CSSA B-3 BIOREACTOR OPERATIONS PERFORMANCE STATUS REPORT (QUARTER 6, MONTHS 16 – 18, AUGUST – OCTOBER, 2008)

JANUARY 6, 2009

This status report summarizes the operation of a bioreactor at Solid Waste Management Unit (SWMU) B-3 from August 1, 2008 through October 31, 2008; comprising the sixth quarter of bioreactor operations and monitoring since system start-up. This status report includes descriptions of current conditions, field observations, analytical results, and an anticipated schedule of activities for the next reporting period. Analytical results from monthly and quarterly regulatory and performance sampling through July 2008 are attached for reference. Parsons site personnel working on this project during the reporting period include Ken Rice, Kyle Caskey, Samantha Elliott, Eric Tennyson, Adrien Lindley, Julie Bouch, Michael Zugelder, and Edward Galbavy.

Executive Summary

Site conditions were normal for this time of year with moderate temperatures and nearly 5 inches of precipitation through the quarter. Injection of extracted groundwater continued through most of the quarter. The few interruptions resulted from ground water levels reaching the automatic cut-off water levels in the extraction wells. Approximately 10,523,698 gallons of groundwater extracted from CS-MW16-LGR and CS-MW16-CC have been injected into bioreactor trench 1 since the start of injection. A total of 2,351,890 gallons of extracted groundwater from wells CS-MW16-LGR and CS-MW16-CC were injected into the bioreactor during quarter 6. The majority of extracted groundwater, ~1,550,000 gallons, was from the CS-MW16-CC well, while ~800,000 gallons were extracted from the CS-MW16-LGR well. By letter dated July 31, 2008, the TCEQ authorized CSSA's request for reduced data collection and reporting requirements on the SWMU B-3 Bioreactor Class V Underground Injection Control (UIC) permit. The UIC reporting requirements are now on a semi-annual basis with the next report due June, 2009. The UIC report containing Quarter 5 and 6 data were delivered to the TCEQ on December 3, 2008.

Data from monitoring efforts indicate that the B-3 bioreactor has continued to maintain appropriate geochemical conditions for effective anaerobic dechlorination of chlorinated aliphatic hydrocarbons (CAHs). Geochemical parameters indicating optimal conditions include the following:

- Concentrations of dissolved oxygen (DO) are generally less than 0.5 milligrams per liter (mg/L) and oxidation-reduction potential (ORP) values are less than -100 millivolts (mV), indicating an anaerobic environment conductive to dechlorination of CAHs within the trenches;
- Production of methane indicating that fermentation is occurring; and
- Hydrogen concentrations are greater than 1.0 nanomoles per liter (nmol/L), indicating that there is sufficient electron donor present to stimulate anaerobic dechlorination of CAHs.

Analytical results for samples collected in trench 1 sumps provide evidence that biotic and abiotic dechlorination of trichloroethene (TCE) is occurring. The consistent presence of the end product ethene provides evidence that the biotic reductive dechlorination process appears to be the major pathway for degradation of CAHs within trench 1. Additionally, two other degradation mechanisms, both biotic and abiotic, appear to be occurring within trench 1.

It appears that biotic anaerobic oxidation of CAHs to carbon dioxide may be occurring with Mn (IV) as the terminal electron acceptor. This degradation pathway reaction results in the production of the reduced form of manganese [Mn (II)]. The detections of high concentrations of Mn(II) in trench 1 may be the result of this biotic process.

Evidence for the existence of an abiotic reductive dechlorination is the presence of reduced iron [Fe(II)] and trans-DCE in trench 1. Although evidence suggests this degradation pathway exists, it may not be a significant contributor to the overall degradation of contaminants.

Summary of Bioreactor Operation

Initial baseline and quarter 1 through quarter 6 analytical results from monitoring of the bioreactor sumps indicate that the SWMU B-3 trenches contain significant levels of *cis*-DCE as well as concentrations of other dechlorination products (e.g., VC, ethene). In addition, minor amounts of toluene, and other fuel related compounds were identified during monitoring of bioreactor trench 1 sumps during the quarter. A summary of the analytical data collected for the reporting period is included in Table 1. A summary of monthly and quarter 6 monitoring results from the surrounding wells and bioreactor trench sumps are attached, analytical results of the surrounding SWMU B-3 multi-port monitoring wells (MPMW or Westbay®) and monitoring wells are also attached.

Results of VOC analysis from monitoring data indicate that groundwater from the uppermost saturated zones of the Westbay® wells CS-WB05 and CS-WB07 contain < 100 micrograms per liter (µg/L) of PCE, TCE, and *cis*-DCE and groundwater from CS-MW16-LGR and the uppermost saturated zones of the Westbay® wells CS-WB06 and CS-WB08 contain > 100 micrograms per liter (µg/L) of TCE and *cis*-DCE. CS-WB06 and CS-WB08 contain < 100 micrograms per liter (µg/L) of PCE and CS-MW16-LGR contains > 100 micrograms per liter (µg/L) of PCE. Quarterly data from the bioreactor trench sumps indicate that contaminant mass stable or decreasing slightly, as *cis*-DCE concentrations have remained low and significant VC and ethene concentrations in the trench sumps have been maintained.

Water quality field measurements from the bioreactor sumps generally indicate that DO remains low (< 0.5 mg/L), ORP averages less than -250 mV, pH ~ 6.7, temperatures range from 24 ^{o}C to 26 ^{o}C, and specific conductivity ranges from 0.565 to 1.011 millisiemens per centimeter (mS/cm). Other observations regarding the data collected during this reporting period are listed below.

Through the 6th quarter, 4.86 inches of precipitation were measured at the B-3 bioreactor site. Average water thickness in Trench 1 during this period is approximately 4 feet.

Attached are graphs including a cumulative total volume of recovered groundwater from CS-MW16-LGR and CS-MW16-CC applied into trench 1, the B-3 Trench 1 average water thickness with rainfall data and average water applied daily to trench 1, the CVOC concentrations in CS-MW16-LGR, and the water level elevations in the defined uppermost saturated zone (zone LGR-03B) of the B-3 multi-port monitoring wells with rainfall data.

Analytical Data Observations

1. Arsenic (As) and manganese (Mn) were reported in bioreactor trench water samples at concentrations ranging from Non-Detect (ND) to 6.2 µg/L for As (MCL is 10 µg/L) and from 172 to 606 µg/L for Mn (MCL is 50 µg/L). Elevated levels of Mn and As were reported in only one of the surrounding monitoring wells during this quarter (CS-B3-MW01) with a Mn of 438 µg/L, and an As of 16.5 µg/L. Elevated levels of Mn were reported in CS-WB06-UGR (1450 µg/L); all other zones reported Mn levels below the MCL and no elevated levels of As were reported in any other of the MPMW zones. The elevated levels are likely due to changing pH conditions of the groundwater and the reduction of naturally occurring As and Mn within the limestone media to more soluble forms. Additionally, the biotic anaerobic oxidation pathway of

CAHs may also be contributing to the elevated levels of Mn within the treatment system.

2. DO and ORP values remain favorable for the reduction of CAHs even with the increased volume of water applied via the continuous operation of the automated injection system, indicating that anaerobic reducing conditions were maintained.
3. The volatile organic compound summary for the trenches indicate a transition from a predominately two-component (VC and cis-DCE) to a three-component (VC, DCE isomer, and ethene) chemical composition in water collected from the trench sumps. This transition indicates the further reduction of contaminants along the degradation pathway toward the end product ethene. Total molar concentrations in the trench sumps remain stable or decreased slightly through the quarter. The trans-DCE isomer in trench 1 is theorized to be the result of an abiotic reductive dechlorination pathway.
4. The dissolved hydrogen concentration in trench 1 sump samples was in the range consistent with reductive dechlorination of CAHs by DHC.
5. Saturated conditions are being maintained within bioreactor Trench 1 with an average water thickness for the quarter of approximately 4 feet. However, pumping rates to the bioreactor have been steadily decreasing.
6. Water Supply issues – Due to continuing drought conditions and decreases in water table elevations, it is likely that the volume of injection water from CS-MW16 wells will decrease. The low-level cut-offs have been reached for both CS-MW16-CC and LGR wells, causing the extraction wells to cut out intermittently.

Anticipated Schedule for Next Period (November 2008 – January, 2009):

- Continue monitoring and maintenance activities for delivery of groundwater to the bioreactor trenches.
- Monthly monitoring events in November and December (Months 19 and 20), and quarterly monitoring event in January (Month 21) for bioreactor system.
- Continue UIC monthly monitoring with semi-annual reporting due June, 2009.
- Anticipate start of new extraction well construction for delivery of additional water to the bioreactor during January 2009. Additionally, plans are being prepared to install six shallow monitoring wells near the bioreactor.
- Planning a water pressure “tracer” test which would inject large quantity of water into selected trenches and monitoring of water levels in trench sumps, Westbay® wells, and surrounding monitoring wells.

Specific Data Observation Notes for Attachments

- Analytical results from the B-3 Trench 1 Sump samples, shown in Table 6.1.2, present data from the quarter 6 sampling events.
- Table 6.1.1 indicates a water thickness of approximately 4 feet in trench 1 was maintained.
- Table 6.1.2 indicates that VC was present at moderate to high concentrations in trench 1 sumps (between 7.7 and 74 µg/L) and Ethene was observed in concentrations ranging from ND to 9.17 µg/L.
- Table 6.1.3 indicates that Mn(II) and Fe(II) were present at concentrations consistent with alternative degradation pathways.
- Table 6.3.3 indicates that vinyl chloride was present (2.2 µg/L) in the sample taken from monitoring well CS-B3-MW01, which remains consistent with samples collected through the previous 15 months. Additionally, table provides evidence of the biotic anerobic degradation pathway with the elevated concentrations of Mn and CO_2.
- Table 6.4.4 indicates that the *Dehalococcoides* (DHC) bacteria populations decreased slightly from month 15 through the quarter in trench 1 sump 2.
- The changes in molar fraction and total molar concentrations shown in graphs of quarter 6 trench 1 sumps indicate a continued reduction in contaminant mass to end products VC and ethene.
- Figure 6.2.5 shows that the water levels in Westbay wells are significantly influenced by precipitation, or lack there of, and pumping at CS-MW16-LGR.
- Figure 6.3.3 shows CS-MW16-LGR well CVOC concentrations over several years with bioreactor injection volume and rainfall amounts. Observations are included on the figure.

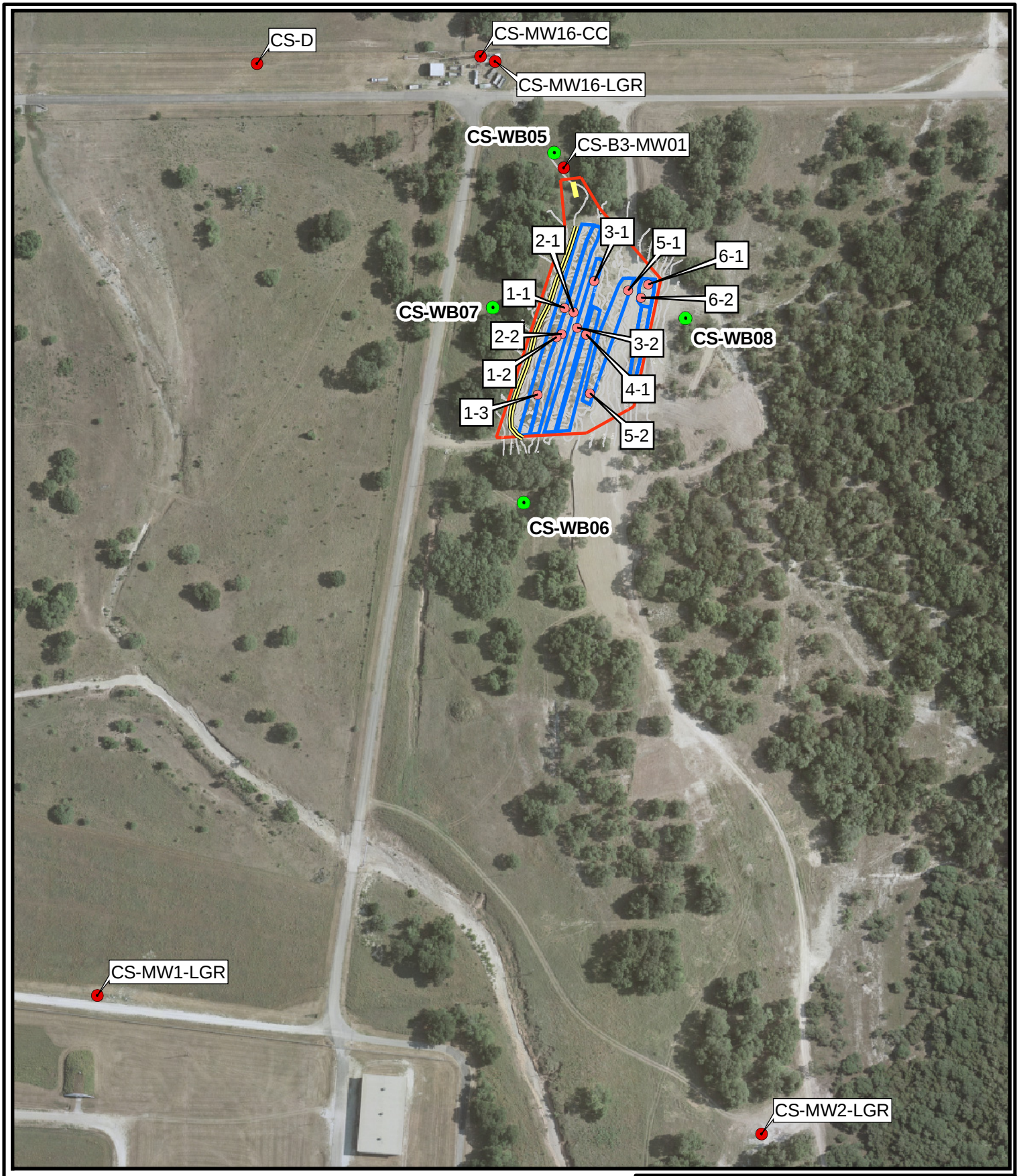

Figure 1

B-3 Bioreactor System
Camp Stanley Storage Activity

P a r s o n s

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Analytical Summary Data

Table 1 Summary of Analysis Presented for Reporting Period

Event	VOCs	TDS	TOC	DOC	MEE & CO_2	SO_3^-	Chloride, Sulfate	Alkalinity	N, NO_3 & NO_2	Fe^{2+}	Mn	Metals	H^+	DHC
Monthly Sampling[a] (16)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monthly Sampling (17)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quarterly Sampling[b] (6)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

a - Monthly sampling includes samples from B3-trench sumps, the uppermost saturated intervals of the multi-port wells (Zone 03B) and B3-UIC samples.
b - Quarterly sampling includes samples from B3-trench sumps, Monitoring Wells, and Multi-port (Westbay) wells and monthly samples.

