Appendix 4-7: Quarterly Reports on Modified Permit Monitoring at STA-2[1]

Larry Fink

APPENDIX NOTES:

This appendix includes the fourth, fifth, sixth, and seventh (final) Quarterly Status Reports on the Stormwater Treatment Area 2 (STA-2) Start-Up and Routine Mercury Monitoring and Mercury Special Studies (MSS) for the respective reporting periods: March 1, 2003 through June 30, 2003; July 1, 2003 through June 30, 2003; October 1, 2003 through December 31, 2003; and January 1, 2004 through February 4, 2004. These reports were submitted by the South Florida Water Management District (District) to the Florida Department of Environmental Protection (FDEP) in September 2003, December 2003, March 2004, and June 2004, respectively. The first, second, and third Quarterly Status Reports on STA-2 Start-Up and Routine MSS are presented in Appendix 4A-7 of the *2004 Everglades Consolidated Report*, located on the District's Website at http://www.sfwmd.gov/org/ema/everglades/consolidated_04/final/appendices/app4a-7.pdf. All of these reports have been completed in accordance with Exhibit E, Memorandum of Agreement (MOA) between the District and FDEP and for Cooperative Agreement C-11900-A03.

[1] Original documents were submitted to the Florida Department of Environmental Protection, dated per enclosed cover letters.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

September 30, 2003

Don Axelrad
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Fourth Quarterly Report for C-11900-AO3

Dear Dr. Axelrad:

Attached is the fourth quarterly report required by the Cooperative Agreement for the Section 319 Grant from the Department (C-11900-AO3). Anomalous mercury conditions have not reappeared in STA-2 Cell 1 surface water, and outflow unfiltered total mercury (THg) and methylmercury (MeHg) concentrations were less than their corresponding inflow concentrations on June 26, 2003. Cell 1 mosquitofish THg and soil MeHg exhibit similar declines.

The first annual report for C-11900-AO3 is Appendix 2B-7 of Chapter 2B in the Everglades Consolidated Report (2004). The extension of the pore water monitoring study through January 2004 will necessitate the rescheduling of the production of the final report for this project. The Tier 2 and 3 pore water monitoring studies began in September 2003 outside this reporting period. In October 2003, the District is planning to conduct the Tier 1 study for the validation of the modified *in situ* "sipper" method of pore water extraction relative to the centrifugation method.

Call me at (561) 682-6749 if you have any follow-up questions or concerns.

Sincerely,

Larry E. Fink, M.S.
Project Manager

LEF/hm
Enclosure

c: Thomas Atkeson, Ph.D., FDEP
Richard Harvey, USEPA 4 (w/o enclosure)
Dan Scheidt, USEPA 4

Status Report on STA-2 Start-Up and Routine Mercury Monitoring and Mercury Special Studies
Reporting Period: 03/01/03- 06/30/03
Final 093003

Executive Summary

STA-2 Cells 2 and 3 met their permit-mandated mercury start-up criteria in September and November 2000, respectively, while Cell 1 experienced anomalous mercury events in the fall of 2000 and 2001. Subsequently, the District applied for a permit modification that would allow flow-through operation to commence without meeting mercury start-up criteria. This was done in the belief that exposure to and/or export of MeHg could be reduced by the flowing water, because it would (1) keep Cell 1 wet, (2) dilute the fresh supply of inorganic mercury in atmospheric deposition, (3) dilute the MeHg produced internally, and (4) increase the sulfate load to the point that sulfide inhibition of MeHg production could occur. The application was submitted in July 2001 and, by letter dated August 9, 2001, FDEP notified the District that it had approved the modification.

The District commenced the expanded mercury monitoring program under the modified permit in August 2001. This was further expanded to include biweekly monitoring of the Cell 1, 2, and 3 outflows after the second anomalous MeHg event occurred in Cell 1 in October 2001. In anticipation that there would be insufficient water during the dry season to keep the water flowing through Cell 1, the District recommended that Cell 1 be dried out until the following wet season, and the Department concurred. This also provided the District with an opportunity to raise the Cell 1 outflow weirs so as to minimize the occurrence of dryouts in the future. Dryout was essentially complete by December 31, 2001, but some drainage continued through February 2002.

