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July 13, 2005

Mr. Norman Shopay  
Project Manager  
California Department of Toxic Substances Control  
Geology and Corrective Action Branch  
700 Heinz Avenue  
Berkeley, California 94710

Subject: Revised Sampling Plan and Standard Operating Procedure for Depth-Specific  
Surface Water Sampling  
Pacific Gas and Electric Company, Topock Project

Dear Mr. Shopay:

This letter transmits the revised Section 5.0 of the *Monitoring Plan for Groundwater and Surface Water Monitoring Program, Revision 0* (GMP Monitoring Plan) describing revisions to the proposed surface water monitoring plan at the Pacific Gas and Electric Company (PG&E) Topock site. In addition, this letter transmits the revised standard operating procedure (SOP) A-12 describing the methods and procedures for collection of depth-specific water sampling. The revised Section 5.0 is intended to replace Section 5.0 in the GMP Monitoring Plan submitted on April 11, 2005. SOP A-12 is intended to supplement *Sampling, Analysis, and Field Procedures Manual, Revision 1* submitted on March 31, 2005.

These documents were originally submitted to DTSC on May 16, 2005, and have been revised in conformance with DTSC's letter dated June 30, 2005. If you have any questions, please do not hesitate to contact me at (805) 546-5243.

Sincerely,

Cc: Kate Burger

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# Monitoring Plan for Groundwater and Surface Water Monitoring Program PG&E Topock Compressor Station Needles, California

Prepared for  
**Pacific Gas and Electric Company**

Revision 1  
July 13, 2005

[Includes Revised Section 5 and revised or new applicable figures](#)

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*Revised or new sections are shown in italics.*

# 5.0 Proposed Surface Water Monitoring Plan

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## 5.1 Monitoring Objectives

Surface water monitoring is an important component of the Topock GMP. In addition to the general GMP program objectives outlined in Section 1.4, the following are specific objectives established for surface water monitoring at the Topock site:

- Conduct routine monitoring of near-shore surface water locations both upgradient and downgradient of the Topock site.
- Augment the routine surface water monitoring program by collecting depth-specific surface water samples in the river channel.
- Collect general water quality data for surface water locations adjacent to the Topock site. The general water quality parameters of pH and specific conductance, which are considered COPCs under the GMP, will be used to evaluate the hydraulic relationship between groundwater and the surface water body (Colorado River). The water quality parameters of hardness, total dissolved solids (TDS), and total suspended solids (TSS), which are considered COI, will be analyzed at the river channel sampling locations only.
- Collect manual river level elevation data periodically to verify the river gauge data collected under the IM PMP activity using transducers. Collection and evaluation of transducer measurements are not part of the GMP.

## 5.2 Assessment and Rationale for Surface Water Monitoring

### 5.2.1 Monitoring Locations

Nine shoreline surface water stations were previously established for routine collection of surface water samples both upstream and downstream of the Topock site. These stations are shown in Figure 5-1. All nine previously-established shoreline surface water stations will continue to be sampled under this revised GMP Monitoring Plan.

This GMP Monitoring Plan, Revision 1 augments the previous surface water sampling program by introducing eight depth-specific surface water sampling stations in the river channel. These depth-specific sampling stations are shown in Figure 5-1.

### 5.2.2 Monitoring Frequency

The nine shoreline surface water stations are currently sampled monthly and quarterly. The site COCs, Cr(T) and Cr(VI), are analyzed monthly for these shoreline stations, and specific conductance and pH, both COPCs, are monitored quarterly. Table 5-1 summarizes the shoreline surface water monitoring frequency and analyses.

In late February 2005, weekly sampling at three of the shoreline surface water stations (CON, R-27, and R-28) was conducted for four consecutive weeks. This sampling was conducted at the direction of DTSC at the same time the weekly contingency sampling of groundwater monitoring wells was implemented in accordance with the IM *Contingency Plan for Sentry Well Groundwater Monitoring* (DTSC 2005b). Weekly sampling of surface water will occur only when specifically requested by the DTSC.

Depth-specific river channel sampling at eight stations will commence in July 2005. These locations will be sampled quarterly for Cr(T), Cr(VI), specific conductance, pH, hardness, TDS, and TSS. During the seasonal low-water stage of the Colorado River, the depth-specific sampling at river channel locations will occur monthly, with samples analyzed for Cr(T), Cr(VI), and hardness only. Although low-water stage typically occurs between December and March, this low water sampling period will be adjusted depending on the projected river stage, which is calculated based on projected releases from Davis Dam and the projected stage in Lake Havasu.

### 5.2.3 Monitoring Parameters

Table 5-1 presents a summary of the surface water sampling analyses and frequency for each surface water station in the GMP. Table 4-3 identifies the analytical methods and reporting limits for the GMP COCs, COPCs, COIs, and field parameters.