Key for table/figure numbering	
First digit (Sample Event)	0 = Baseline 1 = Quarter 1 (or baseline through quarter 1) 2 = Quarter 2 3 = Quarter 3 4 = Quarter 4 5 = Quarter 5 6 = Quarter 6
Second digit (Well/Sump Sampled)	1 = Trench Sumps 2 = Westbay Wells 3 = Monitoring Wells 4 = Combination of Wells and Sumps 5 = Injection System 6 = Extraction Wells
Third digit (Sampled for)	1 = Field Parameters 2 = VOC Analytical Data 3 = Other Analytical Data 4 = Microbial Data 5 = Applied Water Volume 6 = System Physical Parameters
Third digit qualifier (Westbay Identifier)	a = CS-WB05 b = CS-WB06 c = CS-WB07 d = CS-WB08

Table 0 **COC MCLs**

COC	MCL (mg/L)	MCL (µg/L)	Type
Arsenic	0.01	10	Metal
Manganese	0.05	50	
cis -Dichloroethene	0.07	70	Organic Compound
trans -Dichloroethene	0.1	100	
Trichloroethene	0.005	5	
Tetrachloroethene	0.005	5	
Vinyl Chloride	0.002	2	

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 1 Sump 1-1								
Sump Depth:		12.9 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	10.52	6.39	25.77	0.996	0.50	-295.1	2.38
8/13/2008	1008	9.73	6.44	26.30	0.989	0.48	-319.7	3.17
8/20/2008	858	9.56	6.43	25.13	0.663	0.59	-248.8	3.34
8/26/2008	1027	9.55	6.55	25.23	0.92	0.64	-260.3	3.35
9/4/2008	1500	11.32	6.76	25.65	1.008	0.98	-236.4	1.58
9/11/2008	1530	9.72	6.58	25.34	0.704	0.41	-246.6	3.18
9/18/2008	815	8.32	6.69	25.10	0.969	0.62	-241.2	4.58
9/24/2008	830	7.80	6.76	25.19	0.587	0.48	-230.3	5.10
9/30/2008	1030	8.07	6.81	25.40	0.936	0.67	-238.7	4.83
10/6/2008	1055	8.03	6.60	25.16	0.872	0.63	-225.5	4.87
10/14/2008	830	8.23	6.61	24.89	0.915	0.52	-241.4	4.67
10/22/2008		8.54	6.60	24.38	0.884	1.01	-182.0	4.36
10/29/2008	1000	8.26	6.69	24.75	0.804	0.63	-227.1	4.64

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 1 Sump 1-2								
Sump Depth:		12.4 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	10.20	6.45	25.44	1.032	0.47	-273.3	2.20
8/13/2008	1008	9.36	6.51	25.63	1.001	0.47	-303.1	3.04
8/20/2008	858	9.10	6.57	24.87	0.628	0.44	-276.9	3.30
8/26/2008	1027	9.12	6.66	25.33	0.916	0.41	-230	3.28
9/4/2008	1500	10.47	6.76	25.47	0.999	0.73	-206.9	1.93
9/11/2008	1530	9.34	6.66	25.11	0.702	0.44	-219.4	3.06
9/18/2008	815	7.96	6.84	24.73	0.908	0.58	-230.2	4.44
9/24/2008	830	7.54	6.82	25.48	0.642	0.33	-257.2	4.86
9/30/2008	1030	7.70	6.94	24.54	0.824	0.53	-246.1	4.70
10/6/2008	1055	7.65	6.73	24.88	0.832	0.53	-258.3	4.75
10/14/2008	830	7.87	6.68	25.51	0.851	0.44	-251.7	4.53
10/22/2008		8.18	6.76	24.53	0.838	0.60	-243.6	4.22
10/29/2008	1000	7.86	6.81	23.85	0.831	0.38	-268	4.54

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 1 Sump 1-3								
Sump Depth: 12.85 *feet BTOC*								
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	10.00	6.46	26.78	1.005	0.42	-231.8	2.85
8/13/2008	1008	9.14	6.47	26.44	0.992	0.47	-282.2	3.71
8/20/2008	858	8.84	6.52	25.61	0.629	0.39	-245.9	4.01
8/26/2008	1027	8.95	6.67	25.10	0.796	0.39	-237.0	3.90
9/4/2008	1500	10.15	6.78	25.53	0.944	0.64	-202.6	2.70
9/11/2008	1530	9.02	6.65	26.12	0.609	0.42	-227.2	3.83
9/18/2008	815	7.78	6.92	24.88	0.680	0.60	-218.8	5.07
9/24/2008	830	7.42	7.01	25.58	0.467	0.29	-265.9	5.43
9/30/2008	1030	7.58	7.17	24.50	0.668	0.46	-262.8	5.27
10/6/2008	1055	7.50	6.98	24.42	0.626	0.49	-272.3	5.35
10/14/2008	830	7.82	6.98	24.53	0.657	0.44	-269.9	5.03
10/22/2008		8.02	6.99	23.92	0.670	0.41	-296.1	4.83
10/29/2008	1000	7.75	7.04	23.55	0.627	0.43	-309.9	5.10

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 2 Sump 2-1								
Sump Depth:		9.67 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	9.15	6.43	33.31	1.179	0.50	-271.1	0.52
8/13/2008	1008	9.02	6.46	33.52	1.159	0.58	-200.9	0.65
8/20/2008	858	8.99						0.68
8/26/2008	1027	9.08	6.64	33.55	1.130	0.46	-195.5	0.59
9/4/2008	1500	9.19						0.48
9/11/2008	1530	9.4						0.27
9/18/2008	815	9.5						0.17
9/24/2008	830	9.5						0.17
9/30/2008	1030	9.52						0.15
10/6/2008	1055	9.51						0.16
10/14/2008	830	9.53						0.14
10/22/2008		9.38						0.29
10/29/2008	1000	9.4						0.27

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 2 Sump 2-2								
Sump Depth:		10.01 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	9.58	6.56	31.55	1.144	0.37	-254.9	0.43
8/13/2008	1008	9.52	6.50	31.92	1.134	0.47	-272.9	0.49
8/20/2008	858	9.37						0.64
8/26/2008	1027	9.34	6.70	32.22	1.213	0.43	-240.0	0.67
9/4/2008	1500	9.55						0.46
9/11/2008	1530	9.61						0.40
9/18/2008	815	9.62						0.39
9/24/2008	830	9.71						0.30
9/30/2008	1030	9.72						0.29
10/6/2008	1055	9.74						0.27
10/14/2008	830	9.74						0.27
10/22/2008		9.75						0.26
10/29/2008	1000	9.77						0.24

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 3 Sump 3-1								
Sump Depth:		9.96 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	9.96						0.00
8/13/2008	1008	8.70	6.56	34.32	1.335	0.47	-287.9	1.26
8/20/2008	858	8.96						1.00
8/26/2008	1027	8.95	6.69	34.39	1.221	0.35	-258.9	1.01
9/4/2008	1500	8.96	6.73	33.53	1.347	0.44	-246.9	1.00
9/11/2008	1530	9.00	6.64	33.3	0.959	0.34	-240.0	0.96
9/18/2008	815	8.98	6.81	33.58	1.369	0.43	-245.8	0.98
9/24/2008	830	8.98	6.79	33.72	0.997	0.29	-267.4	0.98
9/30/2008	1030	9.02	6.85	33.3	1.406	0.41	-260.4	0.94
10/6/2008	1055	9.00	6.72	33.35	1.327	0.43	-263.7	0.96
10/14/2008	830	8.95	6.78	34.13	1.349	0.36	-261.7	1.01
10/22/2008		9.03	6.94	32.64	1.358	0.33	-149.6	0.93
10/29/2008	1000	9.07						0.89

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 3 Sump 3-2								
Sump Depth:		7.4 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	7.40						0.00
8/13/2008	1008	7.40						0.00
8/20/2008	858	7.40						0.00
8/26/2008	1027	7.40						0.00
9/4/2008	1500	7.40						0.00
9/11/2008	1530	7.40						0.00
9/18/2008	815	7.40						0.00
9/24/2008	830	7.40						0.00
9/30/2008	1030	7.40						0.00
10/6/2008	1055	7.40						0.00
10/14/2008	830	7.40						0.00
10/22/2008		7.40						0.00
10/29/2008	1000	7.40						0.00

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 4 Sump 4-1								
Sump Depth:		6.32 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		*(°C)*	*(m-mho/cm)*	*(mg/L)*	*(eV)*	*(feet)*
8/7/2008	950	6.32						0.00
8/13/2008	1008	6.18						0.14
8/20/2008	858	6.19						0.13
8/26/2008	1027	6.21						0.11
9/4/2008	1500	6.24						0.08
9/11/2008	1530	6.26						0.06
9/18/2008	815	6.32						0.00
9/24/2008	830	6.32						0.00
9/30/2008	1030	6.32						0.00
10/6/2008	1055	6.32						0.00
10/14/2008	830	6.32						0.00
10/22/2008		6.32						0.00
10/29/2008	1000	6.32						0.00

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 5 Sump 5-1								
Sump Depth:		9.33 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
8/7/2008	950	9.33						0.00
8/13/2008	1008	9.18						0.15
8/20/2008	858	9.14						0.19
8/26/2008	1027	9.02						0.31
9/4/2008	1500	9.03						0.30
9/11/2008	1530	9.02						0.31
9/18/2008	815	9.01						0.32
9/24/2008	830	9.08						0.25
9/30/2008	1030	9.06						0.27
10/6/2008	1055	9.09						0.24
10/14/2008	830	9.09						0.24
10/22/2008		9.10						0.23
10/29/2008	1000	9.10						0.23

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 5 Sump 5-2								
Sump Depth:		7.98 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
8/7/2008	950	7.98						0.00
8/13/2008	1008	7.39	6.62	32.27	1.119	0.64	-237.3	0.59
8/20/2008	858	7.54						0.44
8/26/2008	1027	7.66						0.32
9/4/2008	1500	7.67						0.31
9/11/2008	1530	7.71						0.27
9/18/2008	815	7.69						0.29
9/24/2008	830	7.69						0.29
9/30/2008	1030	7.73						0.25
10/6/2008	1055	7.74						0.24
10/14/2008	830	7.74						0.24
10/22/2008		7.78						0.20
10/29/2008	1000	7.80						0.18

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 6 Sump 6-1								
Sump Depth:		11.45 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
8/7/2008	950	11.45						0.00
8/13/2008	1008	11.08						0.37
8/20/2008	858	11.10						0.35
8/26/2008	1027	11.07						0.38
9/4/2008	1500	11.08						0.37
9/11/2008	1530	11.09						0.36
9/18/2008	815	11.08						0.37
9/24/2008	830	11.08						0.37
9/30/2008	1030	11.07						0.38
10/6/2008	1055	11.07						0.38
10/14/2008	830	11.07						0.38
10/22/2008		11.09						0.36
10/29/2008	1000	11.04						0.41
.								

