

September 16, 1998

Mr. Bruce Kaneshiro, Project Manager
C/o Environmental Science Associates
225 Bush Street, Suite 1700
San Francisco, CA 94104

RE: Written Comments on the Draft EIR for Application No. 98-01-008

Dear Mr. Kaneshiro:

[Begin N1]

Please accept the attached written comments submitted by Calpine Corporation on the above draft EIR. We hope that ESA will find our comments environmentally relevant and thus address them in the final EIR. We are especially concerned that the Cumulative Impacts Analysis be modified to more accurately reflect how output projections will vary under the ownership Scenarios 1 and 3. We believe that Geysers' plant outputs have been optimistically projected (in an ambiguous fashion) in the supporting tables and would urge that ESA concentrate their efforts on adjusting those projections in a more realistic, understandable fashion.

[End N1]

Thank you for the opportunity to comment.

Sincerely,

/s/

J.M. Rudisill
Vice President – Geothermal Operations

cc w/attach: C.L. Wardlow
J.E. Ronan, Jr. Esq.
E. Ko, Esq.
L.R. Krumland
R. Zahner
D.J. Gilles

Calpine Corporation's
Comments on
CPUC PG&E Power Plant Sale Draft Environmental Impact Report, 8/98
Compiled by Jacob M. Rudisill and Charlene Wardlow

Significant EIR Issues

Issue	EIR Location	Comments
<p>1. Santa Rosa Reclaimed Water--Geysers Recharge Project.</p>	<p>Page 5-10, 5-11 & 6-24</p> <p>“PG&E is one of the key players in the Santa Rosa Wastewater Modified Geysers Recharge Project.”</p> <p>Page 6-24</p> <p>“...steam field operators and PG&E have entered into an agreement to inject...”</p> <p>Page 5-11</p> <p>“...existing units could be operated at sustained power generation rates for 20 to 30 years.”</p>	<p>[Begin N2] PG&E is not a “key player” in Santa Rosa Reclaimed Water Project. They are not involved in the project and there will be no role for a new owner to assume in the process. [End N2]</p> <p>[Begin N3] No such agreement or commitment of Santa Rosa water to PG&E’s plant area exists (for the Santa Rosa project). [End N3]</p> <p>[Begin N4] Field capacity of 700 MWs is assumed to be sustainable for 25 years.</p> <p>This unsupported assumption is contrary to the field decline data shown in Table C-1. The assertion is not supported by any analysis or reference. [End N4]</p>
<p>2. Generation Forecast</p>	<p>Page C-9, Tables C-1, S.1, S.3, 5.2, 6.1.</p> <p>Generation from the Sonoma County units increases 4 MW from 1999 to 2005 while they operate at maximum base load output. The Lake County units decline only 8 MW.</p>	<p>[Begin N5] This claim that the field will undergo a dramatic reversal of its historic performance trends is unsupported by any assumption in the document. PG&E’s estimates of hypothetical available generation in years of heavy curtailment appear to have been extrapolated without regard for the actual operating conditions of the forecast period.</p>

<p>3. Confusion over capacity factors.</p>	<p>Table S.3 and Footnotes, Tables 5.2, 6.1, C-1</p>	<p>We recommend that actual megawatt-hours be projected instead of percentages. The interchanging use of ‘net generating capacity’ for design capacity and net output throughout the draft EIR is confusing. [End N5]</p> <p>[Begin N6] The term “Capacity Factor” is used to refer to ratios with different bases within the same table, and which are inconsistent with conventional terminology as used in Table 2.1. It is unclear whether one of the “Capacity Factor” used is the same as the “Adjusted Capacity Factor” used by PG&E in its CPUC filings. The text and table should either avoid using ratios (“Factors”) and simply state values in Megawatt hours or annual average power output (in mw). Additionally, adequate definitions and explanations should be provided. The draft document is ambiguous in the analysis of production. [End N6]</p>
<p>4. Cumulative Impacts – Energy and Mineral Resources</p>	<p>Table S.4</p>	<p>[Begin N7] Benefit is claimed for the proposed project that actually occurs only under Alternative 3. The Executive Summary should already state that ownership by the Steam Supplier provide environmental benefit. [End N7]</p>
<p>5. NEC ownership.</p>	<p>Page 6-23</p>	<p>[Begin N8] NEC is not a Japanese turbine producer, but a geothermal steam production company. [End N8]</p>
<p>6. “Increased electrical demand” leading to increased Geysers output.</p>	<p>Overhead presented in Cobb and Santa Rosa.</p>	<p>[Begin N9] The Geysers is a declining resources. It is not logical that increased electrical demand will have any bearing on The Geysers’ output. [End N9]</p>

<p>7. Steam stacking and “puff” definitions</p>	<p>Pages S-16, 1-7, 4.5-47; 4.5-75, Page 6-24 (steam stacking) Page 6-23, 6.4.3, 2nd paragraph (puff)</p>	<p>[Begin N10] Steam stacking is “the controlled release of unabated geothermal steam.” This activity is conducted in accordance with local Air Pollution Control District regulations. The technical discussion of the puff is incorrect. [End N10]</p>
<p>8. Noise level increase for alternative 3.</p>	<p>Page S-24, 4.10-2 Alternative 3.</p>	<p>[Begin N11] Please explain how the noise level will be greater under Alternative 3 – Geysers than under the proposed project. [End N11]</p>
<p>9. “Wasted resource” if plant capacity factor is lower.</p>	<p>Page S-22, Impact 4.8-2, Page 4.8-4 Impact 4.8-2</p>	<p>[Begin N12] If the new owner operates the power plant in a manner similar to PG&E’s operations (Page S-6), the project would promote wasteful and inefficient use of a valuable natural resource. [End N12]</p>
<p>10. The phrase “reasonably foreseeable” could be misleading</p>	<p>Page S-6</p>	<p>[Begin N13] The steam sales agreements between PG&E and each of Unocal, NEC, and Thermal are long term legal obligations which will bind the permitted successors and assigns of the parties. [End N13]</p>
<p>11. Power plant cooling tower drift impact at Geysers.</p>	<p>Pages 4.5-15 & 4.9-13 (Potential Site Contamination 1st Paragraph, last sentence.)</p>	<p>[Begin N14] FTP is discussed but not Geysers cooling tower drift impacts inside and outside of power plant yard. Cooling tower drift is an ongoing issue and has been extensively studied by PG&E (including the Phase 1 Environmental Site Assessment). What are impacts outside of power plant yard? This could be important to new owners in regard to remediation and liability issues. [End N14]</p>

General Comments

[Begin N15]

- ◆ Review focus on accuracy and environmental remediation issues (for due diligence efforts). [End N15]

[Begin N16]

- ◆ General comment throughout -- refer to condensate as steam condensate [End N16]

Page S-21

[Begin N17] Typos, font of 4.6-4. [End N17]

Page 1-7

[Begin N18] Item 1 The statement that Geysers power production becoming non-economic may lead to shutdowns and thus stacking is unsupported. [End N18]

[Begin N19] Item 4; The assertion that increased stream water diversion will occur if sales are unsupported. [End N19]

Page 2-28

[Begin N20] GEO should be GEP. [End N20]

[Begin N21] SMUD is now Sonoma>>>>change throughout EIR [End N21]

[Begin N22] Santa Fe is now Silverado/Calistoga [End N22]

