V	App. D-24	The pipeline alignment along Pine Flat Road is quite controversial. The EIR consultants in appendix D-24 recommend more direct cross-country routing. The "Conclusions and Recommendations of Appendix D-24 are clear in expressing the engineering concerns of cost and constructability. The failure to follow the consultant recommendations (of C1, C2, and C3) has resulted in excessive costs and environmental impacts of significance. We agree with the EIR consultant and recommend the Geysers Recharge be based on a cross-country routing in as straight alignment as reasonable.	061
54			Included, as comments and attached, is a letter to Mr. Edwin Brauner, dated January 30, 1996, entitled *The Geyser Recharge Alternative Reliability, Capital Cost, and Flowrate.* Comments in this letter are still pertinent to the current Draft EIR/EIS. The issues presented in this letter need to be reviewed and the DEIR revised accordingly.	062

#	Chpt-Page	ID Fig/Tbl	Comment	
55			Included by reference and attached is a letter to Mr. Rich Maurer, Parsons Engineering and Science, from Craig Kennedy, Pacific Gas and Electric Company, dated March 11, 1996. This letter indicates there is a potential cost advantage on electrical rates for the Geysers Recharge Alternative. These rates were not incorporated into the Draft EIR/EIS and the values published for costs in *the Alternative Projects Construction Cost Estimate*, date November 1995, have not been updated. Inclusion of the newer electrical rate structure could diminish the disparity between Geyser Recharge and the other alternatives for electrical power. The Geysers Recharge is more sensitive to the electrical factor as about 90% of the operations and maintenance costs are from electrical power required for pumping. The issues of power pricing should be revisited to reflect the lower rates possible with the Geysers Recharge Alternative.	063
56			Attached (in written format), are the verbal comments presented at the Public Hearing on September 24, 1996, by Mr. Anthony J. Chasteen. These comments are submitted by copy of this letter and a response is requested.	064

Unocal Energy Resources Division
Unocal Corporation
3576 Unocal Place
Santa Rosa, California 95403-1774
Telephone (707) 545-7600
Facsimile (707) 545-8746

UNOCAL 76

January 30, 1996

Douglas. S. Hackley
Project Manager

Edwin Brauner, Assistant City Manager
Santa Rosa, City
PO Box 1678
Santa Rosa, CA 95402-1678
Phone: 707.543.3021

Re: The Geysers Recharge Alternative Reliability, Capital Cost, and Flowrate

Dear Ed:

This letter is a follow-up to our meeting of December 19, 1995, where we discussed The Geysers Recharge Alternative. We appreciate you taking the time to openly discuss the issues involved with the transportation and injection of treated wastewater at The Geysers. We continue to believe The Geysers Recharge Alternative is environmentally the superior choice of all the alternatives being studied. Also, we expect you will find The Geysers Recharge Alternative to be economically the more competitive choice when compared to either of the irrigation alternatives.

The particular points discussed at our meeting are summarized in this letter. This letter is not intended to cover all areas that need consideration for re-evaluation of The Geysers Recharge Alternative. Only the main topics are presented with some explanations and graphs to provide a better understanding.

Long-Term Geysers Reliability

You have expressed concerns regarding the long-term viability of injecting water into The Geysers steamfield. To address this we can look at the cumulative mass produced from The Geysers and compare this to cumulative water injection (see Chart 1 attached). This chart shows cumulative mass produced from the beginning of production at The Geysers until now. Chart 1 also shows the projected water injection from now through the end of the EIR/EIS study period. Analysis of The Geysers steamfield production and water injection shows total mass replacement with all injection sources projected to be only 62%. This low percentage leads to a reasonable conclusion that there is adequate ability to inject current water sources along with the future sources of Lake County and Santa Rosa Wastewater.

The treated wastewater of Lake County and Santa Rosa have no inherent qualities (such as solid or salt contamination) that would impede long-term injection of the water into

steamfield injection wells. The quality of the treated wastewater may even be an improvement compared to some of the current water sources used successfully for injection.

Shown are projections for water injection on Chart 1 only through the EIR/EIS study period, though we fully expect that injection can continue for many years to follow. Therefore, we have taken on the task of obtaining long-term wastewater injection agreements with many leaseholders that have a renewal option. The leaseholder commitment necessary to maintain the ability to inject treated wastewater over the life of the project and beyond is in place.

Review of Cost Estimates

A review of the *Alternative Projects Construction Cost Estimate*, dated November 1995, prompts us to propose several alternative modifications. The following alternative modifications will have major impacts on the cost estimate of The Geysers. The cost basis should be changed by considering the elimination of extraordinary cost adders. A 1% Russian River discharge provides a more comparable basis to the irrigation alternatives. Calculate the power costs using a varied cost per kilowatt-hour for alternatives with significantly different power consumption.

Most cost estimates normally have an inherent conservatism, though areas with an extraordinary cost *adder* should be eliminated. Described herein are some of the circumstances where an improved basis for The Geysers Recharge Alternative should be included, especially for impartial comparison to irrigation alternatives. A review of the latest construction cost estimates for the alternatives still considered shows The Geysers Recharge Alternative (4) is a lower cost than any of the irrigation alternatives (refer to the attached Chart 2).[1] Following is an explanation of how the cost advantage of The Geysers versus the irrigation projects is much greater than Harland Bartholomew & Associates (HBA) indicates when comparing them on the same basis.