Monitoring at each surface water station includes the measurement of field parameters using field instrumentation. Surface water is monitored for temperature, specific conductivity, dissolved oxygen, oxidation-reduction potential, pH, and turbidity, using field instrumentation, as described in the Field Procedures Manual (CH2M HILL 2005c).

As part of the IMs being implemented at the Topock site, transducers have been installed at select river gauge stations. Water level data collected using these transducers is downloaded and evaluated under the IM program and is not addressed in the GMP.

Manual surface water level measurements are also routinely collected at three of the surface water stations (RRB, A-Dock, and I-3; other stations as required) as part of the GMP to confirm transducer measurements. Water level measurements are collected as described in the Field Procedures Manual (CH2M HILL 2005c).

## 5.3 Sampling, Analysis, and Field Procedures

### 5.3.1 Sample Collection

Standard procedures to be used in association with GMP monitoring events are presented in the Field Procedures Manual (CH2M HILL 2005c). The Field Procedures Manual presents standardized protocol for sample collection, laboratory analysis, and other field investigation and data collection activities for the several investigation, monitoring, and interim measure programs performed at the Topock Compressor Station.

Shoreline surface water samples are collected in accordance with standard operating procedure (SOP) SOP-A4 in the Field Procedures Manual, from a depth of approximately 6 inches below the water surface.

The river channel surface water sampling stations are located in the river approximately one-third of the river width from the California shoreline. In the event a sampling station is too shallow to safely approach by boat, the next closest location to the station with adequate depth will be sampled, and global positioning system (GPS) coordinates will be recorded. Samples will be collected from one foot off the bottom of the river channel, at the mid-point of the water column, and within one foot of the water surface. Sampling will be conducted from an anchored motorized boat with the use of a portable GPS device for proper spatial accuracy and repeatability. The SOP for river channel sample collection is presented in SOP-A12. This SOP will be incorporated into a subsequent revision of the current Field Procedures Manual (CH2M HILL 2005c).

### 5.3.2 Sample Filtration and Preservation

Shoreline surface water samples for Cr(T) and Cr(VI) analysis will be collected unfiltered and unpreserved, for subsequent filtration and preservation at the laboratory prior to analysis. River channel surface water samples for Cr(T) and Cr(VI) analysis will be field-filtered and preserved at the time of sample collection.

Surface water samples (both shoreline and river channel) for all other laboratory analyses (i.e., pH, specific conductance, hardness, TDS, and TSS) do not require filtration prior to laboratory analysis. Therefore, surface water samples collected for these analyses will not be filtered in either the field or the laboratory.

### 5.3.3 Field Quality Control Samples

Field quality control samples will be collected during each GMP monitoring event in accordance with the PG&E Topock QAPP for Water Quality Sampling and Analysis (CH2M HILL 2005c). Specific to the surface water monitoring plan, one equipment blank will be collected during each river channel surface water sampling event. The equipment blank will be collected by running deionized water through a new segment of tubing used for collection of the depth-specific river channel surface water samples. The equipment blank will be submitted for laboratory analysis for Cr(T) and Cr(VI).

## 5.4 Surface Water Monitoring Schedule

Table 5-1 summarizes the proposed sampling frequencies and analyses for the surface water monitoring program. A schedule of Topock GMP surface water and groundwater monitoring events through June 2006, including approximate sampling dates, is presented in Table 4-4. Following the June 2006 event, the surface water monitoring program will be re-evaluated and modified as warranted with DTSC approval.

TABLE 4-3

Revision 1-7/13/05

Site Analytical Parameters, Test Methods, and Reporting Limits  
 Monitoring Plan for Groundwater and Surface Water Monitoring Program  
 PG&E Topock Compressor Station, Needles, California