Page 2-35

[Begin N23] Geysers Geothermal Field – What is the “Geysers Geothermal Area” Isn’t The Geysers Known Geothermal Resource Area what is really meant? And it is much larger than 5.5 miles by 1 mile. Big Sulphur Creek or Big Sulfur Creek [End N23]

Page 2-36

[Begin N24] 3rd full paragraph, last sentence--add “a conceptual diagram of” after and before “the circulation.” [End N24]

[Begin N25] 4th paragraph, 5th sentence—Southeast Geysers Effluent Pipeline is operating; Santa Rosa Wastewater is a project which the City of Santa Rosa has adopted but it still faces legal challenges and it is undergoing design engineering and funding efforts. [End N25]

[Begin N26] Strike “evaluated as a viable” and replace with “used as a” [End N26]

Page 2-38

[Begin N27] 1st full paragraph, first sentence -- remove “purified”, “pressurized.” Add “to power plants” after “insulated pipes.” [End N27]

Page 2-39

[Begin N28] 1st paragraph, 2nd sentence -- steam condensate has been injected since 1968. [End N28]

[Begin N29] Strike “is believed to”; add s to “increase”: strike “to” and add “s” to “increase.”
[End N29]

[Begin N30] 3rd sentence—strike “it is expected that” [End N30]

[Begin N31] 2nd paragraph, first sentence, last word -- change “agencies” to “steamfield operators”. [End N31]

Page 2-42

[Begin N32] Top of page -- add “Lake County” before “area.” [End N32]

[Begin N33] Table 2-3 -- add Lake County under local and elsewhere. [End N33]

Page 4.1-1

[Begin N34] 4th paragraph, first sentence -- change “Geysers” to “thermal features.” [End N34]

Page 4.1-15

[Begin N35] Under Geysers Power Plant -- change “10” to “30.” [End N35]

Page 4.3-4

[Begin N36] 2nd paragraph, 2nd sentence – change “steam generating conditions” to “production intervals”? [End N36]

Page 4.3-12

[Begin N37] Impact 4.3.3, paragraph 2 -- suggest rewriting entire, unclear paragraph. [End N37]

Page 4.4-10

[Begin N38] Geysers Power Plant, 1st paragraph – what about Cobb, Anderson, other creeks (See 4.4-6.)? [End N38]

[Begin N39] 2nd sentence and Table 4.4-2 -- Units 7-10, 12, 13, 16, 20 are also close to streams.
[End N39]

Page 4.4-13

[Begin N40] 4th paragraph -- DOGGR regulates Class V injection, NCRWQCB also reviews injection “permits.” Class V UIC program is permit by rule. No actual “permits” are issued.
[End N40]

Page 4.5-47

[Begin N41] 2nd paragraph -- rewrite stacking description. Add “controlled” after “scheduled” in last sentence. [End N41]

[Begin N42] 3rd paragraph, 3rd sentence -- replace “relieving” with “lowering.” [End N42]

[Begin N43] Last paragraph -- what about H₂S? [End N43]

Page 4.5-49

[Begin N44] Do PM-10 #s assume all TSPs are PM-10? [End N44]

Page 4.8-2

[Begin N45] 3rd para. –Lake county units do not have untreated sanitary effluent from the plants injected into the steam field. [End N45]

Page 4.9-14

[Begin N46] Impact 4.9-1 -- what is the reasoning supporting the 1st sentence (“divestiture will promote accelerated environmental cleanup....”)? [End N46]

Page 4.9-19

[Begin N47] Add sodium vanadate and hydrogen to list [End N47]

Page 4.9-22

[Begin N48] Impact 4.9-4, 1st paragraph, last sentence -- add “hydrogen.” [End N48]

Page 4.11-8

[Begin N49] 1st paragraph – Unocal responds to incipient fires only. [End N49]

Page 4.11-12

[Begin N50] Police, 2nd sentence -- change to “remote location and restricted access.” [End N50]

Page 4.11-16

[Begin N51] Geysers Power Plant, 1st sentence -- \$920,000 million? Or \$920,000? [End N51]

Page 4.12-14

[Begin N52] GPP description not accurate re: Lake county units. [End N52]

Page 4.14-5

[Begin N53] Geysers Power Plant -- Strike “about 1971” to “1960” [End N53]

Page 5-8

[Begin N54] Last bullet -- “and” should be “an.” [End N54]

Page 5-23

[Begin N55] Basin 2000 and 70 acre parcel are Lake County projects. Why do these projects require Sonoma County Community Development Commission review? [End N55]

Page 5-27

[Begin N56] 2nd paragraph, 2nd sentence -- change condensation to steam condensate. [End N56]

Page 5-32

[Begin N57] Geysers Power Plant, 2nd Paragraph -- two periods at end of 2nd sentence. [End N57]

Page 6-11

[Begin N58] Geologic Problems, 2nd Paragraph -- PG&E is not currently involved with seismic monitoring. [End N58]

Page 6-24

[Begin N59] The flow is 8 mgd, not 6. [End N59]

Page 6-26

[Begin N60] 1st Paragraph, 1st sentence -- why would "risk of an upset condition" increase? [End N60]

Page C-7

[Begin N61] 1st paragraph, 7th sentence change "pump" to "pipe", and 200 to 130. [End N61]

[Begin N62] 4th paragraph, 2nd sentence change "pressure" to "production" [End N62]

Page C-8

[Begin N63] Bullet 4; Change verbs to "collect" and "direct" [End N63]

Page C-9

[Begin N64] 1st sentence "injections" should be "injection" [End N64]

[Begin N65] 3rd paragraph 5th sentence -- There is no substantiation to the statement that operational changes have affected "actual geology" of the KGRA. [End N65]

Page C-21

[Begin N66] Under Geothermal Plant, Unocal is no longer involved with refining and retailing. [End N66]

Page C-33

[Begin N67] Footnote 63 Although technically the UNT/PG&E contract does allow the sale of steam to others, such sale can be performed only after a succession of tests and declaration by each party which severely hinders the ability of the steam supplier to sell to others. [End N67]

[Begin N68] Footnote 65 Add Unit 15. [End N68]

N. CALPINE

N1 Please see responses to Comments H18 and N5.

N2 Please see response to Comment L45.

N3 The reference is to both the Lake County and Santa Rosa effluent pipeline projects. PG&E is a signatory to the former but not to the latter. However, to avoid confusion, the first sentence of the first full paragraph of page 6-24 is amended as follows:

~~In addition, two projects are either underway or proposed the current steam field operators and PG&E have entered into an agreement to inject effluent...~~

Page 6-24, second full paragraph, is hereby amended as follows:

The current steam field operators have a contract to accept effluent from the Lake County Sanitation District effluent injection project this effluent for injection for 25-30 years. Although the Santa Rosa project has been approved by the City of Santa Rosa, neither PG&E nor the steam field operators have entered into agreement to accept the effluent water at this time.

N4 The 700 MW figure cited on page 5-11 of the DEIR (first paragraph, last sentence) is incorrect and inconsistent with Attachment C because it refers to the generating capacity of all 18 Sonoma County generating units at the Geysers, including eight generating units not owned by PG&E, rather than the capacity of the PG&E generating units alone. Accordingly, the last sentence of the first paragraph on page 5-11 of the DEIR is hereby deleted as follows:

~~...These projects would decrease the need for low flow operation and early abandonment of units in the Geysers area. For the units currently owned by PG&E, this would mean an assumed sustained power generation of about 700 MW for 25 years.~~

N5 The figures in the tables cited by the commenter reflect the predicted net capacities of the Geysers units over time after the addition of the Santa Rosa wastewater project. Rather than a “dramatic reversal of historic performance trends,” these numbers reflect the one-time addition of 63 MW of generating capacity shortly after the Santa Rosa wastewater project comes on-line, followed by a steady decline in the steam fields, resulting in a net increase of 4 MW in 2005 for the Sonoma County units.