NA = Not Available

Table 6.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 6

TRENCH 6 Sump 6-2								
Sump Depth:		12.34 *feet BTOC*						
Sample Date	**Sample Time**	**Sump H_20 Level**	**pH**	**Temperature**	**Specific Conductivity**	**Dissolved Oxygen**	**ORP**	**Sump H_20 Thickness**
		(feet BTOC)		***(°C)***	***(m-mho/cm)***	***(mg/L)***	***(eV)***	***(feet)***
8/7/2008	950	12.34						0.00
8/13/2008	1008	11.95						0.39
8/20/2008	858	12.3						0.04
8/26/2008	1027	12.27						0.07
9/4/2008	1500	12.23						0.11
9/11/2008	1530	12.19						0.15
9/18/2008	815	12.15						0.19
9/24/2008	830	12.14						0.20
9/30/2008	1030	12.13						0.21
10/6/2008	1055	12.12						0.22
10/14/2008	830	12.08						0.26
10/22/2008		12.2						0.14
10/29/2008	1000	12						0.34

NA = Not Available

Table 6.1.2 SWMU B-3 Trench 1 Quarter 6 - VOC Analytical Summary Table

Q6	B3 T1-1			B3 T1-2			B3 T1-3		
Date	**8/20/08**	**9/24/08**	**10/29/08**	**8/20/08**	**9/24/08**	**10/29/08**	**8/20/08**	**9/24/08**	**10/29/08**
PCE (µg/L)	0	0	0.55	0	0	0.32	0	0	0
TCE (µg/L)	0	3	0.27	0	3.4	0	0	0.66	0
cis-1,2-DCE (µg/L)	0.8	17	0.52	0.54	8.6	2	2.2	5	0.56
trans-1,2-DCE (µg/L)	7.6	9.8	10	9.1	6.3	8.5	21	29	20
Vinyl Chloride (µg/L)	28	44	46	7.7	30	23	35	74	44
Ethene (µg/L)	0	0	0	6.31	4.47	3.1	3.95	0	9.17
PCE (nM/L)	0.000	0.000	3.317	0.000	0.000	1.930	0.000	0.000	0.000
TCE (nM/L)	0.000	22.833	2.055	0.000	25.877	0.000	0.000	5.023	0.000
cis-1,2-DCE (nM/L)	8.252	175.348	5.364	5.570	88.706	20.629	22.692	51.573	5.776
trans-1,2-DCE (nM/L)	78.391	101.083	103.146	93.863	64.982	87.674	216.606	299.123	206.292
Vinyl Chloride (nM/L)	447.928	703.887	735.882	123.180	479.923	367.941	559.910	1183.811	703.887
Ethene (nM/L)	0.000	0.000	0.000	224.955	159.358	110.517	140.820	0.000	326.916
Total Molar Conc. (nM/L)	534.571	1,003.151	849.763	447.568	818.846	588.691	940.029	1,539.530	1,242.872
% moles PCE	0.000%	0.000%	0.390%	0.000%	0.000%	0.328%	0.000%	0.000%	0.000%
% moles TCE	0.000%	2.276%	0.242%	0.000%	3.160%	0.000%	0.000%	0.326%	0.000%
% moles cis-1,2-DCE	1.544%	17.480%	0.631%	1.244%	10.833%	3.504%	2.414%	3.350%	0.465%
% moles trans-1,2-DCE	14.664%	10.077%	12.138%	20.972%	7.936%	14.893%	23.043%	19.430%	16.598%
% moles Vinyl Chloride	83.792%	70.168%	86.598%	27.522%	58.610%	62.502%	59.563%	76.894%	56.634%
% moles Ethene	0.000%	0.000%	0.000%	50.262%	19.461%	18.773%	14.980%	0.000%	26.303%
sum % moles	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Month 16	Month 17	Month 18	Month 16	Month 17	Month 18	Month 16	Month 17	Month 18

Note: 0 sample indicates a non-detect analyte value

Q6		B3																	
Well ID		**B3 T1-1**						**B3 T1-2**						**B3 T1-3**					
Sample Date		**8/20/2008**		**9/24/2008**		**10/29/2008**		**8/20/2008**		**9/24/2008**		**10/29/2008**		**8/20/2008**		**9/24/2008**		**10/29/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	6.7		2.5		3.2		6.6		8		1.9		4.1		4.1		2.4	
Total Organic Carbon	mg/L	4.8		4		3.9		7.7		7.1		5.7		5.1		3.4		2.7	
Methane	µg/L	7,450		1,420		6,240		5,760		8,180		6,210		5,930		2,050		5,130	
Ethene	µg/L	0		0		0		6.31		4.47		3.1		3.95		0		9.17	
Ethane	µg/L	0		0		0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	555,000		227,000		195,000		286,000		235,000		209,000		350,000		50,200		94,000	
Alkalinity, Total (as CACO3)	mg/L	501		332		511		476		385		477		427		257		375	
Nitrate/Nitrite	mg/L	0		0		0		0		0.034	J	0		0		0		0	
Sulfate	mg/L	1.3		14.4		2.5		10.3		3.9		48.8		2.2		10.1		6.1	
Chloride	mg/L	14.2		14.9		14.8		14.1		14.7		14.6		14.1		14.3		14.4	
Ferrous Iron	mg/L	5		6.8		4.6		6.1		5.3		3.2		5.5		3.2		2.3	
Manganese	µg/L	292		345		285		316		320		368		606		257		172	
Hydrogen	nM/L	6		3.2		4.5		5.4		4.2		3.8		4.8		3.9		4.4	
Hydrogen Sulfide																			
Total Dissolved Solids	mg/L	538		457		488		527		501		503		490		356		384	
Benzene	µg/L	0		0		0		0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0		0		0	
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0		0		0		0	
Dichloroethene, cis-1,2-	µg/L	0.8	J	17		0.52	J	0.54	J	8.6		2		2.2		5		0.56	J
Dichloroethene, trans-1,2-	µg/L	7.6		9.8		10.0		9.1		6.3		8.5		21		29		20	
Methylene chloride	µg/L	0		0		0		0		0		0		0		0		0	
Naphthalene	µg/L	0		1.5		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0		0		0.55	BJ	0		0		0.32	BJ	0		0		0	BJ
Toluene	µg/L	5.1		1.3		1.9		2.1		1.5		0.28	J	1.8		0.62	J	0.5	J
Trichloroethene	µg/L	0		3		0.27	J	0		3.4		0		0		0.66	J	0	
Vinyl chloride	µg/L	28		44		46		7.7		30		23		35		74		44	
Arsenic	µg/L	4.6	J	5.1		0		4.9	J	3.5	J	4.2	J	6.2		3.6	J	0	
Barium	µg/L	103		92.5		103		126		113		133		145		88.2		85.1	
Cadmium	µg/L	0		0		0		0		0		0		0		0		0	
Chromium	µg/L	0		0		0		0		0		0		1.4	J	0		0	
Copper	µg/L	0		0		0		0		0		0		0		0		0	
Lead	µg/L	2.8	J	0		0		2.6	J	0		0		1.9	J	0		0	
Mercury	µg/L	0.09	J	0		0		0.13	J	0		0		0.15	J	0		0	
Nickel	µg/L	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Zinc	µg/L	0		0		0		5.8	J	0.0		0.0		0		0		0	
		Month 16		Month 17		Month 18		Month 16		Month 17		Month 18		Month 16		Month 17		Month 18	

Note: 0 sample indicates a non-detect analyte value

Table 6.2.3a

SWMU B-3 Bioreactor Multi-port Well CS-WB05 - Q6 Performance Data

Q6 **WB05**

Well ID		**CS-WB05-LGR01**		**CS-WB05-LGR03B**						**CS-WB05-LGR04A**		**CS-WB05-LGR04B**		**CS-WB05-BS-01**		**CS-WB05-CC-01**		**CS-WB05-CC-02**	
Sample Date		**10/23/2008**		**8/18/2008**		**9/22/2008**		**10/15/2008**		**10/23/2008**		**10/23/2008**		**10/23/2008**		**10/24/2008**		**10/24/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.56		2.5		1.1	B	0.9		1.30		1.20		0.71		0.76		1.2	
Total Organic Carbon	mg/L	1.5		2.9		2.3		0.69		0.87		0.66		0.51		0.68		0.66	
Methane	µg/L	6.65		1.97				2530		2480		3440		33.4		5.41		7.18	
Ethene	µg/L	0		0				0		0		0		0		0		0	
Ethane	µg/L	0		0				0		0		0		0		0		0	
Carbon Dioxide	µg/L	48,400		23,400				32,600		24,700		44,800		23,800		23,400		26,500	
Alkalinity, Total (as CACO3)	mg/L	433		302		258		364		446		504		316		298		322	
Nitrate/Nitrite	mg/L	0.12		0		0		0		0.053	J	0.069	J	0.069	J	0		0	
Sulfate	mg/L	93		47.9		49.7		50.4		22.1		3.6		32.4		81.3		88.1	
Chloride	mg/L	14.1		10.9		11		11.1		12.2		12.7		12.1		16.5		17.9	
Ferrous Iron	mg/L	0		0		0		0		0		0		0		0		0.21	J
Manganese	µg/L	1.7	BJ	0		0		0		11.7	B	40.4	B	0		0		0	
Hydrogen	nM																		
Hydrogen Sulfide																			
Total Dissolved Solids	mg/L	528		384		383		384		430		446		303		416		415	
Benzene	µg/L	0		0		0		0		0		0.16	J	0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0		0		0	
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0.51	J	0		0		0.42	J
Dichloroethene, cis-1,2-	µg/L	1.1	J	63		49		35		340		640		19		12		81	
Dichloroethene, trans-1,2-	µg/L	0		3.5		2.2		2.5		8.4		16		0.35	J	0.3	J	1.1	
Methylene chloride	µg/L	0		0		0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0.37	J	12		0.29	J	0.19	J	22		81		0.55	J	21		21	
Toluene	µg/L	0		0		0		0		0		0		0		0		0	
Trichloroethene	µg/L	1.7		64		42		24		190		82		0.35	J	22		110	
Vinyl chloride	µg/L	0		0		0		0		0.87	J	2.4		0		0		0	
Arsenic	µg/L	3	J	5		5.5		3.5	J	3.9	J	7.6		0		0		0	
Barium	µg/L	24.6		29.5		30.9		31.3		38.8		27		26.3		20.5		18.3	
Cadmium	µg/L	0		0		0		0		0		0		0		0		0	
Chromium	µg/L	6.3		5.4		15.2		19.8		6.9		1.6	J	1.9	J	2.8	J	0	
Copper	µg/L	0		0		0		0		0		0		0		1.8	J	2	J
Lead	µg/L	0		2.7	J	0		0		0		0		0		0		0	
Mercury	µg/L	0		0		0.081	J	0.12	J	0		0		0		0		0	
Nickel	µg/L	3.6	J	9.6		14.4		11.1		2.2	J	47.5		0		5.4		0	
Zinc	µg/L	13.2	J	9.4	J	10.2	J	67.5		16.4	J	0		0		0		0	
		Q6- Month 18		Month 16		Month 17		Month 18		Q6- Month 18		Q6- Month 18		Q6- Month 18		Q6- Month 18		Q6- Month 18	

Note: 0 sample value indicates a non-detect analyte value

Note: Dry zones including LGR02 and LGR03A were not sampled during the quarterly sampling event.

Q6		WB06															
Well ID		**CS-WB06-UGR01**		**CS-WB06-LGR01**		**CS-WB06-LGR02**		**CS-WB06-LGR03A**		**CS-WB06-LGR03B**						**CS-WB06-LGR04**	
Sample Date		**10/21/2008**		**10/21/2008**		**10/21/2008**		**10/21/2008**		**8/19/2008**		**9/22/2008**		**10/15/2008**		**10/21/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	3		1.3		0.71		1.1						0.69		0.88	
Total Organic Carbon	mg/L	2.9		0.92		0.6		0.83						1.1	B	0.56	
Methane	µg/L	1930		0		0		1.69						8.25		0	
Ethene	µg/L	3.52		0		0		0						0		0	
Ethane	µg/L	0		0		0		0						0		0	
Carbon Dioxide	µg/L	123,000		36,000		8,680		9,660						32,000		33,200	
Alkalinity, Total (as CACO3)	mg/L	492		397		330		324						328		325	
Nitrate/Nitrite	mg/L	0.041	J	0.17		0		0						0		1.1	
Sulfate	mg/L	4.2		19.9		24.6		20.2						20.4		10.3	
Chloride	mg/L	15.1		13.3		10.4		11.9						11.9		12.8	
Ferrous Iron	mg/L	0.22	J	0		0		0						0		0	
Manganese	µg/L	1450		0		0		0						0		0	
Hydrogen	nM																
Hydrogen Sulfide																	
Total Dissolved Solids	mg/L	470		392		311		321		339		327		329		315	
Benzene	µg/L	0		0		0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0		0.16	J
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0		0		0.3	J
Dichloroethene, cis-1,2-	µg/L	22		52		38		190		140		100		170		430	
Dichloroethene, trans-1,2-	µg/L	9.3		3.7		1.8		2.7		1.9		0.25	J	2.8		22	
Methylene chloride	µg/L	0		0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	1.3	J	13		8.8		82		76		61		87		300	
Toluene	µg/L	0		0		0		0		0.25	J	0		0		0	
Trichloroethene	µg/L	0.79	J	20		13		110		96		75		100		200	
Vinyl chloride	µg/L	18		9.7		0		0		0		0		0		0	
Arsenic	µg/L	0		0		0		0						2.8	J	0	
Barium	µg/L	85.4		58.6		59.6		29.5						26.5		27.8	
Cadmium	µg/L	0		0		0		0						0		0	
Chromium	µg/L	9.1		23.6		12.1		10.9						9.4		11.5	
Copper	µg/L	0		0		0		0						0		0	
Lead	µg/L	0		0		0		0						0		0	
Mercury	µg/L	0.24	B	0.25	B	0.29	B	0.3	B					0.1	J	0.28	B
Nickel	µg/L	29.3		17.9		12.2		8.9						5.9		7.1	
Zinc	µg/L	0		0		7.4	J	7.7	J					3.2	J	0	
		Q6 - Month 18		Q6- Month 18		Q6- Month 18		Q6 - Month 18		Month 16		Month 17		Month 18		Q6 - Month 18	