The cost estimate summary in column 4 of Table 1 (attached) shows data for construction costs of The Geysers taken from HBA documents. We believe the totals presented contain overestimates and may contain some inappropriate costs. Piping costs have been inflated by HBA an additional 10%[2] to arrive at a conservative estimate. This inflation seems unnecessary considering the large 25% overall contingency added. Further, there appears to be an additional 10%[3] for the 42 inch piping along Pine Flat Road. The estimate may better reflect a practical approach if the cost basis was *not* along Pine Flat Road. The EIR/EIS *Work-in-Progress* states mitigation to re-align The Geysers Pipeline Route is "to be added" which will likely be a cross-country routing. Piping cost estimate reductions discussed would reduce the capital cost estimate per our analysis (as shown on Table 1, column 4.2 vs. 4.1) by over $20 million.

---

[1] This graph is based on exactly the same data as contained in the *Alternative Projects Construction Construction Cost Estimate*, dated November as prepared by Parsons Engineering Science, Inc. for HBA.
[2] The cost estimate for 42" & 48" pipeline from Loren Weinbrenner to Rich Maurer, dated 9-23-95 contained in the *Alternative Projects Construction Cost Estimate Appendix*, dated November 1995.
[3] The unit costs for the 42" pipe were boosted 10% on Table 4.6, note (1) of the *Alternative Projects construction Cost Estimate*, dated November 1995.

Another major point to examine is the inclusion of some Russian River (RR) discharge for The Geysers Recharge Alternative. The Geysers Recharge Alternative costs of construction and operation are overestimated by not considering the same 1% RR discharge included in the irrigation alternatives. The 1% RR discharge represents a total of 685 million gallons during the winter discharge months. Basing The Geysers alternative on a 1% RR discharge could decrease pipeline and pump installation costs by 10%. Additionally, this approach will lower the operating cost significantly as less water pumped equates to less energy required for pumping. This should lead to using the lower estimate for substation fees,[4] which amounts to a $17 million reduction in capital costs. The above items should lower the capital costs (refer to Table 1, column 4.3 vs. 4.2) for a total of over $30 million. A graphical representation of the savings is shown on the chart summarizing construction cost estimates (attached as Chart 3) under alternative number 4A.

Recalculation of Operating Costs

The electrical power portion of the annual operating cost should be varied between the alternatives to reflect the likely difference in unit power cost. The use of a 5.5 cents per kilowatt-hour average was applied uniformly to all the alternatives. This average cost distorts the comparison for total electrical costs of The Geysers Recharge Alternative to the other alternatives. We believe the range in costs for projected electrical power costs supplied by PG&E were intended to reflect a lower per unit cost when considering a higher total usage. Therefore, using the average cost across all alternatives indicates an inflated total power cost for The Geysers. The result of the above method in an economic evaluation exaggerates The Geysers operating cost. We ask that further clarification of unit cost projections for the various alternatives be the subject of discussions with the City of Santa Rosa, HBA, and PG&E.

In order to provide an example of how present worth comparisons (including O&M) may look, we have shown in Table 1 the operating cost based on a 4.5 cent per kilowatt-hour rate (see attached Table 1, Note 15). The result of using 1.0 cent per kilowatt less indicates that annualized operation and maintenance costs for The Geysers may be overstated by at least $1 million annually. We encourage a recalculation of the O&M costs based on a 1% RR discharge and a differential between unit costs for electrical power cost for The Geysers. Combination of these recalculations decrease the total O&M annual costs for The Geysers by $1.7 million. This recalculation is crucial to an impartial evaluation in the *Socio-Economics* section of the EIR/EIS study.

A graph of estimated improvements for the present worth of The Geysers Recharge Alternative is shown under item 4A on Charts 3 & 4 with the values summarized in Table 2. {Please note the values in the column labeled 4.2 on Table 2 are the values used for alternative number 4A on Charts 3 & 4 attached.} On Chart 4 The Geysers (4A) has a clear cost advantage over irrigation projects when compared on the same basis and discounting extraordinary *adders* discussed above.

[4] Refer to Table 10 and 10.2 of the *Alternative Projects construction Cost Estimate* and *Appendix respectively, both are* dated November 1995.

O&M Present Worth Calculation

Annualized O&M rates used in the calculation of the present worth for alternatives are oversimplified and should be recalculated. A better method to calculate a present worth for each alternative would be to examine the projected costs of power for each year, from year-one through year-twenty using their respective flow projections. Each year's cost can then be brought to a present worth individually and totaled. Using a build-out design flow as an annualized average for all of the first twenty years yields an incorrect economic comparison. Since The Geysers Recharge Alternative calculates to use more energy than other alternatives, the current present worth is exaggerated in the HBA estimate. Oversimplifying the calculations negatively impacts The Geysers more than other alternatives by magnifying differences in O&M cost.

We propose the present worth total for each alternative be recalculated using the method of individual year flows for each of the twenty years. After the individual year's power costs have been calculated for the flow of each year, they can be calculated to a present worth and totaled. The proposed present worth calculation could result in an additional $10 million decrease (not shown in attached graphs or tables) in the total estimate

Ratepayers Perception Concerns

The Geysers Recharge Alternative is adversely portrayed by the public focus on annual fees. The Geysers Recharge Alternative with substantially lower total costs than an irrigation alternative could be incorrectly ranked due to the calculation method used for annual *Service Charges* and one-time *Demand Fees.*[5] The public could be incorrectly influenced by the slightly higher annual fee as they are directly effected. The possibility is one project with the best overall economics could be ranked lower than a second project with a lower *Service Charge*, even though the second project has *less* favorable overall economics.