With the return of the wet season flows in August 2002, the District began a one-year special study to (1) characterize the THg and MeHg concentration trajectories in water, soil, vegetation, and mosquitofish over time, (2) quantify THg and MeHg mass budgets for each cell, and (3) evaluate the physical, chemical, and biological factors that influence the magnitude of MeHg export and bioaccumulation. The third anomalous mercury event, which was detected by this study and occurred on August 22, 2002, in STA-2 Cell 1, began to dissipate from the interior water column almost immediately. Cell 1 met its THg and MeHg start-up criteria (i.e., THg and MeHg concentrations at C1A, the interior monitoring site, were not statistically significantly greater than the corresponding inflow concentrations per two-tailed t test, $p < 0.05$) on November 26, 2002. However, an anomalously high THg concentration of 14.8 ng/L (verified by rework) was detected at C1A on January 23, 2003, but the high turbidity associated with the sample suggests that it was an artifact of the low water levels encountered at the time of sampling. The MeHg result for the same sampling event was low, which would not be inconsistent with the resuspension scenario, because the sediment MeHg concentration is typically several orders of magnitude lower than the THg concentration. Thereafter, the interior surface water concentrations declined steadily to the point that the unfiltered THg and MeHg

concentrations in the Cell 1 outflow were less than their corresponding inflow concentrations on June 26, 2003.

Mosquitofish THg concentrations tracked the water column MeHg concentrations. The build-up and decline of excess MeHg in water paralleled that in surficial soils in Cell 1, but not with the same spatial pattern. The rapid changes in soil chemistry that occurred following Cell 1 reflooding appear to be slowing and stabilizing, with the inverse correlation between acid volatile sulfide as a surrogate for pore water sulfide switching from weakly positive prior to reflooding to moderately negative in the last soil sampling campaign in April 2003. The results of the July 2003 soil sampling trip and the August 2003 vegetation sampling trip will be summarized in the next quarterly report.

The District is required to prepare an ecological risk assessment after one year of monitoring or immediately if, at any time, the average concentrations of THg in mosquitofish and sunfish exceed their respective upper 95th percentile concentrations calculated using monitoring data collected at 12 representative interior marsh sites for the period of record. This did not occur in this reporting quarter. The District will complete its annual collection of mosquitofish, sunfish, and bass at the common inflow, each cell interior, and the common outflow, as well as downstream sites N4 and Z4, in October 2003. After the fish are processed, analyzed, and the data are received and quality assured, the District will complete the ecological risk assessment for wading birds foraging exclusively in STA-2 or downstream sites N4 or Z4. It is anticipated that the report will be available in March 2004.

Based on the continuing trend toward stabilization of Cell 1 soil chemistry and a steady decline in the concentration of soil MeHg during the dry season (**Figure E1**), we recommend that Cell 1 continue to operate in flow-through mode during the wet season to facilitate the build-up of pore water sulfide to inhibitory levels while diluting any excess MeHg production.

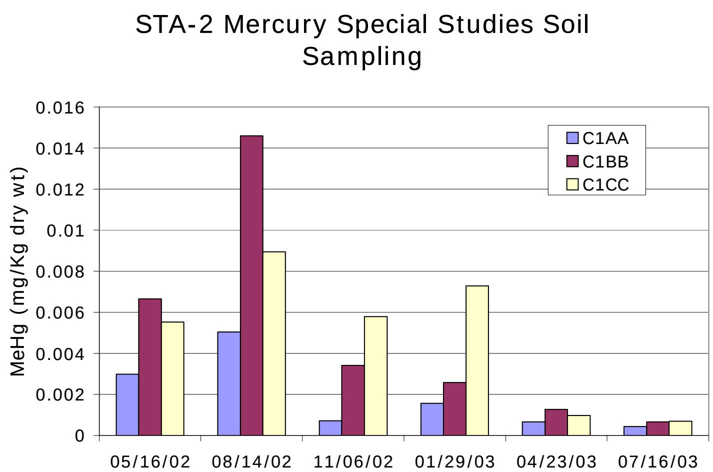


Figure 1E. Soil MeHg concentration (0-4 cm cores) monitoring results to date for the STA-2 Mercury Special Studies Project (MOA).

