



**Pacific Gas and
Electric
Company**

Yvonne Meeks
Manager

Environmental Remediation
Gas T&D Department

Mailing Address
4325 South Higuera Sreet
San Luis Obispo, CA 93401
Location
6588 Ontario Road
San Luis Obispo, CA 93405
Tel: (805) 234-2257
Email: yjm1@pge.com

January 4, 2008

Mr. Aaron Yue
Project Manager
California Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Subject: Hexavalent Chromium Holding Time Study Results

Dear Mr. Yue:

This letter transmits the results of a study of the effects of laboratory holding times on hexavalent chromium concentrations in groundwater samples collected from the PG&E Topock site in May and October 2007. Based on the results of the study which show no significant difference between samples analyzed within 24 hours and samples held up to 21 days, PG&E requests that DTSC allow the change in analytical method for groundwater and surface water sampling at all Topock programs to EPA Method 218.6 and Standard Method 3500-Cr B that allow the longer holding time for hexavalent chromium analysis. PG&E will continue to use the current more frequent matrix spike protocol developed to allow detection of matrix interference specific to the Topock site.

EPA Method 218.6 and Standard Method 3500-Cr B are analytically equivalent to the SW-846 Method 7199 and SW-846 Method 7196A, currently used at Topock. Both are approved by the EPA for holding times of up to 28 days. Use of these longer holding times can significantly improve the efficiency of the Topock monitoring programs.

PG&E requests DTSC approval to implement the alternative analytical methods by February 15, 2008 so the new analytical methods and longer holding times could be implemented in the quarterly sampling event, scheduled for the first week in March, 2008.

PG&E appreciates your consideration of the results of the study and proposed analytical change described in this letter. Please contact me at (805) 234-2257 with any questions or concerns.

Sincerely,

Yvonne Meeks
Topock Project Manager

cc: Chris Guerre/DTSC
Karen Baker/DTSC

Hexavalent Chromium Holding Time Study Results

PREPARED FOR: Pacific Gas and Electric Company

DATE: January 4, 2008

Introduction

On March 12, 2007 the U.S. Environmental Protection Agency (EPA) issued its final rule modifying analytical testing procedures approved for analysis and sampling under the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) (EPA 2007). These regulations became effective on April 11, 2007. One of the changes included in the new regulations provides for a 28-day holding time (HT) for all hexavalent chromium [Cr(VI)] analytical methods covered under authority of the 40 CFR Part 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants). Prior to this ruling, Cr(VI) HT for these methods had been 24 hours.

To date, most Cr(VI) analyses of groundwater, surface water, and pore water samples from the Pacific Gas & Electric Company (PG&E) Topock site have been performed using SW-846 Method 7199 or SW-846 Method 7196A, per PG&E's consent agreement with the California Department of Toxic Substance Control (DTSC). Historically, there were only very minor differences in procedures between SW-846 Method 7199 and EPA Method 218.6, and between SW-846 Method 7196A and Standard Method 3500-Cr B. Historically, these methods have been considered equivalent to one another and were often used interchangeably. As a result of the recent EPA rule, the primary difference between the SW-846 and CWA/SDWA approved methods is the 24-hour HT (SW-846) vs. 28-day HT (CWA/SDWA approved).

As a result of the EPA rule discussed above, this Hexavalent Chromium Holding Time Study was initiated to evaluate the prospect of using the methods covered under authority of 40 CFR Part 136 with a 28-day Cr(VI) HT for future samples collected from the PG&E Topock site. The study was performed by analyzing groundwater samples collected from the site for Cr(VI) subjected to varying HTs.

Study Methods

To evaluate the effects of HT on Cr(VI) concentrations, a set of samples was collected and analyzed twice. The first analysis occurred within the currently required 24-hour HT. Ammonium sulfate buffer (preservative) was added to the sample bottle and the bottle was held at the lab. A second aliquot, taken from the same sample bottle, was analyzed after 7 to 21 days.

The samples were collected during two different routine sampling rounds. A total of approximately 30 samples for SW-846 Method 7199 and 30 for SW-846 Method 7196A were desired to provide an adequate number of samples for statistical analysis. The sample locations were selected using three criteria:

1. Only locations scheduled to be sampled during the regular May and/or October 2007 sampling events were included.
2. Wells were selected to cover a wide range of Cr(VI) concentrations, between less than 0.2 parts per billion (ppb) to 14,800 ppb. Only two wells with historical non-detect Cr(VI) results were included in the study.
3. Locations were chosen so as not to be concentrated in one area, but rather scattered evenly across the site.