Opposition to The Geysers could arise without a fair understanding of the economic analysis. The Geysers' overall positive economics should be emphasized to the public. The *Socio-Economics* section of the EIR/EIS Study should present an overall economic analysis to clarify this issue.

Funding Potential

Federal and State funding sources are potentially available to fund projects like The Geysers Recharge Alternative. This is a significant benefit that is not explained by the EIR/EIS process. Potential funding sources should be explored and contacts begun in the near future. We recommend you initiate the process of making contacts for potential funding. It is understood that the City of Santa must keep an open and unbiased review of all alternatives for the EIR/EIS study. Santa Rosa can begin the search for potential funding prior to project selection and still maintain an impartial position to each alternative. The competition for the types of opportunities mentioned require a proactive approach for success.

[5] Refer to the *Socio-Economics, Roundtable #8,* Work-in-Progress dated December 14, 1995.

Re: The Geysers Recharge Alternative Reliability, Capital Cost, and Flowrate, January 30, 1996

The items identified in this letter could cut total project cost estimates for The Geysers Recharge Alternative by about $70 million. The significance of the issues presented are reinforced by the large potential reduction of estimated costs. If you have questions or comments regarding this information, then please contact me. Again, we appreciate the time spent meeting with us to exchange ideas on Santa Rosa Wastewater.

Sincerely,

DOUGLAS S. HACKLEY
Project Manager

Attachments

CC: A.J. Chasteen
D. Crea
D. Cooley - PG&E
A. Hague - HBA
E.D. Steger
J. Rudisill - Calpine
G. Scott - SLC
dsh 4.3.4.1
K. Talkington
K. Speer
D. Carlson - SR
NGRE-D-310.01