Note: 0 sample value indicates a non-detect analyte value

Table 6.2.3c SWMU B-3 Bioreactor Multi-port Well CS-WB07 - Q6 Performance Data

Q6		WB07													
Well ID		**CS-WB07-LGR01**		**CS-WB07-LGR-02**		**CS-WB07-LGR-03A**		**CS-WB07-LGR-03B**						**CS-WB07-LGR-04**	
Sample Date		**10/22/2008**		**10/22/2008**		**10/22/2008**		**8/18/2008**		**9/22/2008**		**10/15/2008**		**10/22/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	1.7		0.85		0.93		2.1		0.9	B	0.51		159	
Total Organic Carbon	mg/L	1.7		0.8		3.6		2.3		1.9		1.3		109	
Methane	µg/L	0		0		5.17		6.81				4.53		0	
Ethene	µg/L	0		0		0		0				0		0	
Ethane	µg/L	0		0		0		0				0		0	
Carbon Dioxide	µg/L	59,600		11,100		22,800		17,500				12,600		12,300	
Alkalinity, Total (as CACO3)	mg/L	480		348		335		269		224		350		308	
Nitrate/Nitrite	mg/L	0.06	BJ	0.35	B	0.06	BJ	0		0		0		0.93	B
Sulfate	mg/L	98.2		35.8		19.7		20.5		20.2		19.7		10	
Chloride	mg/L	16.5		12.9		10.2		10.3		10.3		10.3		12.1	
Ferrous Iron	mg/L	0		0		0		0		0.16	J	0		0	
Manganese	µg/L	0	B	5	B	2.5	BJ	0		0		0		5.4	B
Hydrogen	nM														
Hydrogen Sulfide															
Total Dissolved Solids	mg/L	558		363		319		319		379		327		313	
Benzene	µg/L	0		0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0.18	J
Dibromochloromethane	µg/L	0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0		0.4	J
Dichloroethene, cis-1,2-	µg/L	2.7		0		23		32		26		27		280	
Dichloroethene, trans-1,2-	µg/L	0.3	J	0		0.42	J	0.82		0.99		0.82		7.7	
Methylene chloride	µg/L	0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	1.2	J	0		5.8		0.38	J	0		0		140	
Toluene	µg/L	0		0		0		0		0		0		0	
Trichloroethene	µg/L	1.8		0.2	J	5.3		5		3.6		3.9		160	
Vinyl chloride	µg/L	0		0		0		0		0		0		0	
Arsenic	µg/L	0		0		0		3.5	J	3.3	J	2.5	J	0	
Barium	µg/L	96.2		100		32.2		34.3		33		30.5		26.2	
Cadmium	µg/L	0		0		0		0		0		0		0	
Chromium	µg/L	2.4	J	20.1		4.2	J	4.7	J	2.2	J	3.3	J	5.9	
Copper	µg/L	0		0		0		0		0		0		0	
Lead	µg/L	0		0		0		2.7	J	0		0		0	
Mercury	µg/L	0.27	B	0.26	B	0.25	B	0		0.083	J	0.095	J	0.27	B
Nickel	µg/L	3.4	J	9.2		0		3.6	J	1.6	J	0.94	J	1.4	J
Zinc	µg/L	0		0		0		8.8	J	0		0		0	
		Q6 - Month 18		Q6 - Month 18		Q6 - Month 18		Month 16		Month 17		Month 18		Q56- Month 18	

Note: 0 sample value indicates a non-detect analyte value

Table 6.2.3d SWMU B-3 Bioreactor Multi-port Well CS-WB08 - Q6 Performance Data

Q6		WB08											
Well ID		**CS-WB08-LGR01**		**CS-WB08-LGR02**		**CS-WB08-LGR03B**						**CS-WB08-LGR04**	
Sample Date		**10/20/2008**		**10/20/2008**		**8/19/2008**		**9/22/2008**		**10/16/2008**		**10/20/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.62		1.2						0.57		2.3	
Total Organic Carbon	mg/L	0.54		0.96						1.1		1.9	
Methane	µg/L	0		5.49						0		0	
Ethene	µg/L	0		0						0		0	
Ethane	µg/L	0		0						0		0	
Carbon Dioxide	µg/L	13,900		29,600						40,200		54,000	
Alkalinity, Total (as CACO3)	mg/L	367		404						327		487	
Nitrate/Nitrite	mg/L	0		0						0.26		0.074	J
Sulfate	mg/L	86.5		97.5						23.5		4.3	
Chloride	mg/L	10.4		11.4						10.7		15.4	
Ferrous Iron	mg/L	0		0						0		0	
Manganese	µg/L	0		0						0		0	
Hydrogen	nM												
Hydrogen Sulfide													
Total Dissolved Solids	mg/L	457		502		332		327		340		461	
Benzene	µg/L	0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0	
Chloroform	µg/L	0		0		0.17	J	0.12	BJ	0.096	J	0	
Dibromochloromethane	µg/L	0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0	
Dichloroethene, cis-1,2-	µg/L	27		17		140		140		150		25	
Dichloroethene, trans-1,2-	µg/L	2.7		0.32	J	2.5		0		2.9		2.4	
Methylene chloride	µg/L	0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0	
Tetrachloroethene	µg/L	0.72	J	4.7		93		99		130		1.7	
Toluene	µg/L	0		0		0		0		0		0	
Trichloroethene	µg/L	4.7		2.7		110		120		150		1.5	
Vinyl chloride	µg/L	0		0.0		0		0		0		0.00	
Arsenic	µg/L	0		0						0		0	
Barium	µg/L	107		56						28.4		53.6	
Cadmium	µg/L	0		0						0		0	
Chromium	µg/L	1.6	J	6.2						3.4	J	3.2	J
Copper	µg/L	0		0						0		0	
Lead	µg/L	0		0						0		0	
Mercury	µg/L	0.27	B	0.27	B					0.07	J	0.29	B
Nickel	µg/L	1.5	J	3.2	J					8.9		3.6	J
Zinc	µg/L	0		0						6.6	J	6.7	J
		Q6 - Month 18		Q6 - Month 18		Month 16		Month 17		Month 18		Q6 - Month 18	

Note: 0 sample value indicates a non-detect analyte value

Note: Dry zones including UGR01 and LGR03A were not sampled during the quarterly sampling event.

Q6		Monitoring Wells									
Well ID		**CS-MW16-LGR**		**CS-MW1-LGR**		**CS-D**		**CS-B3-MWO1**		**CS-MW16-CC**	
Sample Date		**10/27/2008**		**10/27/2008**		**10/28/2008**		**10/27/2008**		**10/27/2008**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	1.1		0.37	J	0.72		13		0.26	J
Total Organic Carbon	mg/L	0.6		0.33	J	1.5		16.7		0.43	J
Methane	µg/L	0.552	J	0		0		1,940		5.4	
Ethene	µg/L	0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0	
Carbon Dioxide	µg/L	27,300		30,400		21,700		169,000		24,400	
Alkalinity, Total (as CACO3)	mg/L	296		308		281		1760		315	
Nitrate/Nitrite	mg/L	1		0.78		1.1		0		0	
Sulfate	mg/L	18		13.4		16.4		1.5		56.8	
Chloride	mg/L	10.8		9.2		10.3		12.8		16	
Ferrous Iron	mg/L	0		7.3		0		0		0.2	J
Manganese	µg/L	0.0		0.0		2.7	J	438.0		0	
Hydrogen	nM	3.6		4				3.6		1.9	
Hydrogen Sulfide											
Total Dissolved Solids	mg/L	312		307		325		803		341	
Benzene	µg/L	0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0	
Chloroform	µg/L	0.14	J	0.14	J	0		0		0	
Dibromochloromethane	µg/L	0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0.0		0.0		0.3	J
Dichloroethene, cis-1,2-	µg/L	120		14		34		170		42	
Dichloroethene, trans-1,2-	µg/L	0.98		0		1.2		7.1		2.2	
Methylene chloride	µg/L	0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0	
Tetrachloroethene	µg/L	150		10		60		0.24	BJ	12	
Toluene	µg/L	0		0		0		0		0	
Trichloroethene	µg/L	140		24		39		0.17	J	52	
Vinyl chloride	µg/L	0		0		0		2.2		0	
Arsenic	µg/L	0		0		0		16.5		0	
Barium	µg/L	32.3		33.1		32.5		833		21.5	
Cadmium	µg/L	0		0		0		0		0	
Chromium	µg/L	0		3.2	J	2.5	J	5.9		0	
Copper	µg/L	5.5		0		0		0		2.4	J
Lead	µg/L	0		0		0		39.8		0	
Mercury	µg/L	0		0		0		0		0	
Nickel	µg/L	0.0		16.7		0.0		36.4		2.1	J
Zinc	µg/L	76.7		0		0		144		0	
		Quarter 6 - Month 18		Quarter 6 - Month 18		Quarter 6 - Month 18		Quarter 6 - Month 18		Quarter 6 - Month 18	

Note : 0 sample value indicates a non-detect analyte value

Monitoring Wells

Baseline - Q6		CS B-3 MW01					CS-MW 16-LGR			CS-MW16-CC	CS-MW01-LGR
	Sample date:	12/19/2006	8/3/2007	10/15/2007	7/22/2008	10/27/2008	12/19/2006	8/3/2007	10/17/2007	10/17/2007	10/28/2008
Dechlorinating Bacteria	units										
Dehalococcoides spp (1)	(cells/mL)	2.37E+01	4.50E-01	1.17E+00	4.25E-01 (J)	2.62E+01	6.90E+01	1.31E-01	3.67E-01	5.93E-01	2.20E+00
Functional Genes	units										
TCE R-Dase (1)	(cells/mL)	<1.11E+00	<2.5E-01	5.68E-01 (J)	<1E+00	<4.44E+00	<2.5E-01	<5E-01	<2.5E-01	<2.5E-01	<5E-01
BAV1 VC R-Dase (1)	(cells/mL)	<1.11E+00	<2.5E-01	1.20E+00	<1E+00	<4.44E+00	<2.5E-01	<5E-01	<2.5E-01	<2.5E-01	<5E-01
VC R-Dase	(cells/mL)	<1.11E+00	<2.5E-01	3.31E+01	<1E+00	<4.44E+00	<2.5E-01	<5E-01	2.47E+00	1.10E+00	<5E-01

Trench Sump	Sample date:	12/19/2006	8/3/2007	8/23/2007	9/17/2007	10/17/2007	11/19/2007	12/18/2007	1/25/2008	2/20/2008	3/26/2008	4/22/2008	5/21/2008	6/16/2008	7/22/2008	8/20/2008	9/24/2008	10/29/2008
B3 T1-1																		
Dechlorinating Bacteria	units																	
Dehalococcoides spp (1)	(cells/mL)									5.01E+04	6.03E+03	8.78E+03						
Functional Genes	units																	
TCE R-Dase (1)	(cells/mL)									2.89E+04	1.83E+03	3.02E+03						
BAV1 VC R-Dase (1)	(cells/mL)									8.49E+00	<5E-01	1.66E-01 (J)						
VC R-Dase	(cells/mL)									4.50E+05	1.17E+04	2.81E+03						
B3 T1-2																		
Dechlorinating Bacteria	units																	
Dehalococcoides spp (1)	(cells/mL)					1.68E+04	2.30E+04	1.99E+03	2.75E+02	2.09E+04	9.03E+04	4.32E+03	5.23E+03	1.85E+04	1.15E+04	1.45E+04	4.08E+02	2.96E+03
Functional Genes	units																	
TCE R-Dase (1)	(cells/mL)					3.71E+03	7.56E+02	2.06E+03	2.32E+02	9.26E+02	4.36E+04	1.79E+03	3.00E+03	9.68E+03	6.67E+03	2.45E+04	2.51E+02	6.55E+02
BAV1 VC R-Dase (1)	(cells/mL)					<2.5E-01	<2.5E-01	<2.5E-01	<5E+00	2.32E+00	3.94E-01 (J)	<5E-01 (J)	2.42E-01 (J)	<5E-01	<2.5E-01	1.27E+00	<5.56E-01	<5E-01
VC R-Dase	(cells/mL)					<2.5E-01	<2.5E-01	3.08E+00	3.40E+02	3.54E+05	2.42E+04	3.45E+02	5.44E+03	1.85E+04	7.17E+03	7.77E+03	2.01E+02	7.60E+01
B3 T1-3																		
Dechlorinating Bacteria	units																	
Dehalococcoides spp (1)	(cells/mL)	2.46E+03	7.62E+00	7.27E+01	4.75E+00				2.15E+03	1.62E+02	7.07E+04	2.46E+04	1.78E+02	6.42E+03				
Functional Genes	units																	
TCE R-Dase (1)	(cells/mL)	<1E+00	<4.55E-01	2.87E+00	4.73E-01 (J)				2.32E+02	5.23E+01	2.75E+04	1.74E+04	2.97E+01	2.14E+03				
BAV1 VC R-Dase (1)	(cells/mL)	<1E+00	<4.55E-01	<5E-01	<5E-01				<1E+00	<8.33E-01	<9.35E-01	<3.33E-01	1.87E+00	<5E-01				
VC R-Dase	(cells/mL)	<1E+00	<4.55E-01	<5E-01	<5E-01				5.89E+01	7.43E+02	6.43E+04	6.13E+02	1.36E+02	5.06E+03				
B3 T2-1																		
Dechlorinating Bacteria	units																	
Dehalococcoides spp (1)	(cells/mL)										4.93E+02							
Functional Genes	units																	
TCE R-Dase (1)	(cells/mL)										6.08E+01							
BAV1 VC R-Dase (1)	(cells/mL)										<5E-01							
VC R-Dase	(cells/mL)										3.93E+01							
B3 T2-2																		
Dechlorinating Bacteria	units																	
Dehalococcoides spp (1)	(cells/mL)										2.21E+02							
Functional Genes	units																	
TCE R-Dase (1)	(cells/mL)										5.82E+00							
BAV1 VC R-Dase (1)	(cells/mL)										<8.7E-01							
VC R-Dase	(cells/mL)										1.47E+01							
B3 T6-1																		
Dechlorinating Bacteria	units																	
Dehalococcoides spp (1)	(cells/mL)		1.45E+02															
Functional Genes	units																	
TCE R-Dase (1)	(cells/mL)		<9.09E-01															
BAV1 VC R-Dase (1)	(cells/mL)		<9.09E-01															
VC R-Dase	(cells/mL)		<9.09E-01															

