APPENDIX E
GEOLOGY AND WELL INFORMATION

Attachment 3
Geology and Well Information

- Summary and Recommendations for all Wells that have Penetrated the Starkey Formation Above or Near the Gas/Water contact (Irani Engineering, September 9, 2008)
- Table 3.1 Existing and Abandoned Well List
- Table 3.2 Existing and Abandoned Well List of Starkey and Deeper Penetrations
- Table 3.3 Existing Well List
- Map A Gill Ranch Gas Field – Base Map
- Map B Gill Ranch Gas Field – First Starkey Subsea Structure Map
- Map C Gill Ranch Gas Field – Second Starkey Subsea Structure Map
- Well Re-entry Plan - Gill No. 61-20
- Well Re-entry Plan - Gill Ranch S.E. No. 21-1
- Well Re-entry Plan - Gill No. 62-21

IRANI ENGINEERING
PETROLEUM ENGINEER
2625 FAIR OAKS BOULEVARD, SUITE 10
SACRAMENTO, CALIFORNIA 95864
916-482-2847
FAX 916-482-7514

September 9, 2008

Dear Todd:

The following is the summary and recommendation for all the wells that have penetrated Starkey formation above or near gas/water contact.

Section 16

Gill No. 38-16, Sec 16, T 13S, R 16E

This well was drilled to 9154'. 7" casing was cemented at 7960' (below both 1st and 2nd Starkey formations). 2nd Starkey was not tested. The well produced from 1st Starkey and Nortonville formations. The well was later abandoned. 1st Starkey was abandoned properly but Nortonville was not abandoned properly. Since Nortonville is not considered an objective at this time there is no reason to re-enter the well.

Section 17

Gill Ranch No. 18X-17, Sec 17, T 13S, R 16E

This well penetrated Moreno, 1st Starkey, and 2nd Starkey zones and produced from Moreno and 2nd Starkey. All the targeted storage zones were abandoned properly. The well is operated by Armstrong Petroleum and is open in Kreyenhagen from 4351'- to 4396'. No action is required at this time. If Gill Ranch Storage takes over this well in the future, the well should be reentered per program dated 8/19/08 and converted to pressure & G/W observation well in 2nd Starkey.

Section 18

Gill Ranch Deep A-3 Sec 18, T 13S, R 16E

This well penetrated both 1st Starkey and 2nd Starkey zones and produced from 2nd Starkey. All the targeted storage zones were abandoned properly. No action is required in this well.

Gill Ranch Deep A-4 Sec. 18, T 13S, R 16E

This well penetrated both 1st Starkey and 2nd Starkey zones and produced from 2ndStarkey. All of the targeted storage zones were abandoned properly. No action is required in this well. A program to convert this well to Pressure & G/W observation well in 2nd Starkey formation was prepared on 8/19/08.

Section 19

Gill No. 726-19, Sec. 19, T13S, R 16E

This well penetrated both Moreno Sand and 1st Starkey. 4-1/2" casing was cemented just above 1st Starkey Sand. Moreno Sand was perforated and produced and then was commingled with Kreyenhagen zone. During the abandonment a fish was left in the hole and there were no cement plugs placed across Moreno or Kreyenhagen formations. If in the future Moreno Sand becomes a storage target we should re-enter and re-abandon this well.

Gill Ranch No. 19X, Sec. 19, T 13S, R 16E

This well penetrated Moreno Sand 2' below G/W contact. 5-1/2" casing was cemented at 4590' and the well produced from Kreyenhagen formation and later was abandoned. If in the future Moreno Sand becomes a storage target we should re-enter and re-abandon this well.

Gill Ranch Deep A-2 Sec. 19, T 13S, R 16E

This well penetrated both 1st Starkey and 2nd Starkey zones and produced from the 2nd Starkey formation. All the targeted storage zones were abandoned properly. This well is open in Kreyenhagen formation at this time. If Gill Ranch Storage takes over this well in the future, the well could be reentered per program dated 8/19/08 and converted to pressure & G/W observation well in 2nd Starkey.

Section 20

Gill No. 61-20, Sec. 20, T 13S, R 16E

This well penetrated 1st Starkey 12' below G/W contact. 5-1/2" casing was cemented at 4537' and the well produced from Kreyenhagen formation. 1st Starkey zone was not abandoned properly for storage operations. This well was abandoned on 11/22/94. The well has to be reentered therefore it has been decided to convert this well to G/W observation well in 1st Starkey. A re-entry program dated 8/18/08 was prepared.

Gill Ranch Deep A-1 Sec. 20, T 13S, R 16E

This well penetrated Moreno, 1st Starkey, and 2nd Starkey zones and produced from Moreno, and 2nd Starkey. All the targeted storage zones were abandoned properly. This well is operated by Armstrong Petroleum and is open in Kreyenhagen formation. There is no need to reenter this well at this time.

Edison Securities A-1, Sec. 20, T 13S, R 16E

This well penetrated Moreno, 1st Starkey, and 2nd Starkey formations. The well produced from 2nd Starkey and Moreno formations. All the targeted storage zones were abandoned properly. Reentry is very difficult and not recommended.

Gill No. 38X-17, Sec. 20, T 13S, R 16E

This well penetrated both 1st Starkey and 2nd Starkey. Cemented 4-1/2" casing protects both Starkey zones. Starkey zones have not been perforated. This well produced from Moreno sand. Some stringer gas sands above Moreno sand are open. No action is necessary in this well.

Section 21

Gill Ranch S. E. No. 21-1, Sec. 21, T 13S, R 16E

This is an abandoned well which penetrated both 1st and 2nd Starkey formations. 4-1/2" casing was set and cemented over the 1st Starkey. 2nd Starkey is 7' above G/W contact and has not been abandon properly for storage operations. The well has to be reentered so a decision was made to convert this well to G/W observation well in 2nd Starkey and pressure & G/W monitoring well in 1st Starkey. A re-entry program dated 8/20/08 was prepared.

Gill No. 62-21, Sec. 21, T 13S, R 16E

This is an Armstrong well which produced from Kreyenhagen formation and was abandoned in March of 2008. This well penetrated 1st Starkey 15' above the G/W contact. 4-1/2" casing was cemented above Starkey formation at 4735'. 1st Starkey was not abandoned properly for storage operations. The well has to be reentered so a decision was made to convert this well to G/W observation well in 1st Starkey. A re-entry program dated 8/18/08 was prepared.

Edison Securities B No. 1, Sec. 21, T 13S, R 16E

This dry hole was drilled 250' into 2nd Starkey Sand and abandoned. 2nd Starkey Sand was encountered 24' below G/W contact therefore there is no need to re-enter the well and plug 2nd Starkey. 1st Starkey and the rest of the well bore were correctly abandoned.

Gill Ranch No. 91-21, Sec. 21, T 13S, R 16E

This well penetrated both 1st Starkey and 2nd Starkey. Cemented 4-1/2" casing protects both Starkey zones. Starkey zones have not been perforated. This well is producing from Kreyenhagen. No action is required at this time. If Gill Ranch Storage takes over this well in the future, the well can be converted to an observation well.

Gill Ranch No. 32-21, Sec. 21, T 13S, R 16E

Armstrong operates this well. This well penetrated both 1st and 2nd Starkey formation above G/W contact. 5-1/2" casing was cemented at TD. All the targeted storage zones were abandoned properly. There is no reason to re-enter this well.

Section 22

Edison Securities No. 25-22, Sec. 22, T 13S, R 16E

This well penetrated 1st Starkey. 5-1/2" casing was run to bottom. 1st Starkey was tested and then abandoned properly. The well produced from Kreyenhagen. Kreyenhagen was abandoned properly but tubing junk was cemented in the hole which makes re-entry below Kreyengagen zone impossible. All the targeted storage zones were abandoned properly in this well.

Sincerely

A. Irani
Registered Petroleum Engineer

Table 3.1

Gill Ranch Storage Field

Existing and Abandoned Well List

Source of Information: California DOGGR Files

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Available Logs	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
Section 16																				
	The Texas Co. Gill 14-16	Vintage Petroleum	Gas	P&A'd	1943	5909	First Starkey	705	4509	7	None	4481-96	Main	12/44 - 11/55	1.53	11/55	Resistivity	4027-4301	None - First Starkey off structure and wet	None
												4468-88; 4345-95	Nortonville	12/55 - 12/76	0.253			797 -990; surface to 50		
	The Texas Co Gill 18-16	Vintage Petroleum	Gas	P&A'd	1949	4522	Domengine	632	4522	5.5	None	4344-50; 4355-4420	Nortonville	11/49 - 5/73	3.29	1993	Resistivity	2086-2549; 630-706; surface to 60	None - shallow production	None
												4450-60; 4470-84	Green, Main							
	The Texas Co Gill 38-16	Vintage Petroleum	Gas	P&A'd	1942	9154	Basement	705	7960	7	None	4415-25; 4445-65; 4470-80	Green, Main	4/43 - 2/52	2.1	7/56	Resistivity	Permanent packer @ 5690 with 2 in.	Discovery well Eastside First Starkey reservoir.	None - First Starkey properly abandoned.
												5745-60	First Starkey	2/57 - 2/94	7.8	1994		tubing. Tubing plug 4088-5000		
	The Texas Co Gill 68-16	Texas Co.	Dryhole	P&A'd	1965	6097	First Starkey	609	4605	2.875	None	4476-84; 4407-15; 4329-34; 4305-16	Nortonville	Did not produce		1965	Resistivity, Sonic	4450 to surface	None - First Starkey off structure and wet	None
Section 17																				
	Cenex Gill 12-17	Cenex	Dryhole	P&A'd	1994	4717	Dos Palos	980	None		None	None				1994	Composite Resistivity Sonic, Mud Log	4190-4523; 844-1035; surface to 30	None - shallow exploratory well	None
	The Texas Co Gill 655-17	Vintage Petroleum	Gas	P&A'd	1945	4496	Domengine	610	4495	5.5	None	4445-55; 4474-84	Green, Main	11/45 - 8/53	0.817	1994	Resistivity	4460-65, Cement retainer 4465, (8/53)	None - shallow production	None
												4345-55; 4365-75	Nortonville	12/53 - 3/90	1.243			45 to 155 filled annulus between casings		
																		surface to 24		
	Texaco Gill Ranch 18x-17	Armstrong Petroleum Co.	Gas	Active	1990	6516	Second Starkey	1496	6515	5.5	None	6207-20	Second Starkey	2/92 - 7/92	1.386	6/93	Composite Resistivity Sonic, Dipmeter	6101-6220, cement retainer 6178	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5564-70	Moreno	7&8/93	0.006	2/94		5525-5570, cement retainer 5550	None - shallow production	None - Moreno properly abandoned
												4455-64	Main	3/94 - 9/05	0.2298	Not abandoned			None - shallow production	None
Section 18																				
	McFarland Gill Trust 1-18	McFarland	Dryhole	P&A'd	1995	6528	Second Starkey	1196	None		None	None				1995	Composite Resistivity Sonic, Neutron Density	5673-5916; 4371-4622;899-1270; surface to 50	None - Second Starkey off structure and wet	None
	McFarland Gill Trust 2-18	Armstrong Petroleum Co	Gas	Idle	1996	6350	Second Starkey	1305	5915	2.875	None	5639-43; 5620-25	Moreno	1/97 - 6/98	0.302	Not abandoned	Composite Resistivity Sonic	Retainer 5680	None - Second Starkey off structure and wet	None
	Gill #1	George F Getty Inc.	Dryhole	P&A'd	1930	4615	Domengine	300	None		None						Sample Log	250 - 650	None - shallow exploratory dryhole	None
	Shell Oil Co 47x-18	DJ Pickrell	Gas	Idle	1967	5700	Moreno	629	4555	4.5	None	4345-49; 4351-54	Nortonville	2/67 - 8/81	2.271	Not abandoned	Resistivity		None - shallow production	None
	Shell Oil Co 38-18	DJ Pickrell	Gas	Idle	1943	5966	First Starkey	539	4410	5.5	Liner 4455-75	4389-4475	Green, Main	12/43 - 12/57	4.754	Green abandoned 1/58	Resistivity	4440-75	None - shallow production, did not penetrate Second Starkey	None
												4413-21; 4393-98	Main, Nortonville	2/58 - 8/75	0.57	Not Abandoned				

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Available Logs	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Phillips Petroleum Co Gill Ranch Deep A-3	Vern Jones Oil and Gas Corp	Gas	P&A'd	1989	8800	Basement	1010	8100	7	7792-8799	6201-15	Second Starkey	9/90 - 4/96	1.432	2002	Mud Log, Neutron Density, Resistivity, Sonic	6210-20; 5960-6120; 820-950; surface to 30	Westside Second Starkey production well	None - Second Starkey properly abandoned
																		6180-81 WSO		
	Phillips Petroleum Co Gill Ranch Deep A-4	Phillips Petroleum Co.	Gas - DNP	P&A'd	1989	6419	Second Starkey	1030	6419	5.5	None	6226-30	Second Starkey	Did not produce		1994	Mud Log, Neutron Density, Resistivity, Sonic	6012-6272; 4032-4300; 533-1190; surface to 40	Westside Second Starkey well that did not produce	None - Second Starkey properly abandoned
Section 19																				
	DJ Pickrell 19x	DJ Pickrell	Gas	Idle	1971	5900	First Starkey	690	4590	5.5	None	4398-4405	Nortonville	7/80 - 6/98	0.63	Not abandoned	Resistivity		None - shallow production, did not penetrate Second Starkey	None
	Texaco Gill 726-19	Texaco	Gas	P&A'd	1964	5800	First Starkey	810	5680	4.5	None	4334-38	Nortonville	3/65 - 1/74	1.915	1993	Resistivity, Sonic	3954-4272; 647-750; surface to 60	None - shallow production, did not penetrate Second Starkey	None
												5570-74	Moreno	3/65 - 1/74	co-mingled	1993			Nortonville and Moreno not abandoned properly	
	Shell Oil Co 32-19	Shell Oil Co.	Dryhole	P&A'd	1957	4488	Domengine	621	None		None					1957	Resistivity	75 sacks pumped at 4481; 373-880; surface to 10	None - shallow exploratory well	None
	Phillips Gill Ranch Deep A-2	Armstrong Petroleum Corp.	Gas	Active	1989	6400	Second Starkey	1005	6400	5.5	None	6198-6212	Second Starkey	9/90 - 5/92	1.16	1994	Mud Log, Neutron Density, Resistivity, Sonic	6024-6215	Westside Second Starkey production well	None - Second Starkey properly abandoned
												4346-70	Nortonville	3/94 to present	0.208	Producing				
	The Texas Co Gill 725-19	The Texas Co.	Gas	P&A'd	1944	4489	Domengine	582	4489	5.5	None	4400; 4440-63;	Green	11/45 - 10/55	6.249	11/55	Resistivity	Retainer 4428	None - shallow production	None
												4416-23; 4395-4405	Main, Nortonville	11/55 - 2/70	2.133	1994		cement retainer 4200; 625 - 845; surface to 50		
	Getty Agri Business A No. 1	Phillips Petroleum Co.	Dryhole	P&A'd	1986	6650	Second Starkey	789	None		None					1986	Mud Log, Neutron Density, Resistivity, Sonic	748-844; 575-744; surface to 59	None - Second Starkey off structure and wet	None
Section 20																				
	Texaco E&P Gill 38x-17	Armstrong Petroleum Corp.	Gas	Active	1997	9508	Basement	1525	6766	7	None	5587-92; 5596-98; 5612-14	Moreno	11/97 to present	0.32	Producing	Composite Resistivity Neutron Density, Composite Resistivity Sonic, Mud Log	9170-9370; 8400-8700; 6664-6864	Westside Second Starkey well. Cased and cemented through zone.	None
																			Second Starkey invaded by water.	
	Texaco Gill 12-20	Armstrong Petroleum Corp.	Gas	Idle	1990	5792	First Starkey	1415	5790	5.5	None	5661-71	First Starkey	3/91 - 6/96	1.845	6/96	Composite Resistivity Sonic	Bridge plug 5640 cement on top.	None - Only First Starkey westside productive well.	None
												5550-56	Moreno	6/96 - present	0.6607	Not abandoned			Not drilled into Second Starkey.	
												5376-80	Moreno	3/97 - present	both Moreno zones	Last production 12/03				
	Phillips Petroleum Co Gill Ranch Deep A-1	Armstrong Petroleum Corp.	Gas	Idle	1989	6502	Second Starkey	1017	5894	5	5564-6502	6202-12	Second Starkey	9/89 - 11/91	2.56	2/94	Mud Log, Neutron Density, Resistivity, Sonic	6066-6425; bridge plug 5564 2 sacks cement on top	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5578-84	Moreno	3/94 - 1/97	1.954	1997				

Table 3.1
Gill Ranch Storage Field
Existing and Abandoned Well List

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Available Logs	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
												4346-52;4370-76; 4389-90; 4448-52	Nortonville	2/97 - present	0.032					
	The Texas Co Gill 21-20	Armstrong Petroleum Corp.	Gas - Converted to Water Injection	Active	1963	6000	First Starkey	815	5710	4.5	None	4460-66	Main	3/64 - 12/71	0.518	Water Injection	GR Neutron, Resistivity	4398-72; 4390-98; 4156-4390	None - shallow production and water injection	None
												5618-23	Moreno	3/64 - 12/71	co-mingled	Last water injection 3/06			Did not penetrate Second Starkey	
												3240-3350	Santa Margarita	6/94 to present	637,253 bbls water					
	The Texas Co Gill 61-20	Texaco	Gas	P&A'd	1944	5809	First Starkey	595	4537	5.5	Liner at 4383	4435; 4450-60;4470-80	Green, Main	1/44 - 1/53	3.74	Green abandoned 11/52	Resistivity	4467 bridge plug 5 ft. cement on top; 4044-4285	Top First Starkey 12 ft. downdip from Eastside First Starky reservor.	Yes. No cement from First Starkey to base of production casing.
												4370-80; 4335-45	Main, Nortonville	11/52 - 12/71	3.49	1994		745-860; surface to 50	First Starkey and Moreno improperly abandoned.	Well will be re-entered and re-completed as a First Starkey eastside reservoir observation well.
	Texaco Gill 14-20	Texaco	Gas	P&A'd	1966	5800	First Starkey	832	5314	2.875	None	5203-08	Moreno	12/66 - 12/89	0.242	1994	Resistivity	5188-5200; 5100-5200; 848-970; surface to 50	None - shallow production, did not penetrate Second Starkey	None
	Shell Oil Co Edison securities 25-20	DJ Pickrell	Gas	Idle	1945	4517	Domengine	505	4465	5.5	Liner 4433-80	4433-80	Main	7/45 - 12/92	1.325	Not abandoned	Resistivity		None - shallow production	None
											Liner 4415-17									
	Phillips Petroleum Co Edison securities A-1	Phillips Petroleum Co.	Gas	P&A'd	1989	8800	Basement	1017	5894	7	5564-6502	6238-44	Second Starkey	4/90 - 1/91	0.4224	5/91	Mud Log, Neutron Density, Resistivity, Sonic	6165-75, bridge plug 6175; 5147-6162	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5526-29	Moreno	5/91 - 12/92	0.3607	1994		4385-4500; 580-800; surface to 40		
	The Texas Co Gill 83-20	The Texas Co.	Gas	P&A'd	1956	4535	Domengine	618	4535	5.5	None	4375-4410; 4450-56; 4480-90	Main, Nortonville	12/56 - 12/64	2.017	1994	Resistivity	Cement retainer 4250; 4078-4250; 777-960; surface to 60	None - shallow production	None
Section 21																				
	Texaco Gill 51-21	Texaco	Gas	P&A'd	1965	4550	Domengine	622	4524	2.875	None	4349-54; 4358-66; 4452-57	Main, Nortonville	3/65 - 3/70	0.251	1993	Resistivity	3686-3900; surface to 700	None - shallow production	None
	The Texas Co 71-21	Texaco	Gas	P&A'd	1943	4801	Dos Palos	590	4537	5.5	None	4464-80; 4496-4505	Green, Main	1/44 - 11/47	0.692	11/47	Resistivity	Cement retainer 4510 10 cu. Ft. on top. Cement retainer	None - shallow production	None
												4435-40; 4390-4400	Main, Nortonville	12/47 - 1/82	4.48	1994		at 4488 2 sacks cement on top; 4189-4398; 831-935;		
																		surface to 50		
	Armstrong Petroleum Corp Gill 91-21	Armstrong Petroleum Corp.	Gas	Active	2005	6470	SecondStarkey	796	6450	4.5	None	4420-30; 4434-42	Nortonville	2/06 to present	0.1062	Producing	Composite Resistivity Sonic, Mud Log		Drilled First and Second Starkey reservoirs found them both invaded by water	None. Both First and Second Starkey reservoir sands cemented behind casing.
																				Cement top calculated at 2500 ft.

Table 3.1

Gill Ranch Storage Field
Existing and Abandoned Well List

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Available Logs	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Texaco Gill 32-21	Armstrong Petroleum Corp.	Gas	P&A'd	1990	6501	Second Starkey	1497	6499	5.5	None	6198-6212	Second Starkey	1/91 - 4/93	2.73	7/93	Composite Resistivity Sonic, Neutron Density	Cement retainer 6169, 25 cu. Ft. cement below and	Second Starkey reservoir discovery well and only eastside	None. Both First and Second Starkey production intervals
												5702-12; 5690-5704	First Starkey	7/93 - 5/97	5.08	2005		22 cu. Ft. above, calculated top 5992. Tubing packer 5616	well to produce from Second Starkey.	abandoned properly.
																		top tubing 5575. Cement 5464 - 5616. 549 to 900???	First Starkey production well.	
																		surface to 30		
	Texaco Gill 62-21	Armstrong Petroleum Corp.	Gas	P&A'd	1971	5900	First Starkey	694	4735	4.5	None	4364-72; 4378-82	Nortonville	2/71 - 4/92	1.5	2008	Resistivity, Sonic	3995-4390; 635-1010;surface to 30	Drilled into eastside First Starkey reservoir 15 ft. above original gas/water contact and reservoir sand invaded by water.	Yes. First Starkey was improperly abandoned. No cement below base of production casing. Well will be re-entered and re-completedas a First Starkey eastside reservoir observation well.
	The Texas Co 33-21	Texaco	Gas	P&A'd	1955	4549	Domengine	618	4549	5.5	None	4386-4411; 4421-28	Nortonville	3/55 - 3/70	4.24	1994	Resistivity	3117-3321; 788-888; surface to 50	None - shallow production	None
	The Texas Co 63-21	Armstrong Petroleum Corp.	Gas - Converted	Idle	1953	4540	Domengine	598	4535	5.5	None	4350-63; 4370-82; 4390-4408; 4458-72	Main, Nortonville	11/53 - 12/67	3.38	Last water injection 12/98	Resistivity	Cement retainer 4145; 3468-4127	None - shallow production and water injection.	None
			to Water Injection									3250-3340		4/71 converted to water injection	1.320,140 bbls water					
	Phillips Petroleum Co Edison securities B-1	Phillips Petroleum Co.	Dryhole	P&A'd	1989	6500	Second Starkey	1012			None					Dryhole	Neutron Density, Resistivity, Sonic	5213-5889; 883-1164; surface to 5	Drilled into eastside First Starkey reservoir 20 ft. above original gas/water contact and found it invaded by water.	None. First Starkey properly abandoned. Top of Second Starkey low on structure and storage reservoir not penetrated by well.
																			Drilled into eastside Second Starkey sand off structure and below orignal gas water contact.	
	Vern Jones O&G Corp Gill Ranch 1-21	Vern Jones Oil and Gas Corp	Gas	P&A'd	1992	6400	Second Starkey	696	5968	4.5	None	5716-26; 5732-35	First Starkey	Flowed water		1992	Composite Resistivity Sonic, Mud Log	Bridge plug 5680; 5229-5468, retainer 5094;	Drilled into eastside First Starkey reservoir 41 ft.above original	Yes. First Starkey behind casing and properly abandoned.