L60130a

CHART 1

Geysers Cumulative Mass Produced or Injected

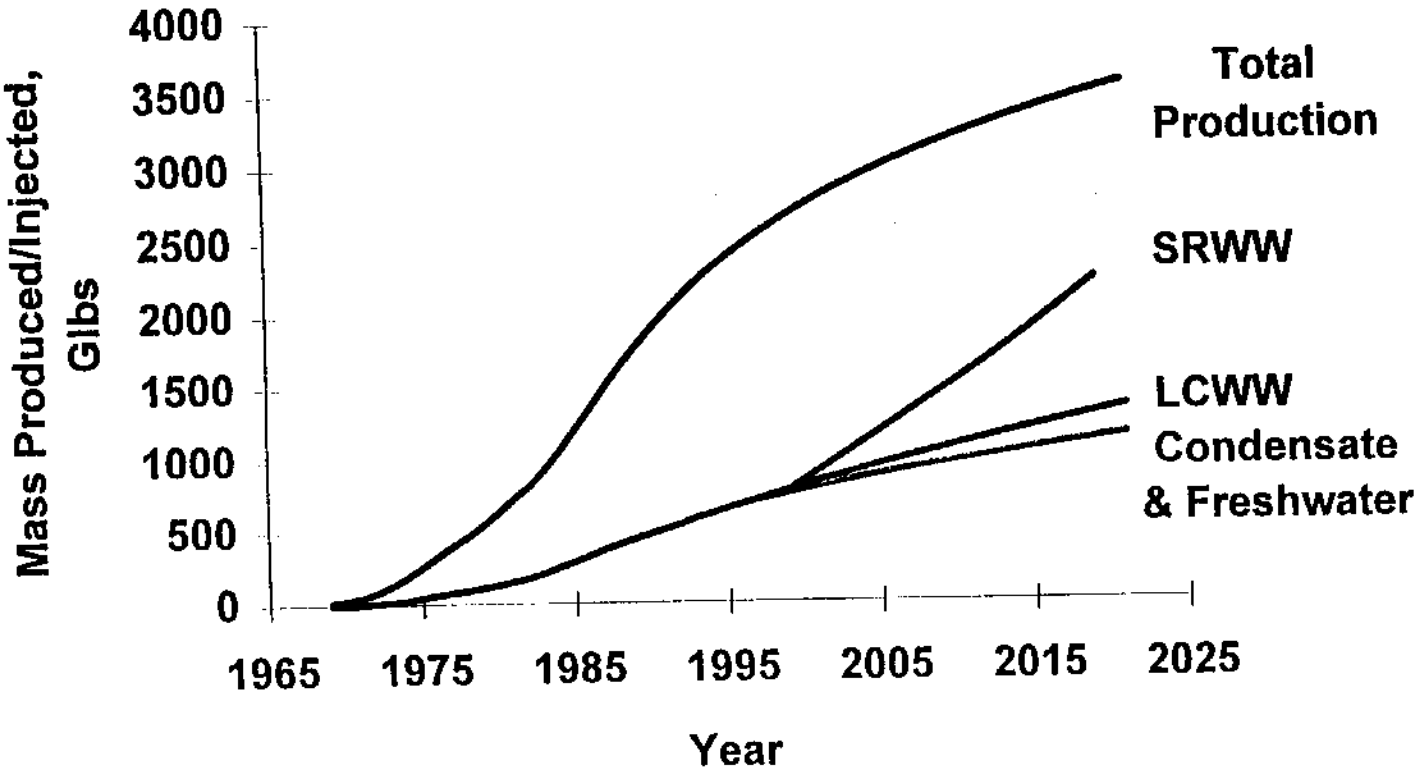
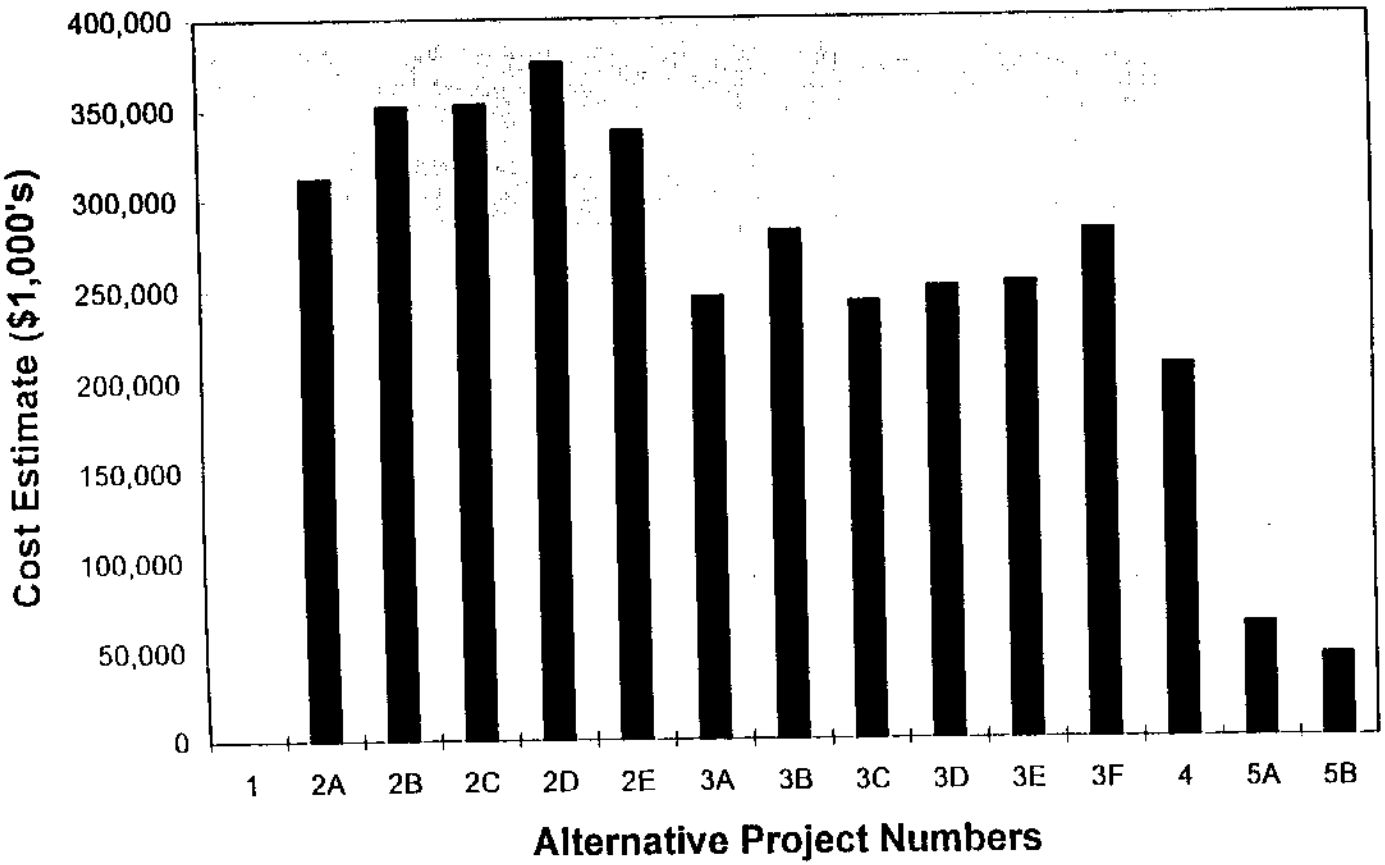


