CSSA B-3 BIOREACTOR OPERATIONS PERFORMANCE STATUS REPORT (QUARTER 9, MONTHS 25 – 27, MAY – JULY, 2009)

OCTOBER 5, 2009

This status report summarizes the operation of a bioreactor at Solid Waste Management Unit (SWMU) B-3 from May 1, 2009 through July 31, 2009, comprising the ninth 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 2009 are attached for reference. Parsons site personnel working on this project during the reporting period include Ken Rice, Samantha Elliott, Eric Tennyson, Adrien Lindley, Julie Bouch, Michael Zugelder, Edward Galbavy, and Justin Kirk.

Executive Summary

Site conditions were hot and dry through the quarter with 2.74 inches of precipitation reported. Injection of extracted groundwater continued through the quarter. The few interruptions resulted from ground water levels reaching the automatic cut-off water levels in the extraction wells. Approximately 17,184,004 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 new extraction well, B3-EXW01 (completed in the lower Glen Rose), began pumping groundwater for injection on July 17, 2009. Through July 31, B3-EXW01 has contributed 126,143 gallons to the bioreactor, bringing the total volume injected since operations began to 17,310,147 gallons. During quarter 9, a total of 2,538,654 gallons of extracted groundwater from wells CS-MW16-LGR, CS-MW16-CC, and B3-EXW01 were injected into the bioreactor. The majority of extracted groundwater, ~1,640,000 gallons, was from the CS-MW16-CC well, while ~772,000 gallons were extracted from the CS-MW16-LGR well. The semi-annual UIC report was delivered to the TCEQ on June 15, 2009 with the next report due December, 2009.

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 indicated by the presence of reduced iron [Fe(II)] and trans-DCE in trench 1. Field sampling analyses (Noblis) indicated positive results for hydrogen sulfide and sulfate-reducing bacteria. Hydrogen sulfide likely reduces iron [III] in soil minerals to iron [II], which is then available to facilitate reductive dechlorination of CAHs. 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 9 analytical results from monitoring of the bioreactor sumps indicate that the SWMU B-3 trenches contain a range of *cis*-DCE levels (0.81 – 57 µg/L) 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 9 monitoring results from the 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 zone of the Westbay® wells CS-WB05, CS-WB07, and CS-WB08 contains < 100 micrograms per liter (µg/L) of PCE, TCE, and *cis*-DCE, while CS-WB06 contains > 100 µg/L of PCE, TCE, and *cis*-DCE. Groundwater from CS-MW16-LGR contains > 100 µg/L of PCE, TCE, and *cis*-DCE and groundwater from CS-MW16-CC contains < 100 µg/L of PCE, TCE, and *cis*-DCE. Quarterly data from the bioreactor trench sumps indicate a slight increase in contaminant mass (total molar concentration) in all trench 1 sumps as well as T2-1, however, over the bioreactor operational period, contaminant mass appears stable or decreasing.

Water quality field measurements from the bioreactor trench 1 sumps generally indicate that DO is similar to the previous quarter with an average of 0.435, ORP has risen since the previous quarter, averaging -159 mV, pH ~ 6.43, temperatures range from 23.8 ^{o}C to 26.58 ^{o}C, and specific conductivity ranges from 0.557 to 1.216 millisiemens per centimeter (mS/cm). Other observations regarding the data collected during this reporting period are listed below.

Water quality field measurements from trench 2 include: average DO, ORP, and pH ~0.51 mg/L, ~6.44, and ~ -140 mV, respectively; temperature ranges from 24.56 ^{o}C to 31.75 ^{o}C; and specific conductivity ranges from 0.505 to 1.088 mS/cm.

Through the 9th quarter of bioreactor operation, 2.74 inches of precipitation were measured at the B-3 bioreactor site. Average water thickness in Trench 1 during this period is approximately 3.39 feet. Average water thickness in Trench 2 during this period is approximately 0.83 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) was not detected above the detection limits in the trench samples collected during quarter 9. Manganese (Mn) was reported in bioreactor trench water samples at concentrations ranging from 105 to 398 µg/L (MCL is 50 µg/L). An elevated level of Mn was reported in only one of the surrounding monitoring wells during this quarter (CS-B3-MW01) with 307 µg/L. Arsenic in CS-B3-MW01 was below the MCL at 7.3 µg/L. Elevated levels of Mn were reported in CS-WB06-UGR01 (1,260 µg/L), and elevated levels of As were reported in CS-WB05-LGR04B (21.6 µg/L); all other MPMW zones reported Mn and As levels below the MCL. 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. Lead levels in groundwater collected from CS-B3-MW01 in July 2009 reached 33.6 µg/L, exceeding the drinking water Action Level of 15 µg/L. Lead exceedances in groundwater at CS-B3-MW01 are a regular occurrence (the last sample with lead values below the action level was collected July 2008 (9.7 µg/L)), and monitoring of lead in groundwater will continue as Bioreactor operations proceed.
3. 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.
4. The volatile organic compound summary for the trenches indicates a continuation of a predominately a three-component (VC, DCE isomer, and ethene) chemical composition in water collected from the trench sumps. This indicates the further reduction of contaminants along the degradation pathway toward the end product ethene. Total molar concentrations in trench sumps T1-1, T1-2, T1-3, and T2-1 remain stable or increased slightly through the quarter. The trans-DCE isomer in trench 1 is theorized to be the result of an abiotic reductive dechlorination pathway.
5. Reductive dechlorination of CAHs by microbial activity other than DHC appears to be occurring as DHC bacterial counts have been negligible.
6. Saturated conditions are being maintained within bioreactor Trench 1 with an average water thickness for the quarter of approximately 3.39 feet with ~320,000 more gallons injected into the bioreactor in quarter 9 than in quarter 8.
7. 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 and new B3-EX01 extraction well will decrease. The low-level cut-offs have been reached for all wells, causing the extraction wells to cut out intermittently.

Anticipated Schedule for Next Period (August, 2009 – October, 2009):

- Continue monitoring and maintenance activities for delivery of groundwater to the bioreactor trenches.
- Conduct monthly monitoring events in August and September (Months 28 and 29), and quarterly monitoring event in October (Month 30) for bioreactor system.
- Continue UIC monthly monitoring with semi-annual reporting due December 2009.
- Begin planning and preparations for a new extraction well near SWMU O-1 for delivery of additional water to the bioreactor.
- Conduct water pressure "tracer" test which includes the injection of a large quantity of water into trench 6 and continued monitoring of water levels in trench sumps, Westbay® wells, and surrounding monitoring wells. Westbay Mosdax strings will be installed in surrounding Westbay wells in early/mid September.
- Begin planning stages for the construction of 6 shallow nested wells around the bioreactor.

Specific Data Observation Notes for Attachments

- Analytical results from the B-3 Trench 1 Sump samples, shown in Table 9.1.2, present data from the quarter 9 sampling events.
- Table 9.1.1 indicates a water thickness of approximately 3.39 feet in trench 1 was maintained.
- Table 9.1.2 indicates that VC was present at moderate concentrations in trench 1 sumps (ranging from 2.7 to 54 µg/L) and Ethene was observed in concentrations ranging from ND to 10 µg/L.
- Table 9.1.3 indicates that Mn(II) and Fe(II) were present at concentrations consistent with alternative degradation pathways. Additionally, Table 9.1.3 provides evidence of the biotic anaerobic degradation pathway with the elevated concentrations of Mn and CO_2.
- Table 9.3.3 indicates that VC was present (2.7 µg/L) in the sample taken from monitoring well CS-B3-MW01, which remains consistent with samples collected through the previous 26 months. Additionally, table 9.3.3 indicates that VC concentration was 15 µg/L in the groundwater extracted by the new extraction well, B3-EX01.
- Table 9.4.4 indicates that the *Dehalococcoides* (DHC) bacteria populations are very low or are no longer present in the trench sumps.
- Table 9.5.3 indicated the total VC concentration within the injection water was 4.6 µg/L. UIC permit limits the injection of VC contaminated groundwater at or above 20 µg/L.
- The changes in molar fraction and total molar concentrations shown in graphs of quarter 9 trench 1 sumps indicate a continued reduction in contaminant mass to end products VC and ethene.
- Figure 9.2.5 shows that the water levels in Westbay wells are significantly influenced by precipitation, or lack there of, and pumping at CS-MW16-LGR.

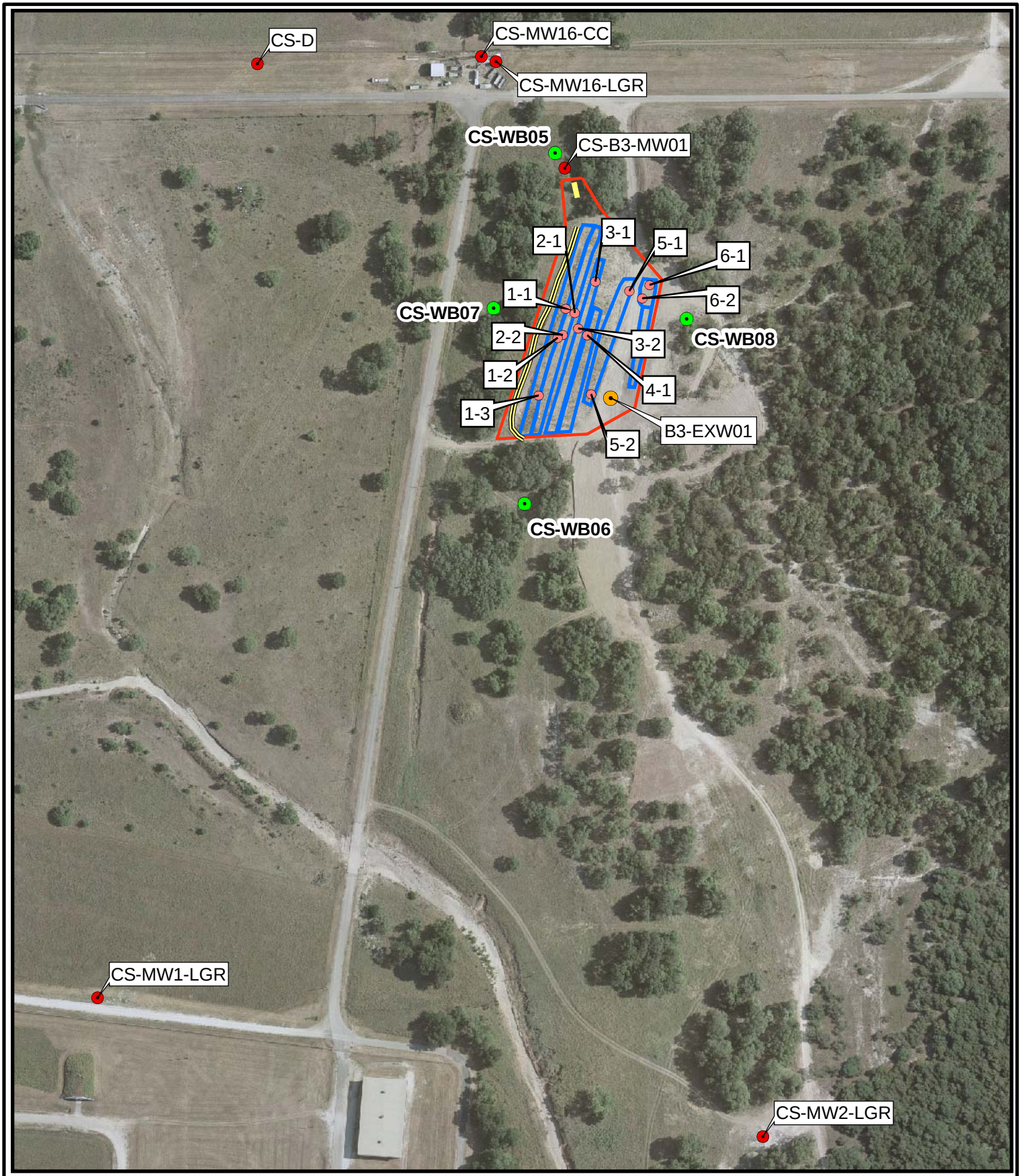

Figure 1

B-3 Bioreactor System

Camp Stanley Storage Activity

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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] (25)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monthly Sampling[a] (26)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quarterly Sampling[b] (9)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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
	7 = Quarter 7
	8 = Quarter 8
	9 = Quarter 9
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	