Analytical Parameter	Units	Groundwater		Surface Water		Drinking Water production wells		Drinking Water Maximum Contaminant Levels <sup>4</sup>
		Analytical Method	Minimum Reporting <sup>1</sup> Limit	Analytical Method	Minimum Reporting <sup>1</sup> Limit	Analytical Method	Minimum Reporting <sup>1</sup> Limit	
<b>Constituents of Concern (COCs)</b>								
Hexavalent Chromium	µg/L	SW 7196 <sup>2</sup>	10	---	---	---	---	Note 5
Hexavalent Chromium	µg/L	SW 7199 <sup>3</sup>	0.2	SW 7199 <sup>3</sup>	0.2	EPA 218.6	0.0002	Note 5
Total Chromium, dissolved	µg/L	SW 6010B	1	SW 6010B	1	EPA 200.7	0.001	50; Note 5
<b>Constituents of Potential Concern (COPCs)</b>								
pH	pH units	EPA 150.1	0.1	EPA 150.1	0.1	EPA 150.1	0.1	6.5 - 8.5*
Specific conductance	µS/cm	EPA 120.1	2	EPA 120.1	2	EPA 120.1	2	1600*
Lead, dissolved	µg/L	SW 6010B	5	---	---	---	---	not established
TPH-Extractable (Diesel Range)	mg/L	EPA 8015M	0.5	---	---	---	---	not established
TPH-Extractable (Motor Oil Range)	mg/L	EPA 8015M	0.5	---	---	---	---	not established
<b>Constituents of Interest (COIs)</b>								
Hardness	mg/L	---	---	EPA 130.2	---	---	---	not established
TDS (mg/L)	mg/L	---	---	EPA 160.1	10	---	---	500*
TSS (mg/L)	mg/L	---	---	EPA 160.2	10	---	---	not established
Antimony, dissolved	µg/L	SW 6010B	3	---	---	---	---	6
Arsenic, dissolved	µg/L	SW 6010B	5	---	---	---	---	50
Barium, dissolved	µg/L	SW 6010B	500	---	---	---	---	1000
Beryllium, dissolved	µg/L	SW 6010B	1	---	---	---	---	4
Cadmium, dissolved	µg/L	SW 6010B	2	---	---	---	---	5
Cobalt, dissolved	µg/L	SW 6010B	5	---	---	---	---	not established
Copper, dissolved	µg/L	SW 6010B	10	---	---	---	---	1000*
Mercury, dissolved	µg/L	SW 7470A	0.2	---	---	---	---	2
Molybdenum, dissolved	µg/L	SW 6010B	5	---	---	---	---	not established
Nickel, dissolved	µg/L	SW 6010B	20	---	---	---	---	100
Selenium, dissolved	µg/L	SW 6010B	5	---	---	---	---	50
Silver, dissolved	µg/L	SW 6010B	5	---	---	---	---	100*
Thallium, dissolved	µg/L	SW 6010B	1	---	---	---	---	2
Vanadium, dissolved	µg/L	SW 6010B	5	---	---	---	---	not established
Zinc, dissolved	µg/L	SW 6010B	20	---	---	---	---	5000*



TABLE 4-3

Site Analytical Parameters, Test Methods, and Reporting Limits  
 Monitoring Plan for Groundwater and Surface Water Monitoring Program  
 PG&E Topock Compressor Station, Needles, California

Analytical Parameter	Units	Groundwater		Surface Water		Drinking Water production wells		Drinking Water Maximum Contaminant Levels <sup>4</sup>
		Analytical Method	Minimum Reporting Limit <sup>1</sup>	Analytical Method	Minimum Reporting Limit <sup>1</sup>	Analytical Method	Minimum Reporting Limit <sup>1</sup>	
<b>Field Water Quality Parameters</b>								
Temperature	°C	Field Instrumentation	---	Field Instrumentation	---	Field Instrumentation	---	
Specific Conductance	µS/cm	Field Instrumentation	---	Field Instrumentation	---	Field Instrumentation	---	
Dissolved Oxygen	mg/L	Field Instrumentation	---	Field Instrumentation	---	Field Instrumentation	---	
Oxidation-Reduction Potential	mV	Field Instrumentation	---	Field Instrumentation	---	Field Instrumentation	---	
pH	pH units	Field Instrumentation	---	Field Instrumentation	---	Field Instrumentation	---	
Turbidity	NTU	Field Instrumentation	---	Field Instrumentation	---	Field Instrumentation	---	

Notes:

- <sup>1</sup> Minimum reporting limit for undiluted samples. Reporting limits are increased when sample dilution is required.
- <sup>2</sup> Method SW 7196A is used for samples collected from monitoring wells where prior monitoring has detected hexavalent chromium [CR(VI)] concentrations above 100 micrograms per liter (µg/L).
- <sup>3</sup> Method SW 7199 is used for all surface water samples and all groundwater samples collected from monitoring wells where prior monitoring has not detected Cr(VI) concentrations above 100 µg/L.
- <sup>4</sup> Drinking water maximum contaminant levels (MCLs) listed are California primary MCLs.
- <sup>5</sup> **Additional Arizona (ADEQ) water quality standards for Chromium: (source: Arizona Administrative Register, Title 18, Section R18-11-109, Appendix A)**  
 Surface water aquatic/wildlife chronic toxicity: dissolved Cr(VI) 11 µg/L  
 Surface water aquatic/wildlife acute toxicity: dissolved Cr(VI) 16 µg/L  
 Surface water fish consumption: total recoverable Cr(VI) 2,000 µg/L  
 Surface water full-body contact: total recoverable Cr(VI) 4,200 µg/L  
 Domestic water source: total recoverable Cr(VI) 21 µg/L, and total recoverable Cr(T) 100 µg/L

Hardness is the sum of the calcium and magnesium concentrations, expressed as calcium carbonate (CaCO3) in milligrams per liter (mg/L)

- \* secondary MCL
- not applicable
- TDS Total Dissolved Solids
- TSS Total Suspended Solids

TABLE 4-4

Revision 1-7/13/05

Summary Schedule for 2005-2006 Monitoring Activities  
 Monitoring Plan for Groundwater and Surface Water Monitoring Program  
 PG&E Topock Compressor Station, Needles, California