CHART 2

Santa Rosa Wastewater Project - Summary

Construction Cost Estimates



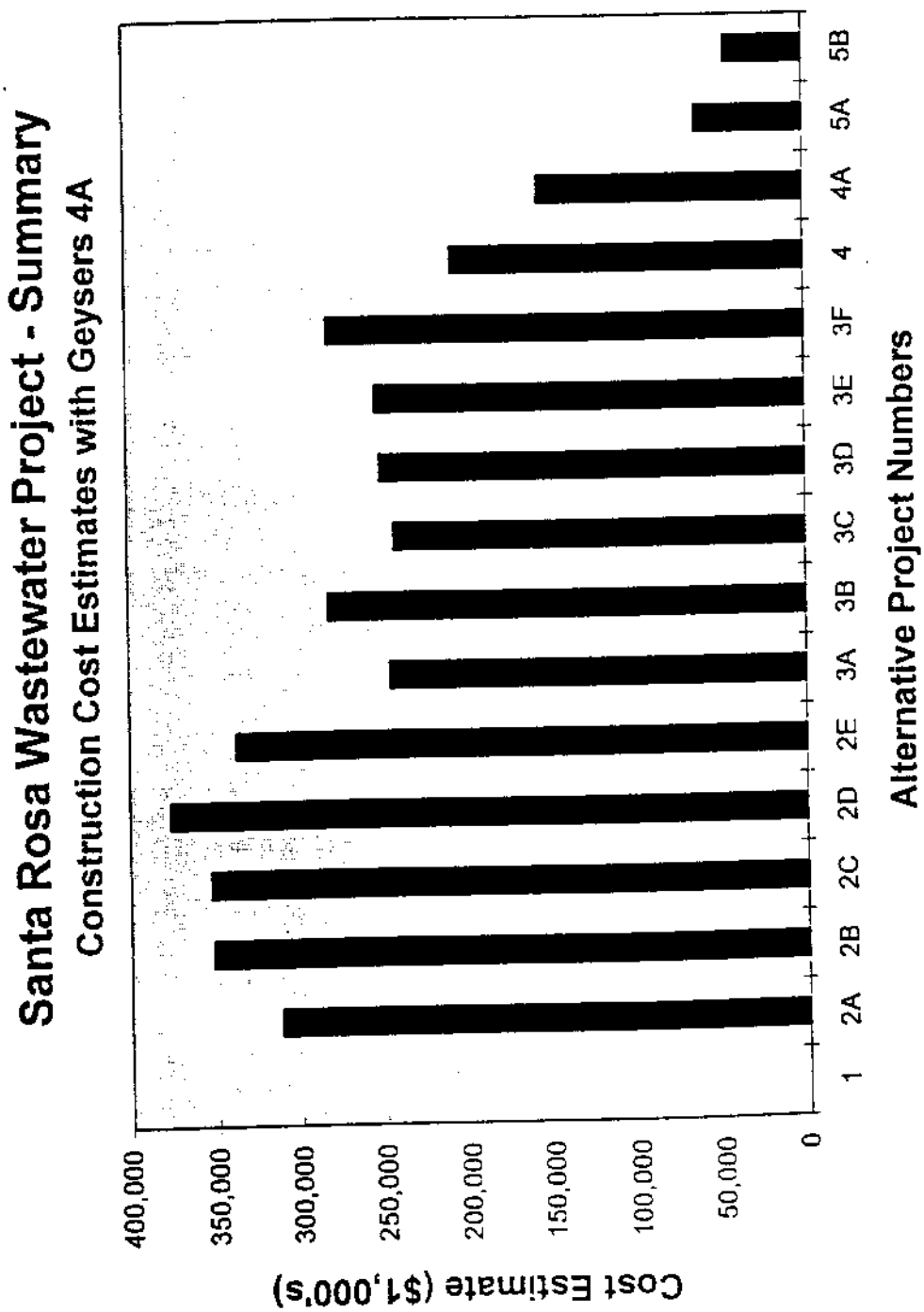


CHART 3
Santa Rosa Wastewater Project - Summary
Construction Cost Estimates with Geysers 4A
Cost Estimate ($1,000's)
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1
2A
2B
2C
2D
2E
3A
3B
3C
3D
3E
3F
4
4A
5A
5B
Alternative Project Numbers