Table 3.1
Gill Ranch Storage Field
Existing and Abandoned Well List

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Available Logs	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
												5458-68; 5160-64	Moreno	6/92 - 6/96	1.59	1996		bridge plug 4414; 4156-4414; 744-1054; surface to 30	gas/water contact and found it invaded by water.	No cement from mid-First Starkey to TD. Second Starkey improperly abandoned.
																			Drilled into eastside Second Starkey reservoir 7 ft.above original gas/water contact and found it invaded by water.	Well will be re-entered and re-completed as an observation well in both First and Second Stareky storage reservoirs.
	Shell Oil Co Edison Securities 85-21	DJ Pickrell	Gas	P&A'd	1963	4580	Domengine	621	4580	4.5	None	4422-40; 4446-58; 4466-78; 4483-90	Nortonville	5/63-3/69	0.577	1977	Resistivity	3387-4535; 532-750; surface to 30	None - shallow production	None
Section 22																				
	Shell Oil Co Gill 13-22	DJ Pickrell	Gas	P&A'd	1957	4550	Domengine	624	4547	4.5	None	4383-96; 4412-16; 4465-73; 4479-95	Main, Nortonville	11/57 - 3/64	0.423	1977	Resistivity	4316-4500; 505-700; surface to 30	None - shallow production	None
	Edison Securities Co Community A-53-22	Edison Securities Co	Dryhole	P&A'd	1950	4648	Domengine	620									Resistivity	4620-48; 15 sacks at 4620; 1705-1800; 590-640, surface	None - shallow exploratory well	None
	Shell Oil Co Edison Securities 25-22	DJ Pickrell	Gas	P&A'd	1944	5780	First Starkey	540	5780	5.5	None	5765--68	First Starkey	Flowed gas and		1977	Resistivity	First Starkey perfs squeezed, 5629-5780; 4330-4550	Drilled into eastside First Starkey reservoir 11 ft.above original	None. First Starkey properly abandoned.
														water on test				390-590; surface to 30	gas/water contact. On test flowed 1,800 mcfd and 430 bwpd.	
												4420-32; 4450-60; 4467-75; 4490-4500	Nortonville	1/46-12/67	3.36				Shallow production.	
	Montara Petroleum Co Edison #1	Montara Petroleum Co	Dryhole	P&A'd	1975	5850	First Starkey	696								1975	Dipmeter, Mud Log, Resistivity, Sonic	4250-4700; 622-746; surface to 29	Top First Starkey 62 ft. downdip from Eastside First Starky reservoir	None. Top First Starkey low on structure.
Section 27																				
	Atlantic Oil Co. Gill Ranch #1	Atlantic Oil Co	Dryhole	P&A'd	1973	5950	First Starkey	650								1973	Mud Log, Resistivity	1370-1613; 588-712; surface to 30	Top First Starkey 36 ft. downdip from Eastside First Starky reservoir	None. Top First Starkey low on structure.

Table 3.1
Gill Ranch Storage Field
Existing and Abandoned Well List

Gill Ranch Storage Field

Table 3.2

Existing and Abandoned Well List of Starkey and Deeper Penetrations

Source of Information: California DOGGR Files

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
Section 16																			
	The Texas Co. Gill 14-16	Vintage Petroleum	Gas	P&A'd	1943	5909	First Starkey	705	4509	7	None	4481-96	Main	12/44 - 11/55	1.53	11/55	4027-4301	None - First Starkey off structure and wet	None
												4468-88; 4345-95	Nortonville	12/55 - 12/76	0.253		797 -990; surface to 50		
	The Texas Co Gill 38-16	Vintage Petroleum	Gas	P&A'd	1942	9154	Basement	705	7960	7	None	4415-25; 4445-65; 4470-80	Green, Main	4/43 - 2/52	2.1	7/56	Permanent packer @ 5690 with 2 in.	Discovery well Eastside First Starkey reservoir.	None - First Starkey properly abandoned.
												5745-60	First Starkey	2/57 - 2/94	7.8	1994	tubing. Tubing plug 4088-5000		
	The Texas Co Gill 68-16	Texas Co	Dryhole	P&A'd	1965	6097	First Starkey	609	4605	2.875	None	4476-84; 4407-15; 4329-34; 4305-16	Nortonville	Did not produce		1965	4450 to surface	None - First Starkey off structure and wet	None
Section 17																			
	Texaco Gill Ranch 18x-17	Armstrong Petroleum Co.	Gas	Active	1990	6516	Second Starkey	1496	6515	5.5	None	6207-20	Second Starkey	2/92 - 7/92	1.386	6/93	6101-6220, cement retainer 6178	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5564-70	Moreno	7&8/93	0.006	2/94	5525-5570, cement retainer 5550	None - shallow production	None - Moreno properly abandoned
												4455-64	Main	3/94 - 9/05	0.2298	Not abandoned		None - shallow production	None
Section 18																			
	McFarland Gill Trust 1-18	McFarland	Dryhole	P&A'd	1995	6528	Second Starkey	1196	None		None	None				1995	5673-5916; 4371-4622;899-1270; surface to 50	None - Second Starkey off structure and wet	None
	McFarland Gill Trust 2-18	Armstrong Petroleum Co	Gas	Idle	1996	6350	Second Starkey	1305	5915	2.875	None	5639-43; 5620-25	Moreno	1/97 - 6/98	0.302	Not abandoned	Retainer 5680	None - Second Starkey off structure and wet	None
	Shell Oil Co 38-18	DJ Pickrell	Gas	Idle	1943	5966	First Starkey	539	4410	5.5	Liner 4455-75	4389-4475	Green, Main	12/43 - 12/57	4.754	Green abandoned 1/58	4440-75	None - shallow production, did not penetrate Second Starkey	None
												4413-21; 4393-98	Main, Nortonville	2/58 - 8/75	0.57	Not Abandoned			

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Phillips Petroleum Co Gill Ranch Deep A-3	Vern Jones Oil and Gas Corp	Gas	P&A'd	1989	8800	Basement	1010	8100	7	7792-8799	6201-15	Second Starkey	9/90 - 4/96	1.432	2002	6210-20; 5960-6120; 820-950; surface to 30	Westside Second Starkey production well	None - Second Starkey properly abandoned
																	6180-81 WSO		
	Phillips Petroleum Co Gill Ranch Deep A-4	Phillips Petroleum Co	Gas - DNP	P&A'd	1989	6419	Second Starkey	1030	6419	5.5	None	6226-30	Second Starkey	Did not produce		1994	6012-6272; 4032-4300; 533-1190; surface to 40	Westside Second Starkey well that did not produce	None - Second Starkey properly abandoned
Section 19																			
	DJ Pickrell 19x	DJ Pickrell	Gas	Idle	1971	5900	First Starkey	690	4590	5.5	None	4398-4405	Nortonville	7/80 - 6/98	0.63	Not abandoned		None - shallow production, did not penetrate Second Starkey	None
	Texaco Gill 726 19	Texaco	Gas	P&A'd	1964	5800	First Starkey	810	5680	4.5	None	4334-38	Nortonville	3/65 - 1/74	1.915	1993	3954-4272; 647-750; surface to 60	None - shallow production, did not penetrate Second Starkey	None
												5570-74	Moreno	3/65 - 1/74	co-mingled	1993		Nortonville and Moreno not abandoned properly	
	Phillips Gill Ranch Deep A-2	Armstrong Petroleum Corp.	Gas	Active	1989	6400	Second Starkey	1005	6400	5.5	None	6198-6212	Second Starkey	9/90 - 5/92	1.16	1994	6024-6215	Westside Second Starkey production well	None - Second Starkey properly abandoned
												4346-70	Nortonville	3/94 to present	0.208	Producing			
	Getty Agri Business A No. 1	Phillips Petroleum Co	Dryhole	P&A'd	1986	6650	Second Starkey	789	None		None					1986	748-844; 575-744; surface to 59	None - Second Starkey off structure and wet	None
Section 20																			
	Texaco E&P Gill 38x-17	Armstrong Petroleum Corp.	Gas	Active	1997	9508	Basement	1525	6766	7	None	5587-92; 5596-98; 5612-14	Moreno	11/97 to present	0.32	Producing	9170-9370; 8400-8700; 6664-6864	Westside Second Starkey well. Cased and cemented through zone. Second Starkey invaded by water.	None

Table 3.2
Gill Ranch Storage Field
Existing and Abandoned Well List of Starkey and Deeper Penetrations

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Texaco Gill 12-20	Armstrong Petroleum Corp.	Gas	Idle	1990	5792	First Starkey	1415	5790	5.5	None	5661-71	First Starkey	3/91 - 6/96	1.845	6/96	Bridge plug 5640 cement on top.	None - Only First Starkey westside productive well.	None
												5550-56	Moreno	6/96 - present	0.6607	Not abandoned		Not drilled into Second Starkey.	
												5376-80	Moreno	3/97 - present	both Moreno zones	Last production 12/03			
	Phillips Petroleum Co Gill Ranch Deep A-1	Armstrong Petroleum Corp.	Gas	Idle	1989	6502	Second Starkey	1017	5894	5	5564-6502	6202-12	Second Starkey	9/89 - 11/91	2.56	2/94	6066-6425; bridge plug 5564 2 sacks cement on top	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5578-84	Moreno	3/94 - 1/97	1.954	1997			
												4346-52;4370-76; 4389-90; 4448-52	Nortonville	2/97 - present	0.032				
	The Texas Co Gill 21-20	Armstrong Petroleum Corp.	Gas - Converted	Active	1963	6000	First Starkey	815	5710	4.5	None	4460-66	Main	3/64 - 12/71	0.518	Water Injection	4398-72; 4390-98; 4156-4390	None - shallow production and water injection	None
			to Water Injection									5618-23	Moreno	3/64 - 12/71	co-mingled	Last water injection 3/06		Did not penetrate Second Starkey	
												3240-3350	Santa Margarita	6/94 to present	637,253 bbls water				
	The Texas Co Gill 61-20	Texaco	Gas	P&A'd	1944	5809	First Starkey	595	4537	5.5	Liner at 4383	4435; 4450-60;4470-80	Green, Main	1/44 - 1/53	3.74	Green abandoned 11/52	4467 bridge plug 5 ft. cement on top; 4044-4285	Top First Starkey 12 ft. downdip from Eastside First Starky	Yes. No cement from First Starkey to base of production casing.
												4370-80; 4335-45	Main, Nortonville	11/52 - 12/71	3.49	1994	745-860; surface to 50	reservor. First Starkey and Moreno improperly abandoned.	Well will be re-entered and re-completed as a First Starkey
																			eastside reservoir observation well.
	Texaco Gill 14-20	Texaco	Gas	P&A'd	1966	5800	First Starkey	832	5314	2.875	None	5203-08	Moreno	12/66 - 12/89	0.242	1994	5188-5200; 5100-5200; 848-970; surface to 50	None - shallow production, did not penetrate Second Starkey	None

Table 3.2
Gill Ranch Storage Field
Existing and Abandoned Well List of Starkey and Deeper Penetrations

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Phillips Petroleum Co Edison securities A-1	Phillips Petroleum Co	Gas	P&A'd	1989	8800	Basement	1017	5894	7	5564-6502	6238-44	Second Starkey	4/90 - 1/91	0.4224	5/91	6165-75, bridge plug 6175; 5147-6162	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5526-29	Moreno	5/91 - 12/92	0.3607	1994	4385-4500; 580-800; surface to 40		
Section 21																			
	Armstrong Petroleum Corp Gill 91-21	Armstrong Petroleum Corp.	Gas	Active	2005	6470	SecondStarkey	796	6450	4.5	None	4420-30; 4434-42	Nortonville	2/06 to present	0.1062	Producing		Drilled First and Second Starkey reservoirs found them both invaded by water	None. Both First and Second Starkey reservoir sands cemented behind casing. Cement top calculated at 2500 ft.
	Texaco Gill 32-21	Armstrong Petroleum Corp.	Gas	P&A'd	1990	6501	Second Starkey	1497	6499	5.5	None	6198-6212	Second Starkey	1/91 - 4/93	2.73	7/93	Cement retainer 6169, 25 cu. Ft. cement below and	Second Starkey reservoir discovery well and only eastside	None. Both First and Second Starkey production intervals
												5702-12; 5690-5704	First Starkey	7/93 - 5/97	5.08	2005	22 cu. Ft. above, calculated top 5992. Tubing packer 5616	well to produce from Second Starkey.	abandoned properly.
																	top tubing 5575. Cement 5464 - 5616. 549 to 900???	First Starkey production well.	
																	surface to 30		
	Texaco Gill 62-21	Armstrong Petroleum Corp.	Gas	P&A'd	1971	5900	First Starkey	694	4735	4.5	None	4364-72; 4378-82	Nortonville	2/71 - 4/92	1.5	2008	3995-4390; 635-1010;surface to 30	Drilled into eastside First Starkey reservoir 15 ft. above original	Yes. First Starkey was improperly abandoned. No cement below
																		gas/water contact and reservoir sand invaded by water.	base of production casing. Well will be re-entered and re-completed
																			as a First Starkey eastside reservoir observation well.

Table 3.2
Gill Ranch Storage Field
Existing and Abandoned Well List of Starkey and Deeper Penetrations

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Phillips Petroleum Co Edison securities B-1	Phillips Petroleum Co	Dryhole	P&A'd	1989	6500	Second Starkey	1012			None					Dryhole	5213-5889; 883-1164; surface to 5	Drilled into eastside First Starkey reservoir 20 ft.above original gas/water contact and found it invaded by water.	None. First Starkey properly abandoned. Top of Second Starkey low on structure and storage reservoir not penetrated by well.
																		Drilled into eastside Second Starkey sand off structure and below orignal gas water contact.	
	Vern Jones O&G Corp Gill Ranch 1-21	Vern Jones Oil and Gas Corp	Gas	P&A'd	1992	6400	Second Starkey	696	5968	4.5	None	5716-26; 5732-35	First Starkey	Flowed water		1992	Bridge plug 5680; 5229-5468, retainer 5094;	Drilled into eastside First Starkey reservoir 41 ft.above original	Yes. First Starkey behind casing and properly abandoned.
												5458-68; 5160-64	Moreno	6/92 - 6/96	1.59	1996	bridge plug 4414; 4156-4414; 744-1054; surface to 30	gas/water contact and found it invaded by water.	No cement from mid-First Starkey to TD. Second Starkey improperly abandoned.
																		Drilled into eastside Second Starkey reservoir 7 ft.above original gas/water contact and found it invaded by water.	Well will be re-entered and re-completed as an observation well in both First and Second Stareky storage reservoirs.
Section 22																			

Table 3.2
Gill Ranch Storage Field
Existing and Abandoned Well List of Starkey and Deeper Penetrations

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Shell Oil Co Edison Securities 25-22	DJ Pickrell	Gas	P&A'd	1944	5780	First Starkey	540	5780	5.5	None	5765--68	First Starkey	Flowed gas and		1977	First Starkey perfs squeezed, 5629-5780; 4330-4550	Drilled into eastside First Starkey reservoir 11 ft.above original gas/water contact.	None. First Starkey properly abandoned.
														water on test			390-590; surface to 30	On test flowed 1,800 mcfd and 430 bwpd.	
												4420-32; 4450-60; 4467-75; 4490-4500	Nortonville	1/46-12/67	3.36			Shallow production.	
	Montara Petroleum Co Edison #1	Montara Petroleum Co	Dryhole	P&A'd	1975	5850	First Starkey	696								1975	4250-4700; 622-746; surface to 29	Top First Starkey 62 ft. downdip from Eastside First Starky reservoir.	None. Top First Starkey low on structure.
Section 27																			
	Atlantic Oil Co. Gill Ranch #1	Atlantic Oil Co	Dryhole	P&A'd	1973	5950	First Starkey	650								1973	1370-1613; 588-712; surface to 30	Top First Starkey 36 ft. downdip from Eastside First Starky reservoir.	None. Top First Starkey low on structure.

Table 3.2
Gill Ranch Storage Field
Existing and Abandoned Well List of Starkey and Deeper Penetrations

Table 3.3

Gill Ranch Storage Field

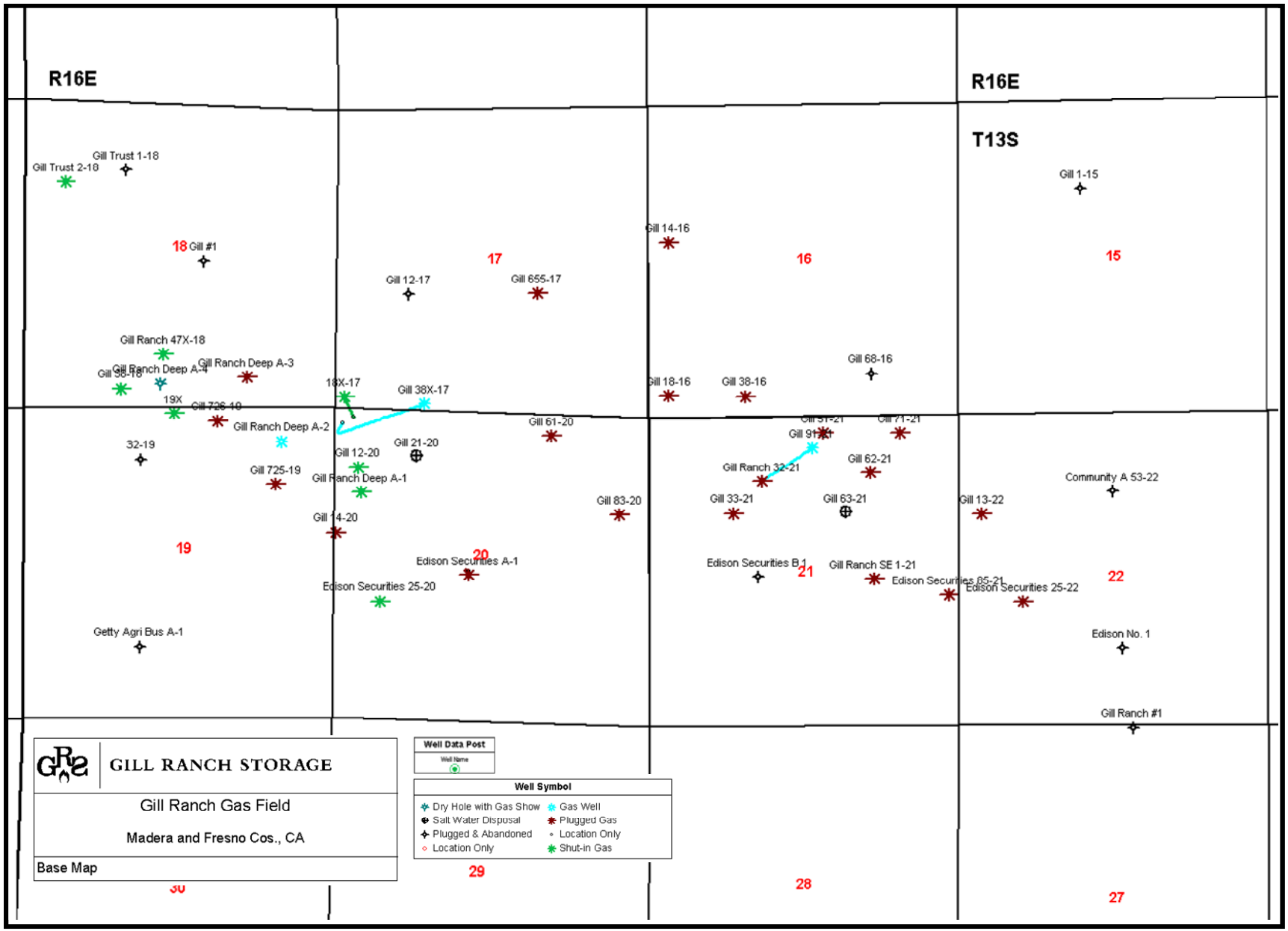
Existing Well List

Source of Information: California DOGGR Files

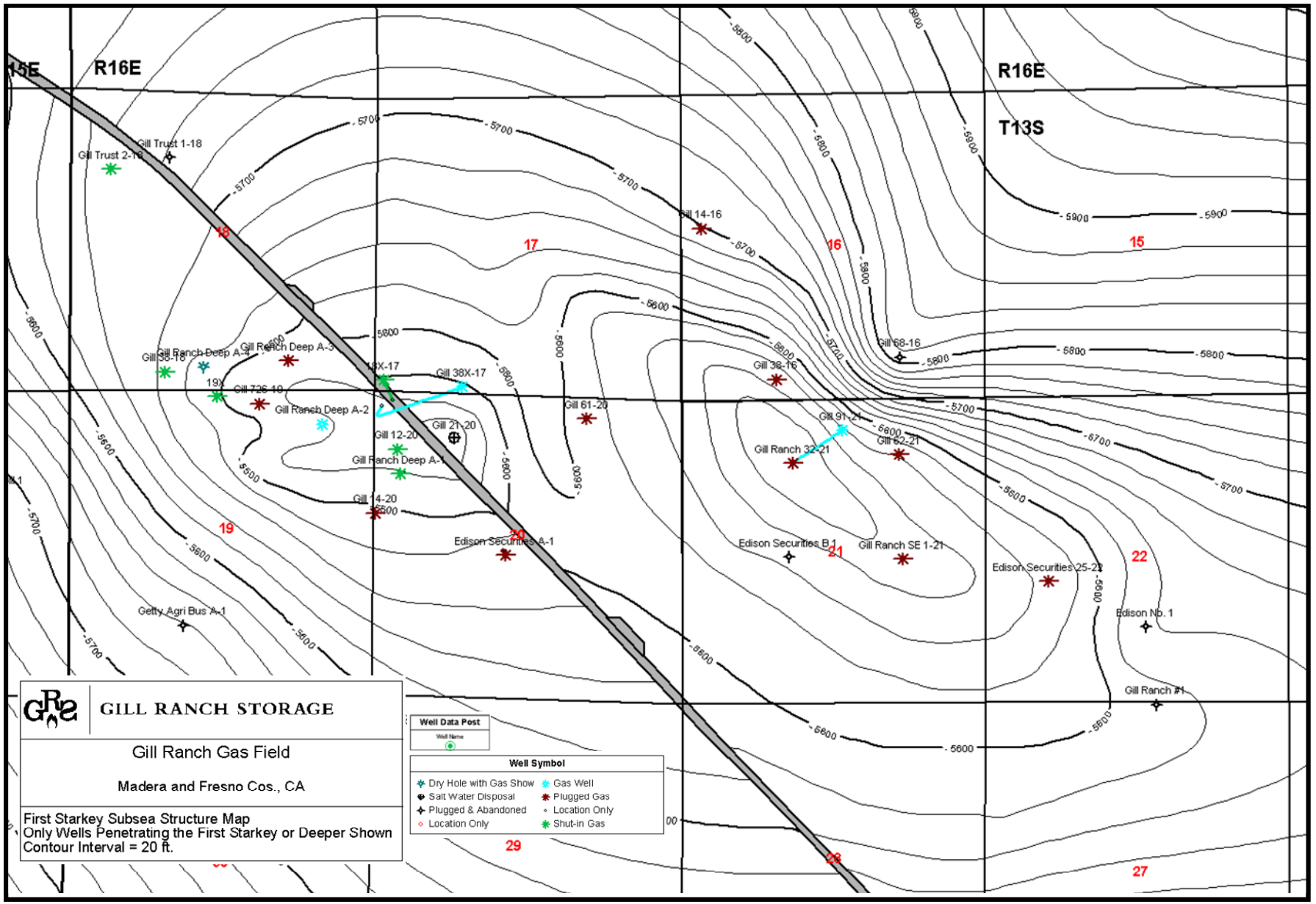
Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
Section 17																			
	Texaco Gill Ranch 18x-17	Armstrong Petroleum Co.	Gas	Active	1990	6516	Second Starkey	1496	6515	5.5	None	6207-20	Second Starkey	2/92 - 7/92	1.386	6/93	6101-6220, cement retainer 6178	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5564-70	Moreno	7&8/93	0.006	2/94	5525-5570, cement retainer 5550	None - shallow production	None - Moreno properly abandoned
												4455-64	Main	3/94 - 9/05	0.2298	Not abandoned		None - shallow production	None
Section 18																			
	McFarland Gill Trust 2-18	Armstrong Petroleum Co	Gas	Idle	1996	6350	Second Starkey	1305	5915	2.875	None	5639-43; 5620-25	Moreno	1/97 - 6/98	0.302	Not abandoned	Retainer 5680	None - Second Starkey off structure and wet	None
	Shell Oil Co 47x-18	DJ Pickrell	Gas	Idle	1967	5700	Moreno	629	4555	4.5	None	4345-49; 4351-54	Nortonville	2/67 - 8/81	2.271	Not abandoned		None - shallow production	None
	Shell Oil Co 38-18	DJ Pickrell	Gas	Idle	1943	5966	First Starkey	539	4410	5.5	Liner 4455-75	4389-4475	Green, Main	12/43 - 12/57	4.754	Green abandoned 1/58	4440-75	None - shallow production, did not penetrate Second Starkey	None
												4413-21; 4393-98	Main, Nortonville	2/58 - 8/75	0.57	Not Abandoned			
Section 19																			
	DJ Pickrell 19x	DJ Pickrell	Gas	Idle	1971	5900	First Starkey	690	4590	5.5	None	4398-4405	Nortonville	7/80 - 6/98	0.63	Not abandoned		None - shallow production, did not penetrate Second Starkey	None
	Phillips Gill Ranch Deep A-2	Armstrong Petroleum Corp.	Gas	Active	1989	6400	Second Starkey	1005	6400	5.5	None	6198-6212	Second Starkey	9/90 - 5/92	1.16	1994	6024-6215	Westside Second Starkey production well	None - Second Starkey properly abandoned
												4346-70	Nortonville	3/94 to present	0.208	Producing			
Section 20																			
	Texaco E&P Gill 38x-17	Armstrong Petroleum Corp.	Gas	Active	1997	9508	Basement	1525	6766	7	None	5587-92; 5596-98; 5612-14	Moreno	11/97 to present	0.32	Producing	9170-9370; 8400-8700; 6664-6864	Westside Second Starkey well. Cased and cemented through zone.	None
																		Second Starkey invaded by water.	
	Texaco Gill 12-20	Armstrong Petroleum Corp.	Gas	Idle	1990	5792	First Starkey	1415	5790	5.5	None	5661-71	First Starkey	3/91 - 6/96	1.845	6/96	Bridge plug 5640 cement on top.	None - Only First Starkey westside productive well.	None
												5550-56	Moreno	6/96 - present	0.6607	Not abandoned		Not drilled into Second Starkey.	
												5376-80	Moreno	3/97 - present	both Moreno zones	Last production 12/03			

Location by Section	Well Name	Operator	Well Type	Status	Year Drilled	Total Depth (Feet)	Deepest Formation Drilled	Surface Casing Depth (Feet)	Production Casing Depth (Feet)	Production Casing Size (Inches)	Other Casing Depth (Feet)	Completion Interval (Feet)	Formation	Production Date	Production Volume (Bcf)	Abandonment Date	Cemented Intervals (Feet)	Relationship to Storage Reservoirs	Mitigation Required
	Phillips Petroleum Co Gill Ranch Deep A-1	Armstrong Petroleum Corp.	Gas	Idle	1989	6502	Second Starkey	1017	5894	5	5564-6502	6202-12	Second Starkey	9/89 - 11/91	2.56	2/94	6066-6425; bridge plug 5564 2 sacks cement on top	Westside Second Starkey production well	None - Second Starkey properly abandoned
												5578-84	Moreno	3/94 - 1/97	1.954	1997			
												4346-52;4370-76; 4389-90; 4448-52	Nortonville	2/97 - present	0.032				
	The Texas Co Gill 21-20	Armstrong Petroleum Corp.	Gas - Converted	Active	1963	6000	First Starkey	815	5710	4.5	None	4460-66	Main	3/64 - 12/71	0.518	Water Injection	4398-72; 4390-98; 4156-4390	None - shallow production and water injection	None
			to Water Injection									5618-23	Moreno	3/64 - 12/71	co-mingled	Last water injection 3/06		Did not penetrate Second Starkey	
												3240-3350	Santa Margarita	6/94 to present	637,253 bbls water				
	Shell Oil Co Edison securities 25-20	DJ Pickrell	Gas	Idle	1945	4517	Domengine	505	4465	5.5	Liner 4433-80	4433-80	Main	7/45 - 12/92	1.325	Not abandoned		None - shallow production	None
											Liner 4415-17								
Section 21																			
	Armstrong Petroleum Corp Gill 91-21	Armstrong Petroleum Corp.	Gas	Active	2005	6470	SecondStarkey	796	6450	4.5	None	4420-30; 4434-42	Nortonville	2/06 to present	0.1062	Producing		Drilled First and Second Starkey reservoirs found them both	None. Both First and Second Starkey reservoir sands cemented
																		invaded by water	behind casing. Cement top calculated at 2500 ft.
	The Texas Co 63-21	Armstrong Petroleum Corp.	Gas - Converted	Idle	1953	4540	Domengine	598	4535	5.5	None	4350-63; 4370-82; 4390-4408; 4458-72	Main, Nortonville	11/53 - 12/67	3.38	Last water injection 12/98	Cement retainer 4145; 3468-4127	None - shallow production and water injection.	None
			to Water Injection									3250-3340		4/71 converted to	1.320,140 bbls water				

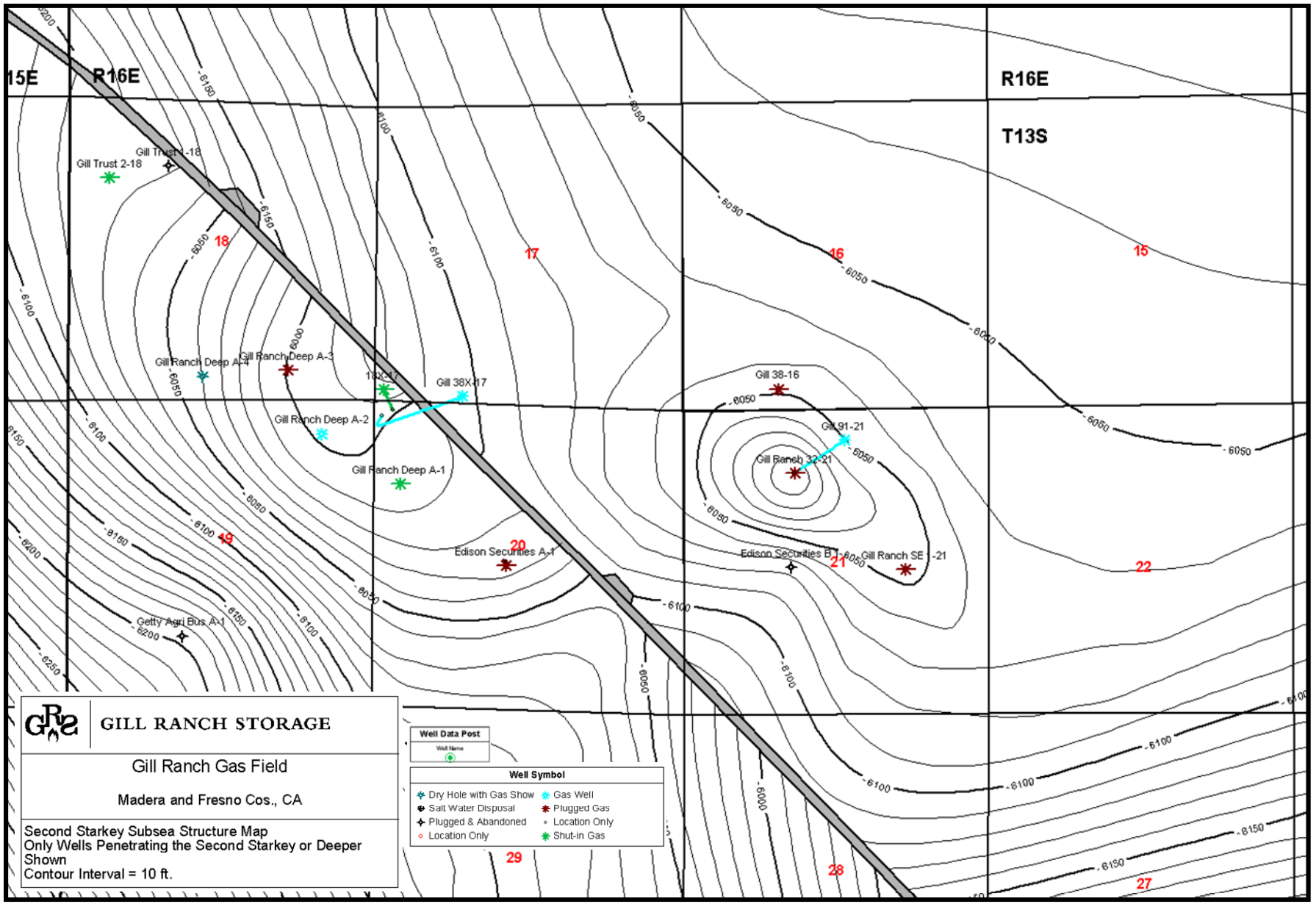
Table 3.3
Gill Ranch Storage Field
Existing Well List



Map A Gill Ranch Gas Field – Base Map



Map B Gill Ranch Gas Field – First Starkey Subsea Structure Map



Map C Gill Ranch Gas Field – Second Starkey Subsea Structure Map

IRANI ENGINEERING
PETROLEUM ENGINEER
2625 FAIR OAKS BOULEVARD, SUITE 10
SACRAMENTO, CALIFORNIA 95864
916-482-2847
FAX 916-482-7514

Gill Ranch Storage

Gill No. 61-20

Location: 5610' South and 1650' West from Northeast corner of Section 20, T 13S, R 16E, MDB&M, Madera Co., California.
Elevation: +180' ground, USGS. +189' KB.
Take all measurements from KB which is 9' above ground.
Keep hole full at all times.
Comply with Standing Orders attached.

Present Condition
TD 5809' PD Surface
Casing: 9-5/8", 36#, J-55, cemented at 595'.
5-1/2", 14#&15#, J-55 & H-40 cemented at 4537' (top of cement calculated around 2800').
Perfs & plugs: 4 JH at 50'. Cement plug from 50' to 6'.
cement plug from 860' to 745'.
4 JHPF 4319', 4335'-4345', 4353'-4363', 4370'-4380'. A 2-3/8" and 3" liner over the perfs from 4285'-4383'.
a cement plug was set above the liner from 4285' to 4044'.
4 JHPF 4435', 4450'-4480'. Below Bridge plug at 4419', squeezed with 100 sacks of cement.
Note: This is a straight hole. There is a restriction at 4369' (possible casing damage due to sand production)

Reentry and Abandonment Program
1. **Survey and find wellhead. Build location to accommodate the workover rig.**
2. **Weld 5-1/2" spool and 3000# casing head on top of the stub.**
3. **Move in a workover rig. Install BOE and test. Pick up 4 drill collars. Pick up 2-7/8", 6.5#, N-80 tubing. Drill out cement plugs with 4-3/4" cement muncher. Use fresh water for drilling. Drill out cement plugs from 6' to 50', 745'-860'. Clean hole to 4044'. Drill out cement plug to 4270'. Change hole to 70 pcf. saltwater treated with Polymer. Drill to top of liner at 4285'. POH.**
4. **Run wash pipe and wash over the lead seal adapter from 4285'-4291'. POH. Run spear, jars, 4 drill collars, tubing and engage inside 2-3/8", 4.6#, Buttress liner. Jar liner loose and pull out. Lay down liner. Pick up mill. Mill out bride plug at 4419' and cement. Clean hole to 4537'. Change hole to 72 pcf. mud. POH.**
5. **Pick up the following BHA: 4-3/4" washover shoe, 4-3/4" washpipe, Jars, 4 drill collars, tubing. RIH and clean any cement below shoe at 4537'. Clean 7-5/8" hole to 5809'. Drill to 5950'.**
6. **Pick up 1800' of 2-7/8", 6.4#, J-55, flushed joint liner and hang liner with bottom at 6000' and top at 4200'. Cement liner with Halliburton. Get off the liner and reverse excess cement.**
7. **Rig up coil tubing unit. RIH with MM and bit. Clean up cement if any from top of liner. Clean inside the liner to at least 5900'. Circulate hole clean. POH. Run CBL/NL from 4100' to PD.**
8. **Run tubing and set Baker Model R packer at 4050'. Swab well and perform liner lap test for DOG.**
9. **Convert well into G/W observation well at 1st Starkey.**

August 18, 2008

IRANI ENGINEERING
PETROLEUM ENGINEER
2625 FAIR OAKS BOULEVARD, SUITE 10
SACRAMENTO, CALIFORNIA 95864
916-482-2847
FAX 916-482-7514

Gill Ranch Storage

Gill Ranch S.E. No. 21-1

Location: 2500' North and 1435' West from Southeast corner of Section 21, T 13S, R 16E, MDB&M, Madera Co., California.

Elevation: +197' ground, USGS. +209' KB.

Take all measurements from KB which is 12′ above ground.

Keep hole full at all times.

Comply with Standing Orders attached.

Present Condition

TD 6400′ PD 4414′

Casing: 8-5/8″, 24#, J-55, cemented at 698′.
4-1/2″, 10.5#, J-55 cemented at 5968′, DV collar at 1392′.
Top of primary cement at 3500′, secondary cement at 1025′.

Plugs: Cement plug from surface to 30′.
Cement plug from 744′ to 1054′.
Cement plug from 4156′ to 4414′.
Bridge plug at 4414′.
Retainer at 5094′, not cemented.
Cement plug from 5229′ to 5468′.
Bridge plug at 5680′.

Perforations: 4 JHPF 4410′-4430′, 5160′-5164′, 5458′-5468′, 5716′-5726′, and 5732′-5735′.

Note: This is a straight hole.

Reentry Program

1. **Survey and find wellhead. Build location to accommodate the workover rig.**
2. **Weld 4-1/2″ spool and 3000# casing head on top of the stub.**
3. **Move in a workover rig. Install BOE and test. Pick up 4 drill collars. Pick up 2-3/8″, 4.7#, N-80 tubing. Drill out cement plugs with cement muncher. Use fresh water for drilling. Drill out freshwater cement plug from 744′-1054′. Clean hole to 4156′. Test casing to 1500 psig for 15 minutes. Notify Irani if the test fails. Change hole to 68 pcf. saltwater treated with Polymer. Drill to top of bridge plug at 4414′. POH.**
4. **Run mill and mill out bridge plug at 4414′, and retainer at 5094′. Mill out cement plug from 5229′to 5468′ and bridge plug at 5680′. Clean hole to top PDF collar. Mill out PDF collar, cement, and shoe at 5968′. Change hole to 72 pcf. mud. POH.**
5. **Pick up the following BHA: 3-3/4″ washover shoe, 3-3/4″ washpipe, Jars, 4 drill collars, tubing. RIH and clean any cement below shoe at 5968′. Clean 7-7/8″ hole to 6400′. POH.**
6. **Pick up 600′ of 2-7/8″, 6.4#, J-55, flushed joint liner and hang liner with bottom at 6400′ and top at 5800′. Cement liner with Halliburton. Get off the liner and reverse excess cement.**
7. **Rig up coil tubing unit. RIH with MM and bit. Clean up cement if any from top of liner. Clean inside the liner to at least 6330′. Circulate hole clean. POH. Run CBL/NL from 5600′ to PD.**
8. **Run tubing and set Baker Model R packer at 5770′. Swab well and perform liner lap test for DOG.**
9. **Reset Model R packer at 5650′. Test tubing and packer to 500 psig. Install X-mas tree and test to 3000 psig. Swab well in. If no entry shoot 4 JHPF 5730′-5738′.**
10. **Convert well into G/W observation well at 2nd Starkey and pressure/G/W observation well at 1st Starkey.**

August 20, 2008

IRANI ENGINEERING
PETROLEUM ENGINEER
2625 FAIR OAKS BOULEVARD, SUITE 10
SACRAMENTO, CALIFORNIA 95864
916-482-2847
FAX 916-482-7514

Gill Ranch Storage

Gill No. 62-21

Location: 6300' South and 1496' West from Northeast corner of Section 21, T 13S, R 16E, MDB&M, Madera Co., California.
Elevation: +188' ground, USGS. +12' KB.
Take all measurements from KB which is 12′ above ground.
Keep hole full at all times.
Comply with Standing Orders attached.

Present Condition
TD 5900′ PD 5′ below ground.
Casing: 8-5/8″, 24#, K-55, cemented at 694′.
4-1/2″, 11.6#, K-55 cemented at 4735′ (calculated cement to surface).
Plugs: Cement plug from 30′ to 5′.
Cement plug from 1010′ to 635′.
Cement plug from 4390′ to 3995′.
Perforations: 4 JHPF 1010′-1012′. Squeezed below cement plug from 1010′ to 684′.
4 JHPF 4328′-4329′, 4364′-4372′, 4378′-4382′. Below cement plug from 4390′ to 3995′.
Fish: 2-3/8″, 4.7#, J-55 is stuck in hole from 3995′ to 635′. The tubing is cemented from 1012′ to 635′.
Note: 4-1/2″ casing has collapsed between 288′ to 301′.

Reentry and Abandonment Program

1. **Survey and find wellhead. Build location to accommodate the workover rig.**
2. **Weld 4-1/2″ spool on top of stub. Weld 8-5/8″ casing head on top of 8-5/8″ stub. Move in workover rig. Pick up 2-3/8″, 4.7#, N-80, EUE, tubing. Run wash over pipe over 4-1/2″ casing and clean cement in the annulus to 288′+. POH and lay down wash pipe. Using handling sub, pull 85000# on 4-1/2″ casing and set slips in the 8-5/8″ casing. Run cement muncher and clean out cement plug from 5′ to 30′. RIH if can not go below 288′, POH, run tapered mill and dress up 4-1/2″ casing from 288′ to 301′. RIH and tag cement plug (top of fish) at 635′.**
3. **Install BOE and test. Run wash over pipe and clean cement from 635′ to 1012′+. Run grapple and recover fish. Lay down fish. Run cement muncher and drill out cement plug from 3995′ to 4300′ using freshwater. Change hole to 70 pcf. mud and drill out cement from 4300′ to 4390′. Clean hole to top of PD at 4614′. POH. Run mill and mill out float collar and shoe. Circulate and condition mud. POH.**
4. **Pick up the following BHA: 3-3/4″ washover shoe, 3-3/4″ washpipe, Jars, 4 drill collars, tubing. RIH and clean any cement below shoe at 4735′. Clean 7-7/8″ hole to TD at 5900′. Drill to 6000′. Use 70 pcf. mud. POH.**

Gill Ranch Storage

Gill No. 62-21

Reentry and Abandonment Program

Page 2

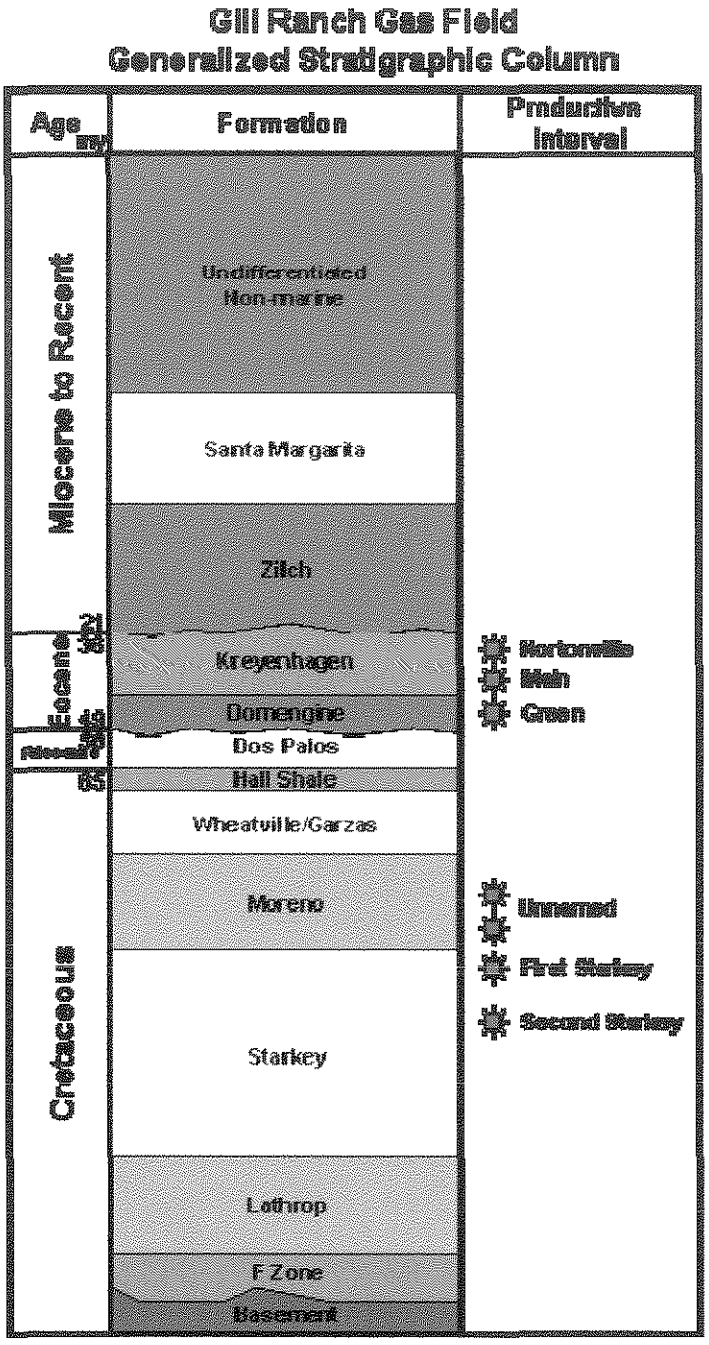
5. **Pick up 1800’ of 2-7/8”, 6.4#, J-55, flushed joint liner and hang liner with bottom at 6000’ and top at 4200’. Cement liner with Halliburton. Get off the liner and reverse excess cement.**
6. **Rig up coil tubing unit. RIH with MM and bit. Clean up cement if any from top of liner. Clean inside the liner to at least 5960’. Circulate hole clean. POH. Run CBL/NL from 4200’ to PD.**
7. **Run tubing and set Baker Model R packer at 4150’. Swab well and perform liner lap test for DOG.**
8. **Convert well into G/W observation well at 1st Starkey.**

August 18, 2008

SECTION 3: PROJECT DESCRIPTION

8. **Submit the completed geotechnical reports describing the analysis of potential gas migration pathways, such as faults, permeable contacts, abandoned wells, underground water pipelines, or other pipelines. (Deficiency.)**

Below is a generalized stratigraphic column for the Gill Ranch Gas Field. The age of the rocks range from the Upper Cretaceous (~80 my) to Recent. The Eocene/Cretaceous boundary is an unconformable boundary. There is an approximately 9 million year time span between the Paleocene Dos Palos Formation and the Eocene Domengine Formation. The Eocene/Miocene boundary is also an unconformable boundary. There is an approximately 15 million year time span between the Eocene and the beginning of the Miocene sediment deposition in the Gill Ranch Gas Field area. Non-deposition of sediments or erosion occurred during each time interval. The productive intervals are identified to the right of the column.



Depleted reservoirs in the First and Second Starkey sands of the Starkey Formation will be developed and utilized as Project storage reservoirs. The Starkey Formation in the Gill Ranch Gas Field area consists of three fluvio/deltaic sequences, First Starkey, Second Starkey, Third Starkey, each capped by shales and siltstones deposited when relative sea level rose and the ocean advanced landward. Each depositional sand sequence coarsens upward, suggesting a transition from deep water to shallow water near shore deposition. Gill Ranch Starkey production is found at the top of the First and Second Starkey deltaic sequences in sandstones

that are cleaner and have larger grain size. Consequently, the reservoir sands are highly porous (25% to 30%) and are very permeable. Permeability is estimated to be in the 100 md. to 500 md. range. Actual permeability measurements will be obtained through core analysis and well testing.

Late Cretaceous tectonic activity associated with the uplift of the ancestral Sierra Nevada created a northwest-southeast trend of anticlinal structures on the east side of the San Joaquin basin. The Gill Ranch Gas Field is situated on one of these. The Gill Ranch Gas Field anticline is gentle and slightly asymmetric as the easterly flank bedding dips are steeper than on the westerly flank. The anticline also gently plunges to the north and south. The doubly plunging anticline is the trapping mechanism for natural gas accumulation in the Cretaceous Formations and to some extent in the overlying Eocene Formations. In the west side of the Gill Ranch Gas Field, the west flank of the anticline is faulted. This fault is a normal fault and is down to the east. It cuts the Cretaceous Formations and disappears into the Eocene Formations. The throw ranges from 80 ft. to 110 ft. in the reservoir area. This fault forms the east boundary of the Second Starkey reservoir. Bedding dip forms the rest of the trap. The east side pools are unfaulted and are confined to the anticlinal closure which is larger in the First Starkey sand than in the Second Starkey sand.

The caprock for the Starkey reservoirs consists of claystones (shale) and siltstones deposited over the delta front of each deltaic sequence as the sea advanced landward. The fine grained (clay), platy, laminated composition of the shales makes them ideal sealing material to prevent gas migration. Detailed well correlation in the Gill Ranch Gas Field area indicate these shales are continuous across the entire Gas Field and formed the seal that prevented vertical and lateral migration of the original gas in the Starkey pools. The caprock is generally 75 ft. to 80 ft. thick over the First Starkey deltaic sequence and 60 ft. to 110 ft. thick over the Second Starkey deltaic sequence (thinner in the east than in the west). The fact that large volumes of gas were contained at normal pressure for the depth of the reservoirs demonstrates that the caprock is an effective seal. Threshold pressure measurements will be acquired from various sealing units (shales) within the caprock to obtain laboratory pressure values that can be utilized to assist Storage Field operating pressure decisions. There is a risk that basing operating decisions from data collected from a few locations in a large geographic area may not be applicable to the entire area. This risk is mitigated by testing numerous samples from each vertical section of the caprock cored and by detailed geologic analysis of the depositional environment and the distribution of the caprock. As stated above, the Starkey shales blanket the entire Gill Ranch Storage Field area and were deposited in a consistent manner. Consequently, the risk of the of the threshold pressure measurements not being representative of the entire caprock system is low.

The shales drape over the anticlinal structure that forms the eastside trap and provide the vertical and lateral seal to gas migration. In the west side, the throw on the fault that forms the trap for the west side Second Starkey is just the right amount to juxtapose shale against the Second Starkey sand and prevent lateral migration from that reservoir. Data from one bottom hole pressure measurement in the east side First Starkey reservoir shows a pressure gradient of 0.454 psi/ft, very close to hydrostatic gradient. This one data point indicates the reservoir is neither overpressured nor underpressured. The quality of the caprock will be confirmed through

core analysis, specifically through lithologic description, petrographic analyses and core analyses such as permeability measurements and threshold pressure measurements.

In the west side Second Starkey pool gas could potentially migrate vertically up the trapping fault. The likelihood of this happening is judged to be very low as it did not happen during primary Gill Ranch Gas Field production. The Second Starkey reservoir was fully pressured when discovered. Large volumes of gas were produced from reservoirs in the Domengine/Kreyenhagen Formations. These reservoirs were depleted and the reservoir pressure was substantially lowered, creating a greater than normal pressure gradient between the Domengine/Kreyenhagen reservoirs and the deeper Second Starkey reservoir. Pressure depletion of the Second Starkey reservoir did not occur. While geologic mapping suggests that the trapping fault extends up and into the overlying Domengine and Kreyenhagen productive sands, production history indicates the fault to be sealed.

The Applicants have identified 17 wells that have penetrated the potential Starkey storage reservoirs to depths above or near the original gas/water contact. Eleven other wells penetrated the Starkey sands off structure and do not pose a concern for gas migration. These wells penetrated the potential storage zones at depths below where the original gas accumulated. Storage operations will not inject gas into this portion of the Starkey sands, thus eliminating these wells as a risk for gas migration.

As a first step to assess the risk of gas migration during storage operations, GRS (on behalf of the Project) completed the public records search to identify all of the wells drilled into the potential Starkey reservoirs and any wells that that might be of concern to a gas storage project. Several wells were identified that penetrated the Starkey sands in the potential storage reservoir and that require remedial work ("workover"). If left in their current condition, they could possibly provide a conduit for storage gas to migrate from the storage reservoirs. The Gill No. 61-20, Gill Ranch S.E. No. 1-21, and Gill No. 62-21 will be re-entered, re-worked and completed as observation wells to enhance the monitoring of the First and Second Starkey formations. All of these wells are located in the eastern section of the potential storage area where both the First and Second Starkey sands are targeted for storage development. Plans and procedures to complete this work on these three wells have been developed and were provided in Attachment 3 to the September 18, 2008 PEA Supplement.

Following is a preliminary outline of the sections to be included in the Post Well Abandonment Gas Migration Contingency Plan.

- A map with the location of all of the Gill Ranch Gas Field wells drilled into the Starkey.
- Well profiles of all of the wells that meet the Significant Well criteria.
- Significant Wells are those wells that drilled into the Starkey sands and penetrated the reservoir in a position that lies within the gas zone or within 20 feet of the base of the original gas water contact.
- Methods for identifying the presence of gas in surrounding soils.

- Locate position of each Significant Well.
- Measure baseline gas levels using an accepted gas leakage survey method.
- Establish acceptable and reasonable safe gas open field limits based on baseline survey and industry standards. Also measure gas quality using chromatographic analysis, if possible.
- Complete the injection fill cycle all reservoirs.
- Visit Significant Wells and complete gas detection survey consistent with background survey.
- If background is within acceptable quantifiable levels, reassess at the next end of the next cycle fill.
- If background exceeds an acceptable value, intensify the survey to determine a likely source. This may require a different gas detection method or equipment.
- Collect a gas sample to determine the gas quality and presence of non-native gas constituents (if possible).
- If, based on compositional analysis, it is determined that the sample is not pipeline gas, no response is necessary and re-survey as described above.
- If it is determined that the sample is pipeline gas, investigate the potential sources which include:
  - Gas pipeline or gathering line
  - Produced water pipeline
  - Leaking conduit connected to storage reservoir
- Conduct further investigation to determine probable source. If the identified source is pipeline related, isolate the lines in the area of the gas anomaly and complete an investigation and appropriate repair
- If the identified source is a well, either abandoned or active, the well will be shut in, injections into the reservoir that it is serving will be suspended during well repair, and plans to repair the well will commence.

- Equipment, procedures and materials for cementing and recompleting an incompetent well will be developed on a case by case basis.

- Once repairs are made, the subject well site and other significant wells will be visited and complete gas detection survey consistent with background survey will occur.

Regarding the new pipelines in the Project area, the vast majority will be installed by the conventional trench and backfill technique using compacted native soil. This includes those pipelines to be installed along the access roads used for agricultural operations. The existing pipelines for production purposes (water and gas) are relatively small in diameter (2" through 8") and appear to have been constructed by the same techniques, using native backfill.

There are no hard surfaces over the existing gas pipelines within the Project area that could potentially trap or promote the migration of leaking gas to a receptor location. In the event of a gas leak, there is the slight potential for migration over short distances (10's of feet). For either the new or existing pipelines, the potential for migration over long distances is virtually non-existent because:

- The pipeline trench was backfilled with native material, essentially the same as the surrounding material,

- There are no hard surfaces to provide a "cap" under which gas could migrate, and

- The surface over the pipelines is non-uniform due to agricultural infrastructure (irrigation ditches, standpipes, etc.) and routinely disturbed by agricultural operations (ripping, tilling, grading, etc.)

The residences nearest to the pipeline are outside the Project area to the north and none of the existing or new pipelines will be in the area of these residences. There is no pipeline corridor that could migrate gas to the north to create a hazard. Within the Storage Field Boundary, there is only one occupied residence; it is located approximately 2 miles from the compressor station and the gas pipeline. There are no other habitable structures within the Storage Field Boundary. To the south, any gas following a pipeline ditch line would need to cross the San Joaquin River to reach a receptor. This is also highly unlikely because gas is lighter than air and the river crossings are all well below the level of the pipeline trenches on either side, creating a natural trap.

The geology of the Project site and surrounding areas do not present structures (e.g., faults, folds, and stratigraphic unconformities) or other features that would concentrate the release of gas to localized areas of the surface. Active faults are not present within the Project site. The bedrock faults do not apparently displace the recent alluvial sediments of the San Joaquin Valley; the faults are buried by alluvium. Therefore, the faults would not present a conduit for gas migration to the surface. Similarly, the alluvium overlies the other geologic structures. If gas were to migrate upward along the faults or other bedrock

structures, it would be released first to subsurface into the extensive deposits of Quaternary and Holocene sediments. Gas would be expected to diffuse through the sediments while migrating through the sediments.

10. Provide a complete history of the gas field, including production and well histories. (Deficiency.)

The Gill Ranch Gas Field was discovered in 1942 by The Texas Company in their Gill 38-16 well. This well was drilled to 9,154 ft (basement) and discovered gas in the Eocene Kreyenhagen (Main Sand) and Domengine (Green Sand) Formations and in the First Starkey sand of the Starkey Formation. Production commenced from the Main and Green in 1943. By 1950 there were 10 wells, all producing gas from the Main and Green sands. Field operators were The Texas Company and Shell Oil Company.

During the period from 1950 to 1960, The Texas Company drilled an additional three productive wells and Shell Oil Company drilled one. A new productive zone in the Kreyenhagen Formation (Nortonville sand) was discovered and several existing wells were re-completed in it. The Green sand within the Domengine Formation began producing water in several wells and that interval was abandoned in those wells. Production from the deeper First Starkey sand began in the Gill 38-16 in 1957 after the shallower Kreyenhagen and Domengine intervals were depleted and abandoned. This is the first production from the First Starkey reservoir that is to be converted to storage in the east side of the Gill Ranch Gas Field.

During the period from 1960 to 1970, The Texas Company drilled an additional four productive wells and Shell drilled two. The Texas Company discovered new gas production in a sand in the Cretaceous Moreno Formation in the west side of the Gas Field in two wells. The other wells were productive in the Main and Nortonville sands of the Kreyenhagen Formation.

During the period from 1970 to 1980, two productive wells were drilled. Both were completed in the Nortonville sand. DJ Pickrell succeeded Shell Oil Company as operator of Shell's lease.

During the period from 1980 to 1990, four productive wells were drilled. All four were drilled in late 1988 through mid-1989. Phillips Petroleum Company acquired ownership of some of The Texas Company (Texaco) interests in the Gill Ranch Gas Field and discovered production in the Second Starkey sand in the west side of the Field. This Second Starkey gas pool is the reservoir that is to be converted to storage in the west side of the Gill Ranch Gas Field.

During the period from 1990 to 2000, six productive wells were drilled in the Gill Ranch Gas Field. Texaco followed up Phillips' west side Second Starkey pool discovery with a development well. Production from the west side Second Starkey reservoir ceased in 1992 and the reservoir was abandoned. Texaco also discovered a small accumulation of gas in the First Starkey on the west side of the Gill Ranch Gas Field. It drilled a well in the First Starkey gas pool in the east side and discovered a new gas pool lower down in the Second Starkey sand, as well gas in the First Starkey. This Second Starkey gas pool is the reservoir that is to be converted to storage in the east side of the Gas Field. Second Starkey production from this well ceased in 1993 and was abandoned. The First Starkey zone was completed shortly after and

produced until 1997. It has also been abandoned. McFarland, a new operator in the Gas Field, discovered a new Moreno gas reservoir in the northwest corner of the Gas Field. Vern Jones, another new operator in the Gill Ranch Gas Field discovered a new Moreno gas reservoir above the east side First Starkey gas reservoir. They were attempting to drill a development well in the First Starkey reservoir and found the gas zone filled with water.

During the period from 2000 to 2008, one well was drilled in the Gill Ranch Gas Field. It was drilled by Armstrong Petroleum Corporation, successor to Texaco and Phillips. It was drilled into the eastside First and Second Starkey reservoirs. It was lower on structure than the well drilled by Texaco and found both Starkey sands filled with water. It established minor production in the Nortonville.

DOGGR online records indicate that currently there are four active wells in the Gill Ranch Gas Field. Three are producing minor amounts from the Eocene Nortonville and Main sands and one is idle in the Cretaceous Moreno sand. Seven wells are listed as idle wells. All are in the west side of the Gas Field awaiting abandonment or a re-completion effort. Three of these produced from the Moreno sand and four from the Main and Nortonville sands. No well is producing or idle in the First or Second Starkey reservoirs. All other Gas Field wells, with the exception of two that have been converted to water injection, have been plugged and abandoned and the surface reclaimed.

Since 1942, forty-four wells have been drilled within the Gill Ranch Storage Field area. Thirty-three of these were productive and eleven were drilled and abandoned. Twenty-nine of these wells were drilled as deep as the First or Second Starkey sands. Of these, eight were productive, including one well that produced from both First and Second Starkey sands. Six other wells were drilled into the First or Second Starkey pools post-production and found the reservoirs watered up.

Gill Ranch Gas Field well histories and wellbore diagrams for the Significant Wells will be provided under separate cover.

11. Include an in depth description of production zones, including depth, types of formations, and characteristics of the storage field. (Deficiency.)

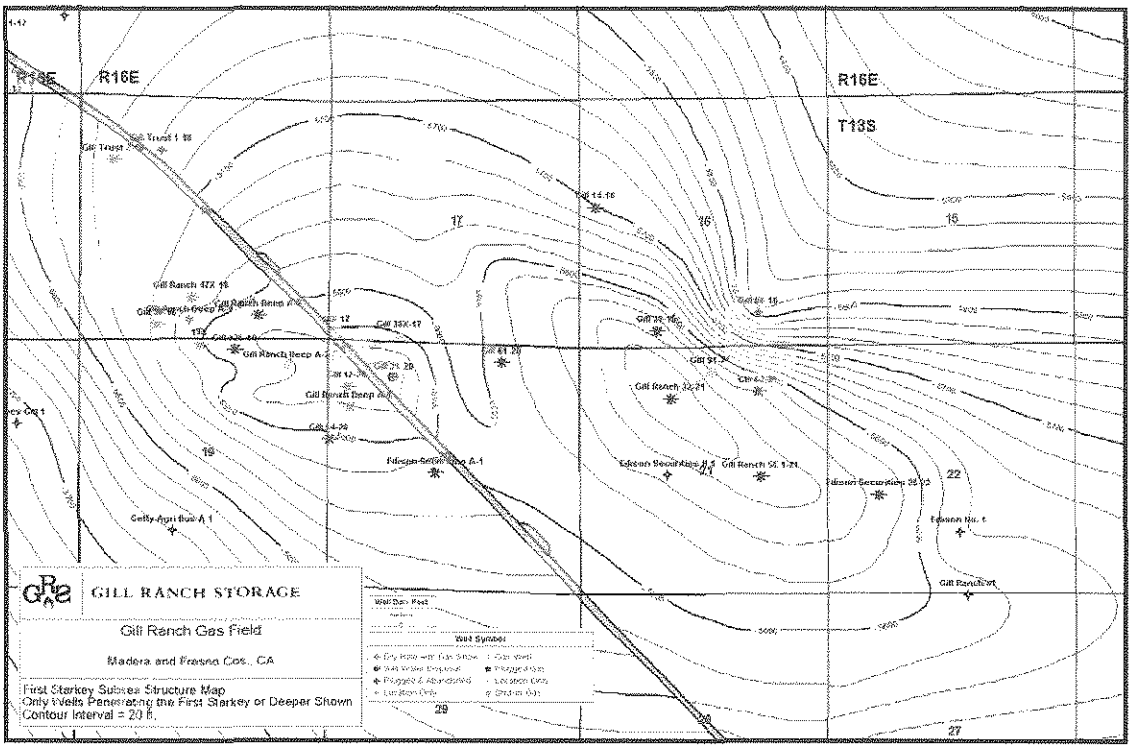
Commercial natural gas production in the Gill Ranch Gas Field has been found in six different reservoir sands in four different geologic formations. Total production from the Gas Field since discovery is 88.17 Bcf. The shallowest production has come from the Nortonville and Main sands within the Eocene Kreyenhagen Formation and the Domengine Formation, which lies directly below the Kreyenhagen Formation. These three sands have produced about 63% of the total production from the Gas Field. Production depth ranges from about 4,200 ft. to about 4,600 ft below ground surface. Unnamed sands in the lower part of the Cretaceous Moreno Formation have produced about 9% of the total Gas Field production. Productive sands within the Moreno have been found as high as 5,375 ft. below ground surface and as deep as 5,615 ft. below ground surface. The Starkey Formation lies below the Moreno Formation and two sands within it (First and Second Starkey) have produced about 28% of the total Gas Field production. The top of the First Starkey sand has been found as high as 5,660 ft. below ground

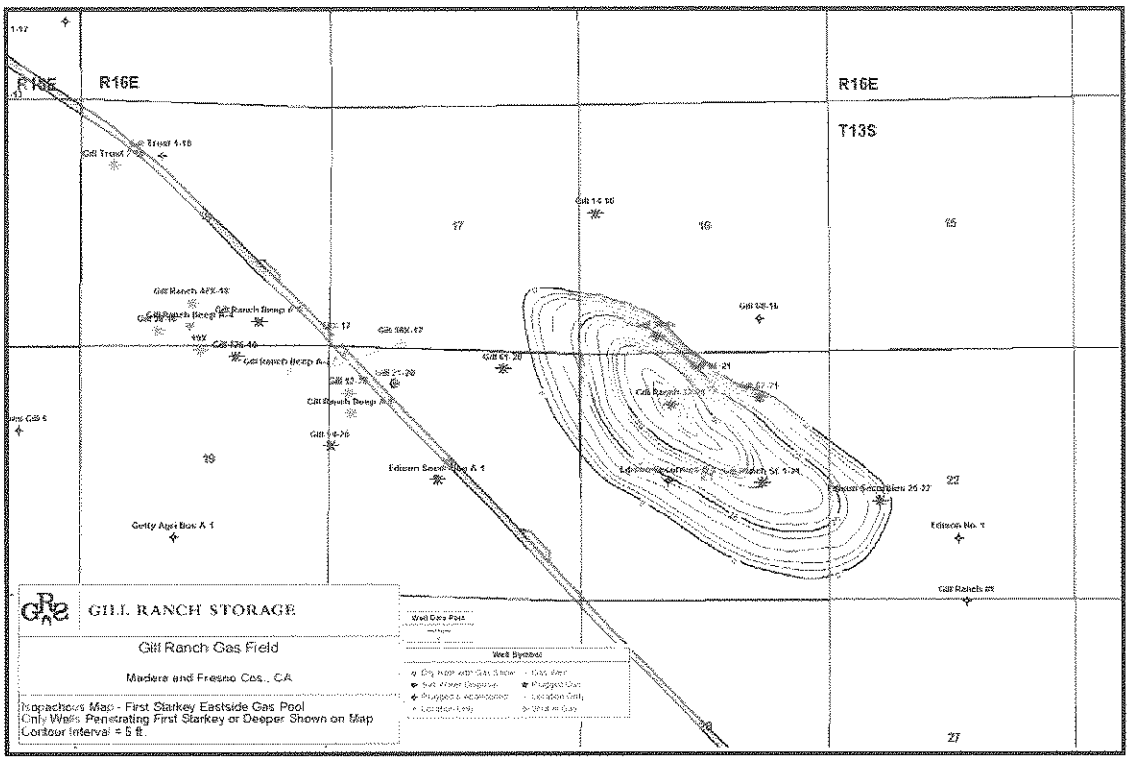
surface. The top of the Second Starkey sand has been found as high as 6,195 ft. below ground surface.

The Starkey Formation in the Gill Ranch Gas Field area consists of three fluvio/deltaic sequences, First Starkey, Second Starkey, Third Starkey, each capped by shales and siltstones deposited when relative sea level rose and the ocean advanced landward. Each depositional sand sequence coarsens upward, suggesting a transition from deep water to shallow water near shore deposition. Gill Ranch Gas Field Starkey production is found at the top of the First and Second Starkey deltaic sequences in sandstones that are cleaner and have larger grain size. Consequently, the reservoir sands are highly porous (25% to 30%) and are very permeable. Permeability is estimated to be in the 100 md. to 500 md. range. Actual permeability measurements will be obtained through core analysis and well testing.

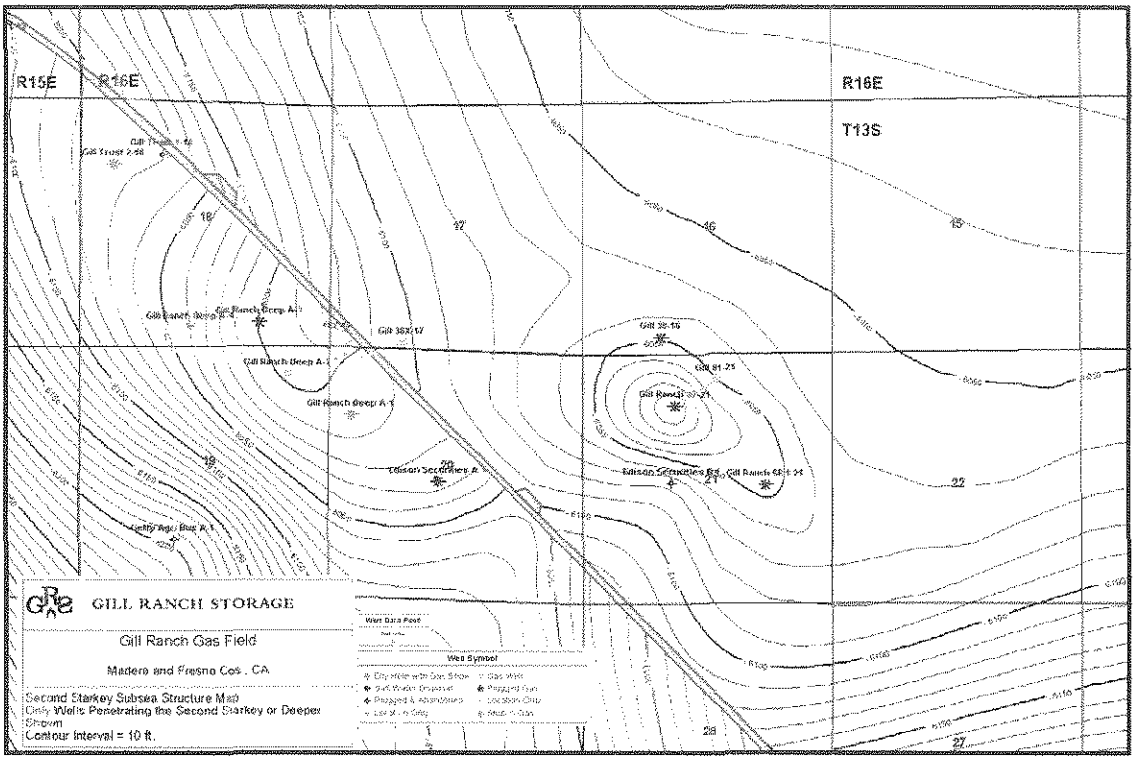
Late Cretaceous tectonic activity associated with the uplift of the ancestral Sierra Nevada created a northwest-southeast trend of anticlinal structures on the east side of the San Joaquin basin. The Gill Ranch Gas Field is situated on one of these. The Gill Ranch anticline is gentle and asymmetric as the easterly flank bedding dips are steeper than on the westerly flank. The anticline also gently plunges to the north and south. The doubly plunging anticline is the trapping mechanism for natural gas accumulation in the Cretaceous Formations and to some extent in the overlying Eocene Formations. In the west side of the Gill Ranch Gas Field, the west flank of the anticline is faulted. This fault is a normal fault and is down to the east. It cuts the Cretaceous Formations and disappears into the Eocene Formations. The throw ranges from 80 ft. to 110 ft. in the reservoir area. This fault forms the east boundary of the Second Starkey reservoir. Bedding dip forms the rest of the trap. The east side pools are unfaulted and are confined to the anticlinal closure which is larger in the First Starkey sand than in the Second Starkey sand.

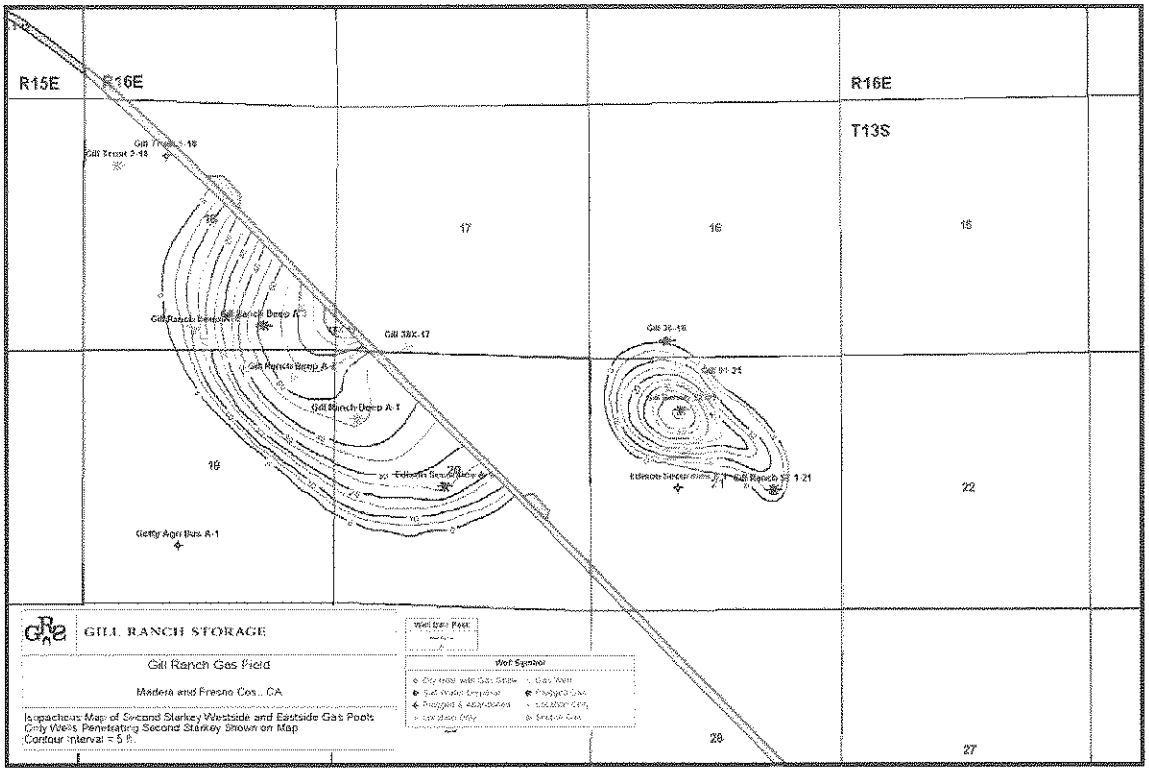
Three Starkey Formation reservoirs will be converted to storage. The largest reservoir is in the First Starkey sand and is located in the east side of the Gill Ranch Gas Field. It produced 12.9 Bcf and 1.36 MM bbls of water from 1957 to 1997 from two wells. The reservoir is located at the top of the northwest trending anticline that is found on the east side of the Gas Field as described above. The subsea top of the reservoir is currently mapped at -5,502 ft. below sea level. The original gas water contact was -5,575 ft. below sea level. Maximum original gas column is 72 ft. When Texaco drilled its development well (Texaco Gill 32-21) in 1990 it found that the gas water contact had risen to -5,552 ft. below sea level or 23 ft. The well produced from July of 1993 to May of 1997. Production ceased due to excessive water production. Four other wells were drilled into the First Starkey pool while it was producing. In each case the well was lower on structure and found that the gas water contact had risen to a depth above the top of the sand. In 2005 Armstrong Petroleum Corporation drilled through the First Starkey reservoir eight feet above the original gas water contact depth and found the sand filled with water. Based on these data it is concluded that the reservoir has filled with water. Please refer to the First Starkey subsea structure map and the gas pool isopach map, both provided below.


R15E
R16E
R16E
T13S
GILL RANCH STORAGE
Gill Ranch Gas Field
Madera and Fresno Cos., CA
First Starkey Subsea Structure Map
Only Wells Penetrating the First Starkey or Deeper Shown
Contour Interval = 20 ft.



The next largest reservoir is in the Second Starkey sand and is located in the west side of the Gill Ranch Gas Field. It produced 6.7 Bcf and 93,000 bbls of water from five wells from 1989 to 1996. The reservoir is located on the west side of the Gas Field and utilizes the northwest trending fault for pool closure as described above. The subsea top of the reservoir is currently mapped at -5984 ft. below sea level. The original gas water contact was at –6,052 ft. below sea level. Maximum original gas column is currently mapped at 70 ft. In 1997 Texaco drilled the Gill 38X-17 through the pool and found that the gas water contact was at least as high as the top of the Second Starkey sand in the well bore (-6003 ft. below sea level). Each well ceased producing when water production became excessive or the water flooded the perforations. Based on these data it is concluded that the reservoir has filled with water. Please refer to the Second Starkey subsea structure map and the gas pool isopach map, both provided below.


R15E
R16E
R16E
T13S
GILL RANCH STORAGE
Gill Ranch Gas Field
Madera and Fresno Cos., CA
Second Starkey Subsea Structure Map
Only Wells Penetrating the Second Starkey or Deeper Shown
Contour Interval = 10 ft.



The smallest reservoir is in the Second Starkey sand in the east side of the Gill Ranch Gas Field and lies directly below the First Starkey reservoir. It produced 2.7 Bcf and 18,300 bbls of water from one well from 1991 to 1993. The reservoir is located in the northwest trending anticline which is more gentle and localized at Second Starkey depth and consequently there is less closure. The subsea top as currently mapped is -6,001 ft. below sea level. The gas water contact is at -6,051 ft. below sea level. Maximum original gas column is currently mapped at 50 ft. It appears the discovery well, Texaco Gill 32-21, drilled into the reservoir very near the top. The well ceased producing when water production became excessive. Based on that data it is concluded that the reservoir has filled with water. Please refer to the Second Starkey subsea structure map and the gas pool isopach map, both of which immediately precede this paragraph.

12. Include additional information on the storage capacity of the gas reservoir and limiting factors, such as formations, faults, and injection and/or withdrawal criteria. (Deficiency.)

The caprock consists of shales and siltstones deposited over the delta front of each deltaic sequence as the sea advanced landward. Detailed well correlation in the Gill Ranch Gas Field area indicate these shales are continuous across the entire Gas Field and form the seal that prevented vertical and lateral migration of the gas in the Starkey pools. These shales are generally 75 ft. to 80 ft. thick over the First Starkey deltaic sequence and 60 ft. to 110 ft. thick over the Second Starkey deltaic sequence (thinner in the east than in the west). These shales drape over the anticlinal structure that forms the eastside trap and provide the vertical and lateral seal to gas migration. The throw on the fault that forms the trap for the west side Second Starkey is just the right amount to juxtapose claystone against the Second Starkey sand and prevent lateral migration from that reservoir. Data from one bottom hole pressure measurement in the east side First Starkey reservoir shows a pressure gradient of 0.454 psi/ft, very close to hydrostatic gradient. This one data point suggests the reservoir is neither overpressured nor underpressured. The quality of the caprock will be confirmed through core analysis, specifically through lithologic description, petrographic analyses and core analyses such as permeability measurement and threshold pressure measurement.

Maximum gas storage operating reservoir pressures were calculated based on experience and information from filings by other storage operators in California. Assuming a 0.6 psia/foot pressure gradient will be required to displace water for the first several years of operation yields a maximum reservoir pressure of 3750 psia at the average depth of the Second Starkey of 6240 feet (pressure gradient=pressure/depth). In the Wild Goose Storage Expansion Project EIR dated March 2002, it is stated that the initial injection pressures required will be 35 to 40 percent higher than original field pressures. Applying 40% to the 2665 psia original pressure for the Second Starkey West yields 3731 psia. This confirms that the 0.6 psia/foot based maximum reservoir pressure of 3750 psia is reasonable.

Measurement of the threshold pressure of the caprock is a standard tool used by storage field operators to ensure that the field operating pressure will not exceed the ability of the caprock to contain the gas. The following is a description of the testing procedure and the application of the data. Several samples from the cored interval will be analyzed to acquire data from individual caprock bedding units so a broader understanding of the caprock sealing qualities can be obtained and to ensure that safe operating pressure conclusions are not based a single data point. A cylindrical sample will be prepared from each interval to be tested where the nature of the core material will permit. The orientation of each sample will be such that the axial length of the sample is parallel to the wellbore in order to represent the assumed vertical migration of pressurized gas in the reservoir. Each sample will be kept saturated with a simulated formation brine throughout the preparation and testing sequence. The composition of the brine is based on actual water analyses conducted on produced water. Each sample will be subjected to a confining pressure to represent the overburden conditions in the reservoir. Upstream gas flow pressure will be increased in a step-wise fashion until movement of the interstitial water is observed in a downstream micropipette. The pressure at which this movement occurred is deemed to be the threshold pressure.

In the laboratory testing, the threshold pressure is the differential pressure measured between an upstream core injection pressure and a downstream pressure which is essentially atmospheric. Since no consideration is given to whatever pore fluid pressure exists in the actual field situation, true gas threshold pressure at which gas may be expected to break through in the field would be the measured "threshold" pressure plus the hydrostatic pressure exerted by the liquid in the pore system. For example, if the hydrostatic gradient is calculated to be 0.45 psi per foot and the threshold pressure measurement for a caprock sample at 5,000 ft. is 1,000 psi., the caprock at that depth would have 2,250 psi (5,000 ft. x 0.45 psi/ft) of pore fluid pressure exerted on it which would have to be exceeded by an additional 1,000 psi of pressure, or 3,250 psi of gas pressure in the reservoir, in order to have gas breakthrough the caprock. Data from a series of tests will be analyzed in a similar manner to aid in the determination of the maximum safe operating reservoir pressure.

The evaluation of the Gill Ranch Gas Field Starkey reservoirs for natural gas storage was based on the assumption that the First and Second Starkey sands produced volumetrically. The east Starkey reservoirs were produced from two wells and the west Starkey from six wells. The following table summarizes the gas and water produced by reservoir. In the table, mmcf is the abbreviation for millions of cubic feet and mbbls is thousands of barrels at 42 gal/bbl.

Table 1

	STARKEY PRODUCTION					
	East			West		
Reservoir	No. producers	Gas mmcf	Water mbbls	No. producers	Gas mmcf	Water mbbls
1st	2	12,913	1,358	1	2,506	831
2nd	1	2,729	18	5	6,968	93
Total		15,642	1,376		9,474	924

Historical production data for each well was obtained from the California Division of Oil and Gas public data base. This was used to create production plots for each of the four reservoirs, which are shown as Figures 1 through 4. First reported production was in 1957. Wells were single reservoir completions. Production was not commingled during primary production.

Figure 1
GILL RANCH - PRIMARY PRODUCTION
East 1st STARKEY

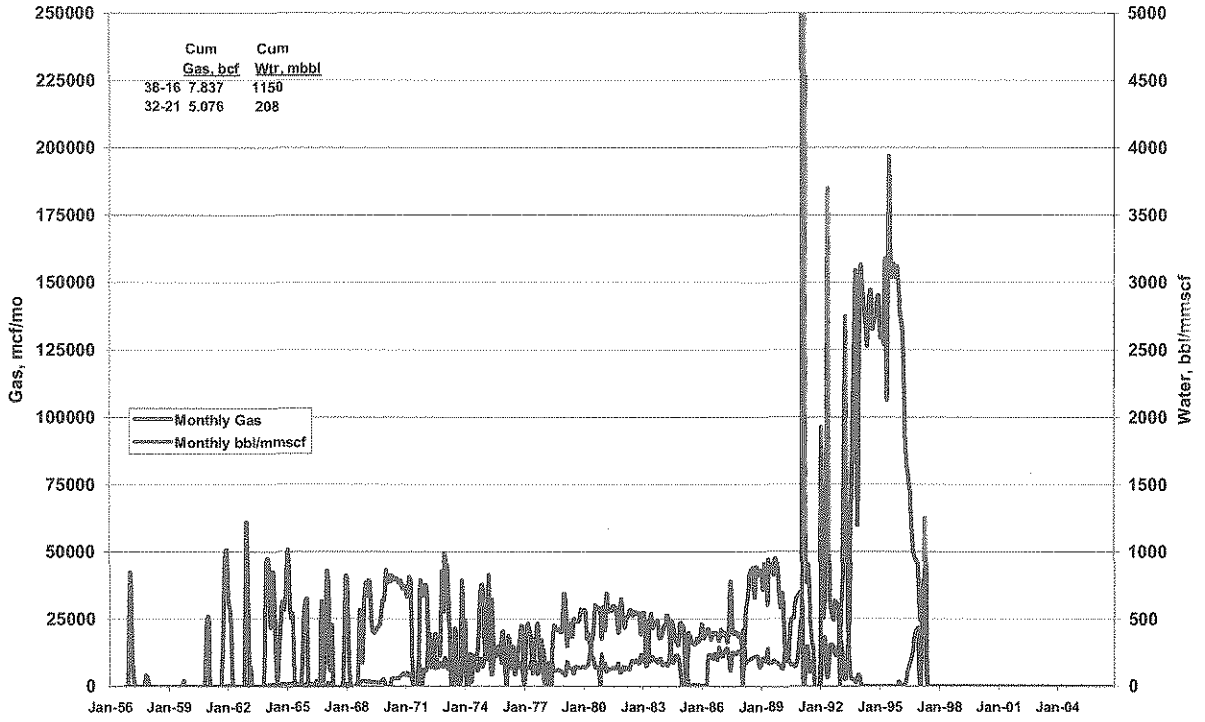


Figure 2
GILL RANCH - PRIMARY PRODUCTION
East 2nd STARKEY

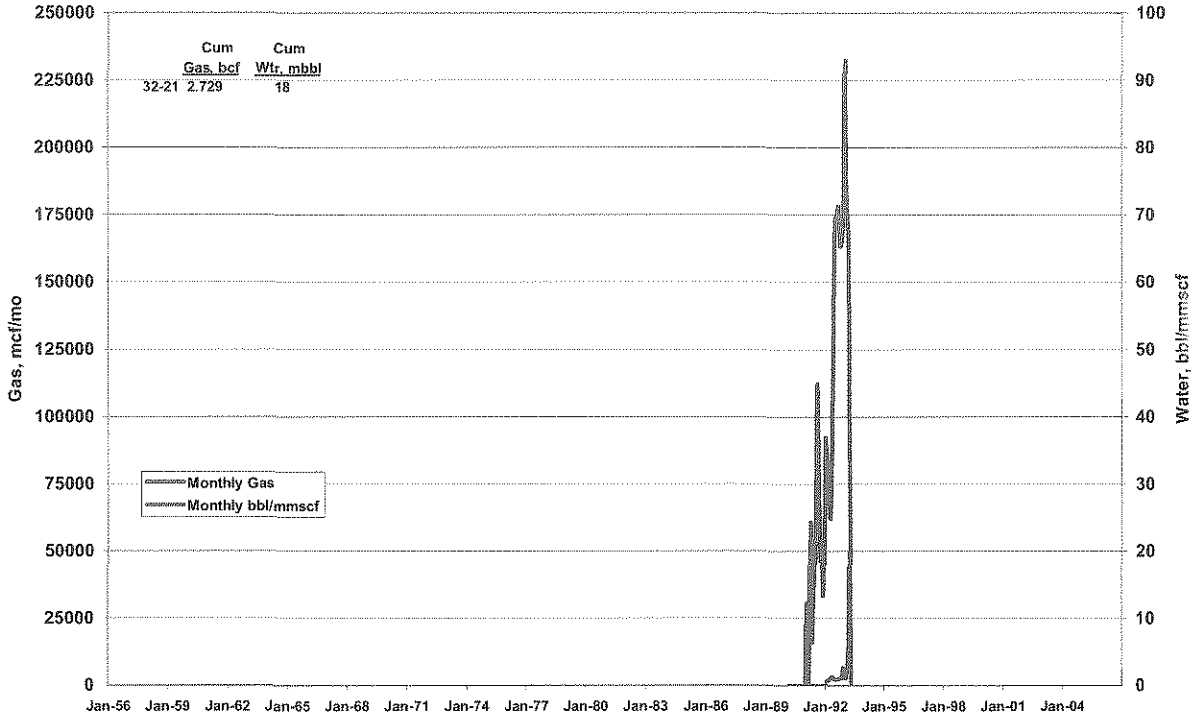


Figure 3
GILL RANCH - PRIMARY PRODUCTION
West 1st Starkey

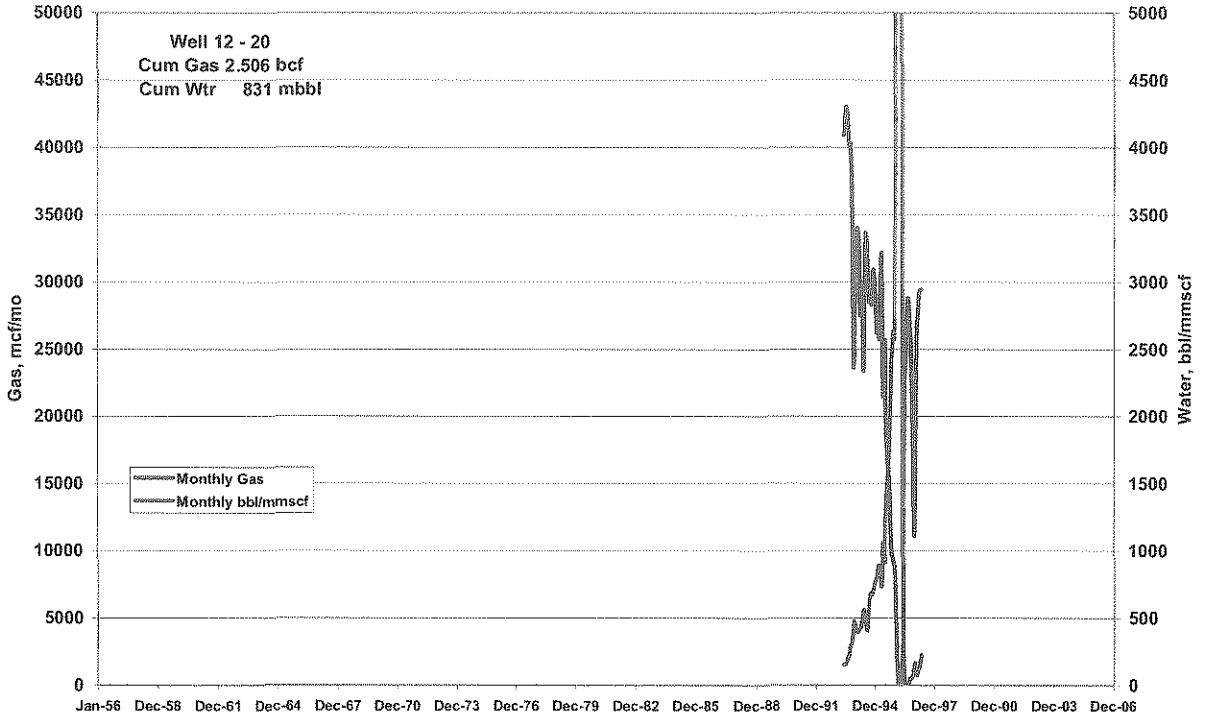
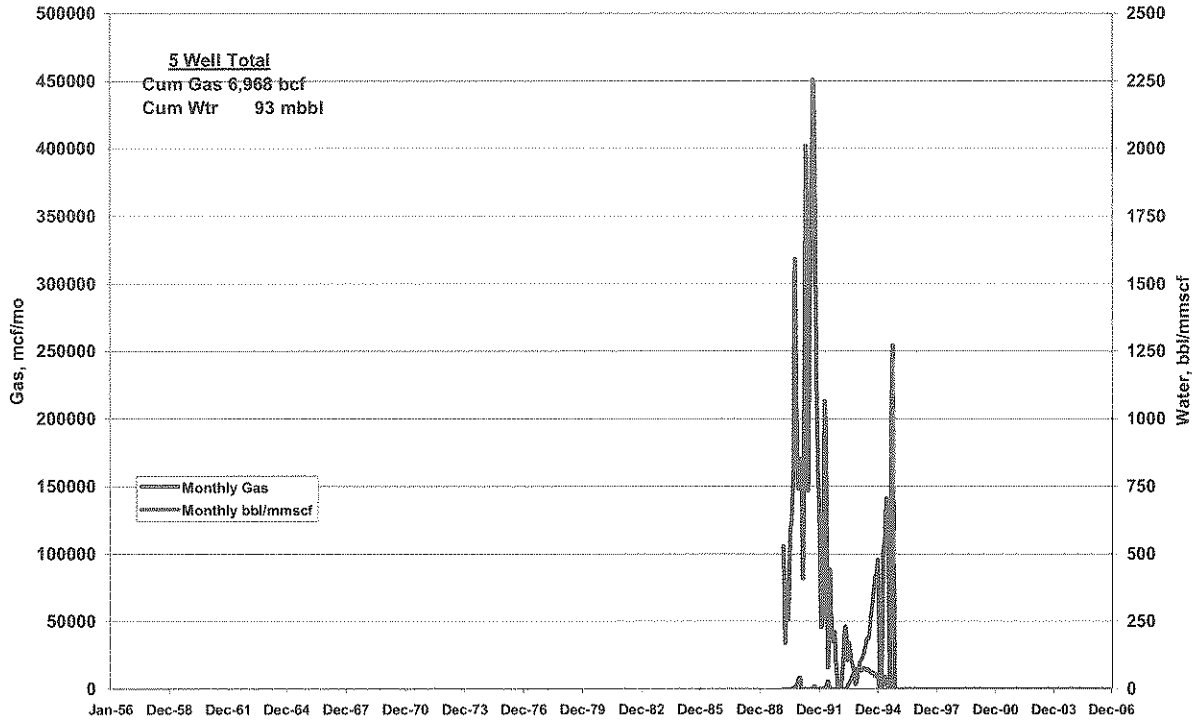


Figure 4
GILL RANCH - PRIMARY PRODUCTION
West 2nd Starkey



The second step in the analysis was to develop a P/z vs. Gp (pressure compensated for gas compressibility versus volume of gas produced) relationship for each reservoir using the California Division of Oil and Gas data, assuming volumetric depletion. Reservoir pressures at the end of production were not available from the public data base, so in this analysis, it was estimated the First Starkey was depleted to a reservoir pressure of 200 psi and the Second Starkey to a pressure of 250 psi. The resulting relationships are shown as Figures 5 through 8. The illustrations show the estimated original gas-in-place for the reservoir depicted (the intersection at a P/z = 0).

The methodology used to determine the estimated working gas, base (cushion) gas, and injected base gas from the illustrations is as follows. The estimated working gas is the volume of gas produced between the maximum reservoir pressure (initial reservoir pressure in these illustrations) and the minimum reservoir pressure (pressure at base gas). The base gas is the difference in gas volume produced down to the minimum reservoir pressure and a zero reservoir pressure (P/z=0). Injected base gas is the difference between the gas volume produced to the minimum operating reservoir pressure and the gas volume produced at the assumed abandonment pressure under primary production. These gas volumes (working gas, base gas and injected base gas) are shown for each reservoir on the plots (Figures 5 through 8).

Figure 5
Gill Ranch - Primary Production
1st Starkey East

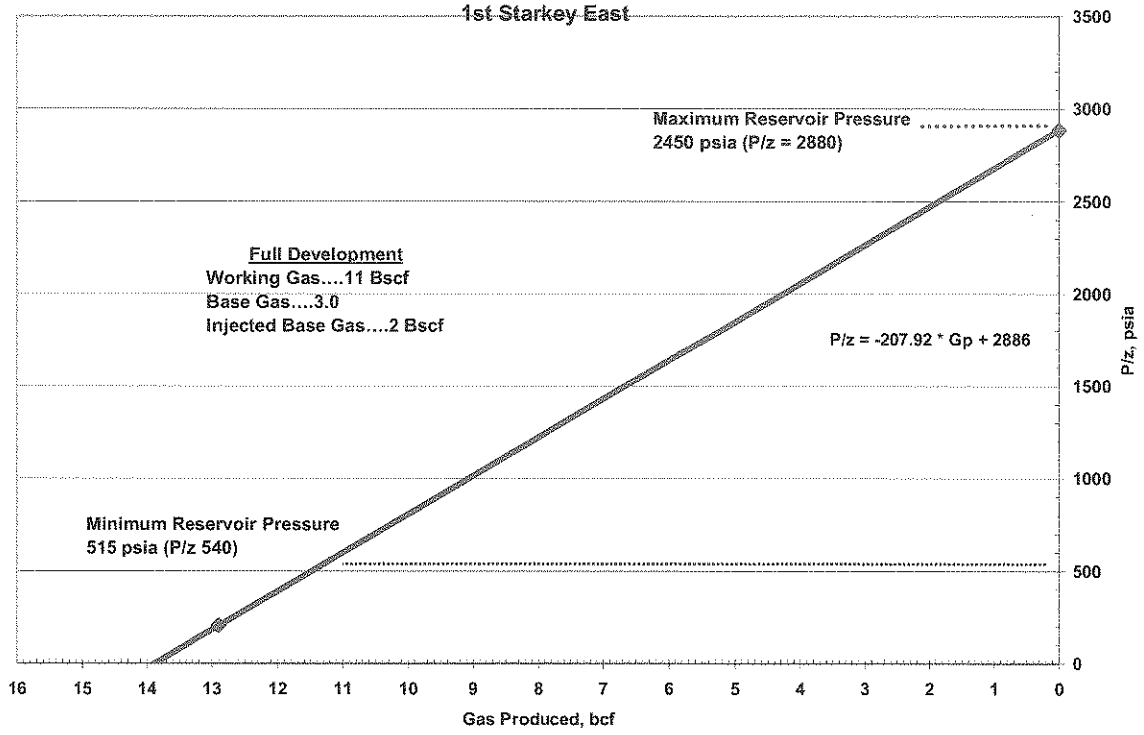


Figure 6
Gill Ranch Primary Production
2nd Starkey East

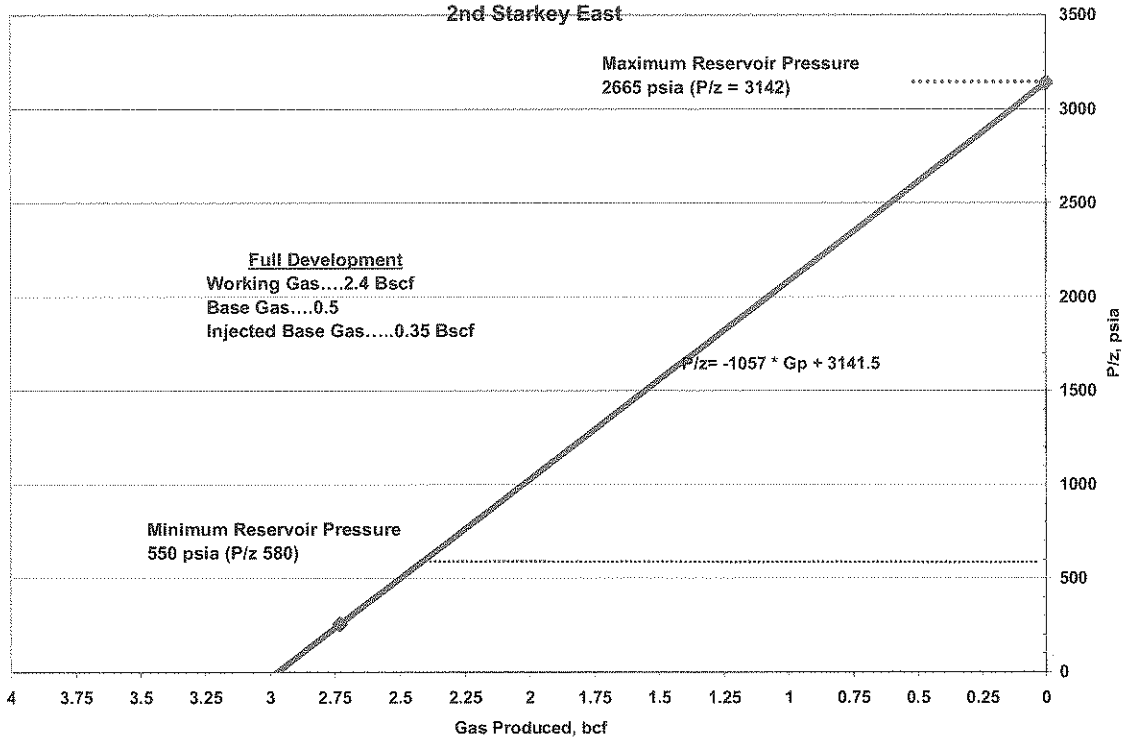


Figure 7
Gill Ranch
1st Starkey West

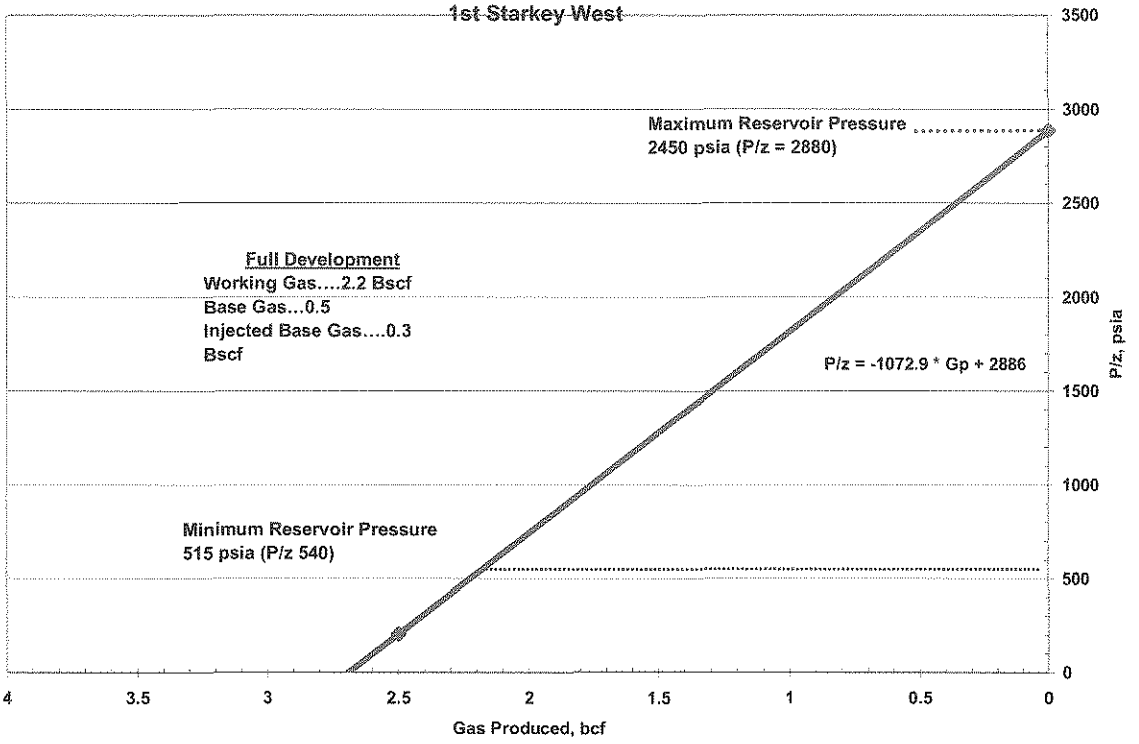
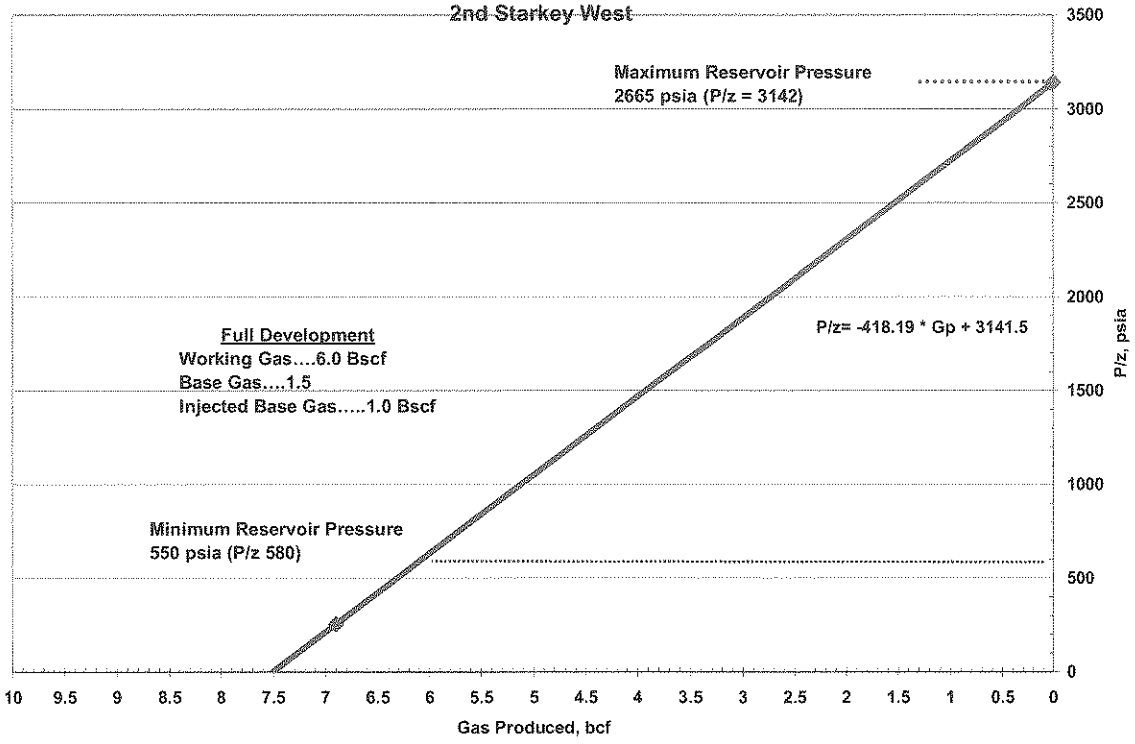


Figure 8
Gill Ranch
2nd Starkey West



Geologic mapping of each Starkey pool to be developed for Project storage operations indicates that each was originally filled to its spill point, i.e., the location where excess gas migrates from the reservoir to another trapping structure or dissipates within various porous and permeable water filled sandstones that it comes into contact with. For the eastside reservoirs, this point is the elevation on the anticline as measured by the gas water contact in each of the discovery wells. Geologic mapping controlled by well and seismic data will indicate one or more locations where this depth is reached. An observation well(s) can then be placed in the right location to monitor for gas migration. Ideally, the observation well will be a few feet (vertically) within the reservoir so the gas/water contact movement can be monitored and storage operations controlled to prevent the migration of gas from the reservoir.

For the west side reservoir, similar conditions exist on the flanks of the pool. There is an additional potential spill point at the point of contact on the trapping fault where the reservoir sand meets the top of the downthrown sand. This is sand to sand contact and should the gas water contact reach this point gas will migrate across the fault. Observation wells strategically placed in the potential spill point areas and careful monitoring of the gas water contact will prevent gas migration from the pool.

Several of the design features of the Gill Ranch Storage Field will assist GRS (as operator) in preventing gas migration to a reservoir spill point. These range from physical aspects of the operation to professional engineering oversight.

First, observation wells will be sited near potential reservoir spill points. Should gas or unexplainable changes in water pressure be detected at one of these wells, injection, if occurring, would cease and withdrawal operations would begin. The working gas volume stored in the reservoir would likely be reduced in subsequent years to prevent migration of gas past the potential spill point.

Second, the nature of storage operations is such that the field only experiences maximum pressure for a small part of each year. This means that the average pressure in the reservoir over time is much less than the maximum. Pressure management is used to maintain the gas filled pore space.

Third, locating horizontal wells near the top of the structure will place the injection point away from the gas-water contact, lessening the chance of pushing the contact to a spill point. Also, the horizontal wells will have a wide injection front with lower pressure differential along the completion interval of the wellbore that will result in a lower risk of gas-water contact movement toward a spill point (as compared to a vertical well at the same injection flow rate and a much more limited entry point into the formation).

Fourth, initial injection rates during development of the reservoir will be lower than those expected to be used when the reservoir is fully developed. Lower injection rates will reduce the risk of gas fingering in sand layers with higher permeability as water is pushed back to reclaim pore space in the rock formation for gas storage.

Fifth, oversight of the operations by a reservoir engineer will more effectively manage the development and continuing operation of the reservoir to prevent gas migration. GRS, as operator, will have an extensive data system for Storage Field operations staff to monitor all parameters of the operation and to store the data. Review of pressure and volume data and its incorporation into inventory verification studies will assess the growth of the gas bubble and highlight whether operating parameters need to be changed to prevent leakage from the reservoir. Limits on both injection and withdrawal flow rates based on well flow tests will manage gas movement within the limits of the reservoir. The key to preventing migration is not only having an extensive infrastructure to acquire data, but also providing for the analysis and interpretation of that data by a reservoir engineer to ensure that the Storage Field is developed and operated in a prudent and safe manner.

13. Include a discussion of cushion gas requirements and whether it would be injected into the reservoir. (Deficiency.)

See the response to item 12 above for a discussion of how the Project's cushion (base) gas requirements were calculated. These calculations assumed a volumetric reservoir. However, 928,000 barrels of water were produced during primary production from the First and Second Starkey wells at the Gill Ranch Gas Field. Large volumes of water were produced in the final months from wells that were located at or near the top of the structures, which is typical of a

water drive reservoir. This also indicates that water has invaded the space originally occupied by native gas. Thus, it is expected that the cushion gas will come from injected pipeline gas.

14. Include, as an appendix, the simulation studies used to predict the reservoir pressure response under gas injection and withdrawal operations. (Deficiency.)

The analysis of available production volume and pressure data (see response to item 12 above) was used to project how the Storage Field would respond under Project storage operations. The illustrations included in the response to item 12 show the reservoir pressure response used to estimate Project storage operating volumes.

16. Include a discussion describing methods for treating produced water or any other associated products. (Deficiency.)

Produced water from the Project storage reservoirs will be the same type of water that was produced during primary production. Gas and water are the two streams that will be produced from Project storage operations. The water will be collected at the well sites and piped directly to holding tanks located near the salt water disposal well. The water will not be treated; it will be injected into the Santa Margarita formation, the same zone that the production operator uses to dispose of produced water from the primary production wells.

17. Include a discussion of the potential locations for the disposal/storage of excess water produced by the wells and storage facilities of the project. Identify potential locations for the disposal and/or storage of the excess waters and a potential location for the second salt water disposal well. (Deficiency.)

An updated site plan is provided in Attachment 1, Drawing 12361-130B-100 (revision P8). The updated site plan reflects minor design changes to the compressor station equipment layout, including changes to the onsite storage tank locations. Based on the current design, two (2) 750 barrel welded tanks with secondary containment will be located in the southeast corner of the compressor facility, near the truck turnaround, for the purpose of providing surge volume for the produced water (salt water) disposal system. When water is being produced, it will flow through this surge volume directly to the disposal pump and will then be immediately injected into the on-site water disposal well. Offsite disposal of fluids may become necessary if the volume of water exceeds the anticipated capacity of the disposal well, and if a second disposal well is not available at that time. Truck load out hardware will be included with the produced water tanks to facilitate transport off site by licensed contractor should this be necessary. Fluids will be disposed of at a certified facility. The "oily water" will be stored in a 500 BBL welded tank with secondary containment located in the same area of the plant.

The containment will consist of a concrete wall designed in accordance with API Recommended Practice (RP) P12R1. The containment area will hold 110% of the largest tank or vessel volume, and the containment structure will be impervious in order to contain spilled oil until it can be

cleaned up. The ground enclosed by the containment will be sloped so as to drain any water away from tanks, and it will be kept cleared of any accumulations of oil, basic sediment, and water. A pipe drain, if used, will be provided at the lowest point to permit draining accumulations of storm water. This pipe drain will have a locked-closed valve outside the drainage area to ensure proper containment and control of fluids other than storm water.

The primary location for the water disposal well will be within the boundary of the compressor facility. If a second disposal well is required, it will be located on the most northerly injection/withdrawal well pad in the east side of the Gill Ranch Gas Field. Both wells will inject into a sand body within the Miocene deltaic Santa Margarita Formation. The Santa Margarita Formation contains four mappable delta sequences in the Gill Ranch Gas Field area. The injection zone is in the third delta sequence. It is approximately 3,200 ft. to 3,400 ft. below the ground surface. Numerous laterally extensive claystone beds between the injection zone and the base of the fresh water (~1,000 ft. below ground surface) prevent vertical migration of the injected water. In addition to the claystone beds there are overlying salt water filled sandstones that would accept vertically migrating water. This zone is the same zone that has been used by the Gill Ranch Gas Field operators. All wells (existing and abandoned) within 2,000 ft. of the disposal wells have casing cemented to isolate the surface fresh water zone from the underlying salt water. There are currently two permitted water injection wells and both are idle.

20. Include a description of the production injection cycles (i.e., 24-hour, weekly, and seasonal). (Data Need.)

The Project is designed to provide up to a four-turn storage service. This means that the surface facilities and wells have been designed to cycle the entire working gas volume of the Gill Ranch Storage Field four times in one year. At design flow rate, a complete injection cycle will require 49 days and a complete withdrawal cycle can be accomplished in 36.5 days. The maximum withdrawal flow rate is 650 mmcfd (plus or minus 10% on an hourly basis). This rate steps down as the reservoir pressure declines. The maximum injection flow rate is 475 mmcfd, which decreases as the reservoir pressure increases. However, the actual injection and withdrawal cycles will be based on market demands.

27. Specify well depths in the project description (well depths are listed in Appendix A, and are all preliminary). State a range if the exact depths are not known. (Deficiency.)

The Applicants estimate that well depths will be as follows:

Salt Water injection well: 3400 ft

Second Starkey IW wells: 6350 ft to 6400 ft
First Starkey IW wells: 5900 ft

OM First Starkey east: 6000 ft

OM Second Starkey west: 6500 ft

The above well depths are based on preliminary drilling plans. Depths will vary depending on actual drilling data.

Gill Ranch Storage Field

Significant Starkey Formation Well List

Location by Section	Well Name	Status	Total Depth (Feet)	Deepest Formation Drilled	Completion Interval (Feet)	Formation	Abandonment Date	Witnessed by DOGGR	Cemented Intervals (Feet)	Date Last Tested	Results of Test
Section 16											
	The Texas Co Gill 38-16	P&A'd	9154	Basement	4415-25; 4445-65; 4470-80 5745-60	Green, Main First Starkey	7/56 1994	Yes	Permanent packer @ 5690 with 2 in. tubing. Tubing plug 4088-5000	12/1/1994	DOGGR witnessed and approved surface plug
Section 17											
	Texaco Gill Ranch 18x-17	Active	6516	Second Starkey	6207-20	Second Starkey	6/93	Yes	6101-6220, cement retainer 6178	7/7/1993	DOGGR witnessed testing of retainer @ 6178'
					5564-70	Moreno	2/94	No	5525-5570, cement retainer 5550	3/5/1994	Tagged top of plug @ 5425'
					4455-64	Main	shut in	No	4449, Bridge plug w/ 1.5 sx cement	6/26-27/1996	Install and test casing and plug
Section 18											
	Phillips Petroleum Co Gill Ranch Deep A-3	P&A'd	8800	Basement	6201-15	Second Starkey	2002	Yes	6210-20; 5960-6120; 820-950; surface to 30 6180-81 WSO	10/25/2002	DOGGR witnessed top of cement plug @ 820'
	Phillips Petroleum Co Gill Ranch Deep A-4	P&A'd	6419	Second Starkey	6226-30	Second Starkey	1994	Yes	6012-6272; 4032-4300; 533-1190; surface to 40	1/10/1994	DOGGR witnessed surface cement plug and steel plate
Section 19											
	DJ Pickrell 19x	Idle	5900	First Starkey	4398-4405	Nortonville	shut in	N/A		3/24/1971	DOGGR witnessed WSO @ 4299'
	Texaco Gill 726-19	P&A'd	5800	First Starkey	4334-38	Nortonville	1993	Yes	3954-4272; 647-750; surface to 60	7/26/1994	DOGGR witnessed top job.
					5570-74	Moreno	1993	Yes			
	Phillips Gill Ranch Deep A-2	Active	6400	Second Starkey	6198-6212	Second Starkey	1994	Yes	6024-6215	1/24/1994	DOGGR witnessed tagging and testing of plug @ 6024'
					4346-70	Nortonville	Prod.				
Section 20											
	Texaco E&P Gill 38x-17	Active	9508	Basement	5587-92; 5596-98; 5612-14	Moreno	Prod.	Yes	9170-9370; 8400-8700; 6664-6864	8/11-12/1997	DOGGR witnessed BOP testing. Rig performed leak off test.
	Phillips Petroleum Co Gill Ranch Deep A-1	Idle	6502	Second Starkey	6202-12	Second Starkey	2/94	Yes	6066-6425; bridge plug 5564; 2 sacks cement on top		DOGGR witnessed testing of plug @ 6066'
					5578-84	Moreno	1997			3/19/1997	Set bridge plug @ 5550' & dumped 2 sx on plug
					4346-52;4370-76; 4389-90; 4448-52	Nortonville					
	The Texas Co Gill 61-20	P&A'd	5809	First Starkey	4435; 4450-60; 4470-80	Green, Main	Green abandoned 11/52		4467 bridge plug 5 ft. cement on top; 4044-4285		
					4370-80; 4335-45	Main, Nortonville	1994	Yes	745-860; surface to 50	11/18/1994	DOGGR witnessed testing of plugs
	Phillips Petroleum Co Edison securities A-1	P&A'd	8800	Basement	6238-44	Second Starkey	5/91	Yes	EZSV @ 7650; 7650 - 7500; 6165-75, bridge plug 6175; 5147-6162	5/9/1991	Tag and test plug @ 6165'
					5526-29	Moreno	1994	Yes	4385-4500; 580-800; surface to 40	1/10/1994	DOGGR witnessed testing of surface plug and welding of steel plate

Gill Ranch Storage Field

Significant Starkey Formation Well List

Location by Section	Well Name	Status	Total Depth (Feet)	Deepest Formation Drilled	Completion Interval (Feet)	Formation	Abandonment Date	Witnessed by DOGGR	Cemented Intervals (Feet)	Date Last Tested	Results of Test
Section 21											
	Armstrong Petroleum Corp Gill 91-21	Active	6470	Second Starkey	4420-30; 4434-42	Nortonville	Prod.	N/A			
	Texaco Gill 32-21	P&A'd	6501	Second Starkey	6198-6212	Second Starkey	7/93	Yes	Cement retainer 6169, 25 cu. ft. cement below and 22 cu. ft. above, calculated top 5992.		
					5702-12; 5690-5704	First Starkey	2005	Yes	Tubing packer 5616 top tubing 5575. Cement 5464 - 5616. 549 to 900 surface to 30	5/6/2005	DOGGR witnessed testing of plug @ 549'
	Texaco Gill 62-21	P&A'd	5900	First Starkey	4364-72; 4378-82	Nortonville	2008	Yes	3995-4390; 635-1010; surface to 30	3/10/2008	DOGGR witnessed testing of plug @ 3995' & placement of plug @ 684'
	Phillips Petroleum Co Edison securities B-1	P&A'd	6500	Second Starkey			Dry	Yes	5213-5889; 883-1164; surface to 5	12/18-19/1990	DOGGR witnessed testing plug @ 5213 @ surface plug
	Vern Jones O&G Corp Gill Ranch 1-21	P&A'd	6400	Second Starkey	5716-26; 5732-35	First Starkey	1992	Yes	Bridge plug 5680; 5229-5468; retainer 5094; bridge plug 4414; 4156-4414; 744-		
					5458-68; 5160-64	Moreno	1996	Yes	1054; surface to 30	9/30-10/1-/1996	DOGGR witnessed testing of plug @ 4156' and 744'
Section 22											
	Shell Oil Co Edison Securities 25-22	P&A'd	5780	First Starkey	5765--68	First Starkey	1946	No	First Starkey perfs squeezed, 5629-5780		
					4420-32; 4450-60; 4467-75; 4490-4500	Nortonville	1977	No	4330-4550; 390-590; surface to 30	7/13/1977	Placed cement from 4550 to 4330 and placed drilling mud from 4330 to surface. Completed abandonment.

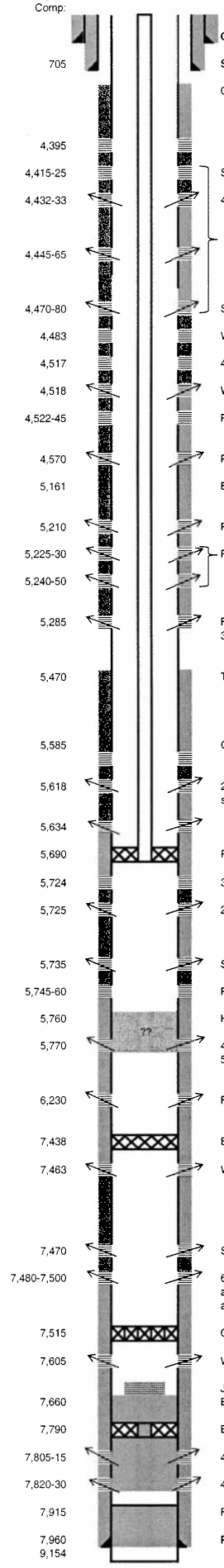
Gill Ranch Storage: Gill Ranch No. 38-16

API No.
Gill Ranch Storage
Madera Co., California
4,950' South & 1,650' East Sec 16 T13S R16E MDB&M

WI/NRI:
Spud: 2-Dec-42
Comp:

KB: 10'
DF:
GL: 185'

Directional Data: Straight hole



Conductor Pipe: All perforated intervals shot 4 shots/foot

705 **Surface Casing:** 11 3/4" 54 LB/FT J-55 at 705; cemented to surface

Calculated top of cement at 3080'.

4,395

4,415-25 Sqz'd & reperf'd 7-4 to 7-7-52.

4,432-33 4 x 1/2" holes shot 7.4.52. Sqz'd 7.4.52. Reperf'd 4 x 3/8" holes 7.5.52.

4,445-65 Tested 11,000 MCFPD dry gas, 825 PSI FTP, 1,725 PSI CP, 43/64" tubing bean.
Sqz'd with 7 sx 7.2.52, 18 sx circulated through 4,415'-25' perf's.

4,470-80 Squeeze date not in record.

4,483 WSO: 4 x 1/2" holes shot 3/30/43. Test recovered sand, no fluid

4,517 4 x 1/2" holes shot 3/24/43.

4,518 WSO, perf date unknown, tested saltwater & sand 3/23/43. Sqz'd w/100 sx 3/23/43.

4,522-45 Perf'd 3/25/43. Swab tested "no gas or oil"

4,570 Perf'd with 4 x 1/2" holes 3/22/43, sqz'd with 16 sx 3/23/43.

5,161 Bridge Plug

5,210 Perf'd 4 x 1/2" holes 3/21/43. Sqz'd while commingled with other perf's 3/22/43.

5,225-30 Perf'd w/45 total shots 3/22/43. No test recorded. Sqz'd (with 5,210' perf's) with 50 sx.

5,240-50

5,285 Four holes shot 2/15/42. Sqz'd with 500 sx at 117 LB/CF 2/18/43. Resqueezed with 30 sx 3/12/47.

5,470 Top of primary cement from Schlumberger temperature survey run 2/15/43

5,585 Cement top

Note: Well records prior to 1988 appear to be incomplete.
Operations below 5,760' should be performed with caution.
Obstacles not shown on this wellbore diagram may exist.
Perforations and cement above 5,760' if important should be confirmed prior to operations.

5,618 2 holes shot 3/4/47. Tested wet with a small amount of gas with a "bad odor". Sqz'd with 50 sx 3/11/43.

5,634

5,690 Permenant packer set on 2 3/8" tubing 2.12.88.

5,724 3 X 1/2" holes shot 3/19/43. Tested 1,700 PSI on 22/64" bean with "lots of sand".

5,725 2 holes shot 3/4/47. Tested wet. Sqz'd with 30 sx 3/5/43.

5,735 Sqz'd & resqueezed with a total of ~176 sx 3/14 & 15/47

5,745-60 Reperf'd 5,745'-55' 4 SPF 2.12.88.

5,760 Hole cleared of cement and plugs to 5,760' 9-25-56.

5,770 4 perf's shot & sqz'd with 15 sx 3/11/43. Cement entered casing through perfs at 5,725; & 5,634'.

6,230 Four holes shot 2/16/43. Sqz'd with 200 sx at 117 LB/CF 2/17/43.

7,438 Bridge plug

7,463 WSO: 2 x 1/2" holes shot 2/25/43. 2 shots added 3/6/43. Sqz'd with 30 sx 3/7/43.

7,470 Squeezed with 30 sx 3/2/47

7,480-7,500 60 x 1/2" holes shot 3/3/43. Tested wet. Sqz'd w/20 sx, sqz cement entry through 7,463 and/or 7,470 perfs. Reperf'd 7,480-90 w/20 shots 3/10/47. Tested a "small amount of gas" and recovered salt water in test pipe.

7,515 Cement retainer set 3/8/43.

7,605 WSO: 2 x 1/2" holes shot 2/25/43. Sqz's w/25 sx 2/27/43

7,660 Junk cement retainer pushed to bottom 3/8/47
Estimated cement top after 3/2/43 squeeze.

7,790 Baker cement retainer set 3/2/43.

7,805-15 40 x 1/2" holes shot 3/1/43.

7,820-30 40 x 1/2" holes shot 3/1/43.

Tested water & sand. Sqz'd with 30 sx 3/2/43.

7,915 Float Collar? Drilled cement from 6,230' & 5,285' sqz to 7,915 2/25/43

7,960 **Production Casing:** 7" 26 & 28 LB/FT J-55 & N-80 cemented at 7960'.

9,154

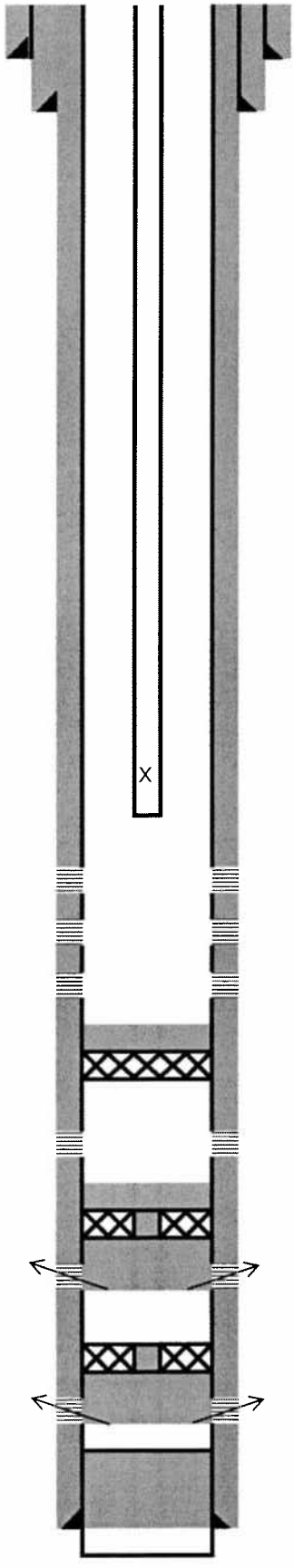
Gill Ranch Storage: Gill Ranch No. 18X-17

API No.
Gill Ranch Storage
Madera Co., California
180' South & 335' East Sec 20 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 13'
DF:
GL: 175'

Straight hole



Conductor Pipe:

1,496 **Surface Casing:** 8 5/8" 24 LB/FT J-44

Cement Top at surace

4,411 **Tubing:** 2 3/8" 4.7 LB/FT N-80 with X nipple above bottom joint

4,351-55

4,369-73

4,391-96

4,440 Cement top
4,449 Bridge Plug

4,455-64

5,425 Cement top
5,550 Cement Retainer

5,564-70

6,178 **Cement Retainer**

6,207-20

Float Collar

6,515 **Production Casing:** 5 1/2" 17 LB/FT N-80 at 6515'
6,516 TD

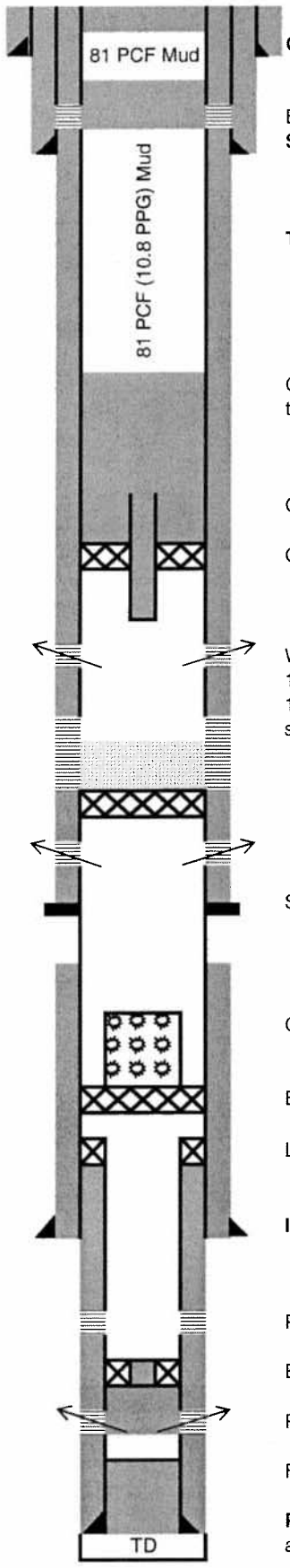
Gill Ranch Storage: Gill Ranch Deep No. A-3

API No. 0403920051
Gill Ranch Storage
Madera Co., California
500' North & 1,500' West Sec 18 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 24'
DF:
GL: 171'

Straight hole



30' surface plug set 10.25.02.

60 **Conductor Pipe:** 13 3/8"

950 Base of fresh water plug: 97 sx "G" set 10.24.02.

1,010 **Surface Casing:** 9 5/8" 36 LB/FT K-55 BT&C. Cement to surface.

Tubing: 2 3/8" 4.7 LB/FT J-55

5,960 Cement plug: 56 sx "G" with 2% KCl set 10.24.02. 1.5 BBL cement bullheaded into the top of the packer.

On/off tool at unspecified depth

6,141 Guiberson Uni Packer VI set 6.17.89.

6,180-81 WSO holes shot 4 SPF 6.11.89. Established circulation between WSO holes and sqz'd with 10.25 BBL 15.8 PPG cement. Resqueezed with 10.5 BBL cement at 15.8 PPG. Perf'd 6,201'-15' 6 SPF with 26 gram charges 6.17.89. Petal basket set at 6,220' 6.22.92 & filled with lead shot to 6,209.6' 6.23.92.

6,201-15

6,210

6,220

6,240-41

6,474 Stage Collar: Cemented with 250 sx at 12.5 PPG & 150 sx at 15.9 PPG. Cement to surface.

Confirmed TCP released 6.18.89, no top of junk in records.

7,700 Bridge plug set 6/11/89

7,792 Lindsey Liner Hanger

8,100 **Intermediate Casing:** 7" 26 LB/FT K-55 cemented to surface at 8100'.

8,186-91 Perf'd with TCP guns 6.10.89

8,250 EZSV cement retainer set 6/8/89.

8,264-98 Perf'd with TCP guns 6.6.89. Sqz'd with 10 BBL 15.8 PPG cement 6.9.89.

8,753 Float Collar

8,799 **Production Liner:** 5" 15 & 18 LB/FT N-80 & K-55 cemented in 6 /18" hole with 120 sx

8,800 TD at 15.9 PPG.

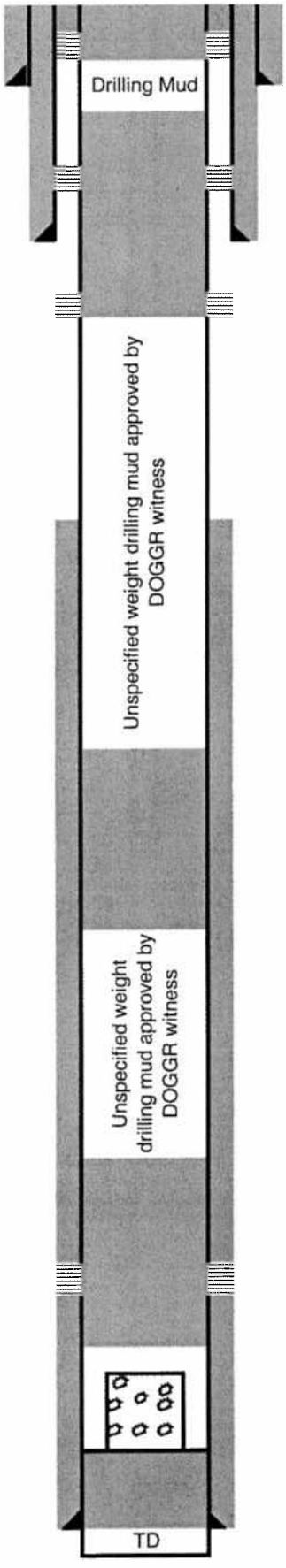
Gill Ranch Storage: Gill Ranch Deep No. A-4

API No. 04-039-20054
Gill Ranch Storage
Madera Co., California
400' North & 2,340' East Sec 18 T13S R16E MDB&M

WI/NRI:
Spud: 16-Nov-89
Comp:

KB: 24'
DF:
GL: 168'

Straight hole



40 — Circ holes shot and cementd with 20 FT^3 1-10-94.
Conductor Pipe:

533 — Cement plug. 78 FT^3 neat "G" set 1.5.94. Tag witnessed by DOGGR.

745-750 — Circ holes shot. Could not break down. Not sqz'd

1,030 — **Surface Casing:** 9 5/8" 36 LB/FT K-55 cemented in 12 1/4" hole with 150 sx lite lead & 270 sx Premium tail. Cement to surface.

1,085-90 — Circulation perf's shot 4 SPF. Could not break down. Not sqz'd.

3,240 — Cement top at 3240' from 2.15.90 Schlumberger CBL.

4,032 — Cement plug. 39 FT^3 neat "G" set 1.4.94. Tag witnessed by DOGGR.

4,300

6,012 — Cement plug. 55 FT^3 neat "G" set 12.31.93. Tag witnessed by DOGGR.

6,226-30 — Second Panoch perf'd 6 SPF 60° phase with 3 3/8" TCP guns 2.16.90. Tested 3,109 MCFPD, 0 BW, 0 BO against 1,918 PSI FTP.

6,272 — TCP guns above top of cement

6,285 — Top of cement

6,419
6,419 — **Production Casing:** 5 1/2" 15.5 LB/FT J-55 cemented in 7 7/8" hole with 425 sx of unspecified cement.

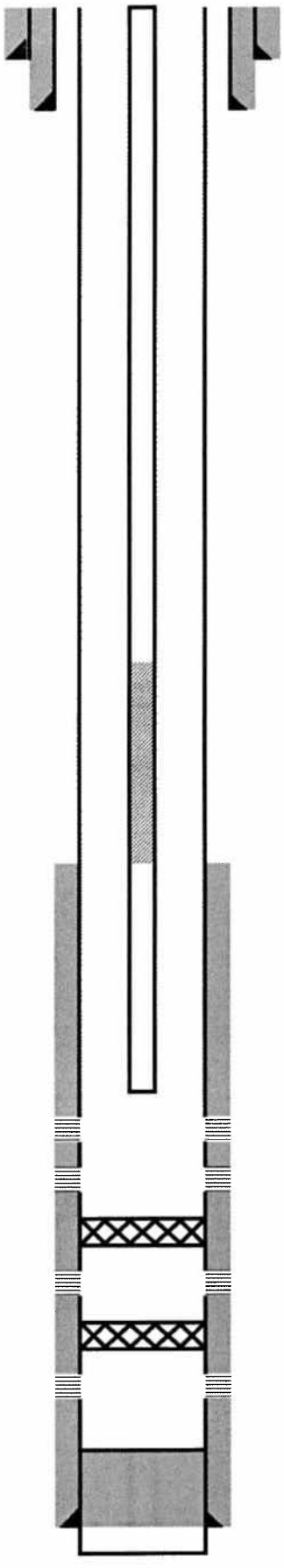
Gill Ranch Storage: Gill Ranch No. 19X

API No.
Gill Ranch Storage
Madera Co., California
100' South & 110' West Sec 19 T13S R16E MDB&M

WI/NRI:
Spud: 18-Mar-71
Comp:

KB: 11'
DF:
GL: 174'

Straight hole



Conductor Pipe:

690 — 9 5/8" 32.3 LB/FT Used H-40 at 690', cemented to surface.

2,526 — Top of sand fill in tubing

~3500' — Cement top is calculated to be at ~3500'

4,265 — Tubing: 2 3/8" 4.7 LB/FT J-55

4,300

4,330-34

4,340

4,398-4,407

4,420

4,478-82

4,500 — Float Collar

4,590 — **Production Casing:** 5 1/2" 15.5 LB/FT J-55 cemented at 4590'.

5,900 — TD

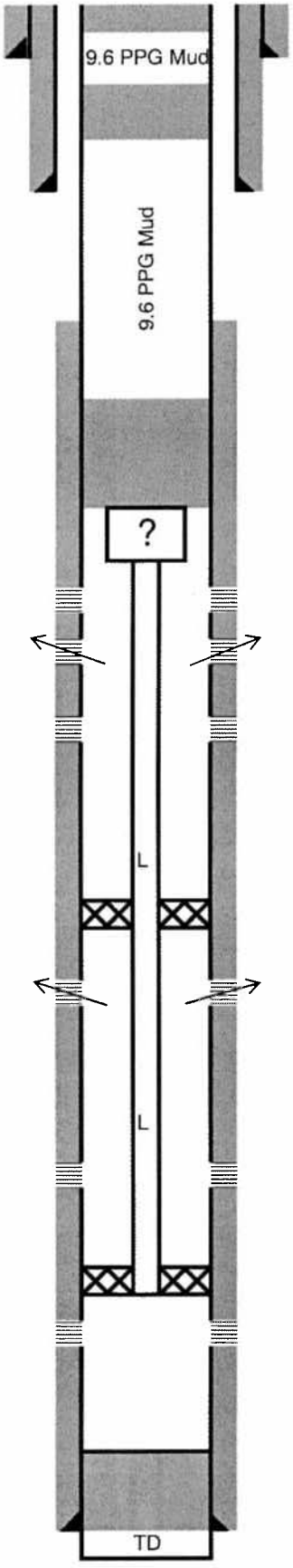
Gill Ranch Storage: Gill No. 726-19

API No. 039-00050
Gill Ranch
Madera Co., California
250' South 2,000' West Sec 19 T13S R16E MDB&M

WI/NRI:
Spud: 28-Sep-64
Comp:

KB: 12'
DF:
GL: 176'

Straight hole



60' surface plug set in 4 1/2" & 4 1/2" x 8 5/8" annulus 11.11.93.

Conductor Pipe:

647
750 — Cement plug: 9 FT^3 plug set and tagged 11.10.93.

810 — **Surface Casing:** 8 5/8", 36#, cemented at 810'.

3800' — Calculated top of cement at ~3800'.

3,954 — Cement plug: 25 FT^3 plug set 11.9.93, tagged 11.10.93.

4,272 — Fish (Wireline?)

NOTE: Records do not specify pulling either of the packers prior to abandonment or details of the fish at 4,272'. The top of the tubing (2 7/8" in original completion, 2 3/8" at abandonmnet) is not specified.

4,292 — WSO: Perf'd 4 x 1/2" holes 10.7.64.

4,295 — WSO: Perf'd 4 x 1/2" shots 10.6.64. Sqz'd with 50 sx 10.6.64.

4,334-38 — Perf'd 2 x 1/2" SPF 10.9.64.

5,417 — Baker Model L sliding sleeve (run open)

5,454 — Baker Model R packer set 10.9.64.

5,472-76 — Perf'd 2 SPF 10.7.64. Tested wet. Sqz'd with 53 sx 10.8.64.

5,514 — Baker Model L sliding sleeve (run open)

5,522-26 — Perf 2 SPF 10.7.64. Tested dry gas

5,554 — Baker Model D packer set 10.9.64.

5,570-74 — Perf'd 2 x 1/2" SPF 10.9.64.

5,633 — Cement Plug

5,680
5,800 — **Production Casing:** 4 1/2" 11.6 LB/FT J-55 cemented in 6 3/4" hole at 5800'.

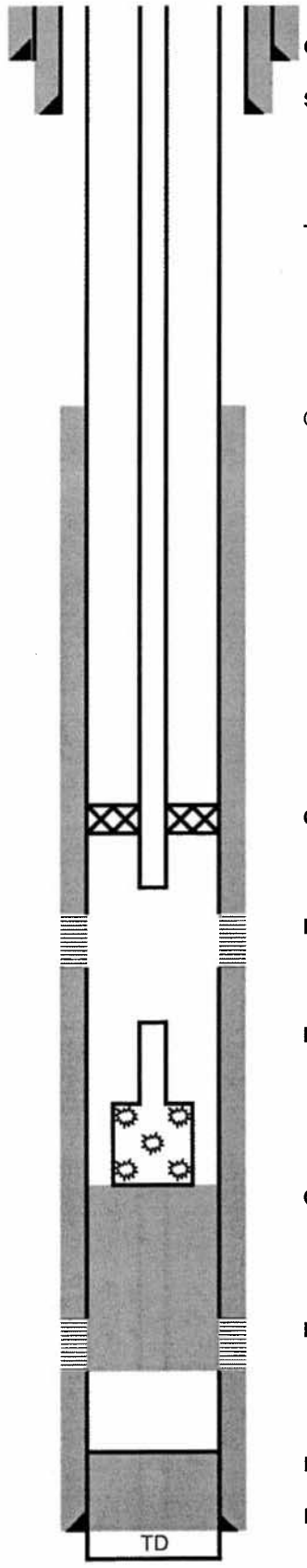
Gill Ranch Deep No. A-2

API No.
Gill Ranch Storage Field
Madera Co., California
600' South 900' West Sec 19 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 24'
DF:
GL: 171'

Straight hole



Conductor Pipe:

1,005 **Surface Casing:** 9 5/8" 36 LB/FT K-55 ST&C cemented at 1005'

Tubing: 2 3/8" 4.7 LB/FT J-55 EUE

~2,600 Calculated cement top estimated at 2600'.

4,234 **Otis Packer**

4,307

4,346 **Perforations:** 6 SPF
4,360

~5,971 **Fish:** 53' fish including 14' of 3 3/8" TCP guns

~6,024
6,024 **Cement Plug**

6,198 **Perforations:** 6 SPF
6,212

Float Collar:

6,400 **Production Casing:** 5 1/2" 15.5 LB/FT J-55 LT&C at 6400'.
6,400

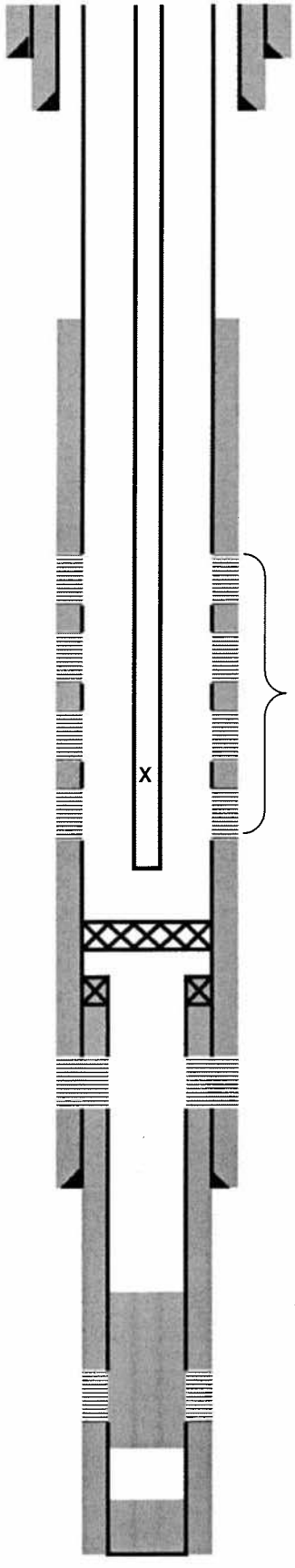
Gill Ranch Deep No. A-1

API No.
Gill Ranch Storage Field
Madera Co., California
1,450' South 450' East Sec 20 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 24'
DF:
GL: 173'

Straight hole



Conductor Pipe:

1,017 **Surface Casing:** 9 5/8" 36 LB/FT K-55 BT&C at 1017'.

Tubing: 2 3/8" 4.7 LB/FT J-55 EUE with X nipple at 4,422'

~3,300' Calculated Cement Top at 3300'.

4,346
4,352
4,370
4,376
4,386
4,390
4,448
4,452
Perforations: 6 SPF

4,455 EOT

5,550 **Bridge Plug**

5,564 **Liner top**

5,578
5,584
Perforations: 4 SPF

5,894 **Intermediate Casing:** 7" 26 & 23 LB/FT K-55

6,066 Cement plug

6,202
6,214
6,425
Perforations: 6 SPF

6,502 **Liner:** 5" 18 LB/FT N-80 & K-55 cemented at 6502

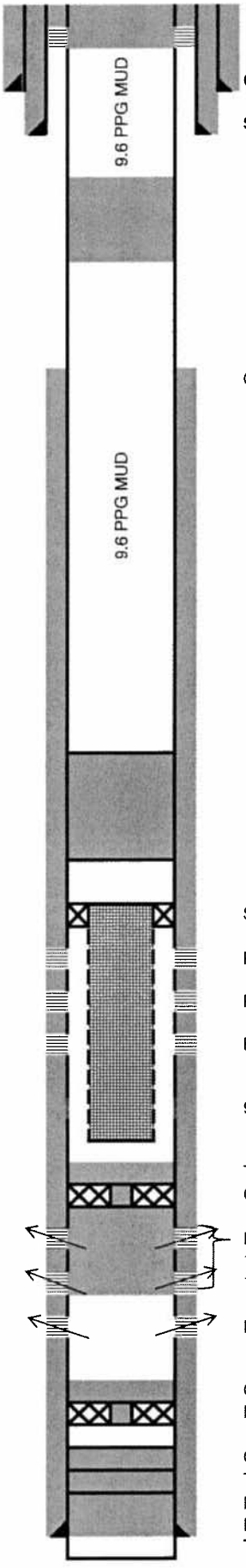
Gill Ranch Storage: Gill Ranch No. 61-20

API No.
Gill Ranch Storage Field
Madera C0., CA
5,610' South, 1,650' West Sec 20 T13S R16E MDB&M

WI/NRI:
Spud: 30-Nov-43
Comp:

KB: 9'
DF:
GL: 180'

Straight hole



Surface Plug at 50' to surface, casing cut off 6' below surface.

Conductor Pipe:

595 **Surface Casing:** 9 5/8" 36 LB/FT J-55 at 595'

745

860

Calculated cement top at 2800'

4,044

4,285

4,285 Sand screen set 9-12-88.

4,320 Perf'd 4 x 1/2" holes 11.19.52.

4,335-45 Perf'd 11.19.52

4,353-63 Perf'd 4 SPF with 1/2" shots 9-11-88.

4,369 9-12-88 impression block indicates collapsed casing at 4,369'
4,383

4,417 Two feet of cement left above bridge plug
4,419 Cast iron cement retainer set 1-21-66

4,450-60 Perf'd 210 x 1/2" holes 12.28.43. Perf'd (reperf'd) 4,469'-80' 11.15.52. 4,450'-60' reperf'd 4 x 1/2" HPF 11.17.52. Tested 4,400 MCFPD after squeeze & reperforating. Reperf'd 4,370'-80'
4,470-80*** 11.19.52. Sqz'd with 100 sx 1.21.66.

4,435 Perf's 4 hole 12.25.43.

*** Note: The perf's shown here as 4,470'-80' are shown on some reports as 4,370' to 4,380'.

4,462 Cement top
4,467 Model K bridge plug

4,481 Cement top after 11.16.52 cementing
4,491 Tagged bottom 11.15.52.
4,497 Float Collar
4,537 **Production Casing:** 5 1/2" 14 & 15 LB/FT J-55 & H-40 at 4537'.
5,809 **TD**

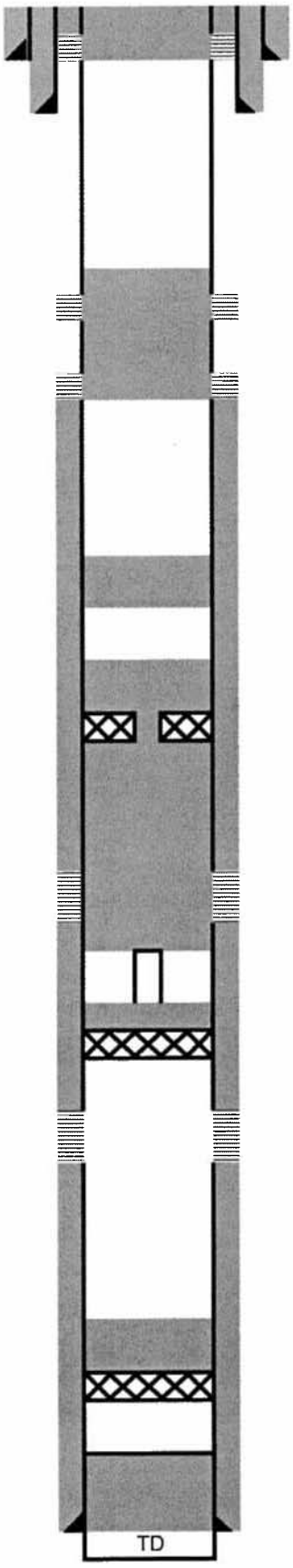
Edison Securities No. A-1

API No.
Gill Ranch Storage Field
Madera Co., California
2,800' South 2,317' East Sec 20 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 24'
DF:
GL: 175'

Straight hole



40' **Conductor Pipe:** Perfs from 35' to 40'.

1,035 **Surface Casing:** 9 5/8" 36 LB/FT K-55 BT&C at 1035'

590' Perfrs at 800'. Squeezed

1090' Perfs from 1085'-1090'. Squeezed
1100' Calculated top of cement at 1100'

4350'
4500' Cement plug from 4350' to 4500'.

5147' Top of cement plug at 5147'

5,459 Otis Versatrieve Packer cemented in place.

5,526 Perforations: 4 SPF
5,529

6162' Bottom of cement plug at 6162'
Junk: Pup joint, 1 jt of 2-3/8", firing head, 3' of TCP gun on bottom

6,165
6,175

6,238 Perforations: 6 SPF
6,244

7,500 Cement Top

7,650 Bridge Plug

Float Collar

7,748 **Production Casing:** 7" 26 & 23 LB/FT K-55 at 5894
8,800

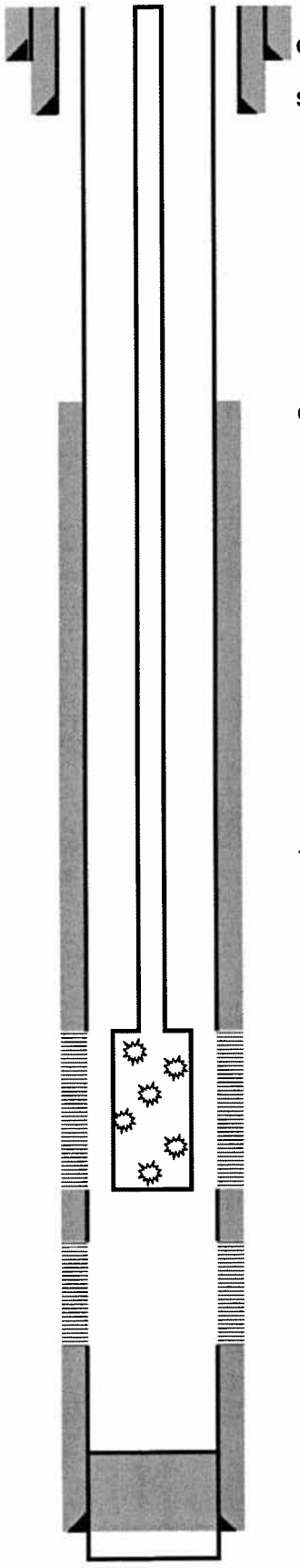
Gill Ranch Storage: Gill Ranch No.91-21

API No.
Gill Ranch Storage
Madera Co., California
1,100' S 1,942' E Sec 21 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 12.5'
DF:
GL: 183'

Directional Well: 11° maximum angle



Conductor Pipe:

766 **Surface Casing:** 8 5/8" 24 LB/FT J-55 cemented at 766'.

Cement top calculated at ~2500'.

Tubing: 140 jts 2 3/8" 4.7 LB/FT J-55 EUE with Vann Guns from 4,420'-42', no packer

4,420 Kreyenhagen: 6 SPF

4,442

4,434

4,442

6,420 Float Collar

6,465 **Production Casing:** 4 1/2" 10.5 LB/FT J-55 cemented at 6465'.

6,470

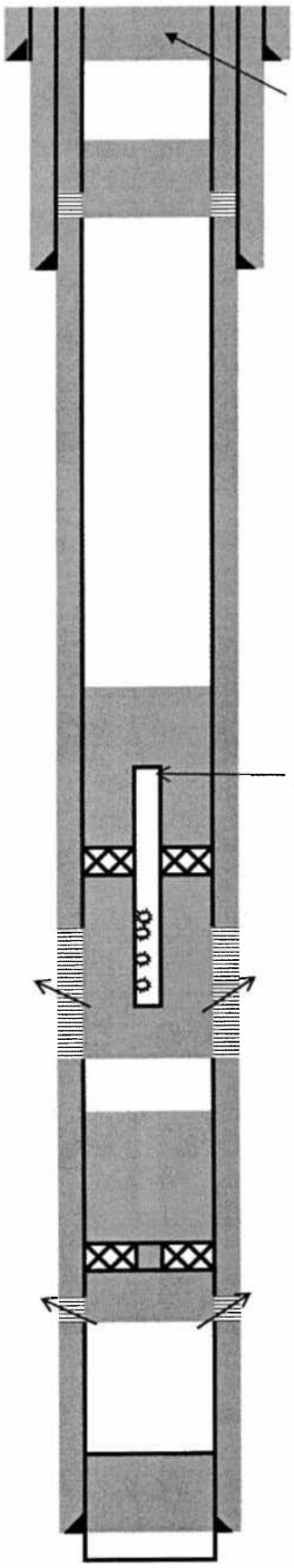
Gill Ranch: Gill Ranch No. 32-21

API No.
Gill Ranch Storage
Fresno Co., California
1,950' East 1,100' South Sec 21 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 13'
DF:
GL: 183'

Directional Data:



Conductor Pipe: 5 1/2" production casing cemented top "calculated around surface"

Surface plut set from 5' to 30' below ground level.

549 Cement Top

1,497 **Surface Casing:** 9 5/8" 47 LB/FT L-80

5,464 Cement Top

5,577 **Junk:** 2 3/8" tubing with packer (5,616') and Vann guns. Top of fish at 5,577, bottom of fish at 5,705'. Fish is stuck in hole, attempts to free the fish were unsuccessful.

5,616

5,690

5,705

5,712

5,922 **Cement plug**

6,170

6,198-6,212

Float Collar

6,499 **Production Casing:** 5 1/2" 20 LB/FT N-80

6,501

Gill Ranch Storage: Gill No. 62-21

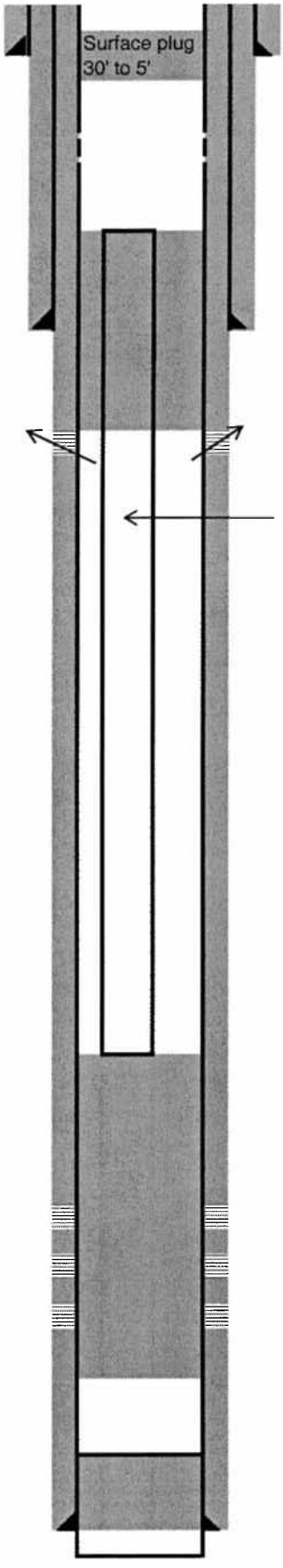
API No.
Field
Madera Co., California
Sec 21 T13S R16E

WI/NRI:
Spud:
Comp:

KB: 12'
DF:
GL: 188'

Directional Data:

Production casing cement top calculated at surface.



Conductor Pipe:

288
301

Note: Collapsed 4 1/2" casing from 288'-301'.

635

694

Surface Casing: 8 5/8" 24 LB/FT K-55

1,010
1,010-12

Fish: Stuck 2 3/8" 4.7 LB/FT J-55 tubing from 3,995'-635, cemented from 1,012'-635'.

3,995

4,328-29

4,364-72

4,378-82

4,390

Float Collar

4,735

Production Casing: 4 1/2" 11.6 LB/FT K-55

5,900

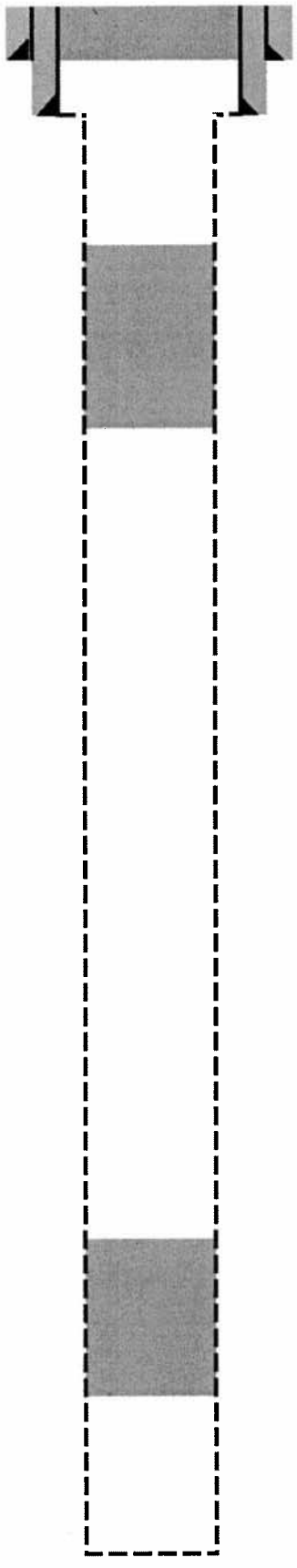
Gill Ranch Storage: Edison Securities B No. 1

API No.
Gill Ranch Storage
Madera Co., California
2,550' N 3,400' W Sec 21 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 193'
DF:
GL: 181'

Directional Data: Straight hole



Surface plug at 5' to 30'

Conductor Pipe:

1,012 **Surface Casing:** 9 5/8" 36 LB/FT J-55

883

Freshwater plug

1,164

5,576

Zone Plug

5,889

Float Collar

6,494 Total Depth

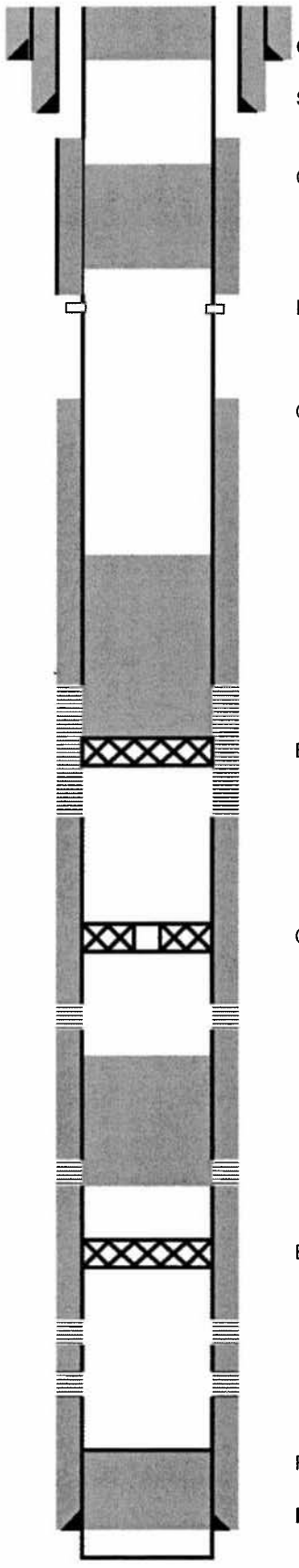
Gill Ranch: Gill Ranch S. E. No. 21-1

API No.
Gill Ranch Storage
Madera Co., California
2,500' N 1,435' W Sec 21 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 12'
DF:
GL: 197'

Directional Data: Straight hole



Surface Plug at 30' to surface

Conductor Pipe:

698 **Surface Casing:** 8 5/8" 24 LB/FT J-55 at 698'

744 Calculated cement top in annulus at 1025'.

1,054

1,392 DV at 1392'

Cement Top 3500'

4,156

4,410

4,414 Bridge Plug

4,430

5,094 Cement Retainer, not cemented

5,160-64

5,229

5,458-68

5,680 Bridge Plug

5,716-26

5,732-35

Float Collar

5,968 **Production Casing:** 4 1/2" 10.5 LB/FT J-55 at 5968'

6,400

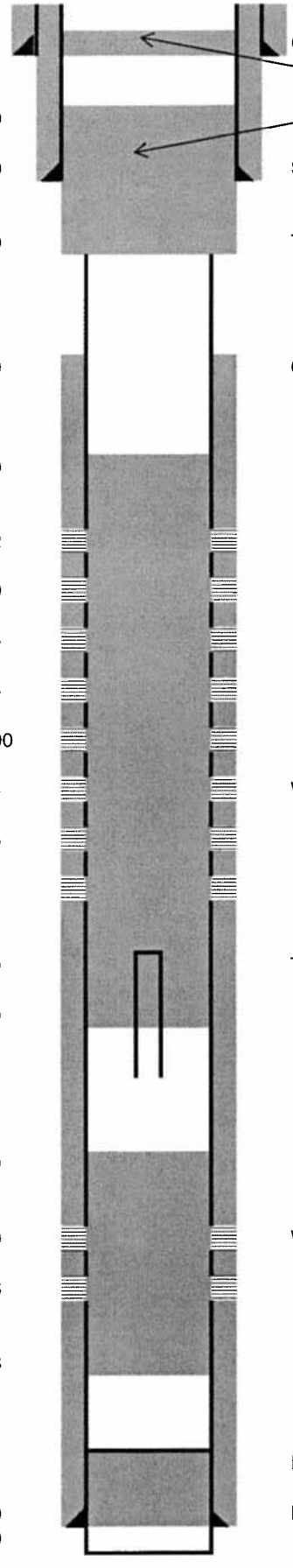
Gill Ranch Storage: Edison Securities No. 25-22

API No.
Gill Ranch Storage
Madera Co., California
1,100' E 2,110' N Sec 22 T13S R16E

WI/NRI:
Spud:
Comp:

KB: 16.5'
DF:
GL: 189'

Directional Data: Straight hole



Conductor Pipe:
Surface plug at 30' to 60'

390 — Cement plug at 590' to 390'

540 — **Surface Casing:** 9 5/8" 31.08 LB/FT H-40 cemented at 540'.

590 — Top of 5 1/2" surface casing at 590'

3,830 — Calculated Cement Top at ~3500'.

4,330

4,420-32

4,450-60

4,467-75

4,490-96.5

4,497.5-4,500

4,515 — Water shut off perforations

4,531-43

4,540-45

4,550 — Top of 2 7/8" "tubing junk" at 4,550'. Tubing shot off 7.12.77.

4,560

5,629

5,740 — Water shut off perforations

5,765-68

5,773

Float Collar

5,780 — **Production Casing:** 5 1/2" 17 LB/FT J-55 cemented at 5780'.

5,780

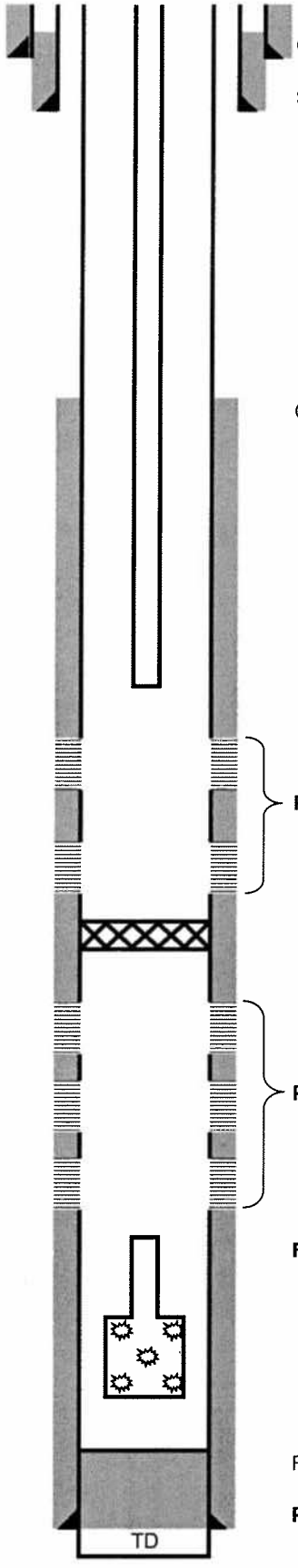
Gill Ranch No. 38X-17

API No.
Gill Ranch Storage Field
Madera Co., California
270' South 142' Eas Sec 20 T13S R16E MDB&M

WI/NRI:
Spud:
Comp:

KB: 12'
DF:
GL: 171'

Directional Well: Maximum inclination 23.7°



Conductor Pipe:

1,525 **Surface Casing:** 9 5/8" 36 LB/FT J-55

2,800 Cement Top

5,382
5,386
5,497
5,505 **Perforations:** 4 SPF

5,580

5,587
5,592
5,596
5,598
5,612
5,614 **Perforations:** 6 SPF

~6,284 **Fish:** 33' of spent 4 5/8" TCP guns and tools (+ trigger bar)

Float Collar

6,766 **Production Casing:** 7" 26 LB/FT J-55
9,502 TD