Month	Start Week/Dates	Monitoring Event	Event Type	Notes
<b>2005</b>				
January	1/10/2005	2005-051-M01	M	Resample for 4th quarter 2004 event. Shoreline SW sampling.
	1/25/2005	2005-052-W04	BW	
February	2/7/2005	2005-053-M02	M	Shoreline SW sampling. Confirmation sampling. Instituted weekly sampling under Contingency Plan.
	2/14/2005	2005-MW-27-confirm	W	
	2/23/2005	2005-054-W08	BW	
March	3/1/2005	2005-055-W09	W	Chromium filtration test round 1 and shoreline SW sampling.
	3/7/2005	2005-056-Q1	Q	
	3/13/2005	IM1-2005-057	W	
	3/22/2005	2005-058-W12	BW	
	3/29/2005	2005-059-W13	W	
April	4/4/2005	2005-060-M04	M	Chromium filtration test round 2 and shoreline SW sampling.
	4/12/2005	2005-061-W15	W	
	4/19/2005	2005-062-W16	BW	
	4/26/2005	2005-063-W17	W	
May	5/2/2005	2005-064-M05	M	Shoreline SW sampling. Weekly contingency sampling reduced to one well.
	5/10/2005	2005-065-W19	W	
	5/17/2005	2005-066 -W20	BW	
	5/24/2005	2005-067-W21	W	
	5/31/2005	2005-068-W22	BW	
June	6/7/2005	2005-069-W23	W	Shoreline SW sampling.
	6/13/2005	2005-070-Q2	Q	
	6/21/2005	2005-071-W25	W	
	6/29/2005	2005-072-W26	BW	
July	7/5/2005	2005-073-W27	W	River channel and shoreline SW sampling.
	7/12/2005	2005-074-M07	M*	
	7/19/2005	2005-075-W29	W	
	7/26/2005	2005-076-W30	BW	
August	8/2/2005	2005-077-W31	W	Shoreline SW sampling.
	8/8/2005	2005-078-M08	M	
	8/16/2005	2005-079-W33	W	
	8/23/2005	2005-080-W34	BW	
	8/30/2005	2005-081-W35	W	
September	9/6/2005	2005-082-W36	BW	River channel and shoreline SW sampling.
	9/13/2005	2005-083-W37	W	
	9/19/2005	2005-084-Q3	Q*	
	9/28/2005	2005-085-W39	W	
October	10/4/2005	2005-086-M10	M	Shoreline SW sampling.
	10/11/2005	2005-087-W41	W	
	10/18/2005	2005-088-W42	BW	
	10/25/2005	2005-089-W43	W	
November	10/31/2005	2005-090-M11	M	Shoreline SW sampling.
	11/8/2005	2005-091-W45	W	
	11/15/2005	2005-092-W46	BW	
	11/22/2005	2005-093-W47	W	
	11/29/2005	2005-094-W48	BW	
December	12/6/2005	2005-095-W49	W	

TABLE 4-4

Revision 1-7/13/05

Summary Schedule for 2005-2006 Monitoring Activities  
 Monitoring Plan for Groundwater and Surface Water Monitoring Program  
 PG&E Topock Compressor Station, Needles, California

Month	Start Week/Dates	Monitoring Event	Event Type	Notes
December	12/12/2005	2005-096-A1	A*	Includes quarterly requirements; river channel & shoreline SW sampling.
	12/20/2005	2005-097-W51	W	
	12/28/2005	2005-098-W52	BW	
<b>2006</b>				
January	1/4/2006	2006-099-W01	W	River channel and shoreline SW sampling.
	1/9/2006	2006-100-M01	M*	
	1/18/2006	2006-101-W03	W	
	1/24/2006	2006-102-W04	BW	
February	2/1/2006	2006-103-W05	W	River channel and shoreline SW sampling.
	2/6/2006	2006-104-M02	M*	
	2/15/2006	2006-105-W07	W	
	2/21/2006	2006-106-W08	BW	
March	3/1/2006	2006-107-W09	W	River channel and shoreline SW sampling.
	3/6/2006	2006-108-Q1	Q*	
	3/15/2006	2006-109-W11	W	
	3/21/2006	2006-110-W12	BW	
	3/29/2006	2006-111-W13	W	
April	4/3/2006	2006-112-M04	M	Shoreline SW sampling.
	4/12/2006	2006-113-W15	W	
	4/18/2006	2006-114-W16	BW	
	4/26/2006	2006-115-W17	W	
May	5/8/2006	2006-116-M05	M	Shoreline SW sampling.
	5/17/2006	2006-117-W20	W	
	5/23/2006	2006-118-W21	BW	
	5/31/2006	2006-119-W22	W	
June	6/5/2006	2006-120-Q2	Q*	River channel and shoreline SW sampling.
	6/14/2006	2006-121-W24	W	
	6/20/2006	2006-122-W25	BW	
	6/28/2006	2006-123-W26	W	

## Notes:

M = monthly  
 Q = quarterly  
 W = weekly  
 BW = biweekly  
 A = annually  
 SW = surface water

\* Depth-specific river channel surface water sampling will be conducted on a quarterly basis after initial July 2005 event (see Section 5), and monthly during low water level periods (typically December through March). Low-water stage events will be evaluated based upon projected river levels.

