Proposal for Modifying Hydraulic Data Collection for the IM Performance Monitoring Program

PG&E Topock Compressor Station

DATE: August 23, 2006

Introduction

This technical memorandum presents an evaluation and recommendations for updating and modifying the hydraulic data collection activity used for PG&E's Interim Measures (IM) performance monitoring program (PMP). The current PMP utilizes an extensive network of pressure transducers (total 70) installed in essentially all groundwater monitoring and test wells in the floodplain and adjoining IM area. Figure 1 shows the locations of wells in the PMP area that are currently used for hydraulic data collection to demonstrate groundwater containment (landward gradient) produced by the IM extraction system.

The current PMP was established in accordance with requirements of the California Department of Toxic Substances Control (DTSC) February 14, 2005 letter "Criteria for Evaluating Interim Measures Performance Requirements to Hydraulically Contain Chromium Plume in Floodplain Area". DTSC is currently reviewing the IM performance requirements. Based on preliminary review and discussions with DTSC, the numerical gradient for demonstrating hydraulic control will remain unchanged from the current requirement of 0.001. New gradient control well pairs will be defined to account for the more complex gradient caused by pumping at both TW-3D and PE-1. It is anticipated that the new IM directive will address:

- Operational requirements for the current IM (i.e., minimum pumping rate, etc),
- New gradient control wells for evaluating and demonstrating hydraulic containment,
- New contingency plan for monitoring chromium concentrations in the IM containment area,
- Updates and clarifications on the reporting requirements for the IM, and
- Updates and modifications to the PMP hydraulic data collection program.

This technical memorandum addresses the final bullet only, updates and modifications to the PMP hydraulic data collection program. These modifications are intended to streamline the data collection process and still provide adequate data to address the anticipated DTSC's 2006 updated IM performance requirements.

IM Status

Full operations of the IM began in July 2005 with the startup of the IM No. 3 treatment facility. Hydraulic control is currently being achieved through pumping from extraction wells TW-3D and PE-1 (Figure 1). The minimum numerical gradient targets have been met for each month of the full-scale IM operations since July 2005. During this time, extraction rates ranged from 70 to 135 gpm.

Pumping at the current 135 gpm flow rate has resulted in very strong landward gradients, even during months of low river stage. Gradients are strongest in the lower depth interval of the aquifer where the pumping wells are screened. The recent IM drilling investigations, and the routine PMP chromium and hydraulic monitoring since 2005 have shown that the chromium plume in the floodplain is confined to the lower depth interval of the Alluvial Aquifer, and that the focus of IM pumping is hydraulic containment in the lower depth interval. Groundwater monitoring has shown that the chromium plume in the upper and mid-depth intervals is confined to the interior portion of the PMP area (MW-20 bench and interior). The only mid-depth well in the floodplain that still shows chromium above 20 µg/L is MW-39-70, about 200 feet from the MW-20 bench.

With the success and attainment of the IM performance standard during the past year, PG&E believes that the hydraulic data collection program of the PMP can be modified to more efficiently generate the data required and still maintain the necessary monitoring and evaluation to demonstrate IM performance.

Current Hydraulic Data Collection Activity

As of August 1, 2006, the current network of pressure transducers (see Table 1) used for PMP includes the following:

- A total of 70 wells/locations (68 wells and 2 river stations) are equipped with pressure transducers,
- Groundwater elevation data are collected at each transducer installation continuously (30 minute readings),
- All stations are downloaded twice a month, and
- The transducer data are calibrated and processed for all stations twice a month to produce the average hydraulic gradient data-sets that are used for performance evaluation.

Proposed Modifications to Hydraulic Data Collection Activity

The hydraulic data collection program is proposed to be revised and modified as summarized in Table 1. The proposed changes include:

- Decrease the network of "primary" pressure transducers for routine data collection from 70 to a total of 57 wells/locations (see Table 1). The pressure transducers currently installed in 13 locations would be removed from full-time service and maintained in the PMP equipment pool (available as backup during instrument maintenance and other

project needs. Rationale for excluding each well from the water level monitoring network is provided in Table 1.

- Decrease to monthly transducer data collection (field download and office processing) for the routine PMP water level monitoring. More frequent bi-weekly data collection of the key gradient control wells can be implemented when needed for performance evaluation.

The proposed modified water level monitoring program will provide the data for measuring and evaluating hydraulic gradients in the lower depth interval during current IM pumping. The shallow and mid-depth wells are not needed to evaluate IM performance on a monthly reporting schedule. However, gradient maps of the shallow and mid-depth wells will be prepared and reported in the quarterly PMRs.

We request DTSC approval of the above recommendations to commence effective September 1, 2006. Pending DTSC approval, the revised hydraulic data collection activity will be incorporated in the PMP Monitoring Plan, to be prepared as directed by the DTSC.

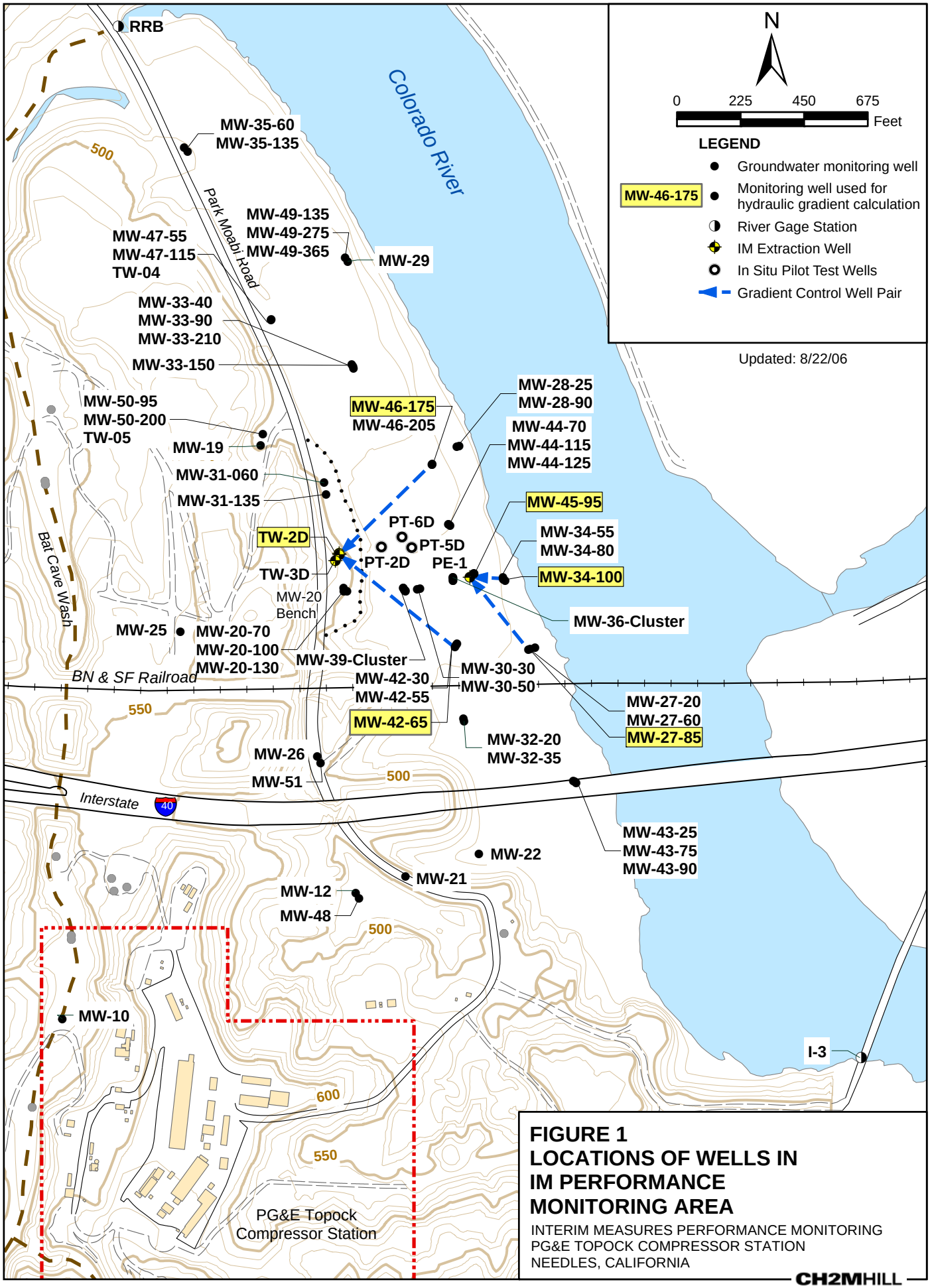

FIGURE 1
LOCATIONS OF WELLS IN IM PERFORMANCE MONITORING AREA

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

TABLE 1
Proposed Modifications to Hydraulic Data Collection Activity
IM Performance Monitoring Program - 2006 Revised Monitoring Plan
PG&E Topock Compressor Station, Needles, California

Revision 1
Draft 8/22/06

Well/Station	Current Data Collection Frequency	Proposed 2006 Data Collection Frequency	Remarks / Rationale
River Stations			
I-3	BW	Monthly	primary river gauge station
RRB	BW	Monthly	
Shallow Wells (Upper Depth)			
MW-10	BW	**None**	Interior well not needed to demonstrate landward gradients for PMP
MW-19	BW	**None**	Interior well not needed to demonstrate landward gradients for PMP
MW-20-70	BW	Monthly	
MW-22	BW	**None**	Very shallow well outside of plume; not needed for PMP gradient contouring
MW-27-20	BW	Monthly	
MW-25	BW	Monthly	
MW-26	BW	Monthly	
MW-28-25	BW	Monthly	
MW-29	BW	**None**	Well completion in floodplain silt; not representative or used for UA contouring
MW-30-30	BW	**None**	Well completion in high saline zone; not used for UA contouring
MW-31-60	BW	Monthly	
MW-32-20	BW	Monthly	
MW-32-35	BW	**None**	Screened in UA and MA intervals; redundant well with MW-32-20
MW-33-40	BW	Monthly	
MW-35-60	BW	Monthly	
MW-36-20	BW	Monthly	
MW-36-40	BW	Monthly	
MW-39-40	BW	Monthly	
MW-42-30	BW	Monthly	
MW-43-25	BW	Monthly	
MW-47-55	BW	Monthly	
Intermediate Wells (Middle Depth)			
MW-20-100	BW	Monthly	
MW-27-60	BW	Monthly	
MW-30-50	BW	Monthly	
MW-33-90	BW	Monthly	
MW-34-55	BW	Monthly	
MW-36-50	BW	Monthly	
MW-36-70	BW	Monthly	
MW-39-50	BW	Monthly	
MW-39-60	BW	Monthly	
MW-39-70	BW	Monthly	
MW-42-30	BW	Monthly	
MW-42-55	BW	**None**	Redundant well with MW-42-65
MW-42-65	BW	Monthly	New Gradient Control Well (and current Gradient Control Well)
MW-44-70	BW	Monthly	
MW-50-95	BW	Monthly	
MW-51	BW	Monthly	

TABLE 1
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Revision 1
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Well/Station	Current Data Collection Frequency	Proposed 2006 Data Collection Frequency	Remarks / Rationale
Deep Wells (Lower Depth)			
MW-20-130	BW	Monthly	Gradient control well; monitors LA-2 interval. Will be backup gradient control well
MW-27-85	BW	Monthly	New Gradient Control Well; monitors LA-1 interval
MW-28-90	BW	Monthly	Monitors LA-1 interval
MW-31-135	BW	Monthly	Gradient Control Well; monitors LA-2 interval. Will be backup gradient control well
MW-33-150	BW	Monthly	Current Gradient Control Well; monitors LA-2 interval
MW-33-210	BW	**None**	Monitors LA-3 interval; too deep for gradient contouring (LA control provided by MW-33-150)
MW-34-80	BW	Monthly	Monitors LA-1 interval; key floodplain cluster and current Gradient Control Well
MW-34-100	BW	Monthly	New Gradient Control Well; key floodplain cluster; monitors LA-2 interval.
MW-35-135	BW	Monthly	Monitors LA-2 interval
MW-36-90	BW	Monthly	Monitors LA-1 interval
MW-36-100	BW	Monthly	Monitors LA-2 interval
MW-39-80	BW	Monthly	Monitors LA-1 interval
MW-39-100	BW	Monthly	Monitors LA-2 interval
MW-43-75	BW	**None**	Redundant with MW-43-90; screened partially in both MA and LA intervals
MW-43-90	BW	Monthly	Monitors LA-1 interval
MW-44-115	BW	Monthly	DTSC proposes for gradient evaluation; key floodplain well, monitors LA-2 interval
MW-44-125	BW	Monthly	Key floodplain well location; monitors LA-2 interval
MW-45-95	BW	Monthly	New Gradient Control Well at PE-1 pumping center; monitors LA-1 interval
MW-46-175	BW	Monthly	New Gradient Control Well; monitors LA-3 interval
MW-46-205	BW	Monthly	Monitors LA-3 interval
MW-47-115	BW	Monthly	Monitors LA-2 interval
MW-49-135	BW	Monthly	Monitors LA-2 interval
MW-49-275	BW	**None**	Monitors LA-4 interval; too deep for gradient contouring (LA control provided by MW-49-135)
MW-49-365	BW	**None**	Monitors LA-4 interval; too deep for gradient contouring; very saline groundwater (LA control provided by MW-49-135)
MW-50-200	BW	Monthly	Monitors LA-3 interval (too deep for gradient contouring.
TW-2D	BW	Monthly	New Gradient Control Well; monitors LA-2 interval. Backup IM extraction well
TW-4	BW	**None**	40-foot well screen (not comparable to other PMP wells); monitors LA-4 interval
TW-5	BW	**None**	40-foot well screen (not comparable to other PMP wells); monitors LA-2 interval
PT-2D	BW	Monthly	In-Situ pilot well, needed for WDR & gradient evaluation; monitors LA-1 interval
PT-5D	BW	Monthly	In-Situ pilot well, needed for WDR & gradient evaluation; monitors LA-1 interval
PT-6D	BW	Monthly	In-Situ pilot well, needed for WDR & gradient evaluation; monitors LA-1 interval
Total Transducer Stations	**70**	**57**	

Notes:

1. Transducer data collection and processing frequency for IM Performance Monitoring program (PMP) is currently bi-weekly (BW).
2. Alluvial Aquifer elevation intervals in feet above mean se level (MSL):
   UA = water table (ave. 455' MSL) to 425', MA = 425-395, LA-1 = 395-370, LA-2 = 370-330, LA-3 = 330-250, and LA-4 below 250' MSL.
3. The last field in monitoring well ID indicates the approximate base depth of well screen (feet below ground surface)