The DEIR analysis did not extrapolate “PG&E’s hypothetical available generation in years of heavy curtailment,” as asserted by the commenter. The amount of available generation at baseload operations in the absence of wastewater injection from either Lake County or Santa Rosa was derived from PG&E’s *Report on Reasonableness of Operations for 1997*, filed in A.97-12-020, at pages 3-21 to 3-23. Available generation for 1998 was drawn from PG&E’s “Amendments to the Must-Run Agreement between PG&E and the ISO and

Schedules for Must-Run Facilities,” filed January 29, 1998, Volume 1B, The Geysers Main-Appendix C and the Geysers - 13&16-Appendix C. These two estimates are consistent with each other and imply baseloaded, continuous operation of the Geysers plants. Actual generation was forecasted by the SERASYM™ production costing model taking into account reliability needs and the hourly demand and the marginal cost of various supplies as discussed in Attachment G of the DEIR. The contract price for the U-N-T and Calpine geothermal facilities were assumed to match those currently found in the PG&E power purchase agreements, which escalate in future years.

The 1992 and 1994 CEC Electricity Report forecasts for Geysers generation were found by analysis to be outdated. Figure N5-1 compares historic actual or available (when curtailed) generation through 1998. It is immediately obvious that the Geysers steam resource is not declining as rapidly as forecast in 1992 and 1994. PG&E’s *Report on Reasonableness of Operations for 1997* discusses the many reasons for this dramatic change in the decline. For this reason, a new forecast was developed.

Unfortunately, the key data set necessary to forecast steam field decline—steam field pressure measured at the wellhead—is proprietary information held by the steam field owners (Calpine and U-N-T). While developing this analysis, informal requests for the most recent steam field forecasts were requested from the steam field owners, but the requests were refused. Without this data set, a trend forecast was developed instead to estimate the decline rate in available generation. The equation is shown in footnote 18 on page C-19 of the DEIR. Figure N5-2 compares two trend forecasts to actual and available (when curtailed) generation excluding the two wastewater effluent pipelines.⁸ The forecasts fit the historic data extremely well. The first forecast used 1988 to 1994 data, which excluded any curtailments; in other words, this forecast is based solely on continued baseload operations. The second forecast incorporated data through 1997. The forecasts were virtually identical, and the latter was chosen because it was statistically more significant.

The baseline forecast was supplemented by the projected annual impact of the Lake County wastewater disposal system for the 1999 forecast and both the Lake County and Santa Rosa wastewater pipelines for the 2005 cumulative projections. Care was taken to allocate the increase in generation between PG&E and other Geysers geothermal generators and among the several affected PG&E units in the case of the Sonoma County disposal impact. The forecasts assume that the Lake County water disposal increased the PG&E Geysers units potential generating capacity by about 13 MW in 1999 and by about 15 MW in 2005. The Santa Rosa pipeline was assumed to be in operation before 2005 and to increase potential generation among the PG&E units by about 63 MW. This forecast is at the minimum end of the range of possible forecasts for the Santa Rosa pipeline; assumes that all of the generation benefit will accrue to PG&E units consistent with the April 1998

⁸ As explained in the DEIR, until 1994 PG&E accepted all available geothermal steam supplies. After 1994, PG&E curtailed steam deliveries, particularly from U-N-T. However, PG&E tracks how much geothermal steam generation would have been available without economic curtailments. This is “available (when curtailed) generation.” This latter data is published in the “Reasonableness of Operations” and the ISO RMRA Appendix C.

agreement between U-N-T and Santa Rosa; and nets out 7 MW of pumping load assumed absorbed by the generators to account for the generators' share of wastewater pumping load.

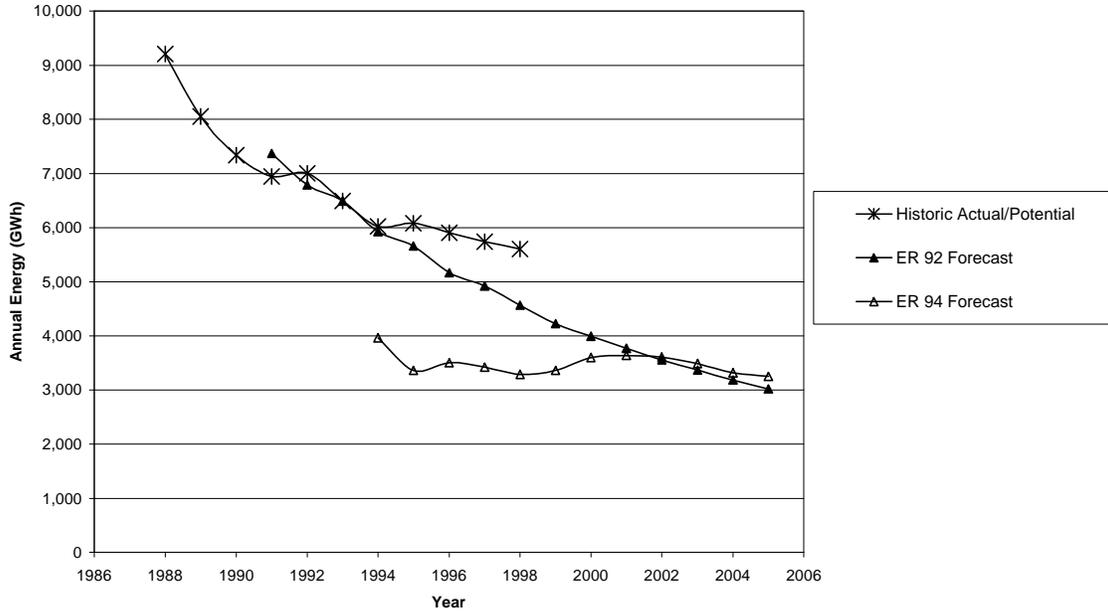
While developing this analysis, informal requests for the most recent steam field forecasts were requested from the steam field operators, but the requests were refused. For this reason, the fundamental equation underlying the forecast in Table C-1 is unchanged.