Sampling events through June 20, 2005 have been completed, later sampling events are scheduled and subject to change.

Forecasted weekly contingency sampling to continue only under DTSC direction.

TABLE 5-1

Revision 1-7/13/05

Surface Water Sampling Analyses and Frequencies  
 Monitoring Plan for Groundwater and Surface Water Monitoring Program  
 PG&E Topock Compressor Station, Needles, California

Well ID	Analytical Parameters and Frequencies						
	Hexavalent Chromium	Total Chromium	Specific Conductance	pH	Hardness	TDS	TSS
<b>River Channel Surface Water</b>							
C-CON	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
C-I-3	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
C-NR1	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
C-NR3	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
C-NR4	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
C-R22	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
C-R27	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
C-TAZ	Q-M*	Q-M*	Q	Q	Q-M*	Q	Q
<b>Shoreline Surface Water</b>							
CON	Q - M	Q - M	Q	Q	---	---	---
I-3	Q - M	Q - M	Q	Q	---	---	---
NR-1	Q - M	Q - M	Q	Q	---	---	---
NR-2	Q - M	Q - M	Q	Q	---	---	---
NR-3	Q - M	Q - M	Q	Q	---	---	---
R-22	Q - M	Q - M	Q	Q	---	---	---
R-27	Q - M	Q - M	Q	Q	---	---	---
R-28	Q - M	Q - M	Q	Q	---	---	---
RRB	Q - M	Q - M	Q	Q	---	---	---

**Notes:**

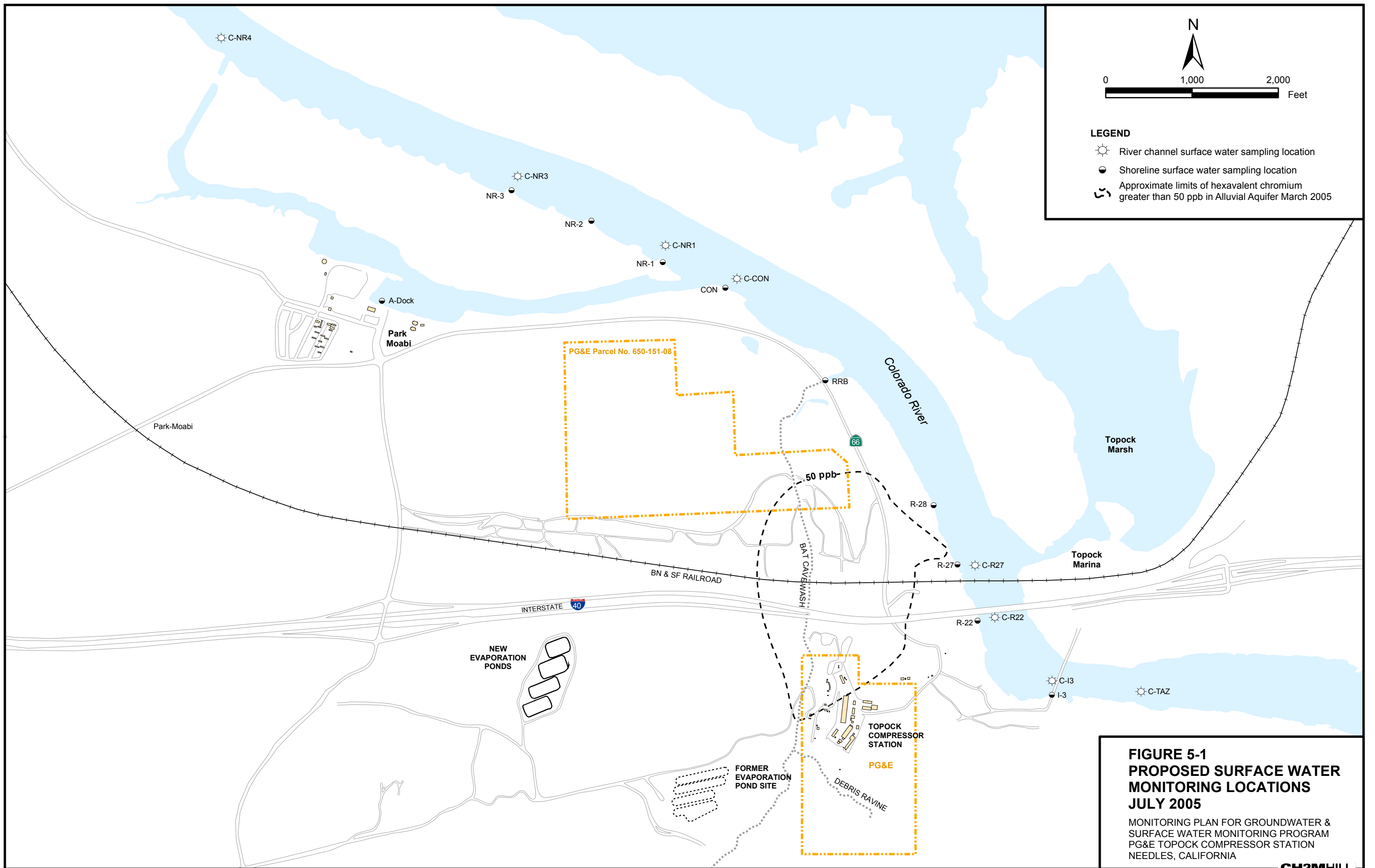
See Table 4-3 for list of methods and reporting limits.