Q6

Well ID		B3-UIC		B3-UIC		B3-UIC	
Sample Date		8/19/2008		9/24/2008		10/21/2008	
Compound	Units	Value	Flag	Value	Flag	Value	Flag
Dissolved Organic Carbon	mg/L						
Total Organic Carbon	mg/L						
Methane	µg/L						
Ethene	µg/L						
Ethane	µg/L						
Carbon Dioxide	µg/L						
Alkalinity, Total (as CACO3)	mg/L						
Nitrate/Nitrite	mg/L						
Sulfate	mg/L						
Chloride	mg/L						
Ferrous Iron	mg/L						
Manganese	µg/L						
Hydrogen	nM						
Hydrogen Sulfide							
Total Dissolved Solids	mg/L	253		356		343	
Benzene	µg/L	0		0		0	
Bromodichloromethane	µg/L	0		0		0	
Bromoform	µg/L	0		0		0	
Chloroform	µg/L	0		0		0	
Dibromochloromethane	µg/L	0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0	
Dichloroethene, cis-1,2-	µg/L	85		84		80	
Dichloroethene, trans-1,2-	µg/L	1.6		2.7		1.6	
Methylene chloride	µg/L	0		0		0	
Naphthalene	µg/L	0		0		0	
Tetrachloroethene	µg/L	52		62		45	
Toluene	µg/L	0		0		0	
Trichloroethene	µg/L	88		92		78	
Vinyl chloride	µg/L	0		0		0	

Note: 0 sample value indicates a non-detect analyte value

Figures

Figure 6.1.2T1-1 B-3 Bioreactor Trench 1 Sump 1 VOC Summary through Quarter 6

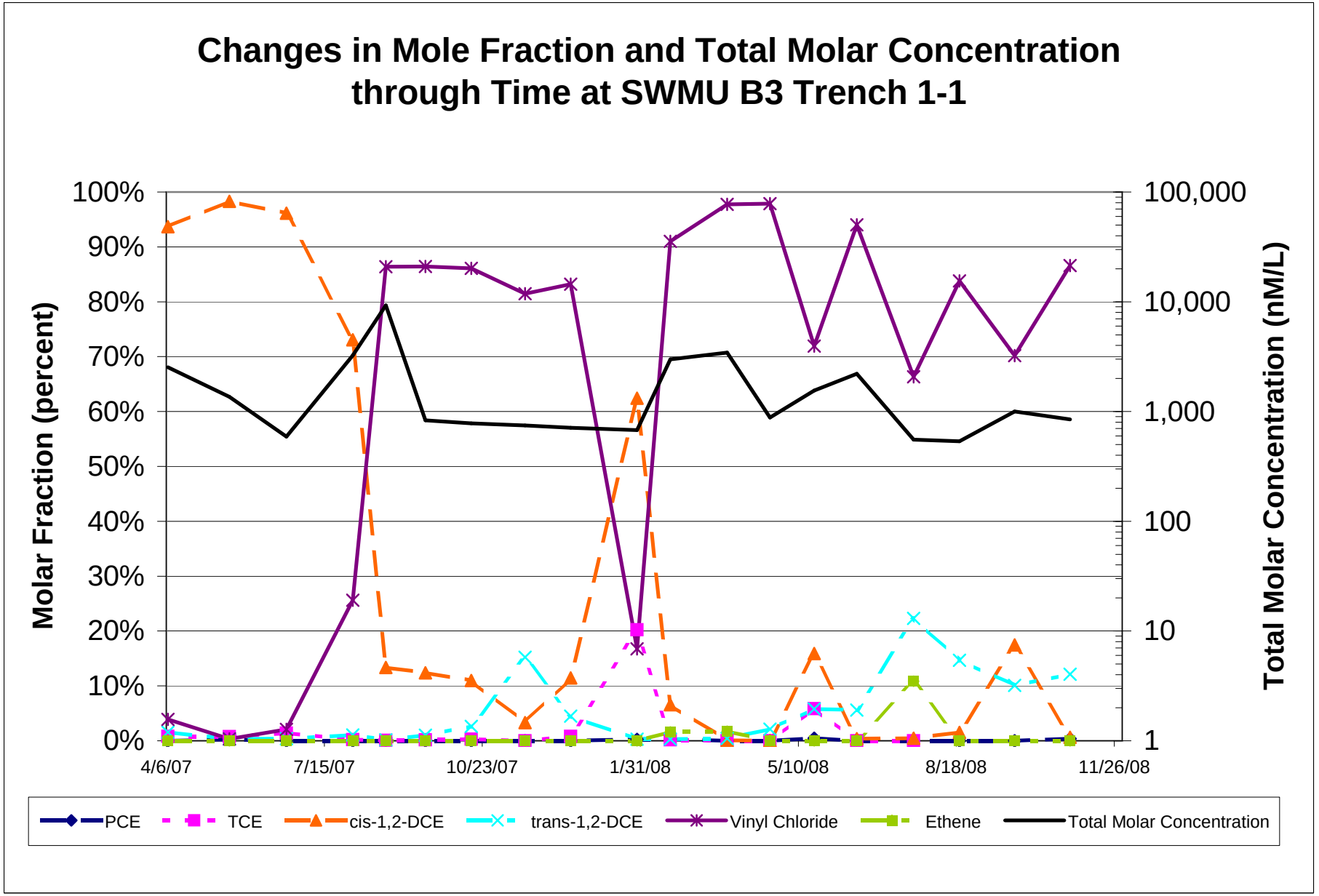

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Figure 6.1.2T1-2 B-3 Bioreactor Trench 1 Sump 2 VOC Summary through Quarter 6

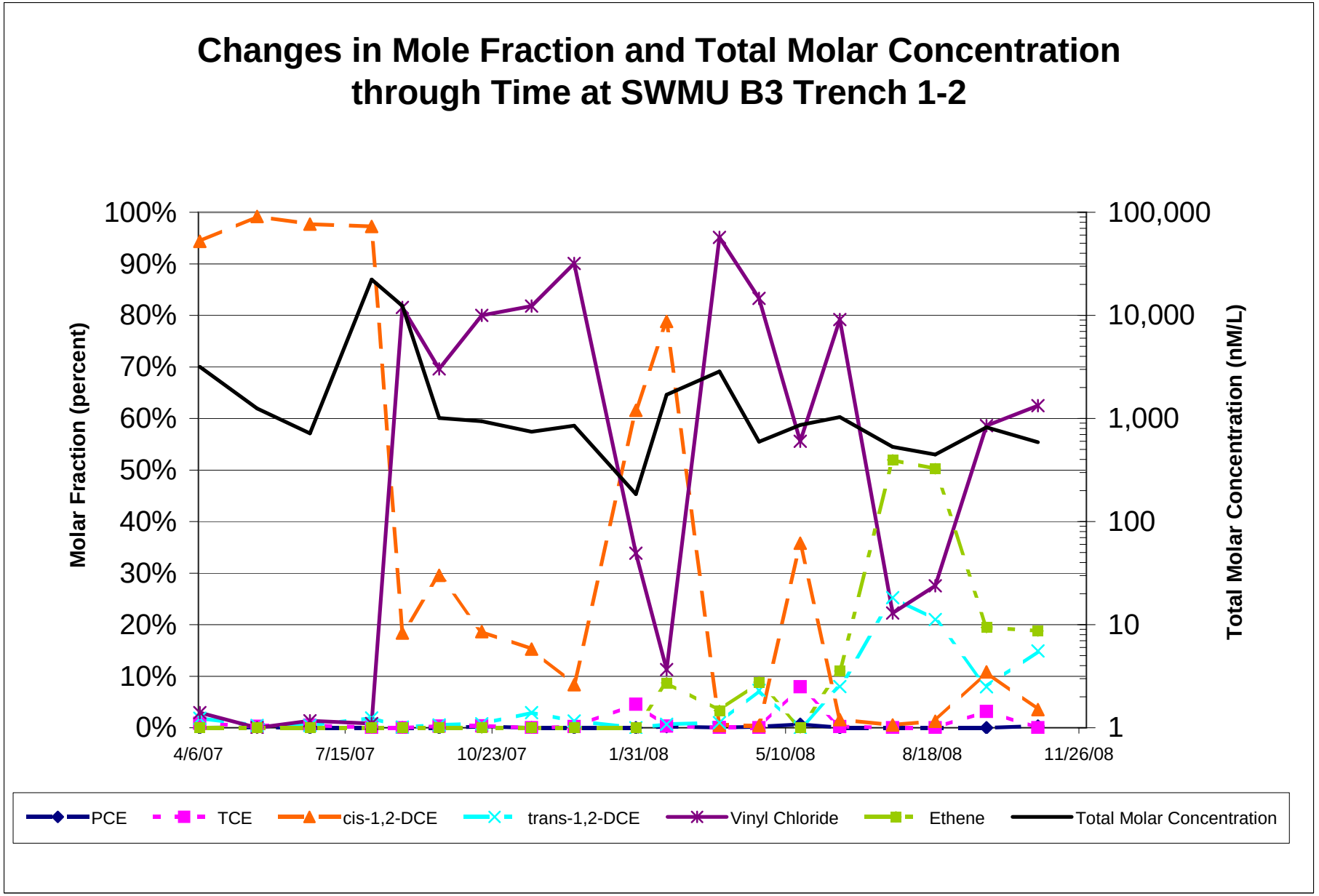

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Figure 6.1.2T1-3 B-3 Bioreactor Trench 1 Sump 3 VOC Summary through Quarter 6

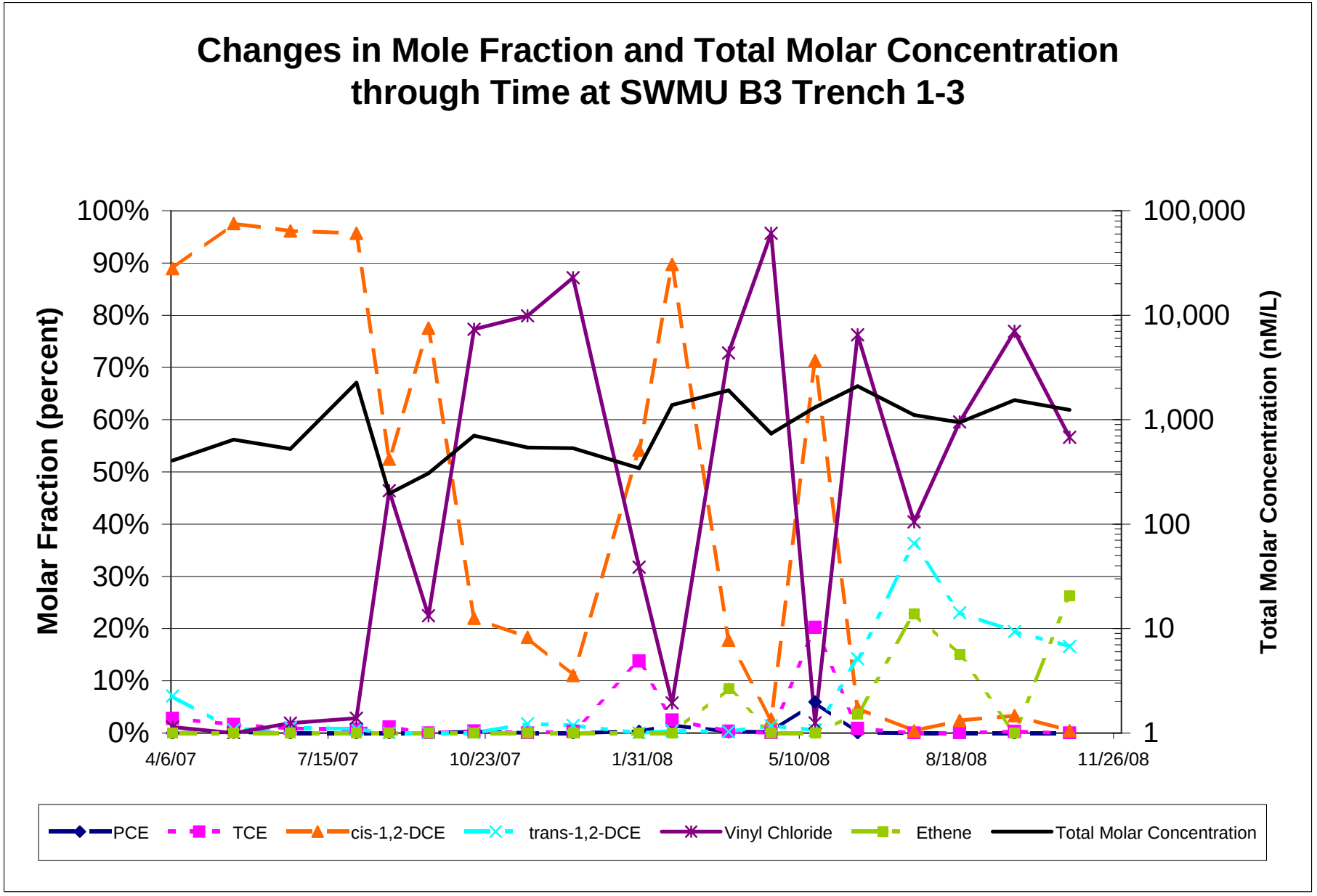

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Figure 6.2.2a Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB05-LGR03B