However, the Geysers generation forecasts shown in Table C-1 and Attachment G are inconsistent because new information about the effect of the Santa Rosa effluent pipeline was included in the SERASYM™ modeling, but not in Attachment C. Therefore, Table C-1 on page C-10 of the DEIR is revised as follows:

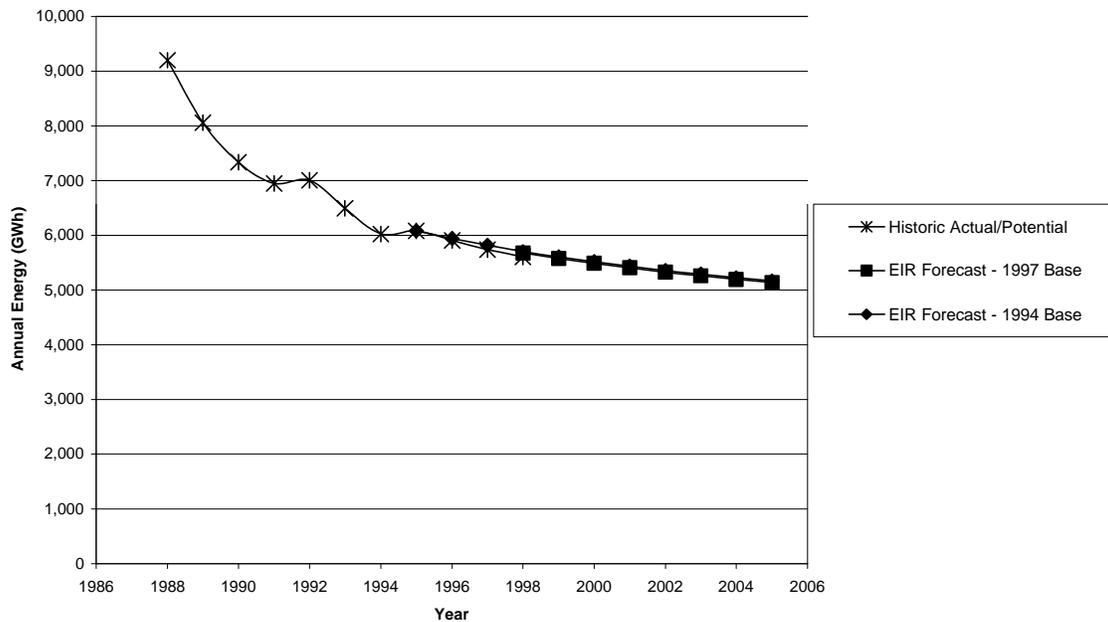
**TABLE C-1
ANNUAL PG&E GEYSERS GEOTHERMAL CAPACITY AND ENERGY**

Year	Available PG&E Generation			Actual PG&E Generation	
	MW	GWh	CF	GWh	CF
1988	1,199	9,203	87.6%	9,203	87.6%
1989	1,079	8,053	85.2%	8,053	85.2%
1990	948	7,335	88.3%	7,335	88.3%
1991	902	6,947	87.9%	6,947	87.9%
1992	882	7,007	90.7%	7,007	90.7%
1993	791	6,491	93.7%	6,491	93.7%
1994	761	6,024	90.4%	6,024	90.4%
1995	748	6,080	92.8%	4,002	61.1%
1996	769	5,904	87.6%	4,515	67.0%
1997	712	5,739	92.0%	4,830	77.4%
1998	686	5,607	93.3%		
1999	665 693	5,445 5,666	93.4%		
2000	652 680	5,338 5,565	93.4%		
2001	697 669	5,703 5,474	93.4%		
2002	688 659	5,629 5,392	93.4%		
2003	679 650	5,555 5,316	93.4%		
2004	672 641	5,498 5,246	93.4%		
2005	664 633	5,433 5,181	93.4%		

**FIGURE N5-1
COMPARISON OF PG&E GEYSERS GEOTHERMAL FORECASTS
(CEC Electricity Reports vs. Historic Data)**



**FIGURE N5-2
COMPARISON OF PG&E GEYSERS GEOTHERMAL FORECASTS
(PG&E Divestiture DEIR vs. Historic Data)**



Addressing the commenter's recommendation to use megawatt-hours instead of percentages, please see the response to Comment N6.

- N6 Because capacity factors are the common measure used for all the divested plants, and because using megawatt-hours would simply add an extraneous calculation for those reading the document, capacity factors will continue to be used throughout the EIR. The commenter is correct, however, that the exact nature of the capacity factors listed in the tables cited is unclear. For clarification, capacity factor is defined as the ratio of power (or generation) actually produced by a generating unit to the maximum power (or generation) it could possibly produce in the same time period. For the four Bay Area fossil-fueled power plants, the term "net capacity" is understood to mean the total amount of power the plants could possibly deliver into the transmission grid, which equals the design or nameplate capacity minus the amount of power consumed by loads within the power plant, such as feed pumps, and electric losses, such as transformer losses. For the Geysers Power Plant, "net capacity" is also understood to mean the total amount of power that the plant could deliver into the transmission grid, but in addition to adjusting the nameplate capacity for in-house loads and losses, the "net capacity" for the Geysers generating units also accounts for the declining capacity of the steam fields that feed the generating units. To better clarify the use of capacity factors for comparative purposes, the following revisions are made in the DEIR:

At page S-10, Table S.1, note (a) is revised as follows:

Capacity factor is the ratio (expressed as a percentage) of operations of a unit or plant to the rated capacity of the unit or plant is defined as the ratio of power (or generation) actually produced by a generating unit to the maximum power (or generation) it could possibly produce in the same time period.

Table S.1, note (b), is revised as follows:

For the four Bay Area fossil-fueled power plants, the term "net capacity" is understood to mean the total amount of power the plants could possibly deliver into the transmission grid, which equals the design or nameplate capacity minus electric losses and the amount of power consumed by loads within the power plant.

Although the net capacity of Unit 7 at the Pittsburg Power Plant is listed as 720 MW in PG&E's PEA, other sources (including the Master Must-Run Agreement between PG&E and the ISO and the Bay Area Reliability Dispatch Requirements) identify the unit's maximum net capacity as 682 MW. Based on this information, the SERASYM™ model results used in this EIR reflect the 682 MW factor.

For the Geysers Power Plant, "net capacity" is also understood to mean the total amount of power that the plant could deliver into the transmission grid, but in addition to adjusting the nameplate capacity for in-house loads and losses, the "net capacity" for the Geysers generating units also accounts for the change over time in the capacity of the steam fields that feed the generating units. The net design or

nameplate capacity of the Geysers Power Plant is actually 1,224 MW (see Table 2.1 in Chapter 2, Project Description). The net capacities shown here for the Geysers plant are the predicted available rated capacities for the plant based on projected steam availability in 1999 and 2005, respectively.

Table S.1, note (e), is revised as follows:

Net available rated capacity for the entire plant in the specified year.

At page S-14, Table S.3, note (a) is revised as follows:

Capacity factor is the ratio (expressed as a percentage) of operations of a unit or plant to the rated capacity of the unit or plant is defined as the ratio of power (or generation) actually produced by a generating unit to the maximum power (or generation) it could possibly produce in the same time period.

Table S.3, note (b), is revised as follows:

For the four Bay Area fossil-fueled power plants, the term “net capacity” is understood to mean the total amount of power the plants could possibly deliver into the transmission grid, which equals the design or nameplate capacity minus electric losses and the amount of power consumed by loads within the power plant.

Although the net capacity of Unit 7 at the Pittsburg Power Plant is listed as 720 MW in PG&E’s PEA, other sources (including the Master Must-Run Agreement between PG&E and the ISO and the Bay Area Reliability Dispatch Requirements) identify the unit’s maximum net capacity as 682 MW. Based on this information, the SERASYM™ model results used in this EIR reflect the 682 MW factor.

For the Geysers Power Plant, “net capacity” is also understood to mean the total amount of power that the plant could deliver into the transmission grid, but in addition to adjusting the nameplate capacity for in-house loads and losses, the “net capacity” for the Geysers generating units also accounts for the change over time in the capacity of the steam fields that feed the generating units. The net design or nameplate capacity of the Geysers Power Plant is actually 1,224 MW (see Table 2.1 in Chapter 2, Project Description). The net capacities shown here for the Geysers plant are the predicted available rated capacities for the plant based on projected steam availability in 1999 and 2005, respectively.

Table S.3, note (g), is revised as follows:

Net available rated capacity for the entire plant in the specified year.