M = monthly

Q = quarterly

--- = not applicable

\* Depth-specific river channel surface water sampling will be conducted on a quarterly basis after initial July 2005 event (see Section 5), and monthly during low water level periods (typically December through March). Low-water stage events will be evaluated based upon projected river levels.



**LEGEND**

- River channel surface water sampling location
- Shoreline surface water sampling location
- Approximate limits of hexavalent chromium greater than 50 ppb in Alluvial Aquifer March 2005

**FIGURE 5-1  
PROPOSED SURFACE WATER  
MONITORING LOCATIONS  
JULY 2005**

MONITORING PLAN FOR GROUNDWATER &  
SURFACE WATER MONITORING PROGRAM  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA

## SOP-A12

### Depth-Specific River Water Sampling Standard Operating Procedures for PG&E Topock Program

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This standard operating procedure (SOP) addresses the procedures and equipment to be used for river channel surface water sampling at the Topock site. This SOP should be used for depth-specific river channel surface water sampling stations on the Colorado River.

#### REQUIRED DOCUMENTS

- 1) Event-specific sampling and analysis plan (SAP).
- 2) Applicable project work plan or monitoring plan. Refer to Topock Program Sampling, Analysis, and Field Procedures Manual and QAPP (Field Procedures Manual), as required.
- 3) Topock Program Health and Safety Plan (HSP).
- 4) Blank sampling logs and field notebook.

#### PREPARATION & SETUP

- 1) Review event-specific SAP or event-specific field instructions, previous sampling logs, Field Procedures Manual, and HSP.
- 2) Initiate field logbook for sampling activity.
- 3) Inspect all equipment and calibrate field water quality (WQ) meters according to SOP-A9, *Calibration of Field Instruments*.
- 4) Inventory sample bottles, required analyses, and confirm the lab courier schedule.
- 5) Field-check and set up sampling equipment: WQ meters, health and safety apparatuses (life vest, rescue rope, life preserver), water depth meter or depth-finder, peristaltic pump, filters, sufficient tygon and silicone tubing, polypropylene rope, sampling equipment, etc.

#### SAMPLING PROCEDURES

- 6) Prepare river water sampling log (use attached form).
- 7) The sampling team will travel to each river sampling station in a motorized boat. A safety inspection of the boat will be performed by the field crew prior to boarding (check for fire extinguisher, etc.). Samples will be collected from selected stations on the river approximately one-third the river width from the California shoreline.
- 8) Collect an equipment blank sample prior to sampling by running deionized water through a new segment of tubing.
- 9) An industry standard (Trimble or similar) resource grade handheld DGPS unit (GeoXT or similar) will be used with real-time correction (wide area augmentation system) to

locate the river channel sampling stations within a 1 meter radius (68% of the time, commonly referred to as 1 sigma accuracy). At each location, two anchors should be positioned upstream at least 10 feet from each other (Attachment A). Record the GPS coordinates on the sampling log. In the event a sampling station is too shallow to safely approach by boat, the next closest location with adequate depth will be sampled and a remark noted on the sampling log with the new GPS coordinates.