Prior to sample collection, the laboratory (Truesdail Laboratories, Inc., 14201 Franklin Avenue, Tustin, CA) was notified as to which samples would be included in the Holding Time Study. Samples were collected using the standard protocols established for the Topock Groundwater and Surface Water Monitoring Program (GMP) program (not field filtered or preserved). Once the samples arrived in the lab, they were analyzed using standard Topock protocols for the specific methods (see PG&E Topock Quality Assurance Project Plan [QAPP] [CH2M HILL, 2005]), then filtered and preserved with ammonium sulfate buffer and stored at 4° C for 7 to 21 days. All Topock-specific quality control (QC) parameters were followed on the original analysis. At the end of the storage time the samples were removed from the refrigerator, allowed to equilibrate to ambient room temperature, pH adjusted as needed for the method, and analyzed using the specific method QC criterion.

Results and Evaluation

The laboratory analytical data included in the Holding Time Study, May and October 2007, were independently reviewed by project chemists to assess data quality and identify deviations from analytical requirements. With the exception of the HT exceedance, which was the purpose of the study, all the analyses and data quality met the PG&E Topock QAPP and laboratory method quality control criteria. The data for SW-846 Method 7199 are presented in Table 1 and Figure 1. Note that SW-846 Method 7199 is the analytical equivalent to EPA Method 218.6, which currently has an HT of 28 days. The data for SW-846 Method 7196A are presented in Table 2 and Figure 2. Note that SW-846 Method 7196A is the analytical equivalent to Standard Method 3500-Cr B, which currently has an HT of 28 days.

Data Summary

- The average Relative Percent Difference (RPD) between samples analyzed within 24 hours and samples held from 7 to 21 days was in the range of 4 percent to 5 percent.
- EPA acceptable precision criterion for duplicate samples analyzed using SW-846 Method 7199 during the same sample run is ≤ 20 percent RPD.
- Even though the Holding Time Study sample pairs were analyzed during different sample runs and should therefore have somewhat more variability than samples analyzed during the same sample run, only two samples out of 61 exceed the 20 percent RPD criterion for duplicate samples (20.4 percent and 22.2 percent). In both cases the higher Cr(VI) value was associated with the longer HT.
- Correlation coefficient (R^2) values of 0.997 and 0.998 indicate a very close correlation between the short HT and long HT sample sets.

Conclusions and Recommendations

The data from this Holding Time Study indicate no significant difference between Cr(VI) results in samples analyzed within 24 hours and samples held up to 21 days. Based on the Cr(VI) Holding Time Study's results, PG&E is requesting approval from the DTSC to switch to the Cr(VI) methods approved by the EPA (2007) with longer HTs. Use of longer HTs will increase the efficiency of the sampling programs at the Topock site by eliminating the need for daily couriers and after-hours work at the lab to meet the current 24-hour HT requirement. It will also allow much more opportunity for re-analysis of samples for which QA/(QC) criteria are not met or which produce anomalous results.

References

- CH2M HILL. 2005. Quality Assurance Project Plan, PG&E Topock Program, Revision 2, March 31.
- EPA 2007. 40 CFR Part 122, 136, 141, 143, 430, 455, and 465. Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Analysis and Sampling Procedures; Final Rule. March 12.

TABLE 1
 PG&E Hexavalent Chromium Holding Time Study - May & October Quarterly Sampling Events- SW-846 Method 7199