CHART 4

Santa Rosa Wastewater Project - Summary

Construction & Present Value Estimates with Geysers 4A

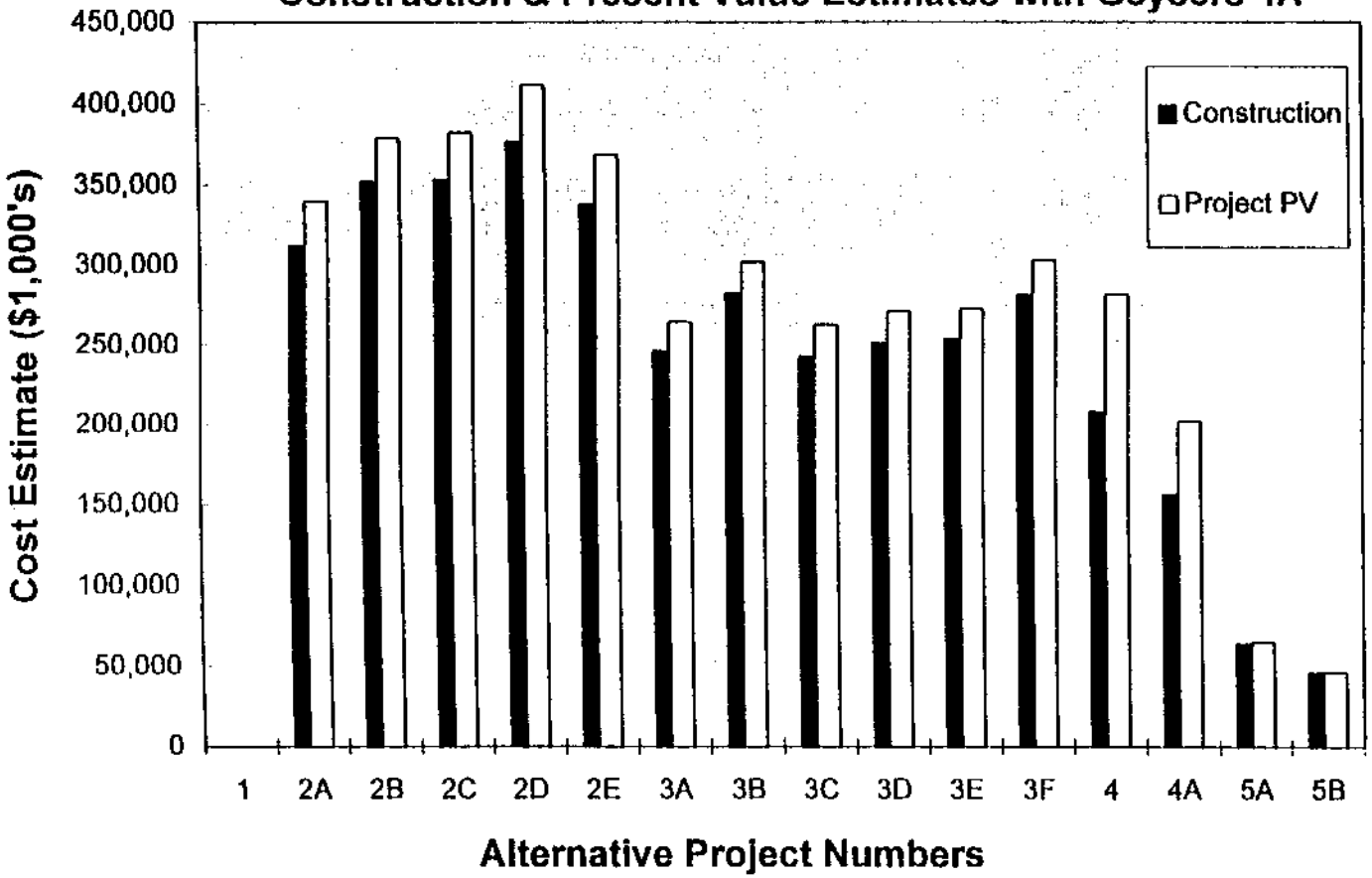


TABLE 1

1/17/96

Santa Rosa Wastewater Project

Geysers Recharge Cost Estimate ($'s)	4	Note	4.1	Note	4.2	Note
Alternative Description	*HBA: Alt. Projects Constr.Cost Estimate*		*Lower Pipe Cost & Not on Pine Flat Road*		*1% RR Discharge & Lower Power Cost*	
Pipe, 48", cl 250,WSCML/C	13,348,000		13,348,000		12,013,200	9
Pipe, 48", cl 150,WSCML/C	16,170,000		16,170,000		14,553,000	9
Pipe, 42", cl 600,WSCML/C	7,060,000	1	4,813,685	6,7	4,332,316	9
Pipe, 42", cl 250,WSCML/C	5,520,000	1	3,763,674	6,7	3,387,307	9
Pipe, 42", cl 150,WSCML/C	5,910,000	1	5,372,781	7	4,835,503	9
Isolation Valve Stas.	500,000		500,000		450,000	9
Air Release Valve Stas.	370,000		370,000		333,000	9
Flushing Valve Stas.	440,000		440,000		396,000	9
Creek Crossings (Open Cut)	150,000		150,000		150,000	
Creek Crossings (Bore and Jack)	40,000		40,000		40,000	
Highways ofr RR Crossings	300,000		300,000		300,000	
Road Pavement Restoration	1,391,400		1,391,400		1,391,400	
Pine Flate Road Reconstruction	8,000,000	2	0	8	0	9
Transport Pipeline Construction	59,199,400		46,659,540		42,181,726	
Geysers Distribution System	17,200,000		17,200,000		15,480,000	10
Piping Subtotal	76,399,400		63,859,540		57,661,726	
Pump Station Basic Costs	32,750,000		32,750,000		29,475,000	11
Surge Arresting System	300,000		300,000		300,000	
Stroage/Wet Well Tank	900,000		900,000		900,000	
Electrical Subtation	2,975,000		2,975,000		2,677,500	12
Stand-by Power	0		0		0	
Telemetry System	60,000		60,000		60,000	
Pump Stations & Electrical	36,985,000		36,985,000		33,412,500	
Fees to PG&E for New Electrical Service	15,000,000		15,000,000		5,000,000	13
PG&E Transmission Interconnection and Distribution Studies	45,000		45,000		45,000	
Utility Services	15,045,000	3	15,045,000		5,045,000	
Headworks Improvements	790,000		790,000		790,000	
Piping & Pumping Subtotal	129,219,400		116,679,540		96,909,226	
Contingency 25%	32,304,850		29,169,885		24,227,306	
Overhead 15%	19,382,910		17,501,931		14,536,384	
Construction Cost Subtotal	180,907,160		163,351,355		135,672,916	
Engineering, Admin, Legal 15%	27,136,074	4	24,502,703		20,350,937	
Land Purchase Cost	209,000		209,000		209,000	
Total Project Capital Cost	**208,252,234**		**188,063,059**		**156,232,853**	**14**
Pipeline Maintenance Cost	31,644		31,644		31,644	
Pumping Equipment Maint. Cost	69,300		69,300		69,300	
Pumping Power Annual Cost	6,583,005	5	6,583,005		4,896,499	15
O&M Subtotal	6,683,949		6,683,949		4,997,443	
O&M Annualize 20 years @ 6.5%	73,647,140		73,647,140		55,064,362	
Total Project Present Worth Cost	**281,899,374**		**261,710,199**		**211,297,215**	**16**

dsh

Table 1 Notes for The Geysers Recharge Cost Estimates

1. The 42" pipeline are inflated by 10% in the HBA estimate for the Pine Flat Road routing. The is a comment in the "Alternative Projects Construction Cost Estimate Appendix" by Loren Weinbrenner that the costs for the 42" and the 48" pipeline costs were 10% high.
2. There is an additional $8,000,000 added to repair and improve Pine Flat Road after routing the pipeline there.
3. The Utility Services includes the $15,000,000 in the cost estimate, though PG&E had indicated the cost could range from $5,000,000 to $15,000,000. On top of the high side estimate there is the 161% markup for total construction costs.
4. The 15% Engineering, Administration, and legal fee compounded onto the other markups seems excessive. Suggest 10% be used when compounded on top of the other contingencies that total 40% or do not compound it and show it as a line item.
5. The $0.055 per kWh was in the middle of the range PG&E provided HBA ($0.045 to$0.068). This number was used for all projects which is an error as the project with the higher power consumption will get the lower rate in the range. Conversely the project with the lower power requirement will likely get the higher rate in the range. To average the rate and apply it the same to all alternatives is not valid.
6. Avoiding Pine Flat Road and following the recommended mitigation in the Geology section could decrease the pipeline length by at least 2 miles.
7. The 10% inflation for following Pine Flat Road should be removed.
8. The $8,000,000 road reconstruction cost would not be required if the mitigation measure were followed. The Pine Flat Road decision inflates the total construction cost estimate by $20,000,000.
9. Consideration of a 1% Russian River discharge during the peak flow months of December, January and February could decrease the pipeline size requirements by 10%. This concept should be considered to evaluate The Geysers Recharge and the irrigation projects on the same basis. About 685 million gallons of wastewater are discharged during peak flows for the irrigation projects, yet none was shown for The Geysers Recharge.
10. A lower peak flow requirement by allowing a 1% Russian River discharge during the peak flow months could decrease the Geysers Distribution System costs by 10%.
11. A lower peak flow demand could result in a 10% decrease in pumping station costs.
12. Lower peak electrical demands and slightly smaller pumping stations could decrease the Electrical Substation costs by 10%.
13. The lower peak demand could allow for utilizing the lower estimate of substation equipment costs at $5,000,000.
14. The considerations of a 1% Russian River flow the same as the irrigation projects (about 685 million gallons) and following the Pine Flat Road mitigation measure could provide a total construction cost $42,000,000 less than the original estimate.
15. The reduced flow results in an annual power cost (at $0.055 per kWh) that is about $600,000 less. Also included is the potential for only a $0.045 per kWh that could result in a significant decrease in operating costs.
16. The combinations of Russian River discharge the same as the irrigation projects and the mitigation measure of the Pine Flat Road result in about a $59,000,000 reduction in total project cost.

1/16/96

TABLE 2
Construction and Present Value Estimates -- Summary

Alternative	Construction	O&M	PV O&M	Project PV
1	0	0	0	0
2A	312,326	2,513	27,690	340,016
2B	352,216	2,411	26,566	378,782
2C	353,287	2,627	28,946	382,233
2D	376,720	3,153	34,741	411,461
2E	338,272	2,730	30,081	368,353
3A	246,410	1,648	18,158	264,568
3B	282,659	1,745	19,227	301,886
3C	243,456	1,753	19,315	262,771
3D	251,478	1,785	19,668	271,146
3E	253,904	1,713	18,875	272,779
3F	281,963	1,906	21,001	302,964
4	208,252	6,683	73,637	281,889
4A	156,233	4,997	45,723	201,956
5A	63,952	97	1,069	65,021
5B	46,352	0	0	46,352

dsh

Pacific Gas and Electric Company

North Coast Division
111 Stony Circle
Santa Rosa, CA 95401-9599

March 11, 1996

Mr. Rich Maurer
Parsons Engineering and Science
1301 Marina Village Parkway, Suite 200
Alameda, CA 94501

Subject: Santa Rosa Subregional Long Term Wastewater Project

Dear Mr. Maurer,

Enclosed is the energy cost data that you recently requested for the subject project. The energy cost estimates for each project alternative were based on the data from Table PS-E-1R1 (dated 3/5/96) that you supplied. I have included firm and non firm electric costs for each alternative. Non firm estimates were only calculated for the pump stations that exceeded 1,000 kilowatts of monthly electric demand. Other smaller stations may also qualify for non firm rates, however, that would have to be determined on a case by case basis. The difference in firm and non firm service was explained in my letter dated September 29, 1995.

All energy cost figures were calculated using currently available electric rates and were based on the electric rates that were effective on January 1, 1996. An exception to this involves all individual pump stations with electric demands that exceed 1,000 kilowatts. Those stations would typically be served under our E-20 electric schedule. This schedule currently includes an Economic Stimulus credit of $.00432 per kilowatt-hour. This credit funded by PG&E shareholders will end on December 31, 1996, so the credit was excluded from the cost estimates for each alternative.

Please remember that these cost estimates are based on current electric rates and service options. Electric rates, service options, and service extension requirements are always subject to change. If you have any questions regarding this information please contact me at (707) 577-7097.

Sincerely,

Craig Kennedy
Major Account Representative

attachments

cc:Dean Cooley

Santa Rosa Subregional Long Term Wastewater Project
Project Alternative Energy Cost Estimates by PG&E
(3/11/96)

		FIRM SERVICE * ESTIMATED PLANNING FIGURES		NON-FIRM SERVICE ** ESTIMATED PLANNING FIGURES	
PROJECT ALTERNATIVES	ANNUAL KWH *(x 1000)*	ANNUAL COST *(x 1000)*	AVERAGE COST/KWH	ANNUAL COST *(x 1000)*	AVERAGE COST/KWH
2A	38,166	$2,595	$0.068	$2,214	$0.058
2B	35,105	$2,352	$0.067	$2,177	$0.062
2C	39,098	$2,658	$0.068	$2,307	$0.059
2D	48,549	$3,155	$0.065	$2,767	$0.057
3A	22,167	$1,618	$0.073	$1,552	$0.070
3B	23,895	$1,720	$0.072	$1,649	$0.069
3C	23,921	$1,722	$0.072	$1,651	$0.069
3D	24,504	$1,764	$0.072	$1,691	$0.069
3E	23,493	$1,691	$0.072	$1,409	$0.060
4 ***	119,691	$7,779	$0.065	$6,942	$0.058
4 ****	119,691	$6,344	$0.053	$5,386	$0.045
5A	1,250	$74	$0.059	N/A	N/A

* Firm Service requires PG&E to provide continuous and sufficient supply of electricity. This is the service level for most non-residential customers.