Figures

Figure 9.1.2T1-1 B-3 Bioreactor Trench 1 Sump 1 VOC Summary through Quarter 9

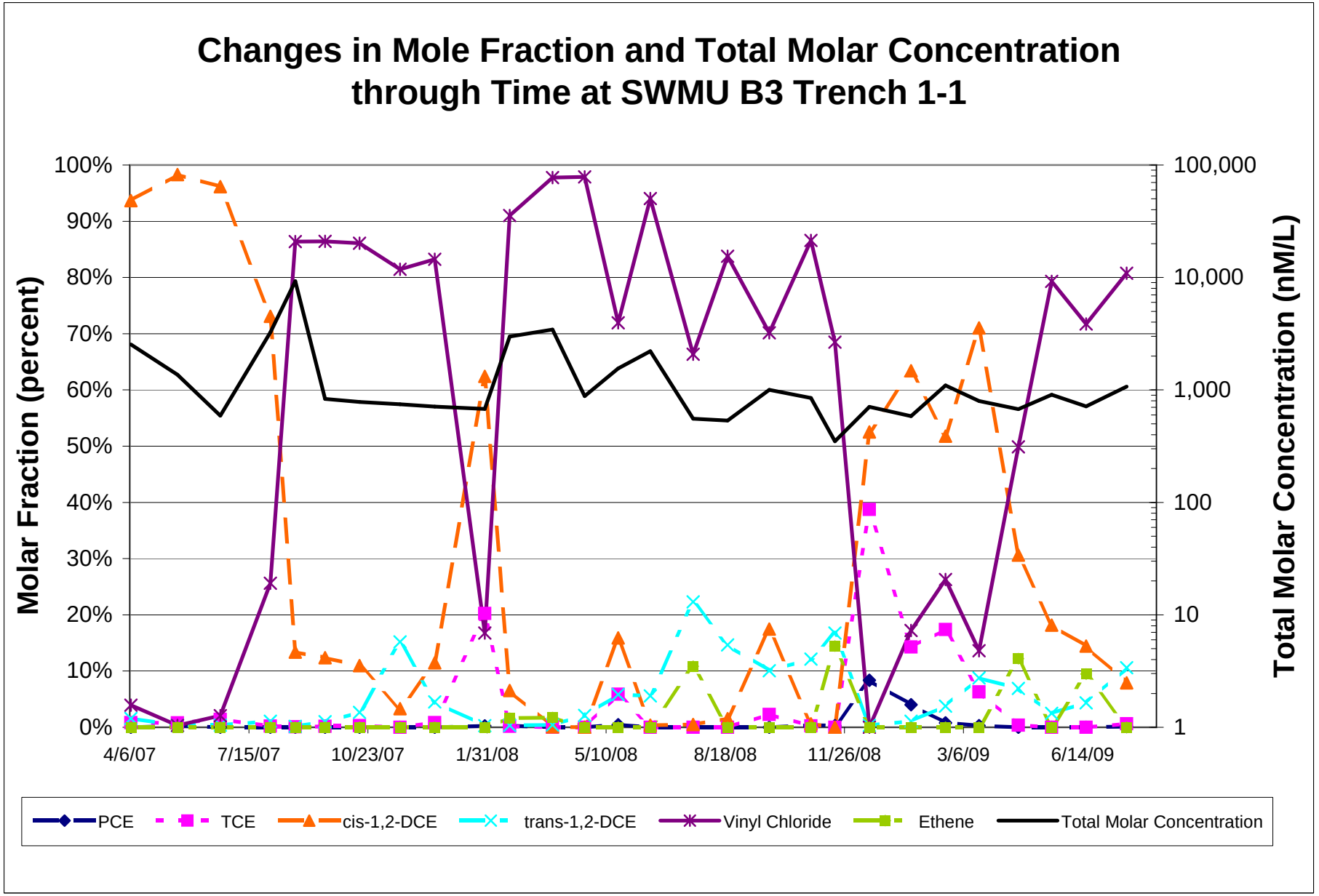

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Figure 9.1.2T1-2 B-3 Bioreactor Trench 1 Sump 2 VOC Summary through Quarter 9

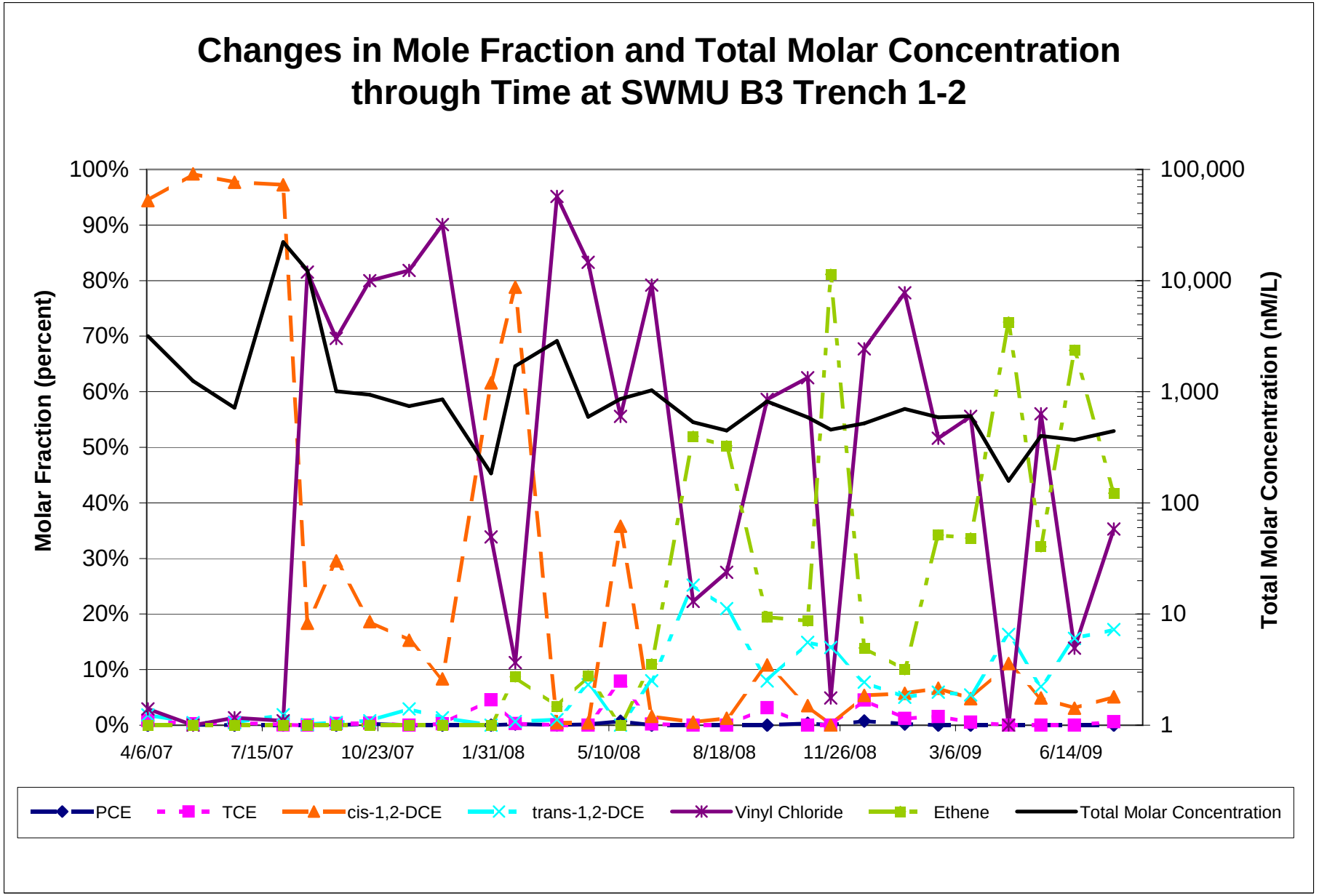

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Figure 9.1.2T1-3 B-3 Bioreactor Trench 1 Sump 3 VOC Summary through Quarter 9

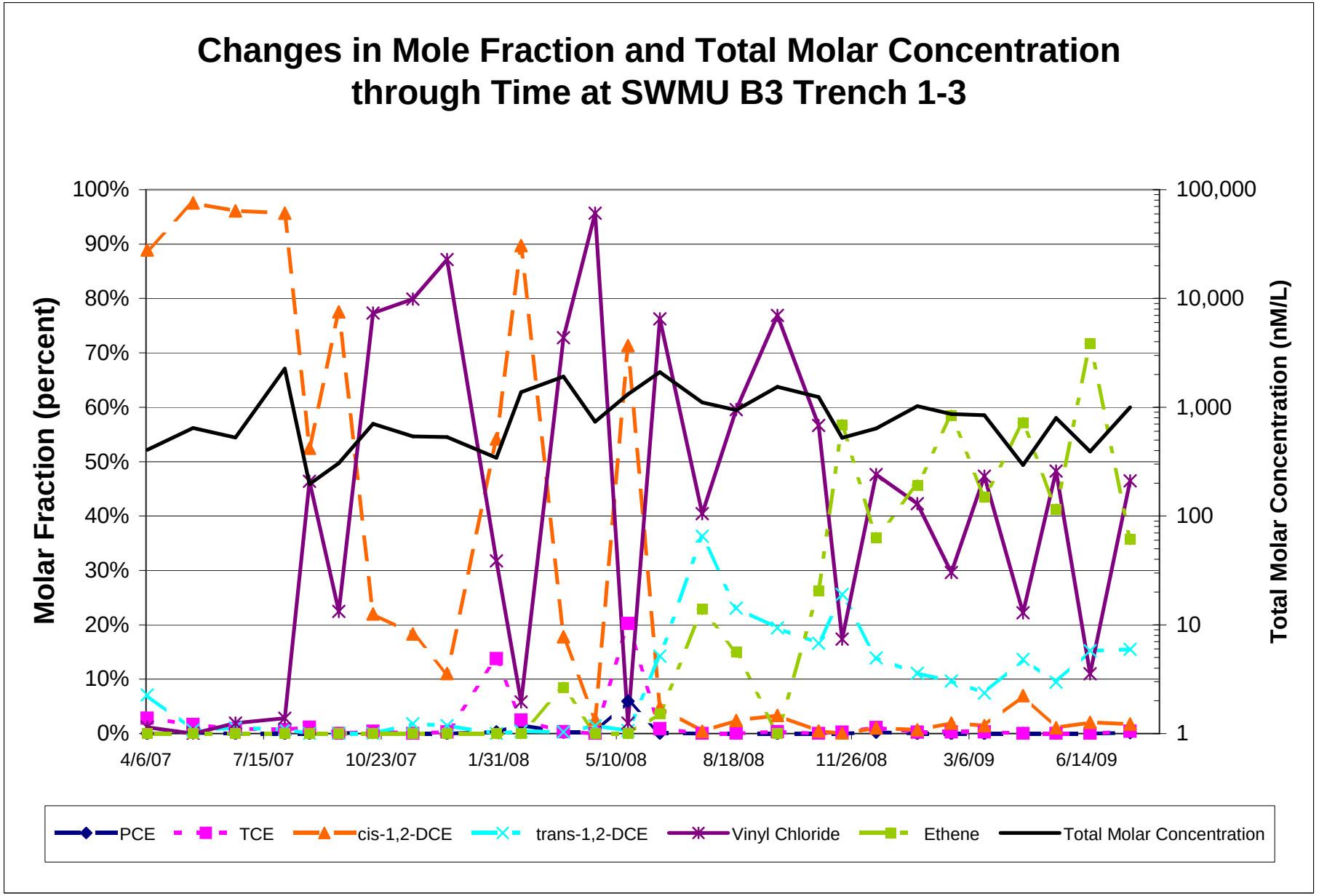

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Figure 9.1.2T2-1 B-3 Bioreactor Trench 2 Sump 1 VOC Summary through Quarter 9

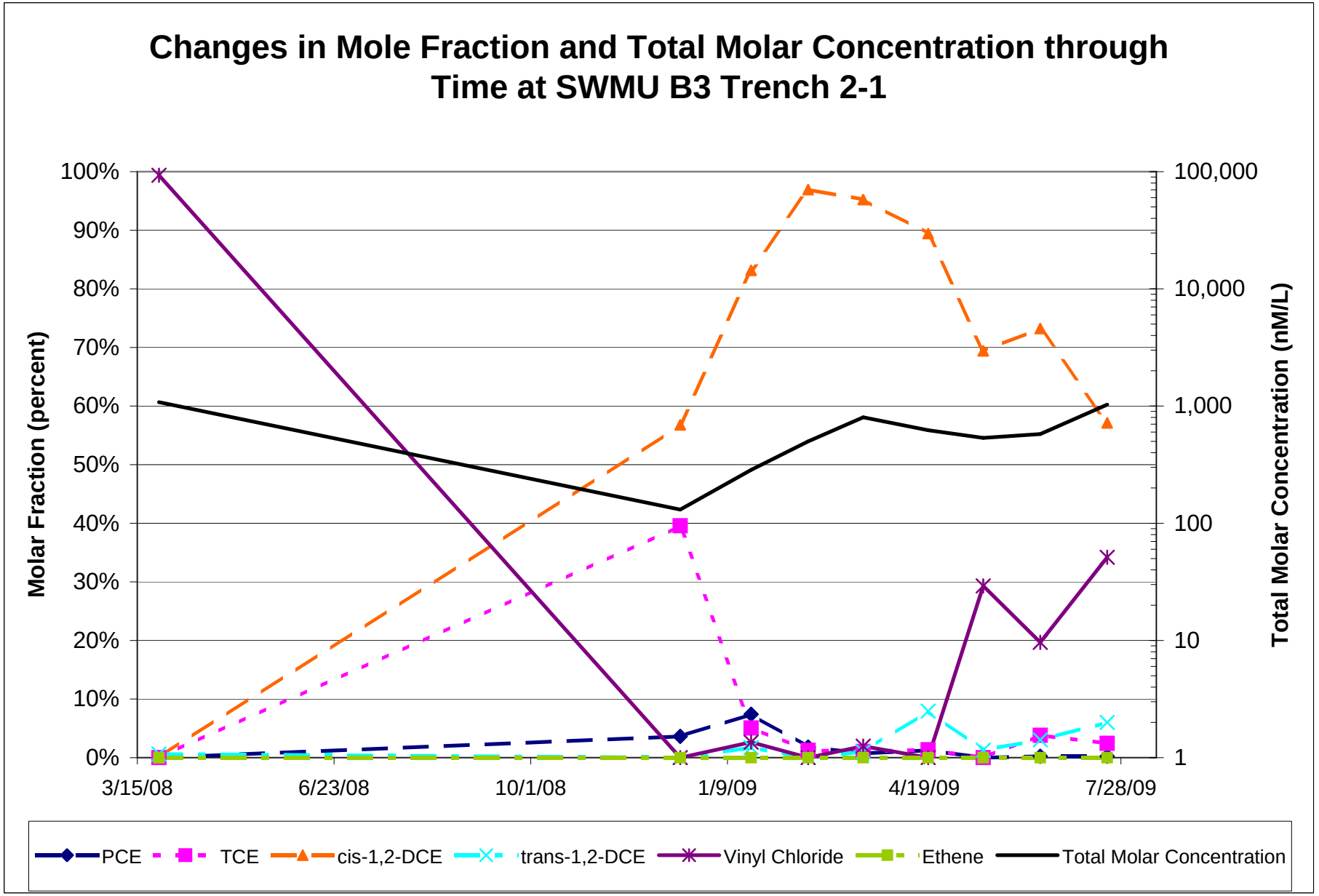

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Figure 9.2.2a Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB05-LGR03B

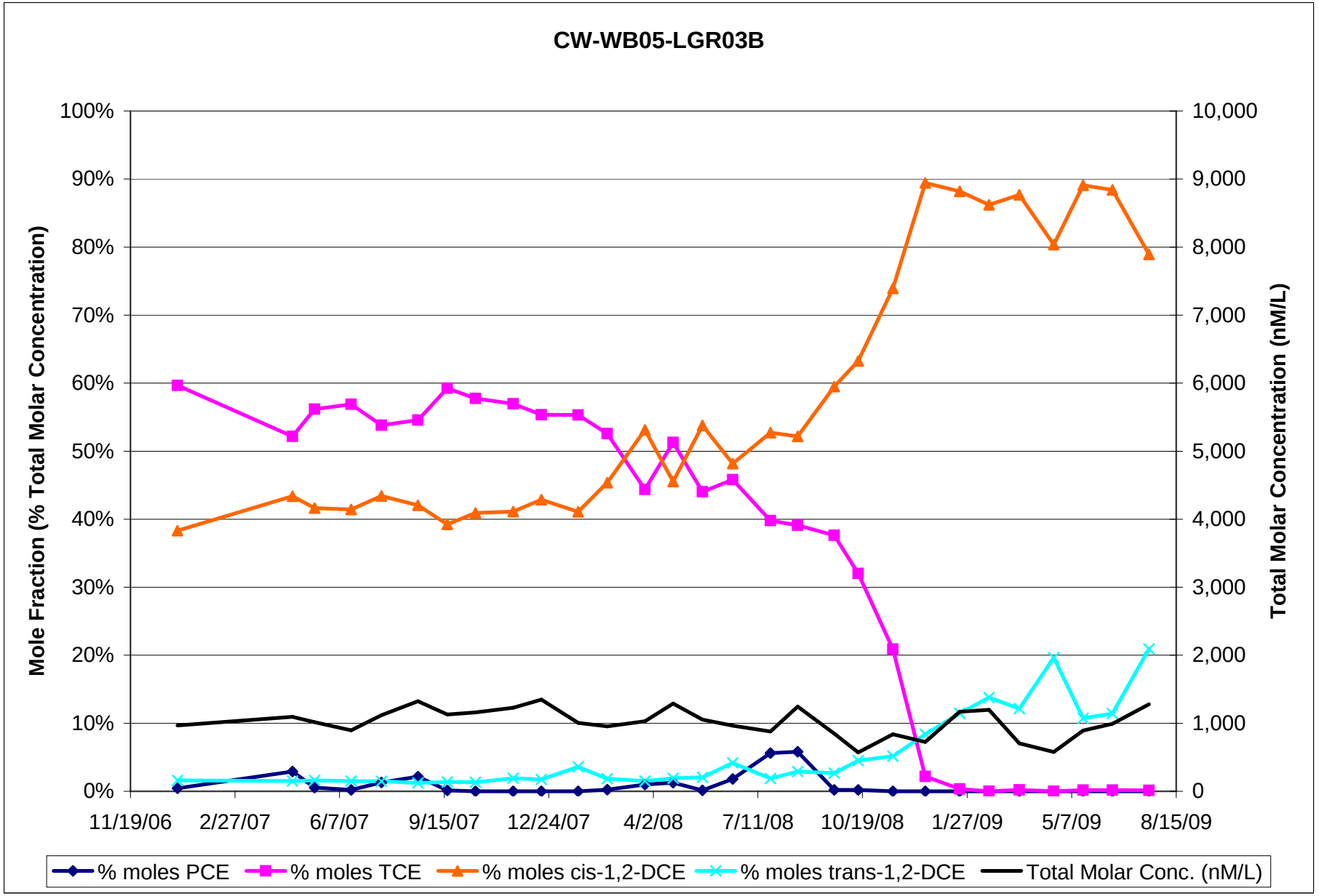

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Figure 9.2.2b Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB06-LGR03B

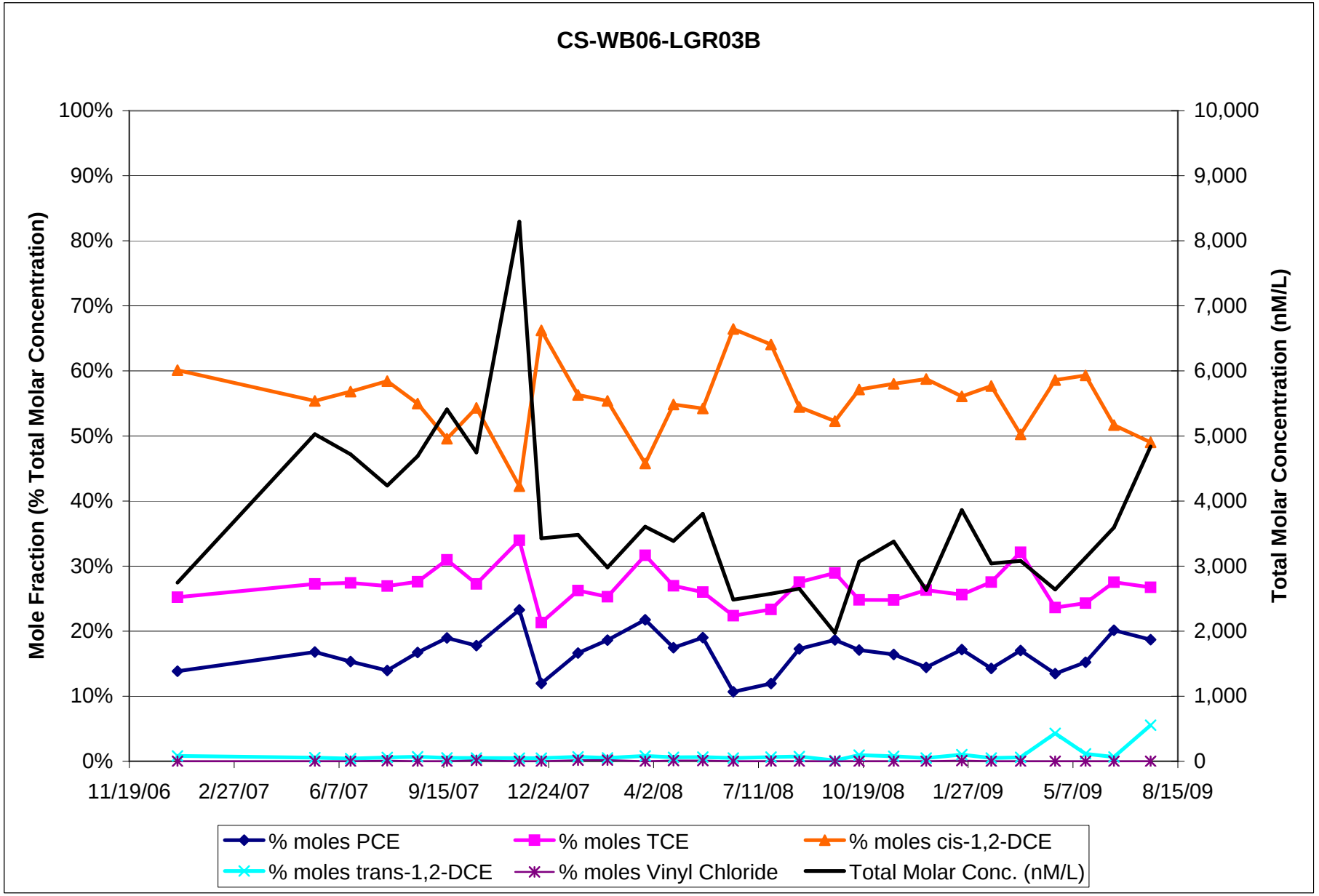

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Figure 9.2.2c Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB07-LGR03B

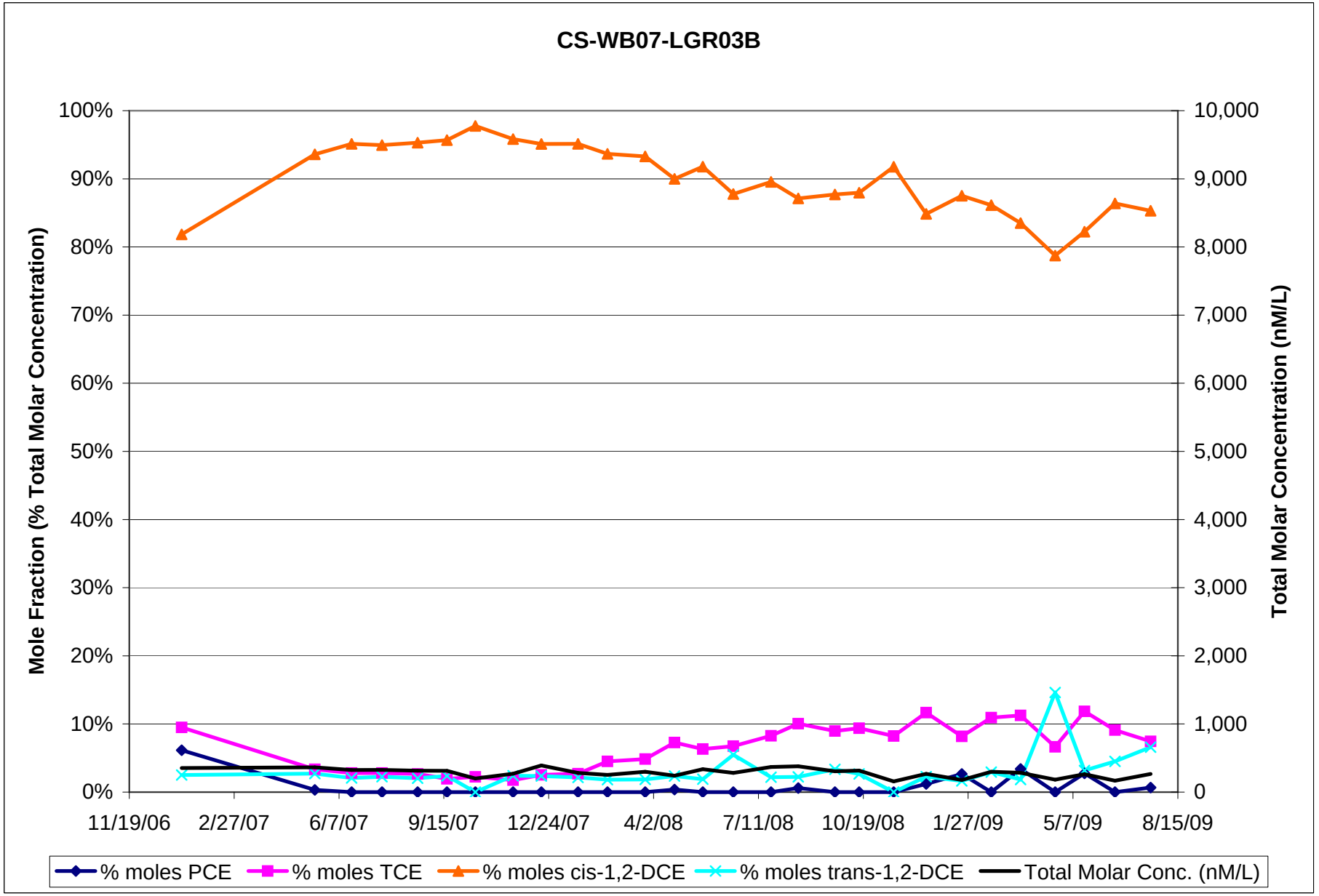

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Figure 9.2.2d Changes in Mole Fraction and Total Molar Concentration through Time at CS-WB08-LGR03B

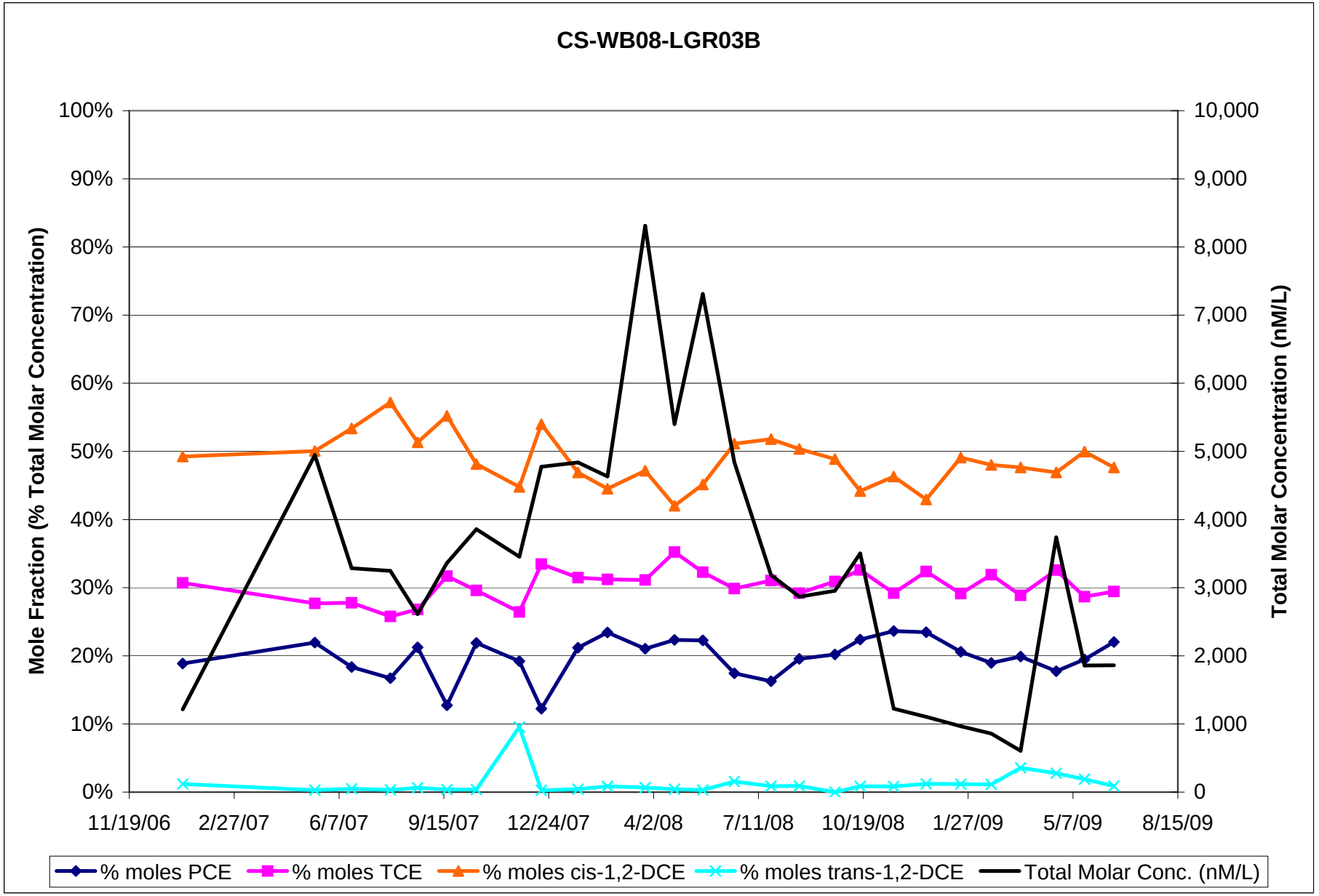

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Figure 9.5.6

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

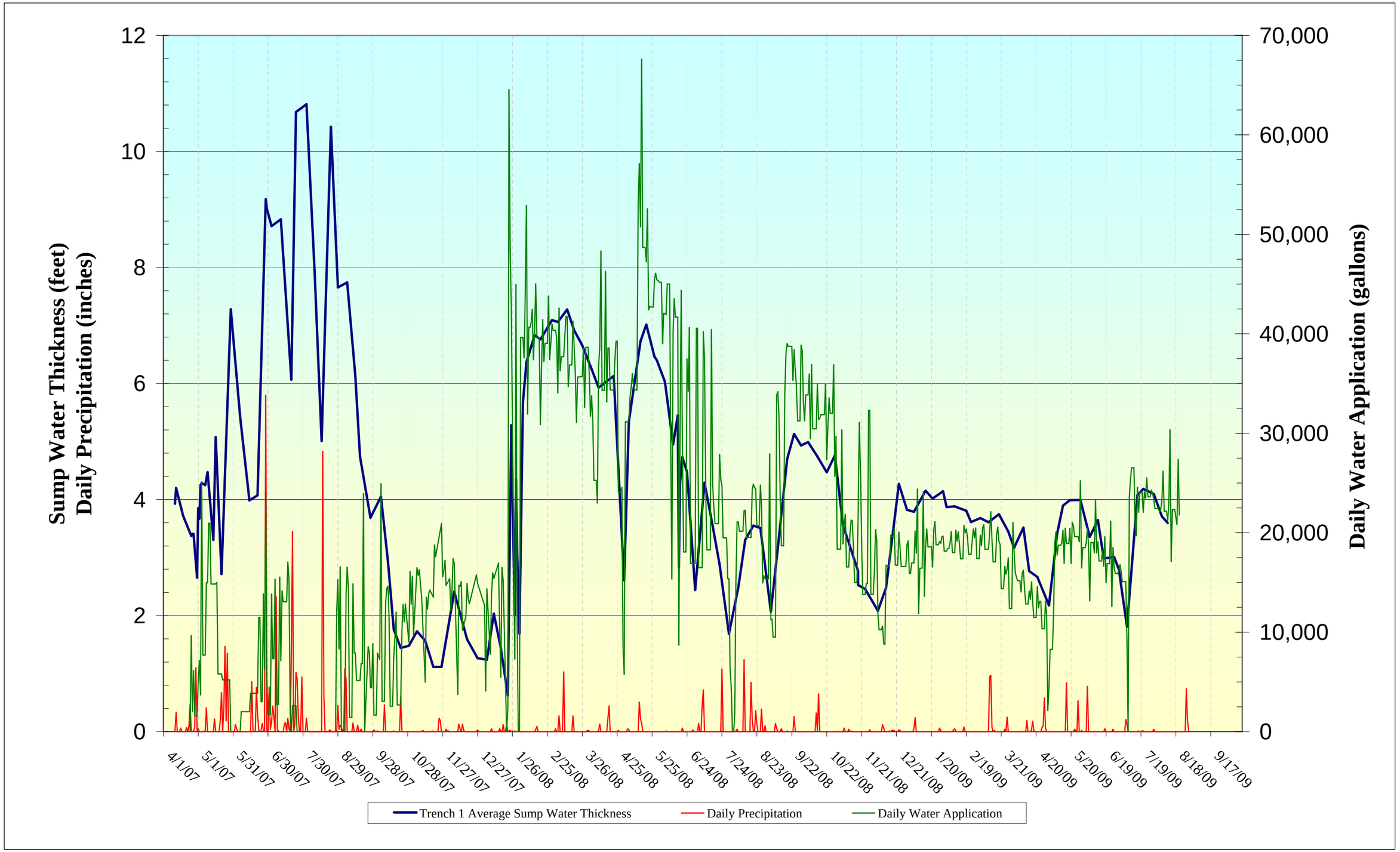

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Figure 9.2.5 Lower Glen Rose Groundwater Elevations (feet above MSL) Measured in Westbay Wells through Quarter 9

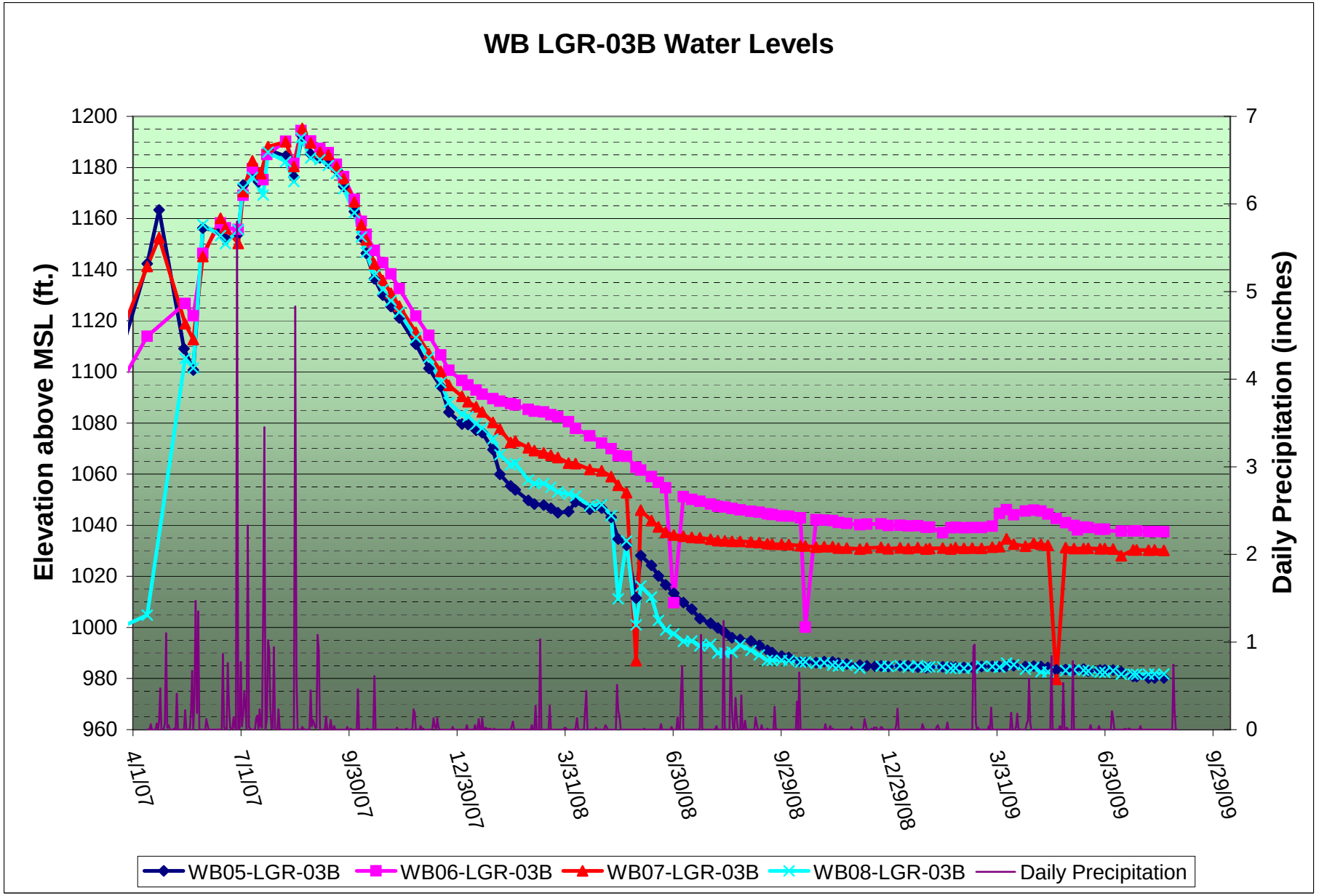

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Figure 9.3.3 Well CS-MW16-LGR CVOC Concentrations, Volume Pumped, and Precipitation

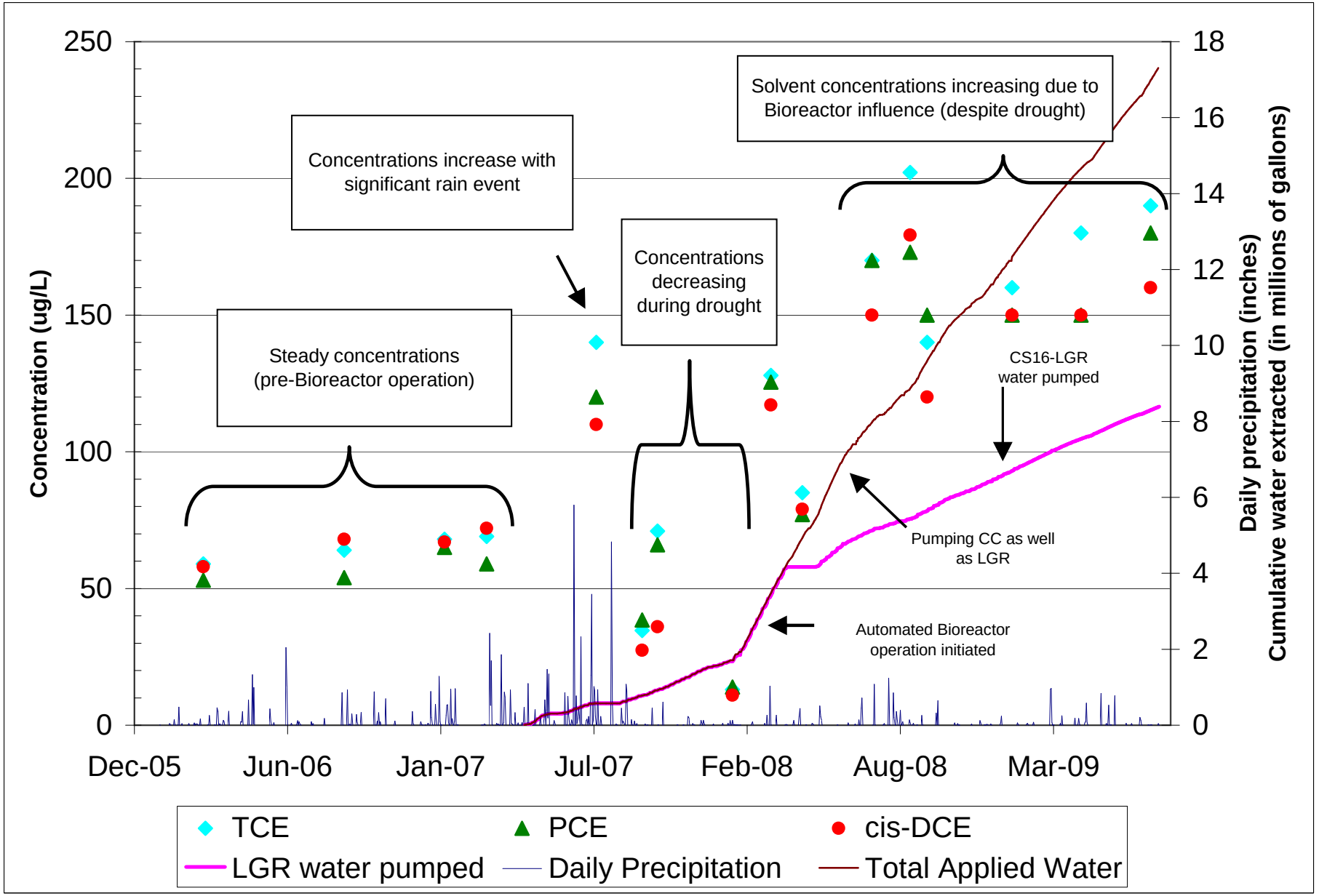

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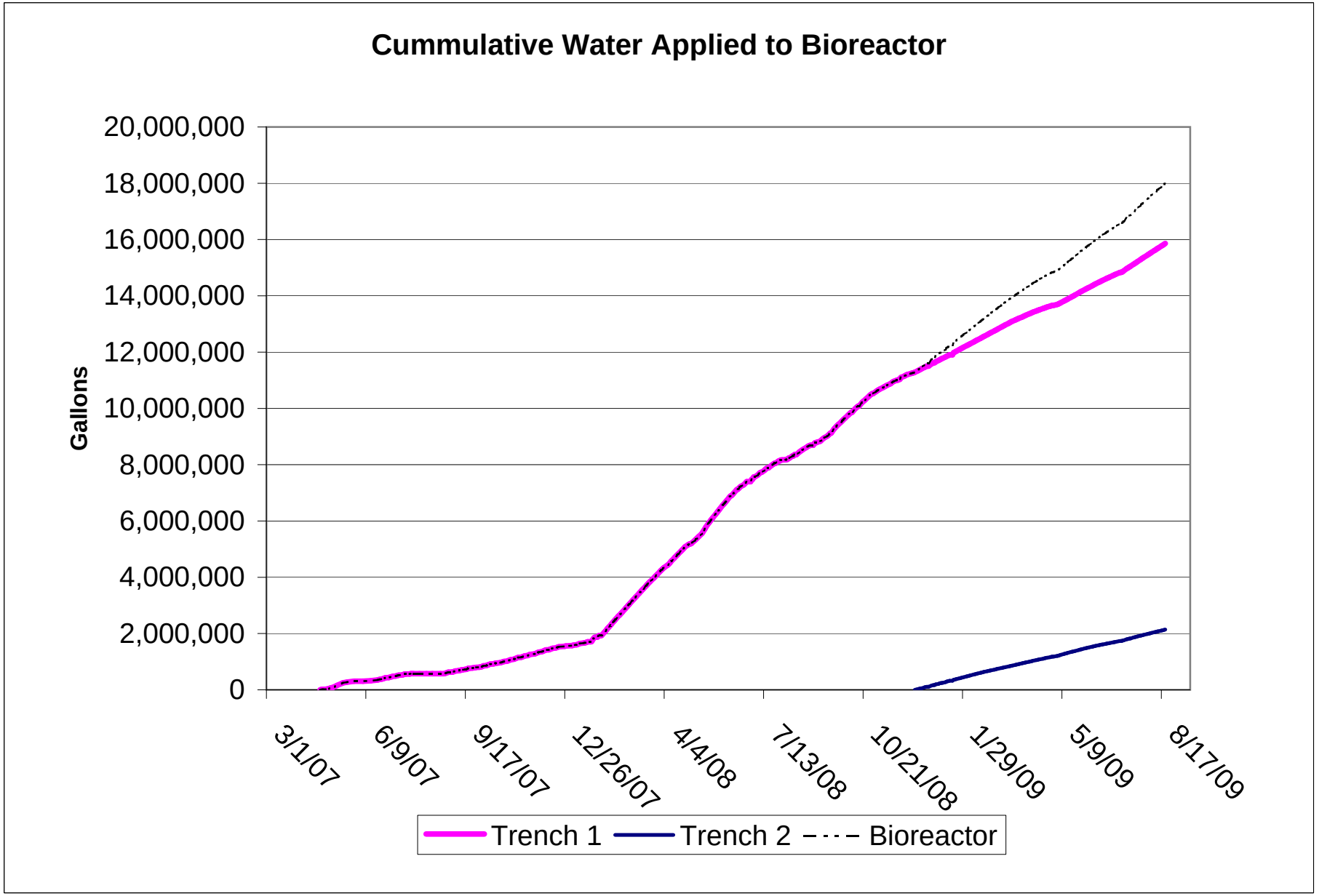
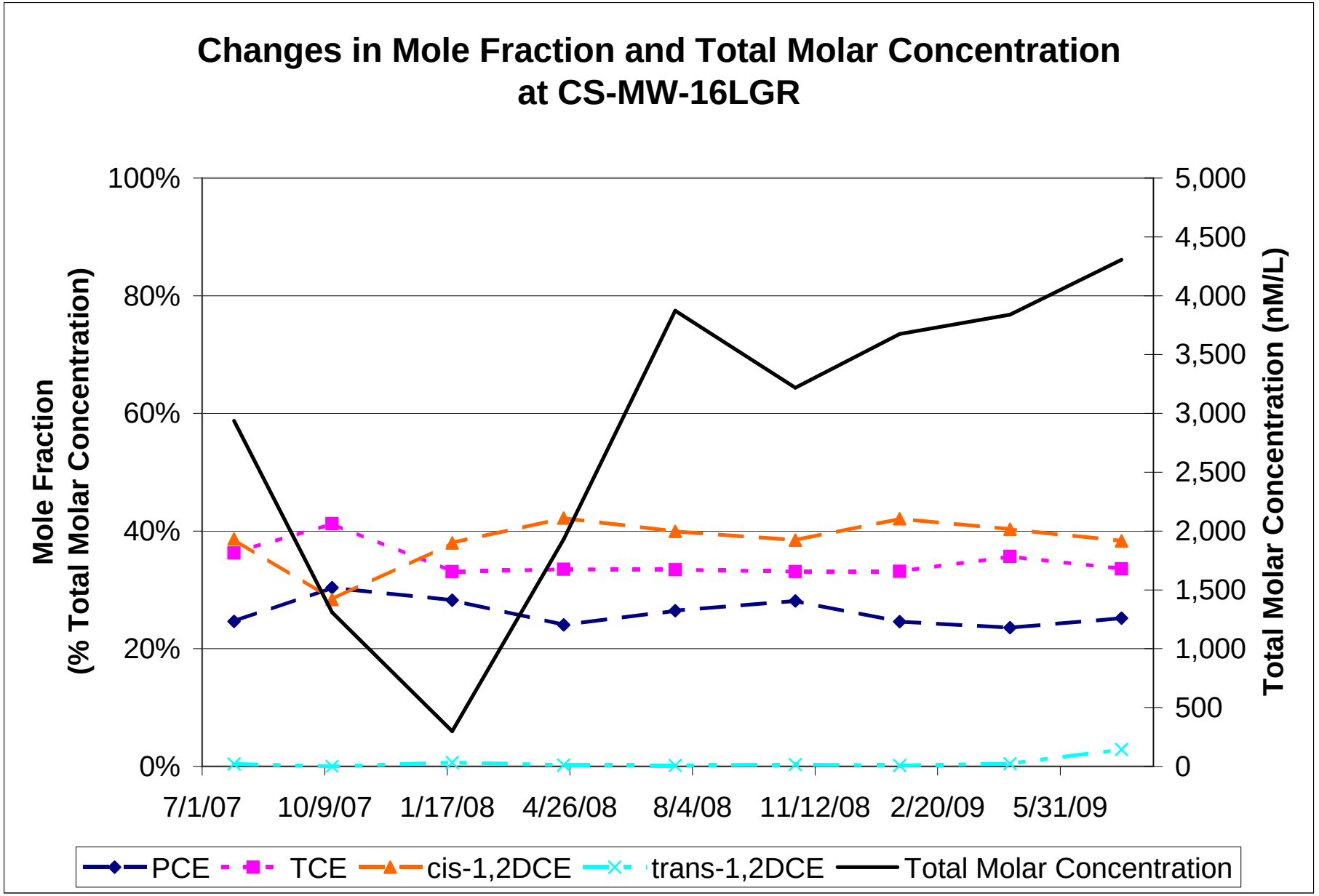
Figure 9.5.5 Cumulative Total Groundwater from CS-MW16 LGR and CC Applied to SWMU B3 Trench 1and 2 through Quarter 9





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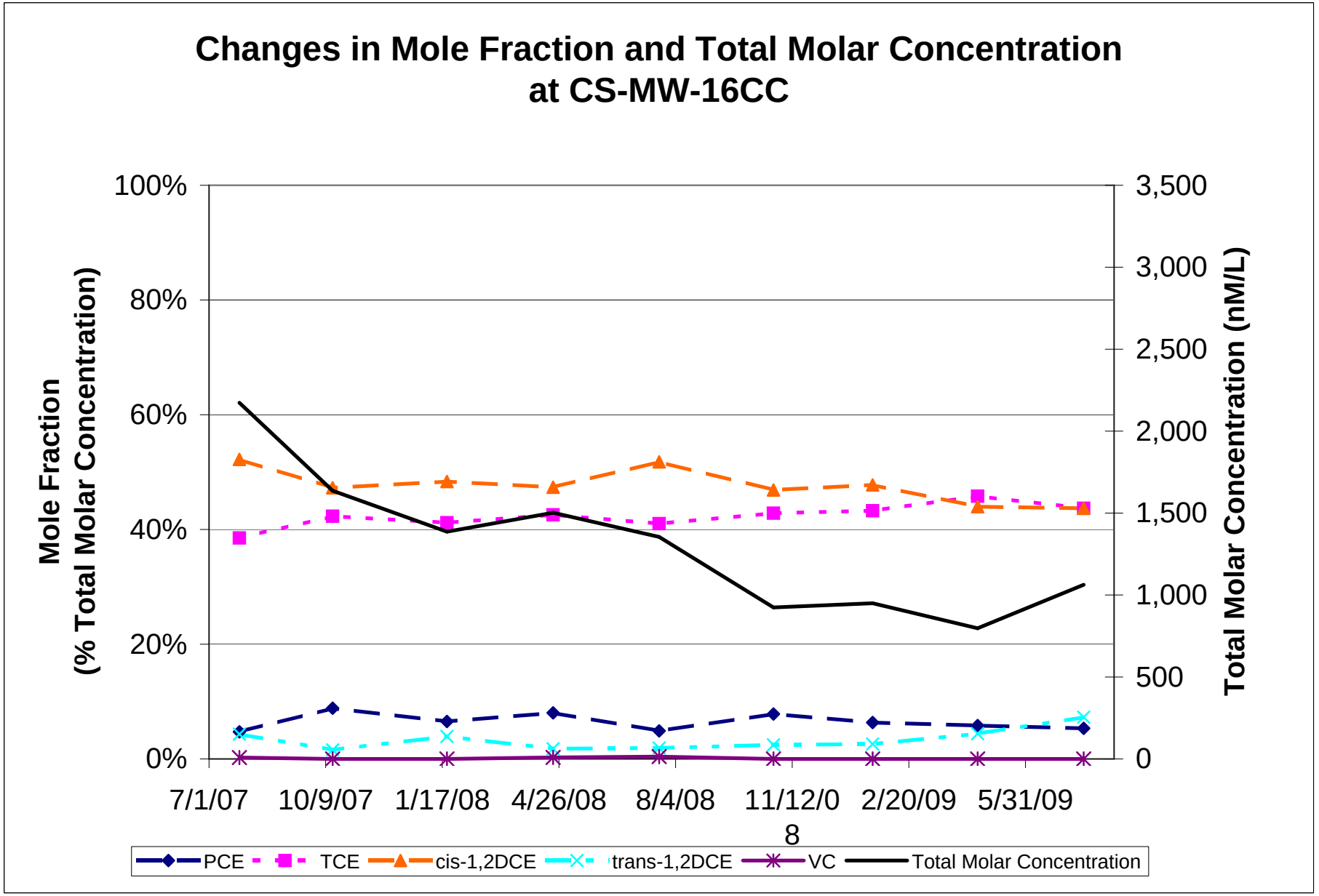

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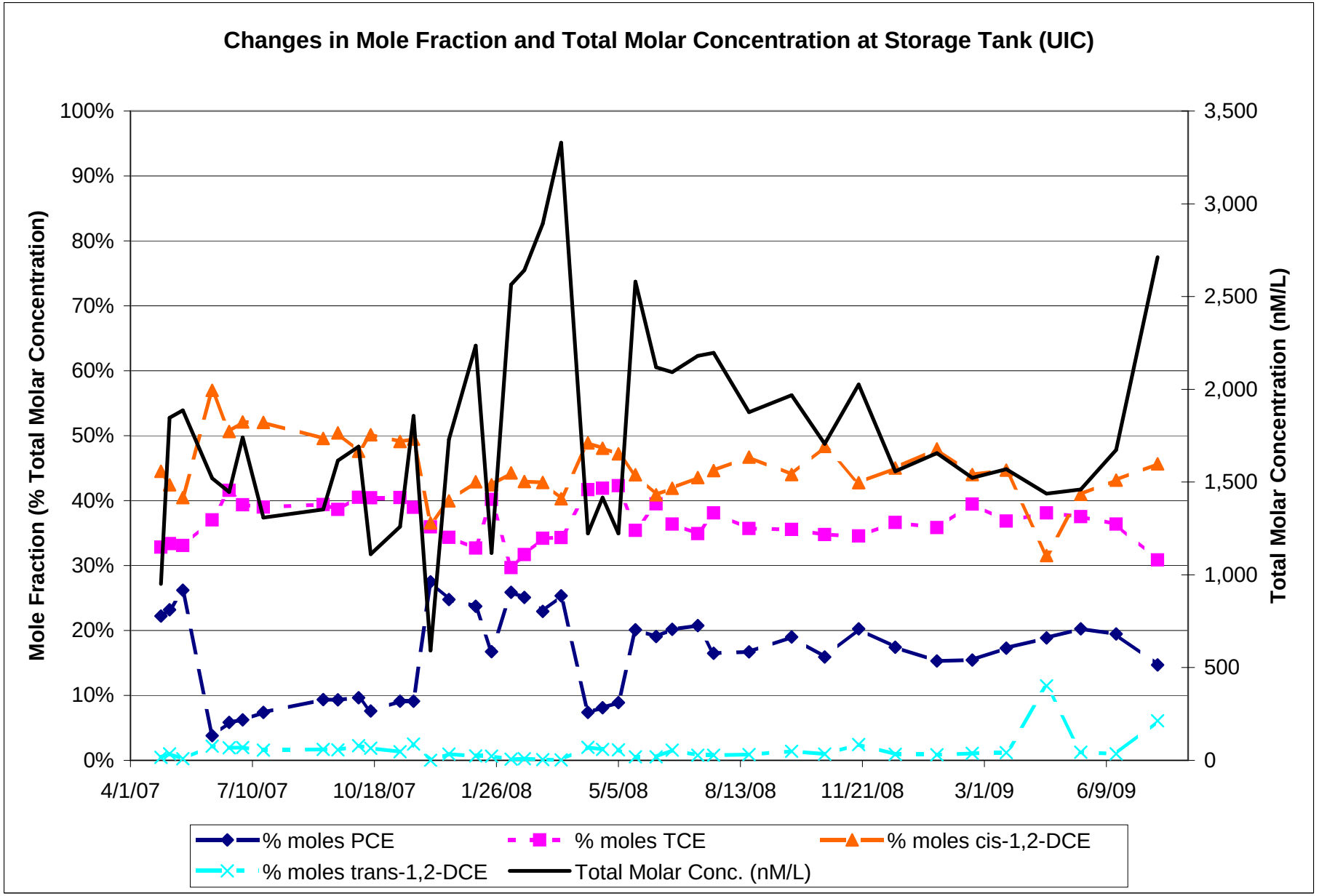
Figure 9.5.2 Changes in Mole Fraction and Total Molar Concentration through Time at Storage Tank (UIC)



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Tables

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	10.68	6.27	24.12	0.58	0.47	-201.0	2.22
5/8/2009	1000	9.61	6.45	24.92	0.557	0.47	-134.3	3.29
5/13/2009	1015	9.00	6.34	24.85	0.749	0.53	-134.7	3.90
5/19/2009	908	8.84	6.53	24.81	1.119	0.26	-181.5	4.06
5/28/2009	1330	8.95	6.36	24.70	0.841	0.40	-141.7	3.95
6/5/2009	1041	9.65	6.26	24.99	0.773	0.39	-159.3	3.25
6/12/2009	1237	9.32	6.35	25.31	0.547	0.51	-137.7	3.58
6/17/2009	845	10.03	6.34	25.57	0.92	0.40	-153.3	2.87
6/26/2009	930	9.92	6.48	26.21	0.849	0.70	-178.9	2.98
6/30/2009	911	10.16	6.53	26.30	0.833	0.45	-161.5	2.74
7/7/2009	915	11.28	6.40	26.37	0.559	0.58	-144.1	1.62
7/16/2009	830	8.88	6.33	26.50	0.87	0.51	-145.2	4.02
7/21/2009	830	8.80	6.64	26.24	0.871	0.47	-194.0	4.10
7/30/2009	755	8.84	6.61	26.11	0.739	0.54	-194.1	4.06

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	10.54	6.24	23.94	0.652	0.46	-189.3	1.86
5/8/2009	1000	9.31	6.26	24.52	0.742	0.48	-151.6	3.09
5/13/2009	1015	8.80	6.22	24.85	0.875	0.49	-156	3.60
5/19/2009	908	8.73	6.44	24.44	1.216	0.24	-177.5	3.67
5/28/2009	1330	8.68	6.34	23.37	0.906	0.39	-135.2	3.72
6/5/2009	1041	9.33	6.25	24.76	0.826	0.40	-152.5	3.07
6/12/2009	1237	9.05	6.37	24.99	0.524	0.48	-138.2	3.35
6/17/2009	845	9.71	6.39	25.33	0.924	0.22	-153	2.69
6/26/2009	930	9.68	6.45	26.02	0.954	0.68	-169.6	2.72
6/30/2009	911	9.91	6.49	26.29	0.991	0.39	-159	2.49
7/7/2009	915	10.83	6.33	26.12	0.604	0.50	-128.8	1.57
7/16/2009	830	8.62	6.31	25.93	0.916	0.54	-146.5	3.78
7/21/2009	830	8.50	6.53	25.41	0.892	0.27	-181.4	3.90
7/30/2009	755	8.58	6.48	25.63	0.805	0.39	-183.7	3.82

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	10.40	6.34	23.80	0.564	0.41	-179.8	2.45
5/8/2009	1000	9.00	6.37	24.72	0.590	0.43	-149.5	3.85
5/13/2009	1015	8.66	6.51	25.19	0.673	0.41	-142.5	4.19
5/19/2009	908	8.61	6.41	25.06	0.951	0.18	-178.4	4.24
5/28/2009	1330	8.54	6.52	24.81	0.758	0.30	-169.4	4.31
6/5/2009	1041	9.10	6.35	25.13	0.718	0.41	-160.0	3.75
6/12/2009	1237	8.84	6.58	25.65	0.524	0.48	-138.2	4.01
6/17/2009	845	9.45	6.34	25.94	0.872	0.18	-145.4	3.40
6/26/2009	930	9.52	6.67	26.41	0.851	0.62	-162.3	3.33
6/30/2009	911	9.69	6.65	26.58	0.837	0.48	-142.5	3.16
7/7/2009	915	10.61	6.46	26.57	0.565	0.51	-121.7	2.24
7/16/2009	830	8.42	6.43	26.46	0.769	0.48	-142.3	4.43
7/21/2009	830	8.30	6.77	26.48	0.738	0.33	-183.5	4.55
7/30/2009	755	8.44	6.58	26.28	0.719	0.44	-185.2	4.41

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	8.58	6.43	24.56	0.550	0.56	-201.0	1.09
5/8/2009	1000	8.6	6.24	25.35	0.584	0.73	-124.7	1.07
5/13/2009	1015	8.64	6.38	25.79	0.707	0.58	-134.2	1.03
5/19/2009	908	8.6	6.58	25.75	1.023	0.61	-134.2	1.07
5/28/2009	1330	8.54	6.38	25.39	0.779	0.47	-110.3	1.13
6/5/2009	1041	8.64	6.28	25.61	0.767	0.45	-141.2	1.03
6/12/2009	1237	8.52	6.38	25.98	0.505	0.55	-121.5	1.15
6/17/2009	845	8.68	6.42	26.54	0.802	0.28	-136.1	0.99
6/26/2009	930	8.63	6.53	26.8	0.772	0.85	-156.5	1.04
6/30/2009	911	8.5	6.47	27.05	0.755	0.39	-139.7	1.17
7/7/2009	915	9.08	6.44	27.07	0.509	0.78	-122.4	0.59
7/16/2009	830	8.52	6.38	27.48	0.882	0.50	-151.4	1.15
7/21/2009	830	8.52	6.68	27.22	0.809	0.28	-167.9	1.15
7/30/2009	755	8.58	6.47	27.54	0.777	0.48	-184.5	1.09

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	9.70						0.31
5/8/2009	1000	9.74						0.27
5/13/2009	1015	9.33	6.42	27.75	1.612	0.44	-152.2	0.68
5/19/2009	908	9.21						0.80
5/28/2009	1330	9.05	6.44	28.97	1.804	0.32	-130.9	0.96
6/5/2009	1041	9.12						0.89
6/12/2009	1237	9.28	6.35	29.4	1.088	0.5	-121.3	0.73
6/17/2009	845	9.32						0.69
6/26/2009	930	9.29	6.51	31.6	1.605	0.59	-139.8	0.72
6/30/2009	911	9.34	6.62	31.28	1.495	0.41	-122.1	0.67
7/7/2009	915	9.50	6.47	31.75	0.977	0.46	-117.7	0.51
7/16/2009	830	9.62						0.39
7/21/2009	830	9.64						0.37
7/30/2009	755	9.61						0.40

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	9.22	6.23	27.31	0.556	0.49	-184.8	0.74
5/8/2009	1000	9.22						0.74
5/13/2009	1015	9.22						0.74
5/19/2009	908	9.16						0.80
5/28/2009	1330	9.20	6.24	29.01	0.897	0.34	-171.1	0.76
6/5/2009	1041	9.20						0.76
6/12/2009	1237	9.20						0.76
6/17/2009	845	9.32						0.64
6/26/2009	930	9.10						0.86
6/30/2009	911	9.21						0.75
7/7/2009	915	9.19						0.77
7/16/2009	830	9.15						0.81
7/21/2009	830	9.12	6.45	34.11	0.924	0.23	-172.7	0.84
7/30/2009	755	9.08						0.88

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	7.40						0.00
5/8/2009	1000	7.40						0.00
5/13/2009	1015	7.40						0.00
5/19/2009	908	7.40						0.00
5/28/2009	1330	7.40						0.00
6/5/2009	1041	7.40						0.00
6/12/2009	1237	7.40						0.00
6/17/2009	845	7.40						0.00
6/29/2009	930	7.40						0.00
6/30/2009	911	7.40						0.00
7/7/2009	915	7.40						0.00
7/16/2009	830	7.40						0.00
7/21/2009	830	7.40						0.00
7/30/2009	755	7.40						0.00

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)*
5/1/2009	1400	6.32						0.00
5/8/2009	1000	6.32						0.00
5/13/2009	1015	6.32						0.00
5/19/2009	908	6.32						0.00
5/28/2009	1330	6.32						0.00
6/5/2009	1041	6.32						0.00
6/12/2009	1237	6.32						0.00
6/17/2009	845	6.32						0.00
6/26/2009	930	6.32						0.00
6/30/2009	911	6.32						0.00
7/7/2009	915	6.32						0.00
7/16/2009	830	6.32						0.00
7/21/2009	830	6.32						0.00
7/30/2009	755	6.32						0.00

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)***
5/1/2009	1400	9.33						0.00
5/8/2009	1000	9.33						0.00
5/13/2009	1015	9.33						0.00
5/19/2009	908	9.33						0.00
5/28/2009	1330	9.33						0.00
6/5/2009	1041	9.33						0.00
6/12/2009	1237	9.32						0.01
6/17/2009	845	9.33						0.00
6/26/2009	930	9.33						0.00
6/30/2009	911	9.33						0.00
7/7/2009	915	9.30						0.03
7/16/2009	830	9.30						0.03
7/21/2009	830	9.30						0.03
7/30/2009	755	9.31						0.02

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)***
5/1/2009	1400	7.03						0.95
5/8/2009	1000	7.82						0.16
5/13/2009	1015	7.30						0.68
5/19/2009	908	7.75						0.23
5/28/2009	1330	7.75						0.23
6/5/2009	1041	7.74						0.24
6/12/2009	1237	7.78						0.20
6/17/2009	845	7.98						0.00
6/26/2009	930	7.83						0.15
6/30/2009	911	7.85						0.13
7/7/2009	915	7.85						0.13
7/16/2009	830	7.87						0.11
7/21/2009	830	7.89						0.09
7/30/2009	755	7.90						0.08

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)***
5/1/2009	1400	11.05						0.40
5/8/2009	1000	11.09						0.36
5/13/2009	1015	11.06						0.39
5/19/2009	908	11.08						0.37
5/28/2009	1330	11.05						0.40
6/5/2009	1041	11.04						0.41
6/12/2009	1237	11.05						0.40
6/17/2009	845	11.03						0.42
6/26/2009	930	11.02						0.43
6/30/2009	911	11.02						0.43
7/7/2009	915	11.00						0.45
7/16/2009	830	11.05						0.40
7/21/2009	830	11.05						0.40
7/30/2009	755	11.05						0.40

NA = Not Available

Table 9.1.1 SWMU B-3 Bioreactor Trenches - Field Measurement Data - Quarter 9

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)***
5/1/2009	1400	11.85						0.49
5/8/2009	1000	11.88						0.46
5/13/2009	1015	11.85						0.49
5/19/2009	908	11.82						0.52
5/28/2009	1330	11.84						0.50
6/5/2009	1041	11.83						0.51
6/12/2009	1237	11.88						0.46
6/17/2009	845	11.87						0.47
6/26/2009	930	11.91						0.43
6/30/2009	911	11.91						0.43
7/7/2009	915	11.88						0.46
7/16/2009	830	11.89						0.45
7/21/2009	830	11.9						0.44
7/30/2009	755	11.9						0.44

NA = Not Available

Table 9.1.2 SWMU B-3 Trench 1 and 2 Quarter 9 - VOC Analytical Summary Table

Q9	B3 T1-1			B3 T1-2			B3 T1-3			B3 T2-1		
Date	**5/19/09**	**6/17/09**	**7/21/09**	**5/19/09**	**6/17/09**	**7/21/09**	**5/19/09**	**6/17/09**	**7/21/09**	**5/19/09**	**6/17/09**	**7/21/09**
PCE (µg/L)	0	0	0.20	0	0	0	0	0	0.31	0	0.23	0.39
TCE (µg/L)	0	0	0.86	0	0	0.37	0	0	0.55	0	2.9	3.3
cis-1,2-DCE (µg/L)	16	10	8.2	1.9	1.1	2.2	0.81	0.78	1.7	36	41	57
trans-1,2-DCE (µg/L)	2.2	3	11	2.7	5.6	7.4	7.3	5.8	15	0.66	1.7	6.0
Vinyl Chloride (µg/L)	45	32	54	14	3.2	9.8	24	2.7	29	9.8	7.1	22
Ethene (µg/L)	0	1.9	0	3.6	7	5.2	9.2	7.9	10	0	0	0
PCE (nM/L)	0.000	0.000	1.206	0.000	0.000	0.000	0.000	0.000	1.869	0.000	1.387	2.352
TCE (nM/L)	0.000	0.000	6.545	0.000	0.000	2.816	0.000	0.000	4.186	0.000	22.072	25.116
cis-1,2-DCE (nM/L)	165.034	103.146	84.580	19.598	11.346	22.692	8.355	8.045	17.535	371.325	422.898	587.932
trans-1,2-DCE (nM/L)	22.692	30.944	113.461	27.849	57.762	76.328	75.297	59.825	154.719	6.808	17.535	61.888
Vinyl Chloride (nM/L)	719.885	511.918	863.862	223.964	51.192	156.775	383.939	43.193	463.926	156.775	113.582	351.944
Ethene (nM/L)	0.000	67.736	0.000	128.342	249.554	185.383	327.986	281.640	356.506	0.000	0.000	0.000
Total Molar Conc. (nM/L)	907.610	713.744	1,069.653	399.754	369.854	443.994	795.576	392.703	998.741	534.908	577.474	1,029.231
% moles PCE	0.000%	0.000%	0.113%	0.000%	0.000%	0.000%	0.000%	0.000%	0.187%	0.000%	0.240%	0.229%
% moles TCE	0.000%	0.000%	0.612%	0.000%	0.000%	0.634%	0.000%	0.000%	0.419%	0.000%	3.822%	2.440%
% moles cis-1,2-DCE	18.183%	14.451%	7.907%	4.902%	3.068%	5.111%	1.050%	2.049%	1.756%	69.419%	73.232%	57.123%
% moles trans-1,2-DCE	2.500%	4.335%	10.607%	6.967%	15.617%	17.191%	9.464%	15.234%	15.491%	1.273%	3.036%	6.013%
% moles Vinyl Chloride	79.316%	71.723%	80.761%	56.026%	13.841%	35.310%	48.259%	10.999%	46.451%	29.309%	19.669%	34.195%
% moles Ethene	0.000%	9.490%	0.000%	32.105%	67.474%	41.754%	41.226%	71.718%	35.696%	0.000%	0.000%	0.000%
sum % moles	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Month 25	Month 26	Month 27	Month 25	Month 26	Month 27	Month 25	Month 26	Month 27	Month 25	Month 26	Month 27

Note: 0 sample indicates a non-detect analyte value

Q9		B3																					
Well ID		**B3 T1-1**						**B3 T1-2**						**B3 T1-3**						**B3 T2-1**			
Sample Date		**5/19/2009**		**6/17/2009**		**7/21/2009**		**5/19/2009**		**6/17/2009**		**7/21/2009**		**5/19/2009**		**6/17/2009**		**7/21/2009**		**5/19/2009**		**6/17/2009**		**7/21/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	5.8		2.8	B	3.1		5.6		2.7	B	4.7		4.7		3.6	B	4.0		4.7		2.4	B	1.8	
Total Organic Carbon	mg/L	6.7		3.6		3.2		6.0		2.9		4.8		5.0		4.0		4.3		5.2		3.0		3.6	
Methane	µg/L	1,420		1,150		3,550		5,400		7,010		5,640		6,250		7,280		9,450		556		265		1,380	
Ethene	µg/L	0		1.9	J	0		3.6		7.0		5.2		9.2		7.9		10		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	239,000		254,000		447,000		272,000		315,000		291,000		179,000		265,000		332,000		161,000		207,000		290,000	
Alkalinity, Total (as CACO3)	mg/L	445		427		490		471		470		468		373		458		395		373		358		443	
Nitrate/Nitrite	mg/L	0		0		0.058	J	0		0.045	J	0		0		0	J	0.044	J	2.7		0.031	J	0.038	J
Sulfate	mg/L	10.2		18.2		3.3		5.6		1.3		2.2		2.0		1.3		1.1		26		34.9		29	
Chloride	mg/L	15.1		15.4		14.2		15.3		15.4		14.4		15.1		15.5		14.2		15		15.3		14.3	
Ferrous Iron	mg/L	3.5		3.1		3.4		5.0		3.5		4.2		2.9		3.8		4.2		2.3		2.0		1.6	
Manganese	µg/L	177		110		203		218		152		256		296		289		306		398		187		105	
Hydrogen	nM/L	2.4		2.9		2.6		5.0		6.1		2.7		3.8		3.8		6.1		2.3		2.4		2.3	
Hydrogen Sulfide																									
Total Dissolved Solids	mg/L	531		510		510		526		486		512		435		490		449		511		454		485	
Benzene	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Bromodichloromethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Bromoform	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Chloroform	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dibromochloromethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Dichloroethene, cis-1,2-	µg/L	16		10		8.2		1.9		1.1	J	2.2		0.81	J	0.78	J	1.7		36		41		57	
Dichloroethene, trans-1,2-	µg/L	2.2		3.0		11		2.7		5.6		7.4		7.3		5.8		15		0.66		1.7		6	
Methylene chloride	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0		0		0.2	BJ	0		0		0		0		0		0.31	BJ	0		0.23	J	0.39	J
Toluene	µg/L	0.60	J	0.53	J	1.3		0.82	J	1.0	J	1.4		0.48	J	1.0	J	1.1		0		0		0.26	J
Trichloroethene	µg/L	0		0		0.86	J	0		0		0.37	J	0		0		0.55	J	0		2.9		3.3	
Vinyl chloride	µg/L	45		32		54		14		3.2		9.8		24		2.7		29		9.8		7.1		22	
Arsenic	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Barium	µg/L	62.1		58.2		68.4		91.0		88.8		104		94		131		101		104		130		62.6	
Cadmium	µg/L	0		0		0.53	J	0		0		0		0		0		0		0		0		0.52	J
Chromium	µg/L	0		0		0		0		0		0		0		0		0		0		0		0	
Copper	µg/L	0		0		2.0	J	0		0		0		0		0		0		0		0		0	
Lead	µg/L	0		2.2	J	0		0		1.9	J	0		0		0		0		0		2.7	J	0	
Mercury	µg/L	0		0		0.086	J	0		0		0.080	J	0		0		0.083	J	0		0		0.082	J
Nickel	µg/L	0		0		0		0		0		0		0		0		0		0.43	J	0		0	
Zinc	µg/L	0		0		247		0		0		64.8		0		2.6	J	84		0		43.8	J	58	
		Month 25		Month 26		Month 27		Month 25		Month 26		Month 27		Month 25		Month 26		Month 27		Month 25		Month 26		Month 27	

Note: 0 sample indicates a non-detect analyte value

Table 9.2.2

SWMU B-3 Westbay Monitoring Wells
Upper Saturated Zone (Zone LGR03B) Analytical Results Summary Quarter 9

Q9	CS-WB05-LGR03B			CS-WB06-LGR03B			CS-WB07-LGR03B			CS-WB08-LGR03B	
Date	**5/18/09**	**6/15/09**	**7/20/09**	**5/19/09**	**6/15/09**	**7/20/09**	**5/18/09**	**6/16/09**	**7/20/09**	**5/18/09**	**6/15/09**
PCE (µg/L)	0	0	0	79	120	150	1.2	0	0.29	60	68
TCE (µg/L)	0.2	0.23	0.22	100	130	170	4.1	2	2.6	70	72
cis-1,2-DCE (µg/L)	77	85	98	180	180	230	21	14	22	90	86
trans-1,2-DCE (µg/L)	9.3	11	26	3.5	2.3	26	0.81	0.73	1.7	3.4	1.6
Vinyl Chloride (µg/L)	0	0	0	0	0	0	0	0	0	0	0
Ethene (µg/L)	0	0	0	0	0	0	0	0	0	0	0
PCE (nM/L)	0.000	0.000	0.000	476.391	723.633	904.541	7.236	0.000	1.749	361.816	410.058
TCE (nM/L)	1.522	1.751	1.674	761.093	989.421	1293.858	31.205	15.222	19.788	532.765	547.987
cis-1,2-DCE (nM/L)	794.224	876.741	1010.830	1856.627	1856.627	2372.357	216.606	144.404	226.921	928.314	887.055
trans-1,2-DCE (nM/L)	95.926	113.461	268.179	36.101	23.724	268.179	8.355	7.530	17.535	35.070	16.503
Vinyl Chloride (nM/L)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ethene (nM/L)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Molar Conc. (nM/L)	891.67	991.95	1,280.68	3,130.21	3,593.40	4,838.94	263.40	167.16	265.99	1,857.96	1,861.60
% moles PCE	0.000%	0.000%	0.000%	15.219%	20.138%	18.693%	2.747%	0.000%	0.657%	19.474%	22.027%
% moles TCE	0.171%	0.176%	0.131%	24.314%	27.534%	26.738%	11.847%	9.106%	7.439%	28.675%	29.436%
% moles cis-1,2-DCE	89.071%	88.385%	78.929%	59.313%	51.668%	49.026%	82.234%	86.389%	85.311%	49.964%	47.650%
% moles trans-1,2-DCE	10.758%	11.438%	20.940%	1.153%	0.660%	5.542%	3.172%	4.505%	6.592%	1.888%	0.887%
% moles Vinyl Chloride	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
% moles Ethene	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
sum % moles	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Month 25	Month 26	Month 27	Month 25	Month 26	Month 27	Month 25	Month 26	Month 27	Month 25	Month 26

Note: Zone CS-WB08-LGR03B was dry and therefore not sampled during the Month 27 sampling event

Table 9.2.3a

SWMU B-3 Bioreactor Multi-port Well CS-WB05 - Q9 Performance Data

Q9		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		**7/29/2009**		**5/18/2009**		**6/15/2009**		**7/20/2009**		**7/28/2009**		**7/28/2009**		**7/28/2009**		**7/27/2009**		**7/27/2009**	
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		1.8		0.83	B	1.2		0.35	J	1.0		0		0		0.30	J
Total Organic Carbon	mg/L	1.3		1.5		0.80		1.3		1.3		0.94		0		0		0	
Methane	µg/L	4.3		297		1010		1,110		1,210		1,230		23.4		3.1		34.9	
Ethene	µg/L	0		0		0		0		0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	49,900		9,380		23,000		29,000		11,000		22,700		24,100		24,300		25,800	
Alkalinity, Total (as CACO3)	mg/L	389		322		318		332		355		384		282		284		285	
Nitrate/Nitrite	mg/L	0		0		0	J	0		0.11		0.11		0		0		0.078	J
Sulfate	mg/L	99.6		47.6		48.7		47		21		5.1		33.9		88.8		92.1	
Chloride	mg/L	13.3		12.3		12.3		12		11.6		12.4		11.8		17		17.7	
Ferrous Iron	mg/L	0		0		0.24	J	0.17	J	0.17	J	0.16	J	0		0		0.16	J
Manganese	µg/L	2.5	J	0		1.5	J	6.0		10.5		41.5		0		0		0	
Hydrogen	nM																		
Hydrogen Sulfide																			
Total Dissolved Solids	mg/L	494		415		412		382		394		376		361		415		566	
Benzene	µg/L	0		0		0		0		0.18	J	0.22	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		0.11	J	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		0.58	J	1.3		0		0		0.63	J
Dichloroethene, cis-1,2-	µg/L	1	J	77		85		98		570		640		48		4.8		63	
Dichloroethene, trans-1,2-	µg/L	0.31	J	9.3		11		26		80		61		7.3		0.84		9.0	
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	0.28	BJ	0		0		0		0.34	BJ	160		0.19	BJ	4.5		1.1	BJ
Toluene	µg/L	0.18	J	0		0		0.2	J	0.26	J	0		0		0		0	
Trichloroethene	µg/L	1.3		0.20	J	0.23	J	0.22	J	110		160		2.5		14		130	
Vinyl chloride	µg/L	0		0		0		0		0.62	J	2.6		0		0		0	
Arsenic	µg/L	0		0		0		0		0		21.6		0		0		0	
Barium	µg/L	30.1		30.4		37.5		31.9		35.1		21.9		26.2		19.9		20.5	
Cadmium	µg/L	0		0		0		0		0		0		0		0		0	
Chromium	µg/L	20		16.2		5.8		5.1		27		2.3	J	3	J	5.6		2.3	J
Copper	µg/L	0		0		0		0		0		0		0		0		0	
Lead	µg/L	0		0		2.0	J	0		0		0		0		0		0	
Mercury	µg/L	0.089	J	0		0		0.07	J	0.068	J	0		0		0.11	J	0.12	J
Nickel	µg/L	13.8		7.8		1.7	J	1.4	J	16.8		73.2		0.78	J	5.6		0.59	J
Zinc	µg/L	6.4	J	0		10.9	J	23.6	J	21.3	J	8.0	J	9.2	J	48.8	J	22.5	J
		Q9- Month 27		Month 25		Month 26		Q9- Month 27		Q9- Month 27		Q9- Month 27		Q9- Month 27		Q9- Month 27		Q9- Month 27	

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

Note: CS-WB05-CC-01 sample from 1/22/08 likely contained water from the inner part of the well due to catastrophic failure of the shoe on the Westbay probe during sampling

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

Q9		WB06															
Well ID		**CS-WB06-UGR01**		**CS-WB06-LGR01**		**CS-WB06-LGR02**		**CS-WB06-LGR03A**		**CS-WB06-LGR03B**						**CS-WB06-LGR04**	
Sample Date		**7/22/2009**		**7/22/2009**		**7/22/2009**		**7/22/2009**		**5/19/2009**		**6/15/2009**		**7/20/2009**		**7/21/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	1.9	B	1.6	B	0.48	BJ	0.17	BJ					0.95		0.78	
Total Organic Carbon	mg/L	2.1	B	1.2	B	1.2	B	0.17	BJ					1.3	B	0.47	J
Methane	µg/L	913		5		0		0						0		0	
Ethene	µg/L	0		0		0		0						0		0	
Ethane	µg/L	0		0		0		0						0		0	
Carbon Dioxide	µg/L	123,000		59,400		7,950		27,300						48,600		15,000	
Alkalinity, Total (as CACO3)	mg/L	462		353		285		284						312		298	
Nitrate/Nitrite	mg/L	0		0.41		0.14		0.083	J					0.21		1.1	
Sulfate	mg/L	4		17.6		24.7		17.5						17.9		10.3	
Chloride	mg/L	15.6		12.2		9.8		11.4						11.6		12.5	
Ferrous Iron	mg/L	0.27	J	0		0		0						0		0	
Manganese	µg/L	1,260		0		1.6	J	0						39		2.7	J
Hydrogen	nM																
Hydrogen Sulfide																	
Total Dissolved Solids	mg/L	497		383		339		334		345		321		359		354	
Benzene	µg/L	0		0		0		0		0		0		0.16	J	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		0.09	J	0		0.097	J	0		0		0.12	J	0.18	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		0.50	J	0		0		0		1.0	J
Dichloroethene, cis-1,2-	µg/L	14		33		28		300		180		180		230		440	
Dichloroethene, trans-1,2-	µg/L	11		2.8		4		20		3.5		2.3		26		37	
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	0.28	J	49		9.7		190		79		120		150		360	
Toluene	µg/L	0		0		0		0		0		0		0		0	
Trichloroethene	µg/L	1.2		42		12		200		100		130		170		240	
Vinyl chloride	µg/L	12		2.2		0		0		0		0		0		0	
Arsenic	µg/L	0		0		0		0						0		0	
Barium	µg/L	82.9		48.6		69.3		28.2						38.2		34.6	
Cadmium	µg/L	0		0		0		0						0.52	J	0	
Chromium	µg/L	7.9		5		8.3		2.1	J					5.2		10.1	
Copper	µg/L	0		0		0		0						1.9	J	0	
Lead	µg/L	0		0		0		0						0		0	
Mercury	µg/L	0		0		0		0						0.061	J	0.061	J
Nickel	µg/L	27.7		3.4	J	7.3		3.4	J					4.9	J	5.3	
Zinc	µg/L	0		0		0		7.5	J					162		9.2	J
		Q9 - Month 27		Q9 - Month 27		Q9 - Month 27		Q9 - Month 27		Month 25		Month 26		Q9 - Month 27		Q9 - Month 27	

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

Table 9.2.3c SWMU B-3 Bioreactor Multi-port Well CS-WB07 - Q9 Performance Data

Q9		WB07													
Well ID		**CS-WB07-LGR01**		**CS-WB07-LGR-02**		**CS-WB07-LGR-03A**		**CS-WB07-LGR-03B**						**CS-WB07-LGR-04**	
Sample Date		**7/27/2009**		**7/23/2009**		**7/23/2009**		**5/18/2009**		**6/16/2009**		**7/20/2009**		**7/23/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0		0.52		0.52		1.3		0.57	B	0.85		0.48	BJ
Total Organic Carbon	mg/L	0		1.3		0.31	J	1.0		0.4	J	1.6		0.48	J
Methane	µg/L	1.3		1.6		0		2.2		4.4		4.2		0	
Ethene	µg/L	0		0		0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0		0		0	
Carbon Dioxide	µg/L	73,700		42,900		17,900		9,310		25,500		39,800		48,200	
Alkalinity, Total (as CACO3)	mg/L	431		304		300		294		282		301		299	
Nitrate/Nitrite	mg/L	0.047	J	0.26		0		0.034	BJ	0.000		0.049	J	0.96	
Sulfate	mg/L	81.7		37.3		19.5		19.4		19.7		19.6		10	
Chloride	mg/L	15.3		12.5		10		10.3		10.1		9.9		11.8	
Ferrous Iron	mg/L	0		0		0		0		0.21	J	0		0	
Manganese	µg/L	11.5		0		0		0		0		2.4	J	9.5	
Hydrogen	nM														
Hydrogen Sulfide															
Total Dissolved Solids	mg/L	504		380		333		359		340		315		339	
Benzene	µg/L	0		0		0		0		0		0		0.17	J
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		0.24	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		1.1	J
Dichloroethene, cis-1,2-	µg/L	1.5		0.40	J	26		21		14		22		430	
Dichloroethene, trans-1,2-	µg/L	0.49	J	0		2.7		0.81		0.73		1.7		36	
Methylene chloride	µg/L	0		0		0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0		0		0	
Tetrachloroethene	µg/L	0.32	BJ	0.62	J	0.69	J	1.2	J	0		0.29	J	360	
Toluene	µg/L	0		0		0		0		0		0		0	
Trichloroethene	µg/L	1.1		1.6		5.2		4.1		2.0		2.6		340	
Vinyl chloride	µg/L	0		0		0		0		0		0		0	
Arsenic	µg/L	0		0		0		0		0		0		0	
Barium	µg/L	106		80.2		35.2		35.1		37.7		37.6		27.5	
Cadmium	µg/L	0		0		0		0		0		0		0	
Chromium	µg/L	4.6	J	4.2	J	2.5	J	16		3.7	J	3.9	J	3.4	J
Copper	µg/L	0		0		0		0		0		0		0	
Lead	µg/L	0		0		0		0		0		0		0	
Mercury	µg/L	0.078	J	0		0		0		0		0		0	
Nickel	µg/L	5.9		2.3	J	1.5	J	8.9		1.4	J	1.5	J	2.7	J
Zinc	µg/L	5.2	J	0		0		0		0		15.6	J	0	
		Q9 - Month 27		Q9 - Month 27		Q9 - Month 27		Month 25		Month 26		Q9 - Month 27		Q9 - Month 27	

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

Note: Dry zones including UGR-01 were not sampled during the quarterly sampling event.

Q9		WB08									
Well ID		**CS-WB08-LGR01**		**CS-WB08-LGR02**		**CS-WB08-LGR03B**				**CS-WB08-LGR04**	
Sample Date		**7/21/2009**		**7/21/2009**		**5/18/2009**		**6/15/2009**		**7/21/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.71		0.92						1.5	B
Total Organic Carbon	mg/L	0.45	J	0.93						1.6	
Methane	µg/L	0.40	J	5.9						0	
Ethene	µg/L	0		0						0	
Ethane	µg/L	0		0						0	
Carbon Dioxide	µg/L	31,300		24,400						263,000	
Alkalinity, Total (as CACO3)	mg/L	339		337						453	
Nitrate/Nitrite	mg/L	0.092	J	0.091	J					0.25	
Sulfate	mg/L	90.3		85.9						6.4	
Chloride	mg/L	10.2		10.7						15.8	
Ferrous Iron	mg/L	0		0.21	J					0	
Manganese	µg/L	2.1	J	1.6	J					3.6	J
Hydrogen	nM										
Hydrogen Sulfide											
Total Dissolved Solids	mg/L	498		470		346		371		509	
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		0		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	
Dichloroethene, cis-1,2-	µg/L	22		29		90		86		38	
Dichloroethene, trans-1,2-	µg/L	7.8		1.7		3.4		1.6		8.3	
Methylene chloride	µg/L	0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0	
Tetrachloroethene	µg/L	2		0		60		68		2.4	
Toluene	µg/L	0		0		0		0		0	
Trichloroethene	µg/L	5.8		0		70		72		3.2	
Vinyl chloride	µg/L	0		0		0		0		0	
Arsenic	µg/L	0		0						0	
Barium	µg/L	102		56.5						63	
Cadmium	µg/L	1.2	J	0.90	J					0	
Chromium	µg/L	8.7		10.7						4.8	J
Copper	µg/L	0		0						0	
Lead	µg/L	0		0						0	
Mercury	µg/L	0		0.065	J					0	
Nickel	µg/L	4.8	J	4.7	J					2.8	J
Zinc	µg/L	4.0	J	6.9	J					15.5	J
		Q9 - Month 27		Q9 - Month 27		Month 25		Month 26		Q9 - Month 27	

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

Note: Dry zones including UGR01, LGR03A, and LGR03B were not sampled during the quarterly sampling event.

Q9		Monitoring Wells									
Well ID		**CS-MW16-LGR**		**CS-MW1-LGR**		**CS-B3-MWO1**		**CS-MW16-CC**		**B3-EXW01**	
Sample Date		**7/20/2009**		**7/20/2009**		**7/20/2009**		**7/20/2009**		**7/20/2009**	
Compound	**Units**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**	**Value**	**Flag**
Dissolved Organic Carbon	mg/L	0.40	J	0.46	J	14.1		0.44	J	0.66	
Total Organic Carbon	mg/L	0.52		0.5	B	16.8		0		0.84	
Methane	µg/L	0		0		536		7.6		19.4	
Ethene	µg/L	0		0		0		0		0	
Ethane	µg/L	0		0		0		0		0	
Carbon Dioxide	µg/L	40,400		49,900		119,000		34,400		59,400	
Alkalinity, Total (as CACO3)	mg/L	278		269		1,160		285		354	
Nitrate/Nitrite	mg/L	1.2		0.85		0		0.18		0.48	
Sulfate	mg/L	17.8		13.3		2.5		61.6		12.2	
Chloride	mg/L	10.3		8.8		13.8		16.5		13.1	
Ferrous Iron	mg/L	0		0		2.5		2.1		0	
Manganese	µg/L	0		0		307		0		92.3	
Hydrogen	nM	2.7		2.8		2.1		2.9		4.8	
Hydrogen Sulfide											
Total Dissolved Solids	mg/L	335		311		1,300		410		425	
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	0.15	J	0.18	J	0		0		0.14	J
Dibromochloromethane	µg/L	0		0		0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0		0.7	J	0.5	J
Dichloroethene, cis-1,2-	µg/L	160		18		180		45		180	
Dichloroethene, trans-1,2-	µg/L	12		1.2		17		7.5		22	
Methylene chloride	µg/L	0		0		0		0		0	
Naphthalene	µg/L	0		0		0		0		0	
Tetrachloroethene	µg/L	180		16		0		9.4		88	
Toluene	µg/L	0		0		0		0		0	
Trichloroethene	µg/L	190		36		0		61		140	
Vinyl chloride	µg/L	0		0		2.7		0		15	
Arsenic	µg/L	0		0		7.3		0		0	
Barium	µg/L	38.2		35.4		592		24.5		46.2	
Cadmium	µg/L	0.54	J	0		0.77	J	0		0	
Chromium	µg/L	0		2.9	J	3.4	J	0		0	
Copper	µg/L	27.1		0		0		1.2	J	0	
Lead	µg/L	3.6	J	0		33.6		0		0	
Mercury	µg/L	0.099	J	0.088	J	0.076	J	0.095	J	0.079	J
Nickel	µg/L	0		12.3		20.4		2.9	J	4.2	J
Zinc	µg/L	213		7.9	J	83.9		43.2	J	181	
		Quarter 9 - Month 27		Quarter 9 - Month 27		Quarter 9 - Month 27		Quarter 9 - Month 27		Quarter 9 - Month 27	

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

Note: Dry monitoring wells including CS-D were not sampled during the quarterly sampling event.

Trench Sump	**Sample date:**	*5/19/2009*	*6/17/2009*	*7/21/2009*
B3 T1-2				
Dechlorinating Bacteria	units			
Dehalococcoides spp (1)	(cells/mL)	8.36E+02	1.18E+03	6.16E+02
Functional Genes	units			
TCE R-Dase (1)	(cells/mL)	1.71E+02	2.47E+02	1.28E+01
BAV1 VC R-Dase (1)	(cells/mL)	<5.00E-01	<5.00E-02	<3.00E-01
VC R-Dase	(cells/mL)	1.93E+02	6.51E+02	2.07E+02
B3 T2-1				
Dechlorinating Bacteria	units			
Dehalococcoides spp (1)	(cells/mL)	4.26E+02	2.58E+01	4.35E+01
Functional Genes	units			
TCE R-Dase (1)	(cells/mL)	1.49E+02	9.60E+00	6.70E+00
BAV1 VC R-Dase (1)	(cells/mL)	<5.00E-01	<5.00E-01	<3.00E-1
VC R-Dase	(cells/mL)	8.00E-01	1.00E-01 (J)	<3.00E-01

Table 9.5.3 SWMU B3-UIC Analytical Summary Table - Quarter 9

Q9		B3					
Well ID		**B3-UIC**		**B3-UIC**		**B3-UIC**	
Sample Date		**5/19/2009**		**6/172009**		**7/21/2009**	
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	389		372		378	
Benzene	µg/L	0		0		0	
Bromodichloromethane	µg/L	0		0		0	
Bromoform	µg/L	0		0		0	
Chloroform	µg/L	0		0		0.10	J
Dibromochloromethane	µg/L	0		0		0	
Dichlorodifluoromethane	µg/L	0		0		0	
Dichloroethene, 1,1-	µg/L	0		0		0.50	J
Dichloroethene, cis-1,2-	µg/L	58		70		120	
Dichloroethene, trans-1,2-	µg/L	1.8		1.6		16	
Methylene chloride	µg/L	0		0		0	
Naphthalene	µg/L	0		0		0	
Tetrachloroethene	µg/L	49		54		66	
Toluene	µg/L	0		0		0	
Trichloroethene	µg/L	72		80		110	
Vinyl chloride	µg/L	0		0		4.6	

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