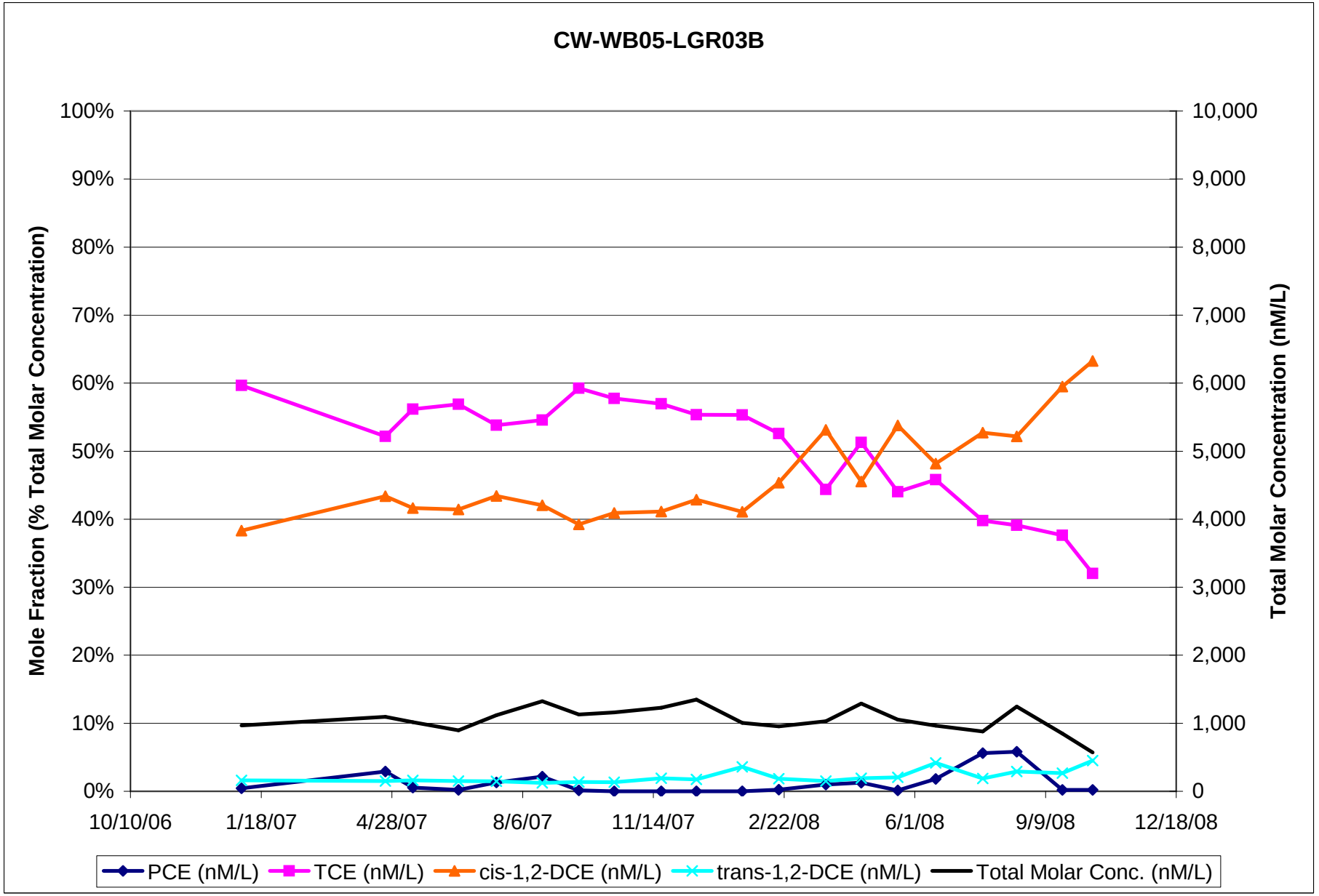

Figure 6.2.2b Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB06-LGR03B

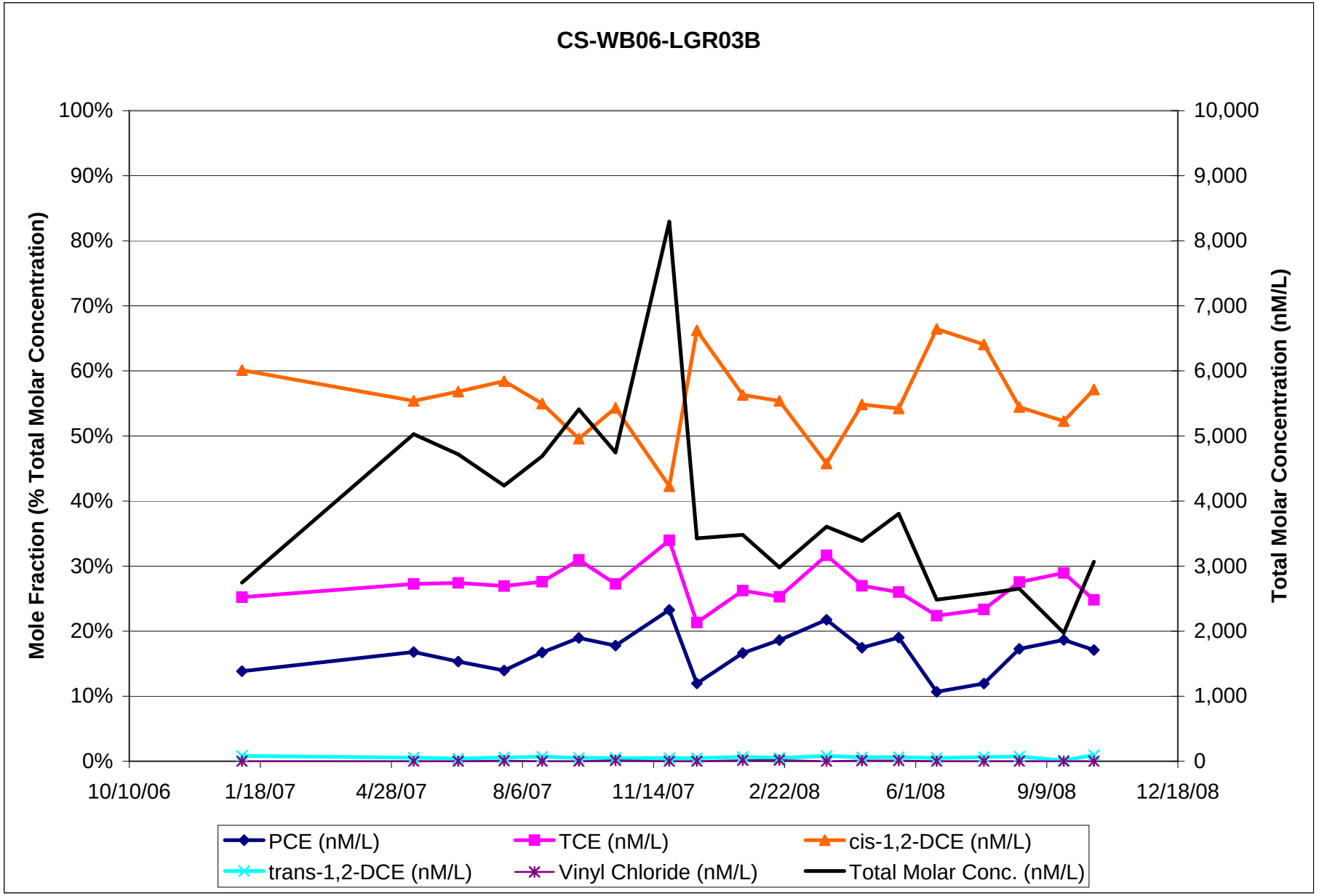

Figure 6.2.2c Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB07-LGR03B

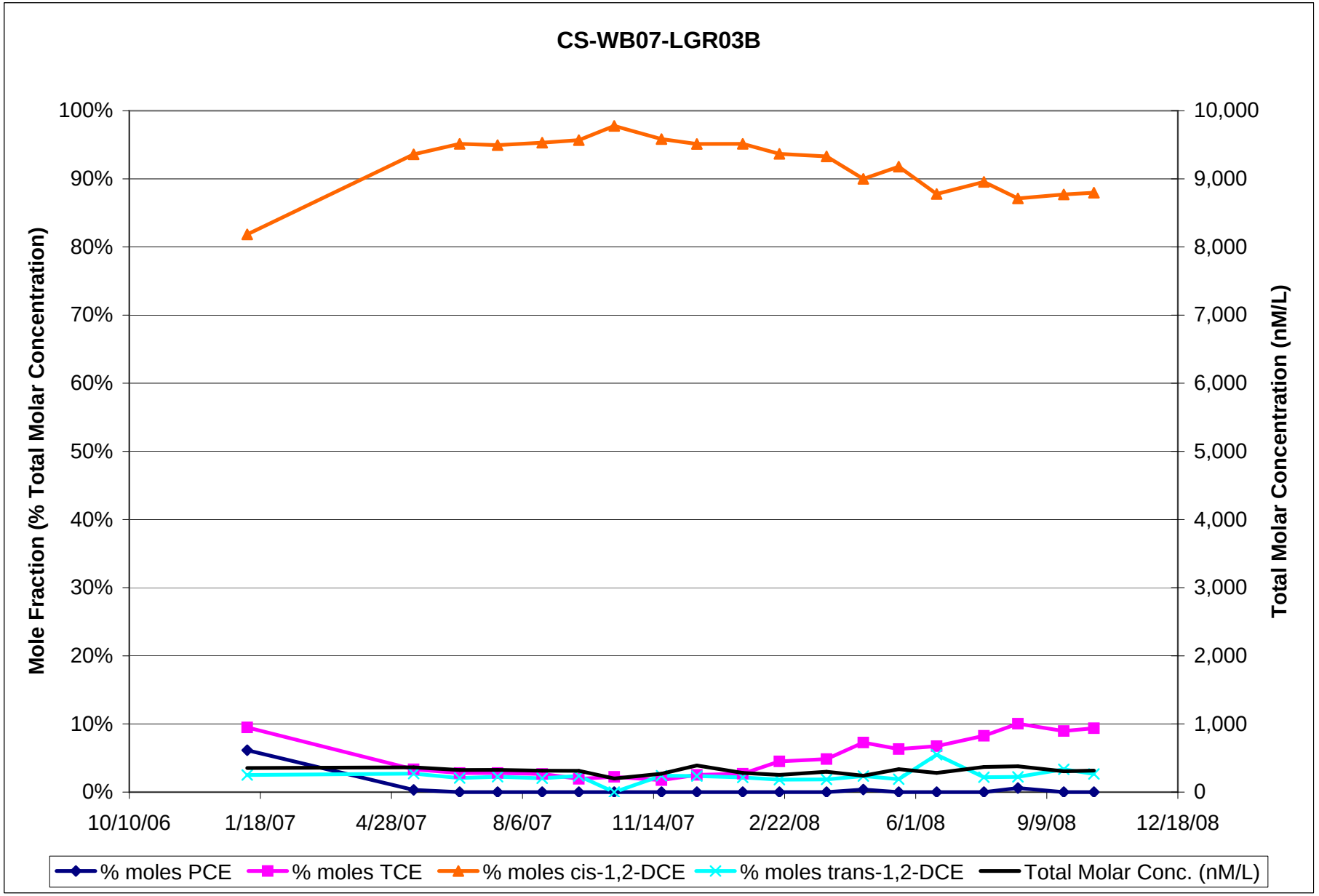

Figure 6.2.2d Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB08-LGR03B

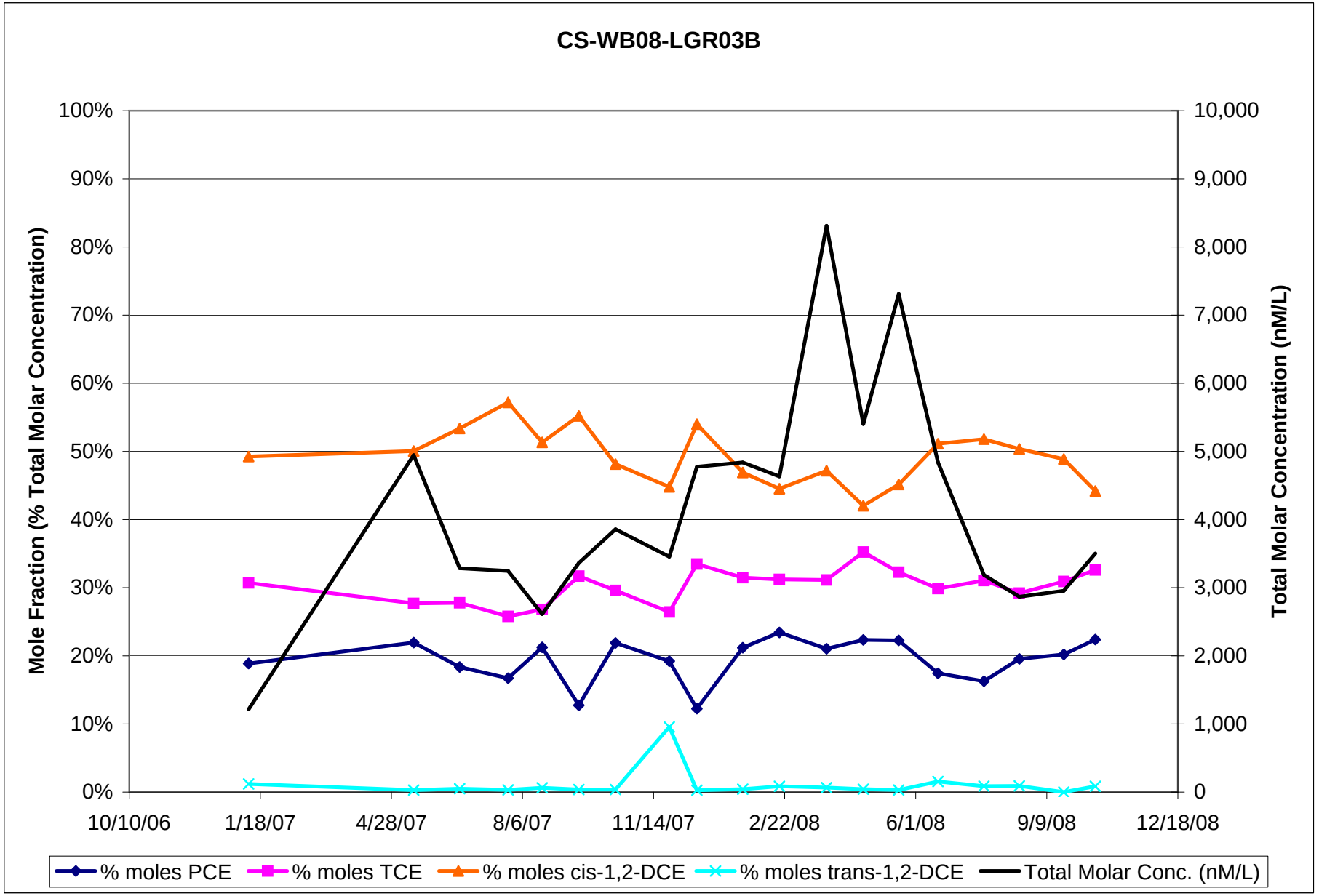

Figure 6.2.5 Lower Glen Rose Groundwater Elevations (feet above MSL) Measured in Westbay Wells through Quarter 6

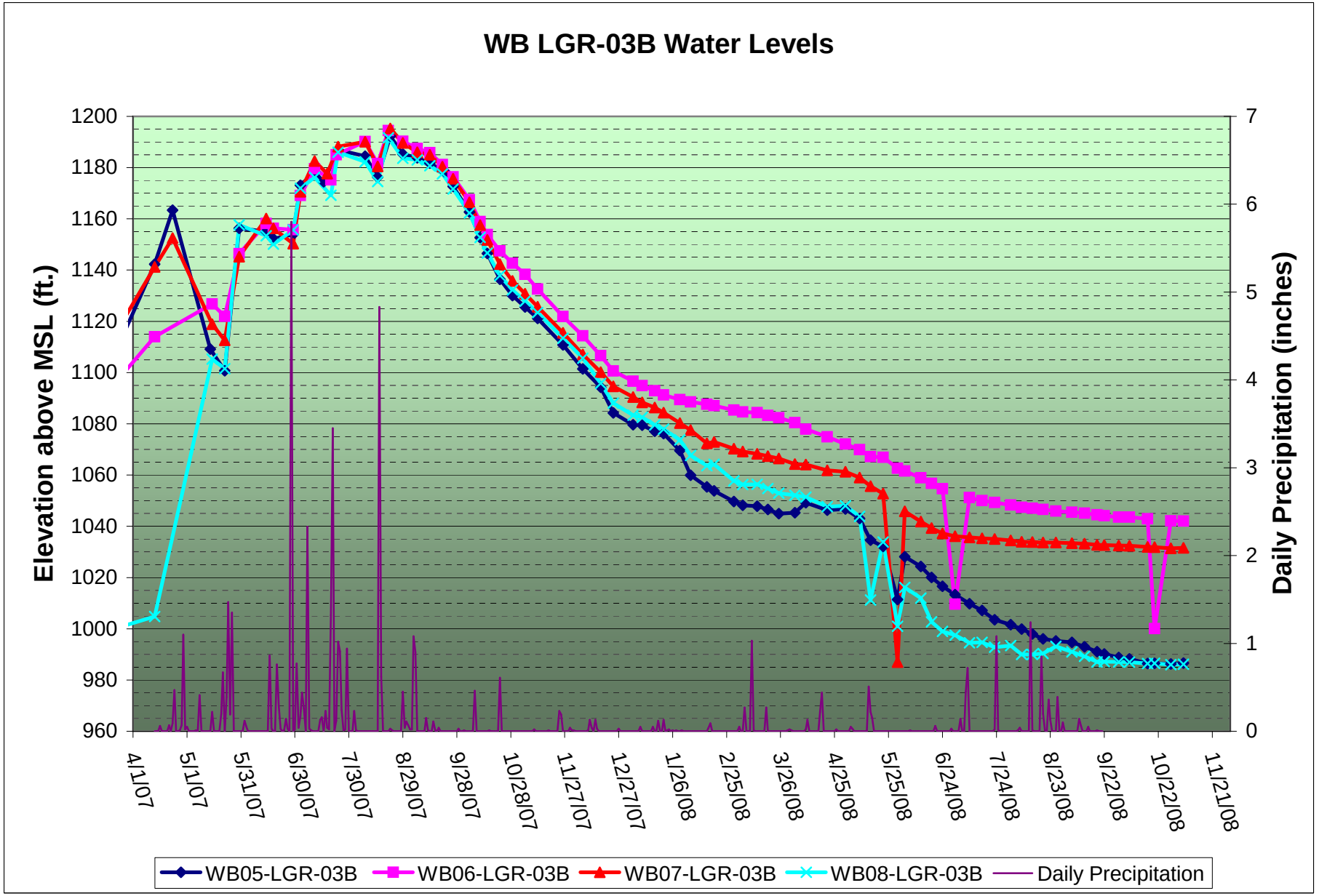

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Figure 6.3.3

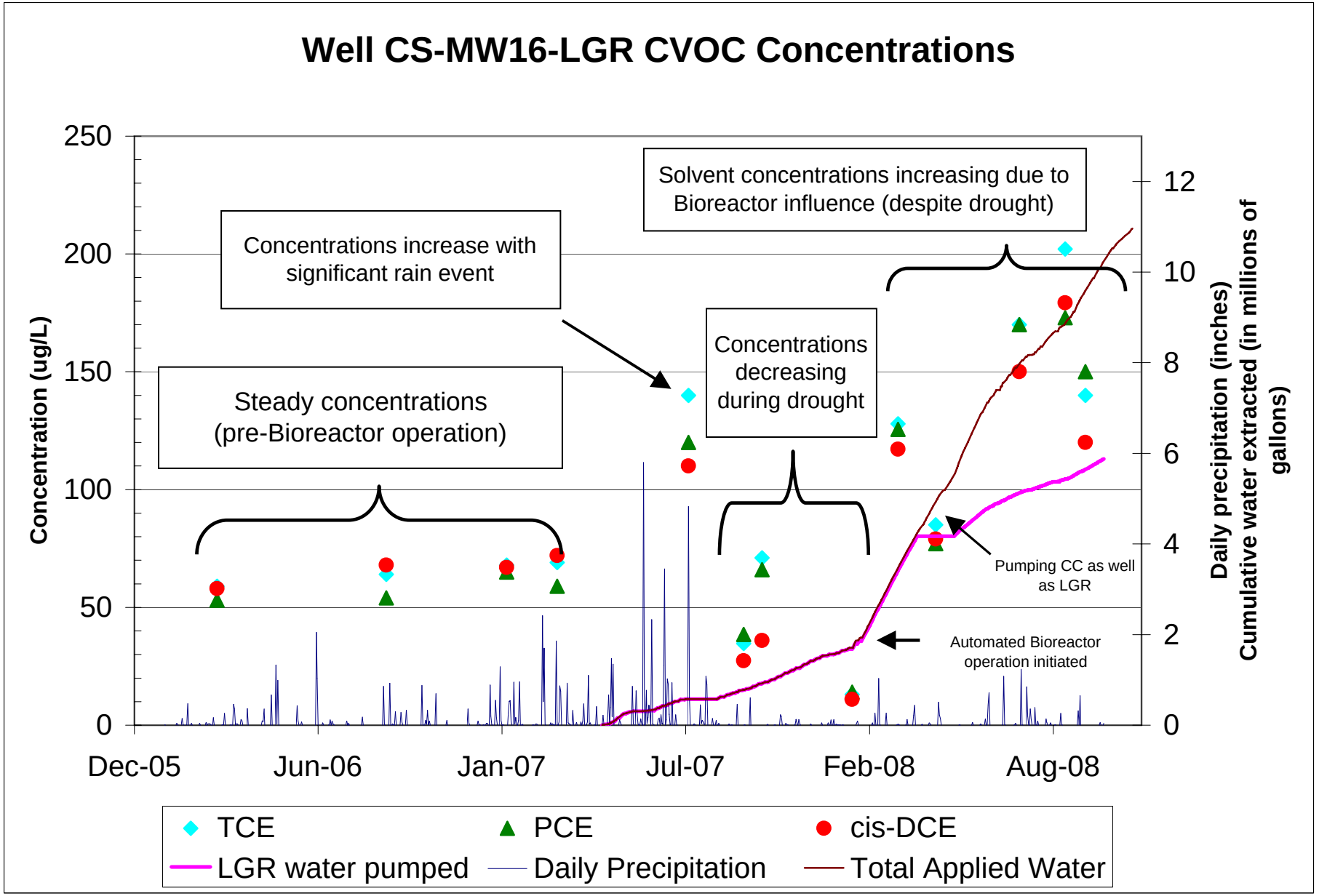

Well CS-MW16-LGR CVOC Concentrations
Concentrations increase with significant rain event
Steady concentrations (pre-Bioreactor operation)
Concentrations decreasing during drought
Solvent concentrations increasing due to Bioreactor influence (despite drought)
Pumping CC as well as LGR
Automated Bioreactor operation initiated
Concentration (ug/L)
Daily precipitation (inches)
Cumulative water extracted (in millions of gallons)
250
200
150
100
50
0
12
10
8
6
4
2
0
Dec-05
Jun-06
Jan-07
Jul-07
Feb-08
Aug-08
TCE
PCE
cis-DCE
LGR water pumped
Daily Precipitation
Total Applied Water

Figure 6.5.5 Cumulative Total Groundwater from CS-MW16 LGR and CC Applied to SWMU B3 Trench 1 through Quarter 6