** Non Firm Service allows some non residential customers to elect level of service other than firm service. Non Firm estimates assume all pump stations with an electric demand greater than 1,000 kilowatts are served using non firm rates. Other stations may be eligible on a case by case basis. Energy costs for those stations with demands less than 1,000 kilowatts are included in this column too. However, firm rates are used for those stations. Refer to letter dated 9/29/95 for a more detailed definition and explanation of non-firm rates.

*** This alternative can be served at either transmission level service or primary voltage service. This option assumes primary voltage service.

**** This option assumes transmission service voltage service for alternative 4. Refer to letter of 9/29/95 for explanation of different service voltages.

Santa Rosa Subregional Long Term Wastewater Project
Project Alternative Energy Cost Estimates by PG&E
(3/11/96)

Assumptions:

- Energy consumption and electric demand information and seasonal estimates are from TABLE PS-E-1R1, 3/5/96, supplied by Parsons Engineering and Science.

- Service voltages and the applicable electric rates for the majority of the pump stations were based on information submitted by an earlier study. That study reviewed the service and electric extension costs based on the locations of the proposed pump stations. Electric service and extension policies are always subject to change.

- All pump stations operate 22 hours per day.

- Time of Use period energy percentages
  Summer Season 18% on peak, 20% partial peak, 62% off peak
  Winter Season 38 % partial peak, 62% off peak.

- Energy estimates are based on PG&E rates effective January 1, 1996. However, rates for all pump stations with electric demands greater than 1,000 kilowatts(E-20 rate schedule) have been modified to exclude the current Economic Stimulus rate credit of $0.00432 per kilowatt-hour. This credit funded by PG&E shareholders will end on December 31, 1996, so it was excluded from the cost analysis.

- Time of Use rates for customers with demands below 500 kilowatts are currently not available. All pump stations below this level were calculated based on PG&E's A-10 General Service electric schedule. Time of Use rates for these stations may be available in the future.

Comments by Anthony J. Chasteen
Unocal Corporation
Santa Rosa Wastewater Project Draft EIR
September 24, 1996

My name is Anthony J. Chasteen. My address is 1300 North Dutton Avenue, Santa Rosa. I first moved to Sonoma County in 1969, and am Unocal's Manager of Operations for The Geysers

My comments are going to be primarily directed toward the Geysers Recharge Alternative of the EIR. While the City has done a thorough job investigating the overall impacts of this option, there are a few items that we propose need further evaluation. I will briefly mention the issues here with detailed written comments submitted later. 067

1. No River Discharge

The City did not investigate a 1% River Discharge in conjunction with The Geysers Recharge alternative. This gives higher capital costs and higher operating expenses in comparison with the other alternatives, which is like comparing apples and oranges.

2. Pipeline Routing and Design 068

There are significant overestimates of cost due to worst case pipeline routing and an excessively conservative belt-and-suspenders approach to estimating the construction costs. Pine Flat Road is not the practical choice for routing the transport pipeline. We understand this routing was chosen to simplify the environmental impact analysis. In reality, the pipeline would probably take a more direct and cost-effective route.

3. Energy Prices 069

Annual power costs are overestimated for the Geysers Recharge. This has presented a cost estimate of nearly $6.8 million per year. Current industry power cost forecasts indicate the annual cost could be on the order of half that amount. Since energy costs are the biggest part of operating costs for this option, this is a significant factor in misrepresenting the monthly increase to ratepayers.

4. Error in Calculating Present Value 070

There are errors in calculating the project's present value for power cost. Using the maximum flow at year 20 exaggerates the power cost required. The actual average flow for the first 20 years should have been used in the cost estimate for power.

5. Funding 071

Opportunities for federal and state funding have not been investigated or included in the EIR. These opportunities will need the aggressive support of the City of Santa Rosa for those funds to be made a reality. Recently passed Assembly Bill 1890, which provides for the Restructuring of the Electrical Utility Industry in California, includes funding opportunities for renewable energy sources. Projects such as the pipeline to The Geysers can be considered within that bill's framework.

In conclusion, we would like to see the approach of a combined solution 072
that involves a minimal river discharge, optimization of irrigation with existing storage, and Geysers Recharge.

The benefits of a modified Geysers Recharge are:

- Limits on river discharge at a minimal rate (1%)
- Maintenance of water for irrigation
- Maximizing reuse of reclaimed water by producing clean, efficient geothermal electrical power

There are opportunities for substantial support of a modified Geysers Recharge. Unocal and our partner, Calpine, are enthusiastic about participating in such a solution for the Santa Rosa Wastewater Project, and we are open to contributions for a modified Geysers Recharge Alternative.

I appreciate this opportunity to present our views.