- 10) Record the depth of the river at each sampling station using the depth-finder or a weighted tape. If a weighted tape is used, read the tape at the river water surface when the weight touches the river floor. Record river depth on the sample log.
- 11) Samples will be collected from three depths at each river channel sampling station: 1 foot from the bottom of the river, at the mid-point of the water column, and 1 foot from the water surface. Calculate the depth of the midpoint of the water column and record on the sample log.
- 12) Samples are to be collected using a variable-speed peristaltic pump with 3/4-inch tygon tubing attached to a weighted polypropylene rope (Attachment A) and a segment of silicone tubing for use in the peristaltic pump. Dedicated tubing will be used for each sample depth at each sample station. Once the sampling depths have been calculated for each station, pre-cut three pieces of tygon tubing and attach them to the rope so that their intakes are at the proper sampling depths. Lower the weighted rope and tubing until the weight touches the river bottom and the tubing intakes are at the correct depths. Confirm river depth using the depth-finder or weighted tape. Attach the discharge end of the sample tubing to the flow cell of the water quality meter. Start the peristaltic pump and allow the flow cell to fill and the water to equilibrate for approximately 3 minutes, or until the temperature readings remain stable for 30 seconds (+/- 1 °C). Record the time, pH, conductivity, turbidity, dissolved oxygen, temperature, salinity, TDS, and ORP on the field log. Note and provide qualifying remarks if parameter readings are anomalous or unstable due to an instrument problem. Turn off the peristaltic pump, remove tubing from the flow cell, and restart the pump. Attach a 0.45 micron filter when sampling for Cr(T) by USEPA Method 6010B or for Cr(VI) by USEPA Method 7199. Refer to SOP-A6 in the Field Procedures Manual for filtration procedures. Pump approximately 500 ml through the system and begin filling the applicable sample bottles. Remove the filter prior to filling sample bottles for the other analyses, which do not require filtration. Ensure that the samples do not contact any source of metal. Place the samples on ice immediately after collection. Record all sample information on the field log.
- 13) Collect remaining samples for analyses according to the event-specific SAP. Use a new piece of tygon tubing and change out the flexible silicone tubing in the peristaltic pump for each depth, at each location.
- 14) Follow the Field Procedures Manual for sample handling and management, equipment decontamination, and investigation-derived waste (IDW) management.

**Project Name** PG&E Topock GMP **Sampling Event** \_\_\_\_\_  
 Job Number \_\_\_\_\_ **Date** \_\_\_\_\_ Time of depth measurement \_\_\_\_\_  
 Field Team \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_\_ GPS Elevation \_\_\_\_\_  
 Field Conditions \_\_\_\_\_ Sample Location Total River Depth \_\_\_\_\_ River Water Column Mid-depth \_\_\_\_\_

**Sample ID** C-NR1-S **Sample Time** \_\_\_\_\_ **GPS Coordinates (measured):** \_\_\_\_\_  
**Depth to Sample:** \_\_\_\_\_ **Time:** \_\_\_\_\_ **Measure Point:** \_\_\_\_\_ **QC Sample No. and Type** \_\_\_\_\_ **QC Sample Time** \_\_\_\_\_  
**Water Level Meter Serial Number:** \_\_\_\_\_ **Water Quality Meter Serial Number:** \_\_\_\_\_ **Sampling Method:** \_\_\_\_\_

Sample Location (Upper, Mid, Lower)	Time		pH	Conductivity	Turbidity NTU	Diss. Oxygen mg/L	Temp. °C	Salinity %	TDS g/L	Eh / ORP mv	Comments (See descriptors below)

Observations: (i.e. low water level, sand bank present, etc..) \_\_\_\_\_  
 Remarks \_\_\_\_\_  
**Color:** clear, grey, yellow, brown, black, cloudy, green **Odor:** none, sulphur, organic, other **Solids:** Trace, Small Qu, Med Qu, Large Qu, Particulate, Silt, Sand

**Sample ID** C-NR1-M **Sample Time** \_\_\_\_\_ **GPS Coordinates (measured):** \_\_\_\_\_  
**Depth to Sample:** \_\_\_\_\_ **Time:** \_\_\_\_\_ **Measure Point:** \_\_\_\_\_ **QC Sample No. and Type** \_\_\_\_\_ **QC Sample Time** \_\_\_\_\_  
**Water Level Meter Serial Number:** \_\_\_\_\_ **Water Quality Meter Serial Number:** \_\_\_\_\_ **Sampling Method:** \_\_\_\_\_

Sample Location (Upper, Mid, Lower)	Time		pH	Conductivity UNITS	Turbidity NTU	Diss. Oxygen mg/L	Temp. °C	Salinity %	TDS g/L	Eh / ORP mv	Comments (See descriptors below)