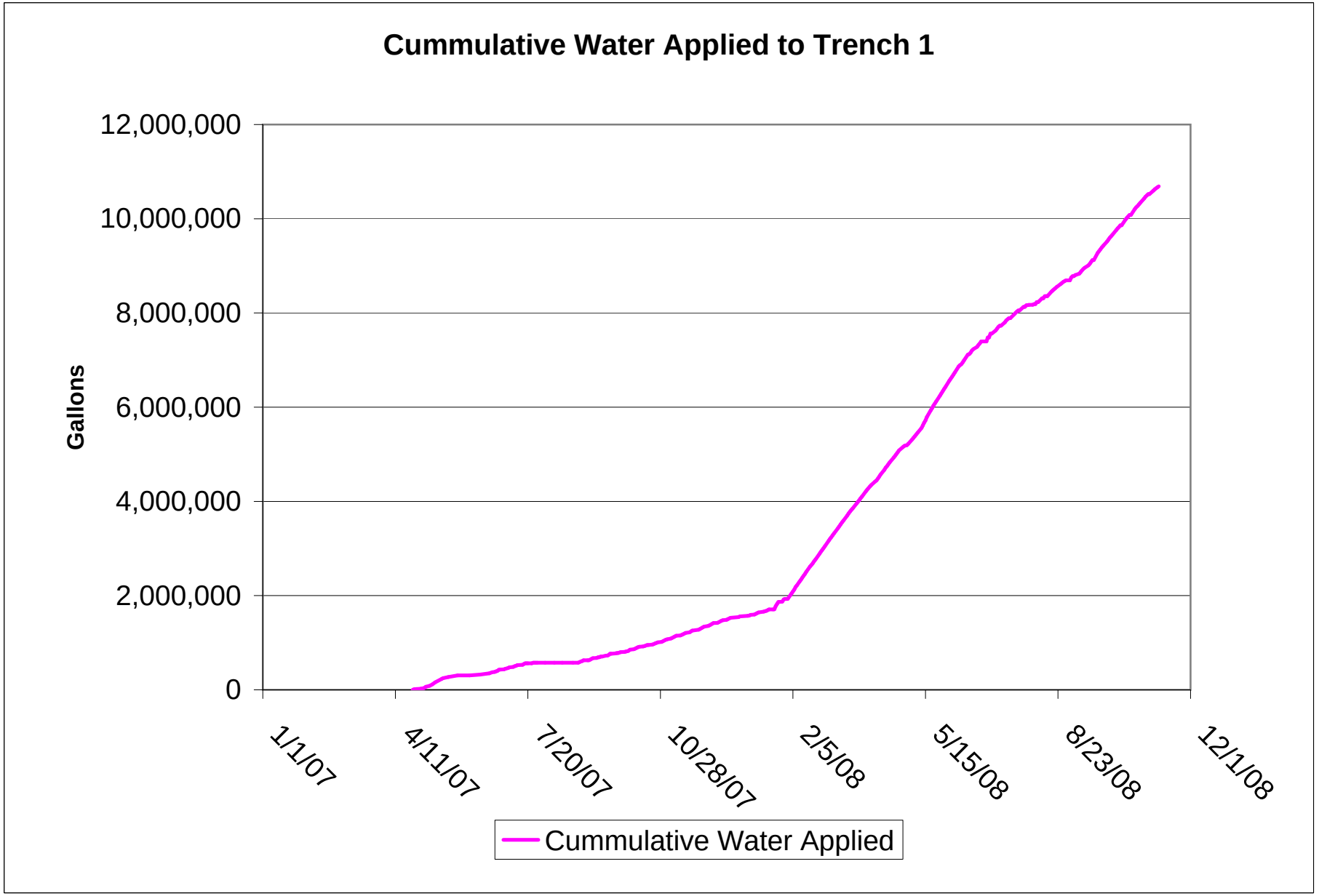
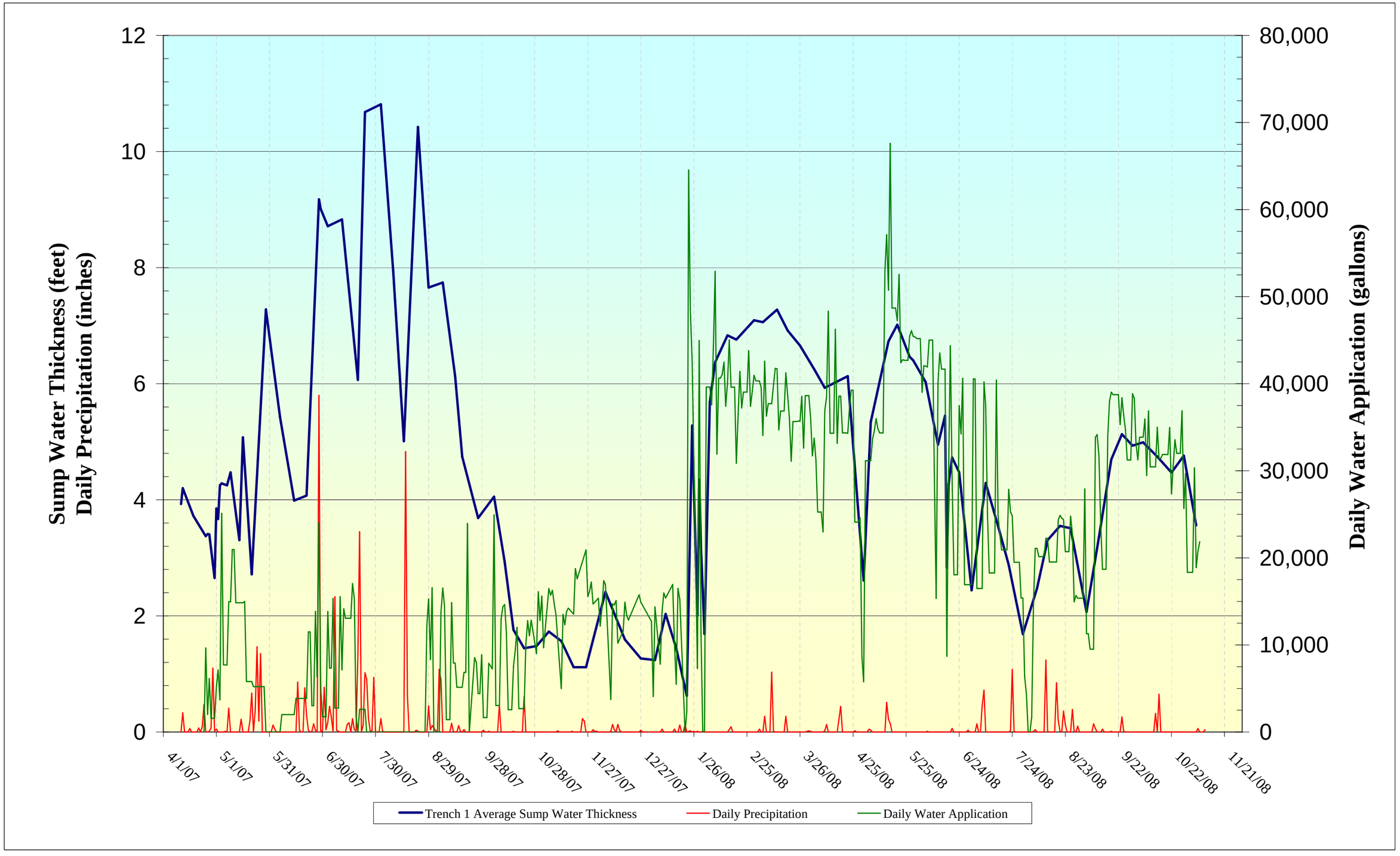


Figure 6.5.6

SWMU B-3 Bioreactor - Trench 1
Average Water Thickness, CS-16 Water Application, and Daily Precipitation



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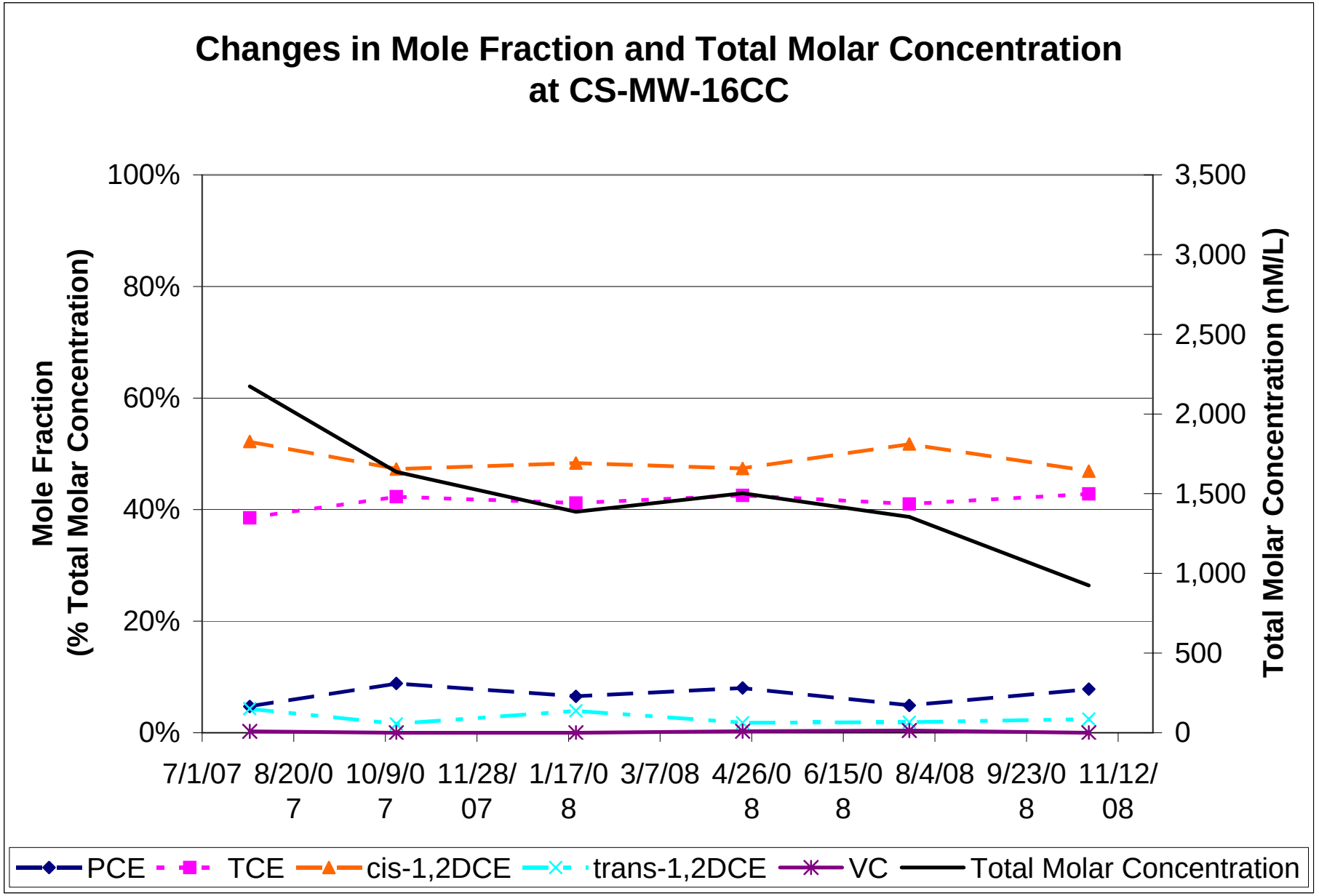
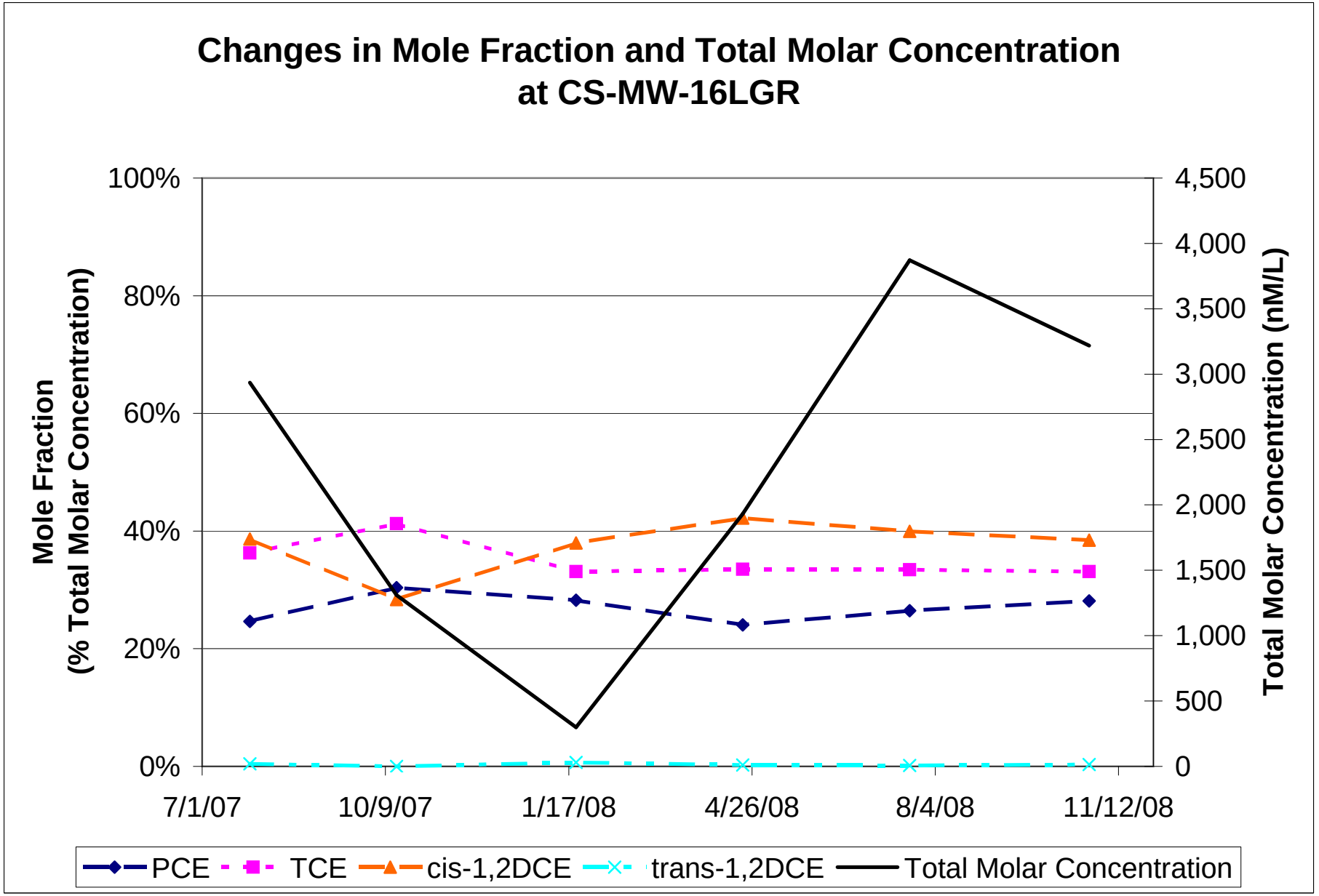

Changes in Mole Fraction and Total Molar Concentration at CS-MW-16CC
Mole Fraction (% Total Molar Concentration)
100%
80%
60%
40%
20%
0%
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Total Molar Concentration (nM/L)
7/1/07
8/20/07
10/9/07
11/28/07
1/17/08
3/7/08
4/26/08
6/15/08
8/4/08
9/23/08
11/12/08
PCE
TCE
cis-1,2DCE
trans-1,2DCE
VC
Total Molar Concentration


Changes in Mole Fraction and Total Molar Concentration at CS-MW-16LGR
Mole Fraction (% Total Molar Concentration)
100%
80%
60%
40%
20%
0%
Total Molar Concentration (nM/L)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
7/1/07
10/9/07
1/17/08
4/26/08
8/4/08
11/12/08
PCE
TCE
cis-1,2DCE
trans-1,2DCE
Total Molar Concentration