Sample Location	Sample Date	Sample Result < 24 Hr Holding Time (ppb)	Sample Result 7 – 21-day Holding Time (ppb)	Date of Second Analysis	Days Sample Held Between Analysis	Relative Percent Difference (RPD)
CW-02D	04-May-07	1.8	1.8	11-May-07	7	0.00
CW-02D	18-Oct-07	1	1	25-Oct-07	7	0.00
MW-14	02-Oct-07	27.2	29.8	19-Oct-07	17	9.12
MW-15	02-Oct-07	12.2	12.7	19-Oct-07	17	4.02
MW-16	02-Oct-07	8.8	9.1	19-Oct-07	17	3.35
MW-27-085	01-May-07	ND	ND	11-May-07	10	0.00
MW-27-085	02-Oct-07	1	1	23-Oct-07	21	0.00
MW-31-135	01-May-07	46.1	48.5	11-May-07	10	5.07
MW-31-135	01-Oct-07	33.2	33.3	19-Oct-07	18	0.30
MW-32-035	30-Apr-07	ND	ND	11-May-07	11	0.00
MW-33-090	02-May-07	18.8	18	11-May-07	9	4.35
MW-33-090	05-Oct-07	18.2	18.6	23-Oct-07	18	2.17
MW-33-150	02-May-07	6.8	6	11-May-07	9	12.50
MW-33-150	09-Oct-07	8.9	9.1	23-Oct-07	14	2.22
MW-33-210	02-May-07	9.2	8.6	11-May-07	9	6.74
MW-33-210	05-Oct-07	11.9	12.5	23-Oct-07	18	4.92
MW-34-100	30-Apr-07	626	576	11-May-07	11	8.32
MW-34-100	03-Oct-07	521	520	23-Oct-07	20	0.19
MW-35-060	01-Oct-07	24.8	26	19-Oct-07	18	4.72
MW-35-135	04-May-07	27.2	24.6	11-May-07	7	10.04
MW-35-135	01-Oct-07	32.4	36.1	19-Oct-07	18	10.80
MW-36-090	02-May-07	2	1.8	11-May-07	9	10.53
MW-36-090	09-Oct-07	3.2	3.1	23-Oct-07	14	3.17
MW-40D	04-May-07	78	67	11-May-07	7	15.17
MW-40D	04-Oct-07	112	115	23-Oct-07	19	2.64
MW-44-115	04-May-07	1080	1080	11-May-07	7	0.00
MW-44-115	04-Oct-07	763	775	23-Oct-07	19	1.56
MW-44-125	03-May-07	254	272	11-May-07	8	6.84
MW-46-175	04-May-07	86.4	106	11-May-07	7	20.37
MW-46-205	04-May-07	3.7	4	11-May-07	7	7.79
MW-47-055	04-May-07	30.3	32.4	11-May-07	7	6.70
MW-47-115	04-May-07	14.1	13.9	11-May-07	7	1.43
Count =				32	Average RPD	5.16

TABLE 2
 PG&E Hexavalent Chromium Holding Time Study - May & October Quarterly Sampling Events- SW-846 Method 7196A

Sample Location	Sample Date	Sample Result < 24 Hr Holding Time (ppb)	Sample Result 7 - 21 day Holding Time (ppb)	Date of Second Analysis	Days Sample Held Between Analysis	Relative Percent Difference (RPD)
MW-09	04-Oct-07	304	306	23-Oct-07	19	0.66
MW-10	03-May-07	1230	1100	14-May-07	11	11.16
MW-10	02-Oct-07	1010	1050	23-Oct-07	21	3.88
MW-11	03-May-07	350	344	14-May-07	11	1.73
MW-12	03-May-07	2620	2650	14-May-07	11	1.14
MW-12	04-Oct-07	2830	2940	23-Oct-07	19	3.81
MW-19	02-May-07	836	787	14-May-07	12	6.04
MW-19	05-Oct-07	1390	1420	23-Oct-07	18	2.14
MW-20-070	03-May-07	2790	2880	14-May-07	11	3.17
MW-20-070	11-Oct-07	2400	2370	23-Oct-07	12	1.26
MW-20-100	03-May-07	10100	10300	14-May-07	11	1.96
MW-20-100	10-Oct-07	9000	8920	23-Oct-07	13	0.89
MW-20-130	03-May-07	13400	14800	14-May-07	11	9.93
MW-20-130	05-Oct-07	12200	12300	23-Oct-07	18	0.82
MW-25	02-Oct-07	895	971	23-Oct-07	21	8.15
MW-31-060	04-Oct-07	726	709	23-Oct-07	19	2.37
MW-36-100	02-May-07	297	313	14-May-07	12	5.25
MW-36-100	10-Oct-07	228	285	23-Oct-07	13	22.22
MW-37D	03-May-07	1350	1390	14-May-07	11	2.92
MW-37D	04-Oct-07	834	823	23-Oct-07	19	1.33
MW-39-080	03-May-07	156	153	14-May-07	11	1.94
MW-39-100	03-May-07	2670	2720	14-May-07	11	1.86
MW-39-100	10-Oct-07	1660	1710	23-Oct-07	13	2.97
MW-45-095A	04-May-07	169	169	14-May-07	10	0.00
MW-50-095	04-Oct-07	217	223	23-Oct-07	19	2.73
MW-50-200	30-Apr-07	10900	11300	14-May-07	14	3.60
MW-50-200	04-Oct-07	9430	9580	23-Oct-07	19	1.58
MW-51	01-May-07	4670	4980	14-May-07	13	6.42
MW-51	05-Oct-07	4500	4480	23-Oct-07	18	0.45
		Count =	29	Average RPD		3.87