At page 5-18, Table 5.2, note (a) is revised as follows:

Capacity factor is the ratio (expressed as a percentage) of operations of a unit or plant to the rated capacity of the unit or plant is defined as the ratio of power (or

generation) actually produced by a generating unit to the maximum power (or generation) it could possibly produce in the same time period.

Table 5.2, note (b), is revised as follows:

For the four Bay Area fossil-fueled power plants, the term “net capacity” is understood to mean the total amount of power the plants could possibly deliver into the transmission grid, which equals the design or nameplate capacity minus electric losses and the amount of power consumed by loads within the power plant.

Although the net capacity of Unit 7 at the Pittsburg Power Plant is listed as 720 MW in PG&E’s PEA, other sources (including the Master Must-Run Agreement between PG&E and the ISO and the Bay Area Reliability Dispatch Requirements) identify the unit’s maximum net capacity as 682 MW. Based on this information, the SERASYM™ model results used in this EIR reflect the 682 MW factor.

For the Geysers Power Plant, “net capacity” is also understood to mean the total amount of power that the plant could deliver into the transmission grid, but in addition to adjusting the nameplate capacity for in-house loads and losses, the “net capacity” for the Geysers generating units also accounts for the change over time in the capacity of the steam fields that feed the generating units. The net design or nameplate capacity of the Geysers Power Plant is actually 1,224 MW (see Table 2.1 in Chapter 2, Project Description). The net capacities shown here for the Geysers plant are the predicted available rated capacities for the plant based on projected steam availability in 1999 and 2005, respectively.

Table 5.2, note (g), is revised as follows:

Net available rated capacity for the entire plant in the specified year.

At page 6-8, Table 6.1, note (a) is revised as follows:

Capacity factor is the ratio (expressed as a percentage) of operations of a unit or plant to the rated capacity of the unit or plant is defined as the ratio of power (or generation) actually produced by a generating unit to the maximum power (or generation) it could possibly produce in the same time period.

Table 6.1, note (b), is revised as follows:

For the four Bay Area fossil-fueled power plants, the term “net capacity” is understood to mean the total amount of power the plants could possibly deliver into the transmission grid, which equals the design or nameplate capacity minus electric losses and the amount of power consumed by loads within the power plant.

Although the net capacity of Unit 7 at the Pittsburg Power Plant is listed as 720 MW in PG&E’s PEA, other sources (including the Master Must-Run Agreement between PG&E and the ISO and the Bay Area Reliability Dispatch Requirements) identify

the unit's maximum net capacity as 682 MW. Based on this information, the SERASYM™ model results used in this EIR reflect the 682 MW factor.

For the Geysers Power Plant, "net capacity" is also understood to mean the total amount of power that the plant could deliver into the transmission grid, but in addition to adjusting the nameplate capacity for in-house loads and losses, the "net capacity" for the Geysers generating units also accounts for the change over time in the capacity of the steam fields that feed the generating units. The net design or nameplate capacity of the Geysers Power Plant is actually 1,224 MW (see Table 2.1 in Chapter 2, Project Description). The net capacities shown here for the Geysers plant are the predicted available rated capacities for the plant based on projected steam availability in 1999 and 2005, respectively.

Table 6.1, note (d), is revised as follows:

Net available rated capacity for the entire plant in the specified year.

At page C-10, Table C-1, the following text is hereby added as a note to the table:

Capacity factor is defined as the ratio of power (or generation) actually produced by a generating unit to the maximum power (or generation) it could possibly produce in the same time period. The available rated capacity and potential maximum generation at the Geysers generating units changes over time as the capacity of the steam fields changes, while the nameplate or design capacity stays constant at 1,224 MW.

- N7 Table S.4 assesses potential cumulative impacts when considering the potential impact of the project together with the potential impact of other local projects. A beneficial impact at the Geysers is claimed because of the potential beneficial impact of local projects--specifically the Santa Rosa Wastewater Injection project, which would help sustain the viability of the Sonoma County steam field. This beneficial impact would occur whether or not the Geysers generating units are purchased by the steam field owners.
- N8 Page 6-23 of the DEIR (first paragraph under Section 6.4.3, third sentence) is hereby amended as follows:

Unocal, NEC (~~a Japanese turbine producer~~), and Thermal Power Company (a subsidiary of Calpine) operate as an undivided partnership, called UNT, to supply steam to PG&E's Sonoma County units.

Page C-21 (last paragraph, fifth sentence) is revised to read:

NEC is a Japanese turbine producer that has manufactured...

- N9 The Geysers has been experiencing economic curtailments by PG&E because the market price has been insufficient to make Geysers generation economically attractive during

some periods. Increased demand translates directly into increased market prices, which in turn reduces the amount of economic curtailment at the Geysers. Thus, generation would increase despite the fact that the resource is declining overall.

- N10 The Final EIR will be corrected to change the definitions of “steam field stacking” on pages S-16, 1-7, 4.5-47, 4.5-75 and 6-24, and of “puff” on page 6-23.

The third sentence of the paragraph after the “Alternative 3” heading on page S-16 is corrected as follows:

Steam stacking, which is the controlled release of unabated steam, is caused by the build-up of steam pressure ~~in the pipelines under the wellhead~~ when power plants are idled for maintenance or other reasons.

The first sentence of the first full, numbered paragraph on page 1-7 is corrected as follows:

- (1) The potential for “steam stacking” in the Geysers Geothermal Area. Any reductions in the operation of units at the Geysers Power Plant resulting from divestiture could result in controlled releases of unabated steam ~~releases through unabated steam vents~~.

The first full paragraph on page 4.5-47 is corrected as follows:

In terms of quantities, the major emissions from the plant consist of total organic gases (primarily methane), particulate matter (including PM-10 and PM-2.5), H₂S, ammonia, and hydrogen. “Permitted” emissions levels relate to particulate matter and H₂S. H₂S emissions can occur as a result of steam stacking, which is the term used to describe the controlled release of unabated steam in order to relieve a buildup of steam pressure in a geothermal field due to a temporary slowdown in use of the steam wells. ~~The steam buildup may result in an unscheduled release of steam from the field to release the excess pressure.~~

The fourth sentence of the paragraph under “Geysers Power Plant” on page 4.5-75 is corrected to read:

This is because the peaks in hydrogen sulfide concentrations (and ensuing complaints) that have occurred in the past have been the result of ~~uncontrolled~~ controlled releases of steam due to events like steam stacking rather than from the steady-state, “~~controlled~~” emissions released at the power plants.

The fourth sentence of the second paragraph of Section 6.4.3 (Page 6-23) is corrected as follows:

If the steam from the steam fields is not used continuously (i.e., when generating units are not operated consistently or at sufficiently high levels), pressure could rise

to the point that steam stacking (the controlled release build-up of unabated steam pressure) can occur ~~in the pipelines~~.

The fifth sentence of the bottom paragraph on page 6-23 is corrected as follows:

The release of this pressure, ~~known as a "puff,"~~ is potentially hazardous both in its intensity and because of its hydrogen sulfide content.