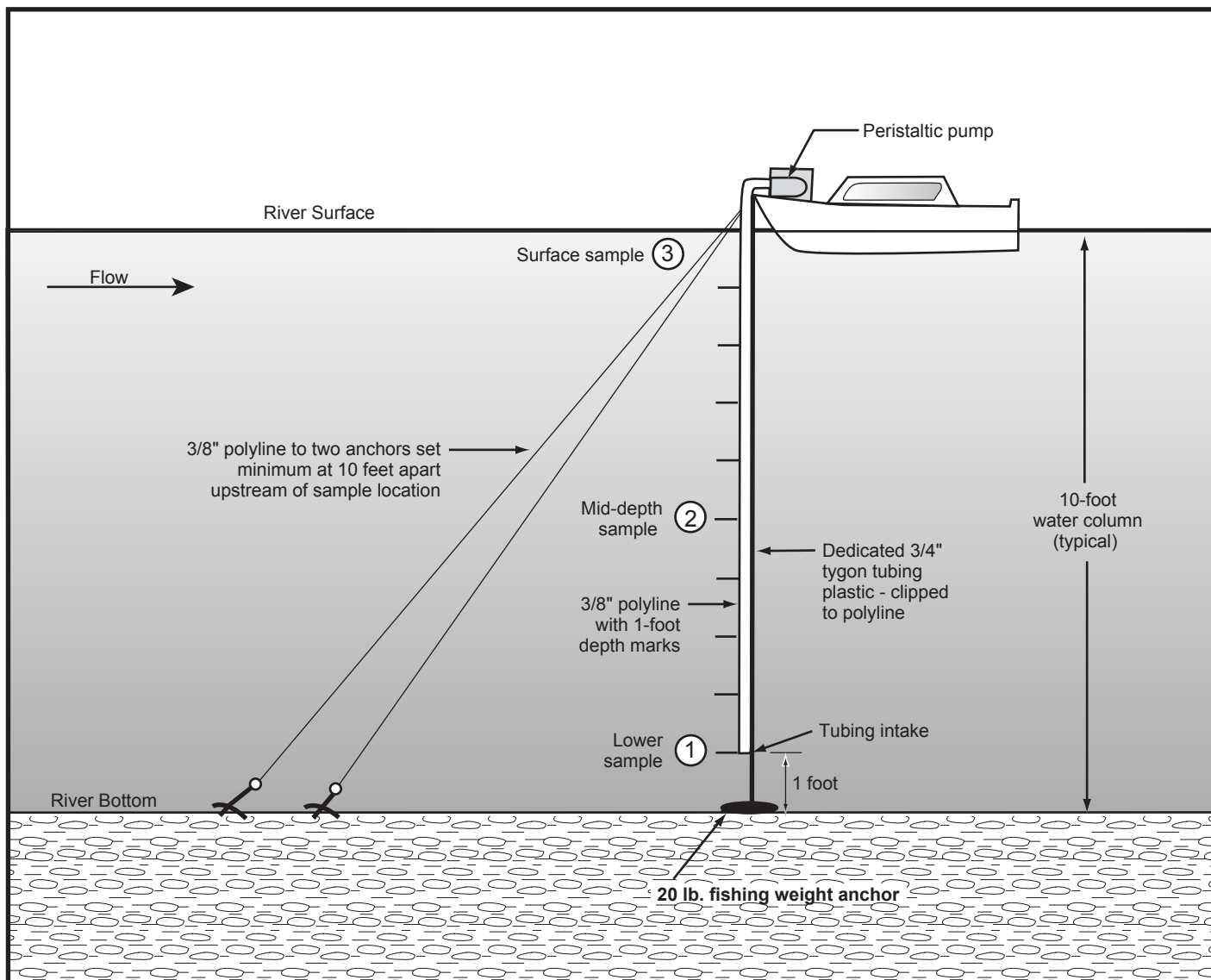
Observations: (i.e. low water level, sand bank present, etc..) \_\_\_\_\_  
 Remarks \_\_\_\_\_  
**Color:** clear, grey, yellow, brown, black, cloudy, green **Odor:** none, sulphur, organic, other **Solids:** Trace, Small Qu, Med Qu, Large Qu, Particulate, Silt, Sand

**Sample ID** C-NR1-D **Sample Time** \_\_\_\_\_ **GPS Coordinates (measured):** \_\_\_\_\_  
**Depth to Sample:** \_\_\_\_\_ **Time:** \_\_\_\_\_ **Measure Point:** \_\_\_\_\_ **QC Sample No. and Type** \_\_\_\_\_ **QC Sample Time** \_\_\_\_\_  
**Water Level Meter Serial Number:** \_\_\_\_\_ **Water Quality Meter Serial Number:** \_\_\_\_\_ **Sampling Method:** \_\_\_\_\_

Sample Location (Upper, Mid, Lower)	Time		pH	Conductivity UNITS	Turbidity NTU	Diss. Oxygen mg/L	Temp. °C	Salinity %	TDS g/L	Eh / ORP mv	Comments (See descriptors below)

Observations: (i.e. low water level, sand bank present, etc..) \_\_\_\_\_  
 Remarks \_\_\_\_\_  
**Color:** clear, grey, yellow, brown, black, cloudy, green **Odor:** none, sulphur, organic, other **Solids:** Trace, Small Qu, Med Qu, Large Qu, Particulate, Silt, Sand





### River Channel Water Sampling Locations

- ① Lower sample collected at one foot above river bottom.
- ② Mid-depth sample collected at mid-depth of river water column.
- ③ Surface sample collected at one foot below water surface.

Notes:

See SOP-A12 for other sampling details

**ATTACHMENT A (SOP-A12)  
DEPTH-SPECIFIC RIVER WATER  
SAMPLING METHOD**  
MONITORING PLAN FOR GROUNDWATER &  
SURFACE WATER MONITORING PROGRAM  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA