



Linda S. Adams
Secretary for
Environmental Protection



Department of Toxic Substances Control

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630



Arnold Schwarzenegger
Governor

October 26, 2006

Ms. Yvonne Meeks
Portfolio Manager – Site Remediation
Pacific Gas and Electric Company
4325 South Higuera Street
San Luis Obispo, CA 93401

MODIFICATION OF GROUNDWATER AND SHORELINE SURFACE WATER
SAMPLING FREQUENCIES AT PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK
COMPRESSOR STATION, NEEDLES, CALIFORNIA (EPA ID NO. CAT080011729)

Dear Ms. Meeks,

The Department of Toxic Substances Control (DTSC) has completed the evaluation of the sampling frequencies for the Site-Wide Groundwater Monitoring Program (GMP) and PG&E's request to modify the shoreline surface water sampling program. As a result, Dr. Kate Burger has provided a set of recommendations for the sampling frequencies of these monitoring programs in the enclosed memorandum to Mr. Christopher Guerre. DTSC has also provided a presentation of our recommendations to the consultative workgroup members during the October 18, 2006 meeting.

DTSC, hereby, approves the request for a modification of the shoreline surface water sampling program and directs PG&E to modify, effective immediately, the sampling frequencies pursuant to the enclosed recommendations. Please note that this directive does not affect any changes to the methodologies and procedures used for the GMP. Furthermore, the sampling frequency modification outlined in the enclosed memorandum is unrelated to the sampling, monitoring and reporting requirements established under the Interim Measures Compliance Monitoring Program.

Ms. Yvonne Meeks
October 26, 2006
Page 2 of 2

If you have any questions regarding this matter, please feel free to contact me at
(714) 484-5439.

Sincerely,

A handwritten signature in black ink, appearing to read 'Aaron Yue', with a stylized flourish at the end.

Aaron Yue
Senior Hazardous Substances Engineer
Geology, Permitting and Corrective Action Branch

aky:100602A

Enclosure

cc: PG&E Topock Consultative Workgroup Members – Via e-mail



Linda S. Adams
Secretary for
Environmental
Protection



Department of Toxic Substances Control


Maureen F. Gorsen, Director
8800 Cal Center Drive
Sacramento, California 95826-3200



Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Christopher Guerre, CHG
Project Manager
Hazardous Waste Management Program, Cypress Office

FROM: Kate Burger, PhD, PG 
Engineering Geologist, Northern California Geological Services Unit
Engineering & Geology Support Branch
Site Mitigation and Brownfields Reuse Program

DATE: August 24, 2006

SUBJECT: Recommended Groundwater Sampling Frequencies
Site-Wide Groundwater Monitoring Program (GMP) and
Floodplain Interim Measures Groundwater Monitoring Program
Pacific Gas and Electric Company, Topock Compressor Station, Needles
San Bernardino County, Project No. 22120/540015-48/36-HWMP

DOCUMENTS REVIEWED

Technical Memorandum, Evaluation of Sampling Frequencies of Topock GMP Monitoring Wells, PG&E Topock Compressor Station. Prepared by CH2M Hill. Dated July 25, 2006.

PG&E request to modify shoreline surface water sampling program. E-mail from Julie Eakins (CH2M Hill) to DTSC. Dated August 22, 2006.

INTRODUCTION

The Northern California Geological Services Unit (GSU) of the Department of Toxic Substances Control (DTSC) has evaluated two groundwater monitoring programs currently being implemented by the Pacific Gas and Electric Company (PG&E) for the Topock Compressor Station. The first program includes the site-wide groundwater monitoring program (GMP) which historically has been conducted to support the RCRA Facility Investigation (RFI). With the recent completion of the data collection activities for the groundwater portion of the RFI, it is an appropriate time to identify a GMP that will support the next phase of the project. The second program provides an on-going assessment of the performance of the interim measure (IM) implemented to control the chromium plume in the floodplain area. The recent installation of additional monitoring

wells, and the DTSC intention to update the performance monitoring criteria for the floodplain IM, make this a suitable time to reassess this program.

To assist with this evaluation of the monitoring programs, PG&E provided the above-referenced technical memorandum with recommended sampling frequencies for selected wells in the GMP and the floodplain IM monitoring program (IMP). The PG&E recommendations are based on an analysis performed using the Monitoring and Remediation Optimization System (MAROS) software developed by the Air Force Center for Environmental Excellence. The evaluation used the Modified Cost Effective Sampling (CES) methodology to estimate an appropriate sampling frequency for each well; this methodology considers concentration trends, variability, and magnitude. PG&E used a data set of Alluvial Aquifer wells having six or more sampling events between April 1, 2004 and March 31, 2006. Therefore, PG&E has not provided a sampling frequency recommendation for wells installed after November 2004.

PG&E has also submitted a request to reduce the sampling frequency for the shoreline surface water monitoring program stations.

GSU RECOMMENDATIONS

1. GSU does not consider the largely annual to biennial sampling frequencies recommended by the MAROS evaluation to be appropriate to support the evaluation of IM performance or to fully support the Corrective Measures Study. Hence, although GSU considered the PG&E input, GSU used its own evaluation to provide the enclosed recommendations for the GMP and floodplain IM monitoring programs. These recommendations are summarized in Table 1 and shown on Figures 1, 2, and 3, and are based on the technical factors described below.
2. GSU recommends that PG&E and DTSC reevaluate the appropriate groundwater sampling frequencies for the GMP and floodplain IM monitoring program in approximately 12 months. In particular, GSU anticipates that the sampling frequencies for some wells installed since January 2005 may be able to be decreased at that time because an adequate baseline data set will have been collected.
3. GSU recommends approval of the PG&E request to monitor the shoreline surface water stations at the same frequency and timing as the in-channel surface water sampling locations.

Floodplain Interim Measure Monitoring Program (IMP)

1. More frequent sampling (e.g., bi-weekly, monthly, quarterly) should be conducted for wells (1) completed in the lower depth interval of the Alluvial Aquifer, (2) that are located near the river or at locations useful for understanding plume response to the groundwater extraction, and (3) that are designated as assessment wells for the IM monitoring program.

2. Wells completed in the upper and middle depth intervals of the Alluvial Aquifer can be monitored at a lower frequency (e.g., quarterly, semi-annually, annually). Wells in these depth intervals that are designated as IMP assessment wells should be sampled at least quarterly.
3. Lower sampling frequencies are appropriate for wells without detectable chromium concentrations, for wells with consistently low chromium concentrations, and wells that are not used to define the plume margin.
4. Wells that provide redundant data should be removed from the monitoring program.
5. The minimum sampling frequency for new monitoring wells should be quarterly. The appropriate sampling frequency should be reevaluated after at least six samples have been collected.
6. Active extraction wells are sampled on a monthly basis. Inactive extraction wells located on the MW-20 bench are sampled on an annual basis.

Site-wide Groundwater Monitoring Program (GMP)

1. Quarterly sampling should be conducted as necessary to evaluate concentrations in the interior of the plume in the upland area and to define the eastern plume margin. Lower sampling frequencies (e.g., semi-annual, annual) are appropriate for other wells located within the plume or near the plume margins.
2. The minimum sampling frequency for new monitoring wells should be quarterly. The appropriate sampling frequency can be reevaluated after at least six samples have been collected.
3. The minimum sampling frequency for wells with less than six samples should be at least semi-annual.
4. With the exception of well TW-04, hydraulic test wells should be sampled on an annual or biennial basis because of the long screen length. GSU is recommending a semi-annual sampling frequency for new test well TW-04 because of its position relative to the chromium plume in the floodplain area.
5. Semi-annual sampling is appropriate for monitoring wells in the vicinity of the IM 3 injection well field.
6. Biennial sampling is appropriate for wells located in upgradient areas.
7. Bedrock monitoring wells should be sampled on a quarterly sampling frequency.
8. Wells providing poor quality or redundant data should be removed from the monitoring program.

Shoreline Surface Water Monitoring Program Under GMP

The GMP Monitoring Plan defines the current surface water monitoring program for the nine shoreline locations and specifies a monthly sampling frequency for these locations. Over the past year, chromium has not been detected in any sample collected for the surface water monitoring program. PG&E proposes to modify the shoreline surface water sampling frequency to be consistent with the frequency for the in-channel surface water sampling (quarterly during most of the year and monthly during the low river months). Given the depth of the groundwater plume near the river and the sampling results over the past few years, GSU concurs that a reduced sampling frequency is appropriate for the shoreline surface water sampling locations. If DTSC approves the PG&E request, the next shoreline surface water sampling event would occur in October 2006.

If you have questions regarding this memorandum, please call me at (916) 255-6537.

Peer reviewed by: Alfredo Zanoria, CEG, CHG

**TABLE 1. RECOMMENDED GROUNDWATER SAMPLING FREQUENCY MODIFICATIONS
SITE-WIDE AND FLOODPLAIN INTERIM MEASURE GROUNDWATER MONITORING PROGRAMS
PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK COMPRESSOR STATION**

Well No.	Sampling Frequency			Program		Well Type								Well Location							Screened Unit				Other						
	Current ¹	MAROS ²	GSU Recommendation	IM Assessment Well ³	Site-wide Monitoring Program (GMP)	IM Monitoring Program (IMP)	Monitoring Well Installed After 6/05	Monitoring Well Installed Before 6/05	Piezometer	Inactive Extraction Well	Active Extraction Well	Hydraulic Test Well	Injection Well	Water Supply Well	Interior Plume	Plume Margin	Above Plume	Below Plume	Outside of Plume	Floodplain	Upland	Bat Cave Wash	Background Well	Proximal to IM 3 Injection Well Field	Upper Depth Interval of Alluvial Aquifer	Middle Depth Interval of Alluvial Aquifer	Lower Depth Interval of Alluvial Aquifer	Bedrock	Cr Non-detect or Consistently Low	Cr Variable or Trending	Redundant or Poor Quality Data
MW-9	S	A	A		x		x							x							x	x			x						
MW-10	S	Q	Q		x		x							x							x	x			x					x	
MW-11	S	A	A		x		x							x							x	x			x					x	
MW-12	Q	A	Q		x		x							x	x						x				x					x	
MW-13	Q	B	S		x		x								x						x	x			x						
MW-14	Q	A	S		x		x											x			x			x	x				x		
MW-15	S	B	B		x		x											x			x		x		x				x		
MW-16	S	B	B		x		x											x			x		x		x				x		
MW-17	S	B	B		x		x											x			x		x		x				x		
MW-18	S	A	S		x		x											x			x		x		x				x		
MW-19	Q	Q	Q		x		x							x							x				x						
MW-20-70	Q	A	Q		x	x	x							x							x				x						
MW-20-100	Q	Q	Q		x	x	x							x							x					x					
MW-20-130	Q	Q	Q		x	x	x							x							x					x					
MW-21	Q	B	Q	x	x	x	x								x						x				x				x		
MW-22	Q	B	S		x	x	x												x	x					x				x		
MW-23	Q	--	Q		x		x											x			x						x		x		
MW-24A	S	Q	Q		x		x							x							x				x						
MW-24B	S	Q	Q		x		x							x							x					x					
MW-24BR	Q	--	Q		x		x										x				x						x		x		
MW-25	Q	A	S		x		x							x							x				x						
MW-26	Q	A	S		x		x							x							x				x						

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PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK COMPRESSOR STATION**

Well No.	Sampling Frequency			Program			Well Type							Well Location							Screened Unit				Other						
	Current ¹	MAROS ²	GSU Recommendation	IM Assessment Well ³	Site-wide Monitoring Program (GMP)	IM Monitoring Program (IMP)	Monitoring Well Installed After 6/05	Monitoring Well Installed Before 6/05	Piezometer	Inactive Extraction Well	Active Extraction Well	Hydraulic Test Well	Injection Well	Water Supply Well	Interior Plume	Plume Margin	Above Plume	Below Plume	Outside of Plume	Floodplain	Upland	Bat Cave Wash	Background Well	Proximal to IM 3 Injection Well Field	Upper Depth Interval of Alluvial Aquifer	Middle Depth Interval of Alluvial Aquifer	Lower Depth Interval of Alluvial Aquifer	Bedrock	Cr Non-detect or Consistently Low	Cr Variable or Trending	Redundant or Poor Quality Data
MW-27-020	Q	B	A			x	x									x		x						x					x		
MW-27-060	Q	-	A			x	x									x									x				x		
MW-27-085	Q-M	-	Q-M	x	x	x	x								x											x			x		
MW-28-025	Q	B	A			x	x									x								x				x			
MW-28-090	Q-M	B	Q	x	x	x	x									x										x		x			
MW-29	Q	B	A			x	x											x						x				x			
MW-30-030	Q	B	B			x	x									x								x				x		x	
MW-30-050	Q	A	--			x	x									x									x			x		x	
MW-31-60	Q	A	S		x	x	x							x							x			x							
MW-31-135	Q	A	S		x	x	x							x							x					x					
MW-32-020	Q	B	Q	x	x	x	x								x									x				x			
MW-32-035	Q	B	Q	x	x	x	x								x									x				x			
MW-33-040	Q	B	Q	x	x	x	x								x									x				x			
MW-33-090	Q	B	Q	x	x	x	x								x										x			x			
MW-33-150	Q-M	--	Q	x	x	x	x								x											x		x			
MW-33-210	Q-M	--	Q	x	x	x	x								x											x		x			
MW-34-055	Q	B	A			x	x									x									x			x			
MW-34-080	Q-M	B	Q-M	x	x	x	x									x										x		x			
MW-34-100	Q-M-BW	--	Q-M-BW	x	x	x	x							x												x			x		
MW-35-60	Q	A	S		x	x	x											x						x							
MW-35-135	Q	A	S		x	x	x											x			x					x					
MW-36-020	Q	B	A			x	x									x								x				x			

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SITE-WIDE AND FLOODPLAIN INTERIM MEASURE GROUNDWATER MONITORING PROGRAMS
PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK COMPRESSOR STATION**

Well No.	Sampling Frequency			Program			Well Type							Well Location							Screened Unit				Other						
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MW-36-040	Q	B	A			x	x									x								x					x		
MW-36-050	Q	B	A			x	x									x									x				x		
MW-36-070	Q-M	B	Q	x	x	x	x								x										x				x		
MW-36-090	Q-M	A	Q-M			x	x								x											x					
MW-36-100	Q-M	A	Q-M			x	x								x											x					
MW-37S	Q	B	S		x		x								x						x	x			x				x		
MW-37D	Q	Q	Q		x		x								x						x	x				x				x	
MW-38S	S	A	A		x		x								x						x	x			x						
MW-38D	S	A	A		x		x								x						x	x				x					
MW-39-040	Q	B	Q	x	x	x	x								x									x					x		
MW-39-050	Q	A	A			x	x									x									x				x		
MW-39-060	Q	A	A			x	x									x									x				x		
MW-39-070	Q-M	A	Q			x	x								x										x						
MW-39-080	Q-M	A	Q-M			x	x								x											x					
MW-39-100	Q-M	A	Q-M			x	x								x											x					
MW-40S	Q	B	A		x		x								x						x				x				x		
MW-40D	Q	A	Q		x		x								x						x					x				x	
MW-41S	Q	--	S		x		x									x					x	x		x	x				x		
MW-41M	Q	--	S		x		x														x	x		x	x				x		
MW-41D	Q	--	S		x		x								x						x	x		x		x			x		
MW-42-030	Q	--	S			x	x									x					x				x				x		

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PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK COMPRESSOR STATION**

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MW-42-055	Q	-	Q	x	x	x		x							x				x						x			x			
MW-42-065	Q	-	Q	x	x	x		x							x										x			x			
MW-43-025	Q	-	S			x		x										x	x					x				x			
MW-43-075	Q-M	-	Q			x		x										x	x							x			x		
MW-43-090	Q-M	-	Q			x		x										x	x							x			x		
MW-44-070	--	--	Q	x	x	x	x										x								x			x			
MW-44-115	Q-M-BW	--	Q-M	x	x	x	x							x												x					
MW-44-125	Q-M-BW	--	Q-M	x	x	x	x							x												x			x		
MW-45-95	--	--	--			x			x						x											x					
MW-46-175	Q-M-BW	-	Q-M	x	x	x	x							x												x					
MW-46-205	--	--	Q			x	x										x									x					
MW-47-55	--	--	Q	x	x	x	x								x									x				x			
MW-47-115	--	--	Q	x	x	x	x								x											x			x		
MW-48-135	--	--	Q		x			x									x				x						x				
MW-49-135	--	--	Q			x	x											x	x							x			x		
MW-49-275	--	--	Q			x	x											x	x							x			x		
MW-49-365	--	--	Q			x	x											x	x							x			x		
MW-50-95	--	--	Q		x			x							x										x						
MW-50-200	--	--	Q		x			x							x											x					
MW-51	--	--	Q		x			x							x											x					

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PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK COMPRESSOR STATION**

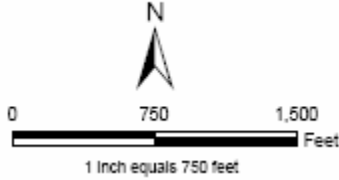
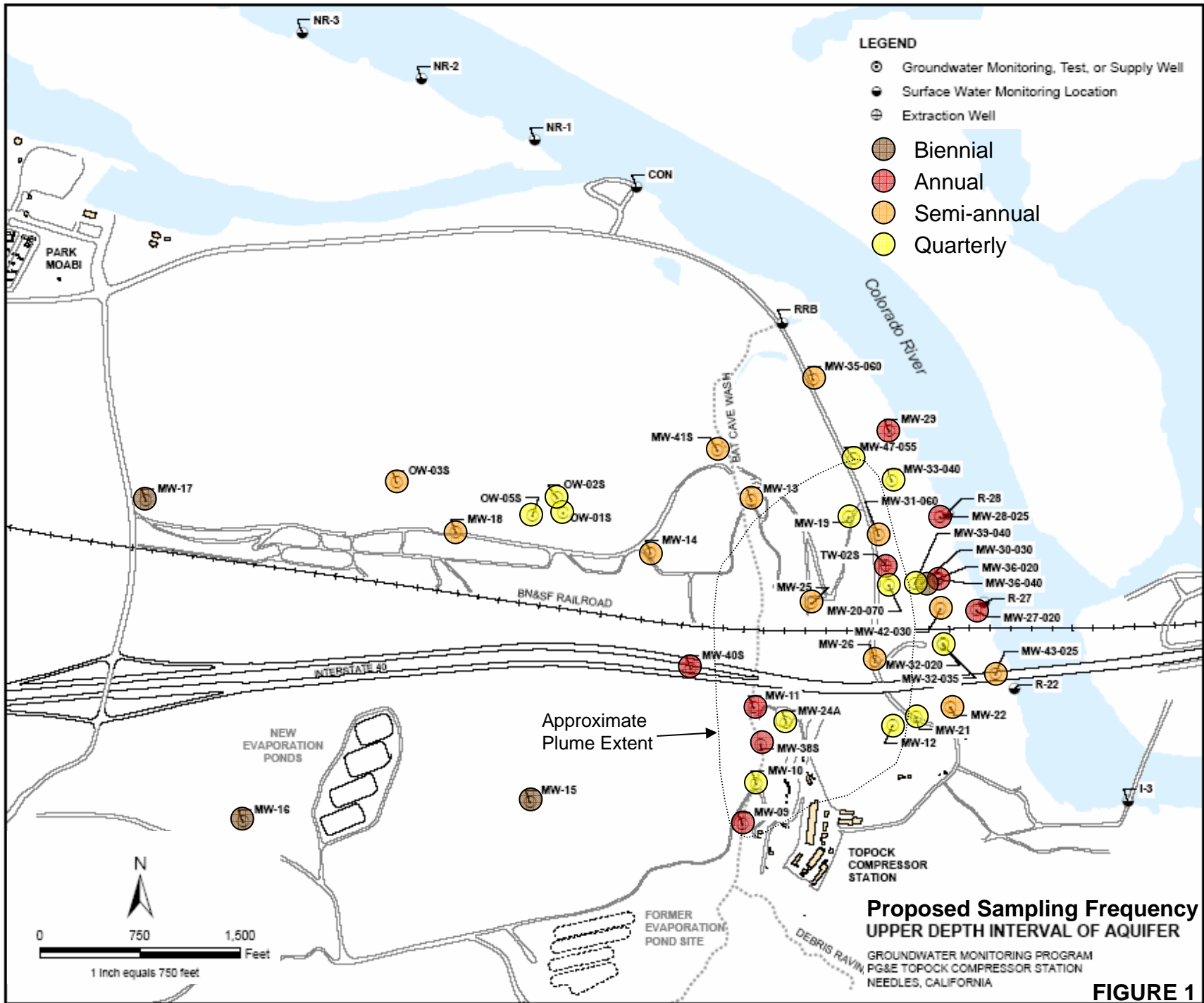
Well No.	Sampling Frequency			Program	Well Type								Well Location							Screened Unit				Other								
	Current ¹	MAROS ²	GSU Recommendation		IM Assessment Well ³	Site-wide Monitoring Program (GMP)	IM Monitoring Program (IMP)	Monitoring Well Installed After 6/05	Monitoring Well Installed Before 6/05	Piezometer	Inactive Extraction Well	Active Extraction Well	Hydraulic Test Well	Injection Well	Water Supply Well	Interior Plume	Plume Margin	Above Plume	Below Plume	Outside of Plume	Floodplain	Upland	Bat Cave Wash	Background Well	Proximal to IM 3 Injection Well Field	Upper Depth Interval of Alluvial Aquifer	Middle Depth Interval of Alluvial Aquifer	Lower Depth Interval of Alluvial Aquifer	Bedrock	Cr Non-detect or Consistently Low	Cr Variable or Trending	Redundant or Poor Quality Data
OW-3S	S	-	S	x		x												x		x			x	x								
OW-3M	S	-	S	x		x												x		x			x		x							
OW-3D	S	-	S	x		x												x		x			x		x							
Park Moabi	Q	-	B	x									x					x		x					x			x				
PE-1	M	-	M		x					x				x						x					x							
PGE-6	B	-	-										x	x							x				x							x
PGE-7	B	-	B	x									x	x							x					x	x					
PGE-8	B	-	B	x								x					x				x					x	x					
TW-1	B	-	B	x							x										x				x	x	x					
TW-2D	Q	-	A		x					x				x							x					x						
TW-2S	Q	-	A		x					x				x							x					x						
TW-3D	M	-	M		x						x										x					x						
TW-4	-	-	S	x								x			x											x						
TW-5	-	-	A	x									x													x						

¹ As indicated in July 2004 GMP Monitoring Plan or, as directed by DTSC.

² Technical Memorandum, Evaluation of Sampling Frequencies of Topock GMP Monitoring Wells, CH2M Hill, July 25, 2006.

³ IM assessment wells are wells subject to the IMP contingency plan.

A is annually Q is quarterly
 B is every two years S is semi-annually
 BW is biweekly W is weekly
 M in monthly

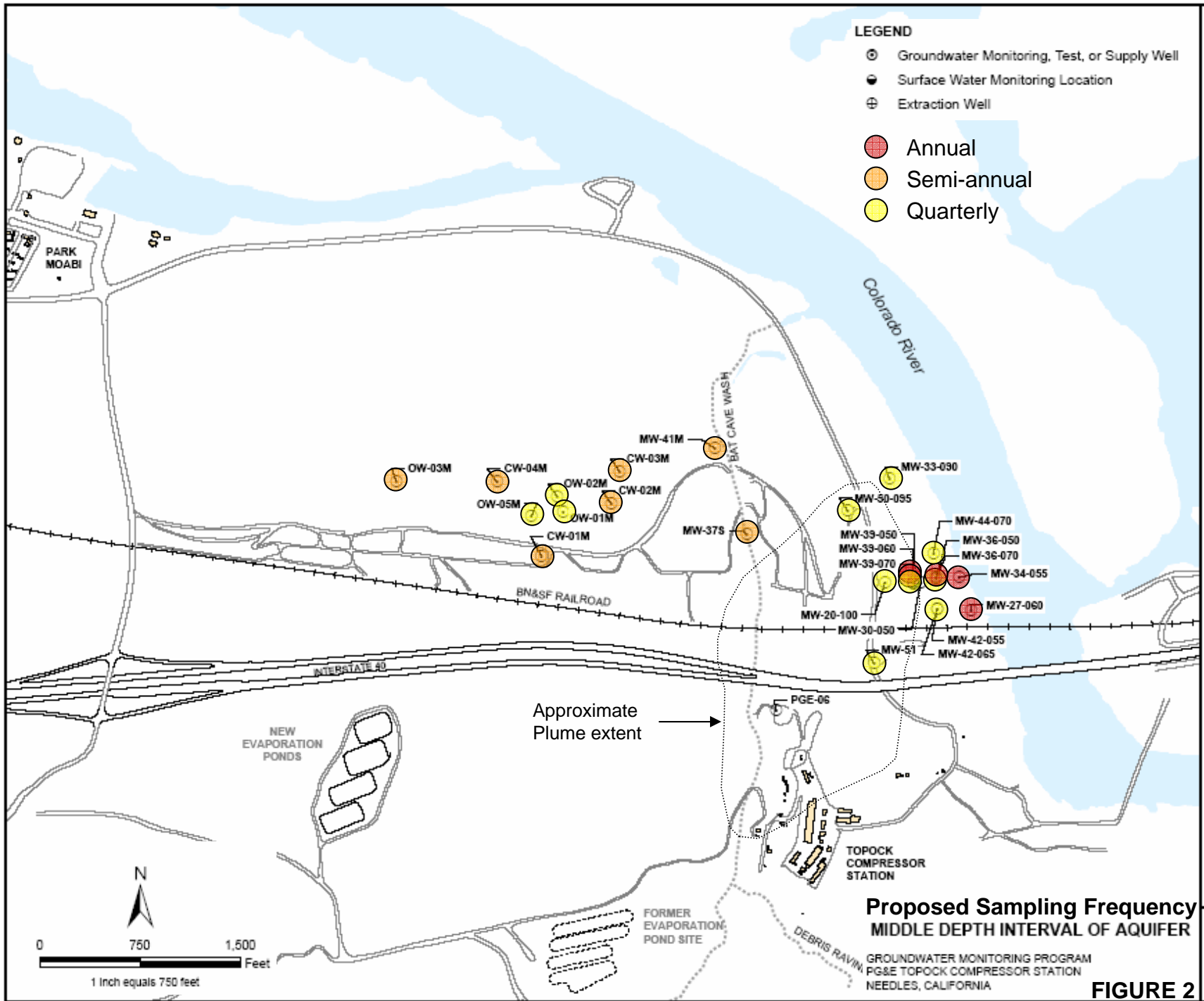


Approximate
Plume Extent

**Proposed Sampling Frequency
UPPER DEPTH INTERVAL OF AQUIFER**

GROUNDWATER MONITORING PROGRAM
FG&E TOPECO COMPRESSOR STATION
NEEDLES, CALIFORNIA

FIGURE 1



Approximate Plume extent →