- N11 As stated on page 6-27 of the DEIR, under Alternative 3, the level of noise would not be expected to increase, but the frequency of noise events could be increased compared to both the baseline and the project. It is assumed that the plant would continue to operate within established controls of noise.
- N12 The impact cited by the commenter on pages S-22 and 4.8-4 of the DEIR relate to wasteful or inefficient use of non-renewable resources. It has no relation to the use of renewable resources, such as geothermal steam at the Geysers. The CEQA Guidelines require a study of a project's impact on non-renewable resources, such as natural gas, because those resources are finite; once non-renewable resources are depleted, they are gone forever. Conversely, renewable resources are essentially infinite (over time) and cannot be depleted. Though steam pressure and quality have declined at the Geysers steam fields, the heat source creating the steam is essentially infinite, and steam production will continue as long as the fields are recharged through injection and re-injection (though new wells may have to be drilled because of changes in the subterranean geology), which is why all geothermal power resources are classified as renewable under all applicable federal and state laws. Therefore, the commenter's assertion that PG&E's present operations result in, or a new owner's operation would result in, wasteful use of geothermal steam is outside the scope of the EIR.

In addition, the conclusion reached on page 4.8-5 of the DEIR relies on the tenet that "efficient use" of non-renewable resources (e.g., natural gas) could mean increasing near-term generation from the Geysers generating units. For example, increased use of the Geysers might reduce natural gas use at older fossil-fueled plants, thus reducing air pollution and the use of non-renewable resources in the near term. As these older gas plants are retired, newer, cleaner combined-cycle gas-fired plants will come on line. On net, society benefits by having cleaner air on a net present value basis, and by not depleting natural gas stocks as rapidly as might have occurred if Geysers generation was reduced in order to prolong the life of the steam fields.

- N13 It is due to these long-term obligations, which as noted would be transferred to the new owners, that it is reasonably foreseeable that a new owner would pay a steam price similar to that currently paid by PG&E and would operate the units in a manner similar to PG&E's operation. However, it is feasible that market forces, organizational differences, or other unforeseen forces could cause a new owner to operate the plants in a different manner, subject to contractual constraints. For this reason, the phrase "reasonably foreseeable" was used. Please also see the response to Comment P13.

N14 The commenter indicates that FTP is analyzed in the DEIR (beginning on page 4.5-13) but that cooling tower drift at the Geysers is not. It is important to understand that FTP (fallout-type particulate) as discussed in the DEIR is not related to cooling tower drift. Cooling tower drift is a mist or fog that forms in the immediate area surrounding the exhaust stack of a cooling tower and is associated with the cooling tower's exhaust plume. Generally, this mist results in water droplets being deposited on surfaces (i.e., buildings, ground, plants, etc.) downwind of the cooling tower. These water droplets contain dissolved and suspended solids present in the condensed steam that is released through the cooling towers. The solids, or particulate matter, include sulfur compounds, boron, and other compounds that are naturally occurring constituents of the geothermal steam. The horizontal extent of this deposition of these water droplets depends on several factors, including the level of operation of the tower, the humidity and temperature of the ambient air, and the ambient wind speed.

Cooling tower drift affects only the very localized area surrounding the tower, which is typically a zone between one quarter to one half mile. Since the PG&E typical power plant site configuration at the Geysers tends to be fairly small in area, it can be expected that cooling tower drift would be deposited on terrain both inside and outside each unit's fence line. As mentioned on page 4.9-13 in the fifth paragraph, distressed vegetation caused by cooling tower water drift has been observed by Phase I investigators. This distressed vegetation was attributed, by the Phase I investigators, to dissolved boron present in the cooling water being deposited via cooling tower drift and has been noted in the Phase I report at Units 5/6, 7/8, 9/10, 11, 12, 13, 16, 17, 18, 20 and the former Unit 15. No testing has been conducted since the Phase I study was performed (1997) to confirm the cause of damage to vegetation or the presence of boron.

The Permits to Operate issued by the local air districts restrict the emission rate for total suspended particulates (TSP), which include the particulate matter present in cooling tower drift. PG&E monitors and reports the average annual total suspended and dissolved solids present in the cooling tower water to the air districts, which then calculate estimated emission rates. None of the Geysers units in Lake and Sonoma Counties have ever received a citation by the local air districts for particulate emission exceedances.

Potential effects of cooling tower drift will continue regardless of who owns or operates the Geysers Power Plant, and thus would not be affected by the project. Furthermore, short of the units ceasing to operate entirely, these potential impacts occur at most levels of unit operation.

Under the Purchase and Sale Agreement, and as is discussed in response to Comment F41, as well as in the DEIR starting at the bottom of page 4.9-16, PG&E is responsible for remediation of soil and groundwater contamination present at the property before the closing of the sale to the extent required by a regulatory agency with jurisdiction over the site. If it is determined in the future that cooling tower drift resulted in soil or groundwater contamination at the Geysers Power Plant before the closing of the sale, PG&E will be

responsible for remediation of such contamination to the same extent as PG&E is responsible for pre-closing soil or groundwater contamination from other causes. PG&E's responsibilities for remediation specifically excludes any obligation to restore or replace vegetation at the site or at any offsite area affected by operations at the site. Therefore, new owners would be responsible for restoring or replacing vegetation at the site or at any offsite area affected by operations at the site that is required after the close of sale.

In addition, if the new owner were to terminate operations at a site, the new owner (rather than PG&E) would be responsible for discharging any obligations imposed by steam purchase agreements, real property agreements, or governmental authorities (including any obligations imposed by the California Energy Commission certifications or use permits) that may require revegetation or restoration of the site to its natural state or original condition.

N15 Comment noted.

N16 In response to comment, text throughout the DEIR relating to "condensate" shall hereby be meant to read "steam condensate."

N17 Comment noted.

N18 The referenced statement in the DEIR is simply a summary of expressed public concerns and does not represent any conclusions made in the EIR. It remains unchanged.

N19 Page 1-7, Item No. 4 of the DEIR lists concerns of the public concerning the project. Although there currently are diversions of some creeks for reinjection, there is no evidence that new owners would attempt additional creek diversions. Diverting surface waters requires approval from the California Department of Water Rights. Concerns about effects on salmonids and the recent listing of steelhead salmon presents very severe limitations on approvals of any potential future diversion. Approval for a major creek diversion by Unocal was denied about ten years ago.

N20 Page 2-28, second complete paragraph, fifth sentence is hereby amended to read:

...Geothermal Energy Partners (GEO GEP)...

N21 Comment noted.

N22 Comment noted.

N23 There is no precise measurement as the boundary of the Known Geothermal Resource Area (KGRA) is irregular. The Geysers Geothermal Field is the central part of a large complex that includes the Clear Lake, Geysers, and Geysers-Calistoga KGRA. The shape of the entire KGRA is irregular but roughly measures 30 miles wide by 50 miles at the longest point. The Geysers itself occupies the central part of the KGRA and measures roughly 3.5 miles wide in the center by 10 miles long.

In order to reflect Calpine's comment for clarification, the first and second line of the third full paragraph on page 2-35 of the DEIR is revised as follows:

The Geysers Geothermal ~~Area~~ Field, located in the Mayacmas Mountains, is an unusual area of hot springs and steam vents. The area is roughly ~~5.5~~ 10 miles long and ~~± 4~~ miles wide and is drained by Big Sulphur Creek. The main natural thermal area or reservoir is located along Geyser Creek, a tributary of Big ~~Sulphur~~ Sulfur Creek,...

N24 Page 2-36, third full paragraph, last sentence is hereby amended to read:

Figure 2.17 shows a conceptual diagram of the circulation of heated underground water at the Geysers Geothermal Area.

N25 Page 2-42, third paragraph is hereby revised as follows:

The City of Santa Rosa is considering a similar wastewater injection project that could provide an additional 80 to 100 MW of generating capacity at the plant. The Environmental Impact Report (EIR) for this project was certified by the City on January 22, 1998. April 20, 1998. An Environmental Impact Statement (EIS) under the National Environmental Policy Act has also been completed, however, the Record of Decision (ROD) has not been issued pending the application and approval of permits from the Corps of Engineers National Environmental Policy Act review for this project is currently in progress. (See Chapter 5, Cumulative Impacts, for a more detailed discussion of this project.). The City is proceeding with engineering design of the project to support the permit applications (Carlson, 1998).

The following reference is hereby added to page 2-46 of the Project Description:

Carlson, Dan, Engineer, City of Santa Rosa, personal communication, November 4, 1998

N26 Page 2-38, first complete sentence, is hereby amended to read:

Also, wastewater injection is being used as a ~~evaluated as a viable~~ means of recharging fluids to the steam field...

N27 Page 2-38, first full paragraph, first sentence, is hereby amended to read:

Generally speaking, steam is drawn from wells, ~~purified,~~ transported through insulated pipes; to power plants, ~~pressurized,~~ and converted into electrical power.

N28 Page 2-39, first paragraph, second sentence is amended to read:

~~Since 1968~~Currently, the condensate from PG&E's Geysers Power Plant ~~is~~ has been returned to the steam suppliers (i.e., Unocal-Thermal and Calpine) for reinjection into the steam field.

N29 Page 2-39, first paragraph, first sentence is amended to read:

The injection of water (either condensate from the electric power generation process or water from other sources) into injection wells in the steam fields ~~is believed to~~ increases the amount of recoverable steam pressure and ~~to~~ increases the reliability of steam delivery.

N30 Page 2-39, first paragraph, third sentence is amended to read:

In addition, ~~it is expected that~~ the recently initiated...

N31 Page 2-39, second paragraph, first sentence, is hereby amended to read:

...to supply this wastewater to the steam fields controlled and maintained by those ~~agencies~~ steam field operators.

N32 Page 2-42, first line, is hereby amended to read:

...development occurs in the Lake County area...

N33 The table presented in the DEIR was reproduced from the PG&E PEA and is, as stated, a partial list. The Lake County units would continue to need a Hazardous Materials Storage Permit and permits for any underground storage tanks.

N34 Please see response to Comment H24.

N35 Page 4.1-15, last sentence, is hereby amended to read:

The Geysers have been in operation for more than ~~ten years~~ 30 years, with many starting up in the 1970s.

N36 Page 4.3-4, second paragraph, second sentence is hereby amended to read:

...generally coincides with zones of intensive hydrothermal alteration of the Franciscan rocks and ~~steam-generating conditions~~ production intervals.

N37 Paragraph 2 of Impact 4.3-3 (Page 4.3-12) is hereby replaced with the following:

Each of the generating units is connected to a system of steam collection that is tied to the production of many wells. As steam pressure declines in any one well in the field, steam is directed to the plant from other production wells to maintain an optimum operating level.

The collection of steam at a well is temporarily shut off when pressure declines below the minimum until the pressure reestablishes itself to the desired operating level, at which time it is opened again to supply steam to the collection system.

The Geysers is a vapor dominated system. When the steam pressure drops and the well is shut off, pressure reestablishes itself by the process of connate or injectate water moving through the fractures and pores of the surrounding reservoir rock. The water is converted into steam by contact with the hot rock. As the amount of steam increases, the steam pressure builds again in the pores and fractures of the reservoir rock. The production wells then draw off the pressurized vapor and convey it to the plant.

Steam generation is related to economic considerations, power demand, contracts between suppliers and plant operators, O&M requirements, operating strategy, environmental controls etc. However, from a geophysical perspective, steam production is limited by the characteristics of the reservoir rock (heat, fracture and porosity, structure, geochemistry, etc.), the availability of water, and the extent of steam field development (number and relative location of production/injection wells). Probably the most limiting consideration is the availability of water. The Geysers steam field has been overdeveloped because steam extraction exceeds the available steam supply. Given the existing infrastructure and the assumption that the operators would want to continue its use to optimum levels, the desired levels of steam production cannot be met largely because sufficient water vapor is no longer generated in the hot rock. While loss of heat in the rock has occurred in some areas and, in some cases, loss of fracture and pore space because of mineralization has reduced production, for the most part these do not seem to be major causes of steam declines.

In the past, the primary source of water has been connate water. Beginning in 1969, operators began to inject water into the reservoir rock to increase the rate of recovery of steam pressure. In some areas of the Geysers, injection derived steam accounts for 28 percent of steam production. The basic assumption underlying the use of injectate (from either power plant condensate, collection of surface water or importation of water such as the Southeast Geysers Effluent Pipeline, discussed below) is that if more water is injected into the reservoir rock at the proper application rates, steam pressure can be reestablished and sustained.

Sufficient injection water is not available from in-situ sources in the Geysers, that is, steam condensate and surface water collected in small basins (the Geysers in fact receives substantial rainfall—in some places over 80 inches/year). Environmental planning and regulatory restrictions in place prevent the further development of local surface water sources for use in injection. Therefore, steam field operators, in conjunction with PG&E and local agencies, have undertaken importation of water,

which is discussed further below. Importation of those supplies is expected to reestablish steam levels or, at the least, slow the decline in the stream production.

N38 Page 4.4-10 of the DEIR (fourth paragraph, after third sentence) is hereby revised as follows:

Other important tributaries include Cobb Creek, Anderson Creek, and Bear Canyon Creek.

N39 The following information is hereby added to Table 4.4-2 of the DEIR:

Units 9,10 Cobb Creek

N40 Page 4.4-13 of the DEIR (fourth paragraph) is hereby revised as follows:

Groundwater resources at the Geysers are regulated by the California Division of Oil, Gas, and Geothermal Resources (DOGGR) and by Sonoma and Lake Counties. DOGGR first must approve an applicant's project, which may be for one or multiple wells, and issue a project approval letter. Injection wells are regulated by the U.S. EPA, however, DOGGR has a Memorandum of Understanding with the EPA to issue individual well permits. Permits for injection are obtained through DOGGR with appropriate review from the Central Valley and North Coast RWQCB, as appropriate. Additional regulation is provided by the U.S. Bureau of Land Management (BLM), with delegated authority under the Federal Land Policy and Management Act and Geothermal Steam Act. The BLM, under these and other federal laws, is also responsible for protection and management of water resources on BLM lands and may issue injection permits.

N41 Please see response to Comment N10.

N42 Page 4.5-47, second complete paragraph, third sentence is hereby amended as follows:

By using automatically activated valves, the manifold distributes the steam according to need, thereby ~~relieving~~ lowering pressure in the line.

N43 The incinerator is designed to oxidize hydrogen sulfide to sulfur dioxide, a less toxic substance. The difference in toxicity between the two pollutants can be emphasized by comparing the short-term standards, where the state one hour standard for sulfur dioxide is over eight times greater than the standard for hydrogen sulfide. Sulfur dioxide emissions are usually very small, because only the residual hydrogen sulfide that is not removed by the abatement process is usually incinerated to sulfur dioxide. With respect to atmospheric oxidation of hydrogen sulfide to sulfur dioxide and ultimately to sulfuric acid, the reaction rates are very slow and should not significantly affect sulfur dioxide concentrations near the plants. This is explained further in response to Comment T5b.

N44 The power plants' PM-10 emissions estimates shown in Tables 4.5-21 and 4.5-22 of the DEIR are based on Title V applications. The PM-10 emission factors used in the Title V applications assume that all of the particulate matter emitted from the geothermal plant sources is PM-10. Most of the PM-10 emissions are emitted at the cooling towers.

N45 The following sentence is hereby added to page 4.8-2 of the DEIR (end of third paragraph):

Lake County units do not have untreated sanitary effluent from the plant injected into the steam field.

N46 Please see the response to Comment F41. The explanation of why divestiture would promote environmental cleanup at the Potrero Power Plant applies to the Geysers Power Plant and to the other plants being divested as well.

N47 Page 4.9-20 of the DEIR (at end of bulleted paragraphs) is hereby supplemented as follows:

- Hydrogen, the lightest element, is a flammable gas. Hydrogen gas is used at power plants to provide a low-friction atmosphere inside the turbines. Hydrogen is nontoxic, except that it would be an asphyxiant within enclosed spaces. Hydrogen is flammable or explosive when mixed with air or oxygen, and is a dangerous fire hazard when exposed to heat or oxidizing agents. It burns cleanly to form water. Although it is non-toxic, the flammable properties of hydrogen make it a dangerous gas that must be handled carefully.
- Sodium vanadate (technically sodium ammonium decavanadate) is used at several Geysers units within their Stretford sulfur abatement systems. Sodium vanadate is stored as a solid in small amounts (approximately 2-3 pounds at each unit), then mixed with other components as needed to make up Stretford sulfur abatement solution. No hazardous vanadate waste is generated. The chemical is listed as an acute and chronic irritant. Irritation would be primarily to the eyes or respiratory tract upon exposure to vanadate dust. Sodium vanadate emits acrid smoke when heated to decomposition.

N48 Page 4.9-22, first paragraph, last sentence is hereby amended to read:

Compressed gases including hydrogen are also handled at the plants.

N49 Page 4.11-8, first paragraph, first sentence is hereby amended to read:

Unocal currently maintains a private fire brigade, including one fire engine, for responding to incipient fires ~~emergencies~~ within the Geysers area.

N50 Page 4.11-12, last paragraph, second sentence is hereby changed as follows:

Currently, the plant does not pose any particular police protection problems, partly due to its remote location ~~which restricts~~ and restricted access.

N51 Page 4.11-16, under Geysers Power Plant, the first sentence is hereby amended to read:

The Geysers Power Plant generates an estimated \$920,000 ~~million~~ per year in property taxes to Lake County...

N52 Page 4.12-14 of the DEIR (fourth paragraph) is hereby amended to read:

The Geysers is not served by public sanitary and storm sewer collection infrastructure. At the Sonoma County geothermal units, wastewater from the domestic and sanitary uses is discharged to the on-site gray water or septic tank facilities, and then sent to the steam supplier for reinjection to the steam field. Stormwater is captured by the on-site berms located around the units and also reinjected into the steam field. At the Lake County units, gray water is hauled by a septic tank company and disposed of off site.

N53 Page 4.14-5, under Geysers Power Plant, the first sentence is hereby amended to read:

Commercial operations at the Geysers Power Plant first began in ~~about 1974~~ 1960.

N54 Page 5-8, under the last bullet, is hereby amended to read:

...a PG&E-funded project that would replace ~~and an~~ an existing 230/115 kV transformer...

N55 The referenced discussion contains inadvertent errors and is accordingly modified as noted below. It should be noted that the Santa Rosa Modified Geysers Recharge Project was approved in spring 1998 but is currently under litigation. Construction of the project has been delayed pending the outcome of the litigation.

Page 5-23 of the DEIR (first complete paragraph) is hereby amended as follows:

The Basin 2000 Project, which would require approval by the U.S. Environmental Protection Agency, is under consideration by the Lake County Sanitation District (LACOSAN). and the The Santa Rosa Modified Geysers Recharge Project are under consideration by the Sonoma County Community Development Commission and will be accepted or rejected based upon their ~~its~~ compliance with local planning and zoning regulations and policies. The Santa Rosa Modified Geysers Recharge Project is also subject to review and approval was approved by the City of Santa Rosa in January 1998. Although two lawsuits challenging the EIR were subsequently filed, one has been settled, and the City believes the other will be settled soon.⁹ Construction is expected to begin in 1999 and be completed by 2002. This project also requires U.S. Army Corps of Engineers approval for a Nationwide Permit under Section 404 of the federal Clean Water Act. Any development on the

⁹ Dan Carlson, Capital Projects Coordinator, City of Santa Rosa, personal communication, October 30, 1998.

recently sold 70-acre parcel (shown in Table 5.1) would also be subject to approval by the ~~Sonoma~~ Lake County Community Development ~~Commission~~ Department.

N56 Page 5-27, second paragraph, second sentence is hereby amended as follow:

~~Condensation~~ Steam condensate from the generating units would continue to be reinjected...

N57 The second sentence of the second paragraph under Geysers Power Plant, page 5-32, is hereby corrected to have only one period.

N58 Please see response to Comment H11. The last paragraph on page 6-11 is hereby amended by deleting the last sentence as follows:

However, the impact would be less than significant. ~~PG&E would likely continue its existing involvement in monitoring seismic activity associated with the Geysers' operation.~~

N59 Please see response to Comment P54.

N60 As described in Impact 4.9-4 (page 4.9-22), the Geysers use various hazardous materials for operation and maintenance. The presence and use of these materials pose a risk of upset. An increase in capacity utilization would require additional use of these materials and, therefore, a slightly higher risk of upset.

N61 Page C-7, first paragraph, sixth sentence, is hereby amended to read:

...and the steam pressure from the field has been dropping for many years, currently to as low as ~~200~~ 130 pounds per square inch (psi) from a peak of 500 psi.

The eighth sentence is hereby amended to read:

Another key problem is that it is not economical to ~~pump pipe~~ the steam for more than about a mile...

N62 Page C-7, fourth paragraph, second sentence, is hereby amended to read:

...the average resulting sustained ~~pressure~~ production determines total 'field capacity' for the next six months...

N63 Page C-8, the fourth bullet is hereby amended as follows:

Most operators now ~~capture~~ collect condensed steam from their wells and ~~pump~~ direct (inject) the water back into the ground to stimulate steam production.

N64 The first line on page C-9 is hereby amended to read:

...hope that the additional injections will boost...

N65 Page C-9, third paragraph, fifth sentence is hereby amended as follows:

The changes in operations by PG&E and NCPA also have affected both the apparent steam production rate, and the ~~actual geology~~ steam field well pressures of in the KGRA.

N66 Page C-21, last paragraph, fourth sentence is hereby amended to read:

Unocal is primarily a large oil and gas production, ~~refining and retailing~~ company, which also has developed geothermal plants internationally.

N67 Page C-33, footnote 63 is hereby amended to read:

While the steam suppliers could theoretically sell to NCPA, SMUD or the QFs, at least ~~three~~ two practical matters basically foreclose this option: (1) such sale can be performed only after a succession of tests and declarations by each party, which severely hinders the ability of the steam supplier to sell to others; (2) steam can be moved only a short distance before it loses its effective energy (i.e., a mile or less in most cases); and (3) PG&E's generation capacity dwarfs the capacity owned by all of the other generators combined.

N68 Page C-33, footnote 65 is hereby revised as follows:

PG&E has already shut down ~~the oldest four~~ five Geysers plants, the Central California Power Agency has shut down the Coldwater Creek plants, and CDWR's Bottlerock plant has never opened.