Introduction

This is the fourth quarterly report on expanded mercury monitoring in Stormwater Treatment Area 2 (STA-2) under the modified permit FDEP No. 0126704-001-GL, Cooperative Agreement C-11900-A03, and the Memorandum of Agreement (MOA: C-13812) between the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD). **Attachment 1** reproduces copies of invoices for contract labor, chemical analyses, equipment, supplies, and shipping.

Tier 1 and Tier 2/3 Pore Water Monitoring Status Update

All three tiers of the study are now under way. In this quarter, the District has made further progress in acquiring a viable field pore water sampling capability under Tier 1 for implantation in Tiers 2 and 3. Firm bids have been received and accepted from Tetra Tech for implementation of the Tier 1 pore water methods development study and the Tier 2/3 "routine" pore water collection at nine interior pore water characterization sites and one pore water variability study site. Unavoidable delays in issuance of the pore water SOWs translated into a delay in taking the field to initiate pore water sample collection with the modified sipper. The first set of samples for the reconnaissance task were collected in August 2003. The first set of routine pore water samples were collected in September 2003. The Tier 1 sipper vs centrifugation validation study will be conducted in the last week in September 2003 and the first week of October 2003. The results of the aforementioned studies will be reported in the next quarterly report.

Results

The rain, surface water, soils, mosquitofish, and vegetation data collected this quarter, which were available as of August 31, 2003, are included in Tables 1-5. The results of treatment cell inflow and Cell 1 interior biweekly monitoring of surface water for unfiltered THg and MeHg are summarized in **Figures 7** and **8**. The inflow and interior mosquitofish THg results are depicted in **Figure 9**. The inflow, outflow, and downstream concentrations of THg in mosquitofish and sunfish are depicted in **Figures 10** and **11**, respectively. **Figures 12** and **13** illustrate the concentrations of unfiltered THg and MeHg in water samples collected from the expanded inflow and outflow monitoring sites from April 2002 through March 2003. Filtered THg and MeHg concentrations collected from the expanded interior monitoring sites through April 30, 2003, are displayed in **Figures 14** and **15**, while **Figure 16** summarizes the mosquitofish THg concentrations. The rain depth and THg flux for the period of STA-2 operation are depicted in **Figures 17 and 18,** respectively. The MeHg concentrations in the top 4 cm of soil at Sites AA, BB, and CC in Cell 1 are displayed in **Figure 19**. **Figure 20** summarizes the univariate Pearson correlation coefficient values between soil MeHg concentration and other soil chemistry parameters for each of the five soil sampling campaigns completed to date, while **Figure 21** refocuses on the correlation between the MeHg/THg fraction and other soil parameters for five of the six soil trips broken out by treatment cell. The data from the sixth trip are pending. **Figures 22A** and **22B** illustrate the magnitudes of the THg and MeHg soil bioconcentration factors (SBCFs), respectively, for cattail, sawgrass, and mixed submerged macrophyte species as the ratio of wet tissue concentration to wet soil concentration in samples collected from the same site and time period. **Figures 23A** and **23B** illustrate the magnitudes of the THg and MeHg soil bioconcentration factors (SBCFs), respectively, for cattail, sawgrass, mixed submerged macrophyte species, and periphyton as the ratio of wet tissue concentration to filtered water concentration in samples collected from the same site and time period.

Discussion

Data

The third anomalous mercury event, which was detected by this study and occurred on August 22, 2002, in STA-2 Cell 1, began to dissipate from the interior water column almost immediately. Cell 1 met its THg and MeHg start-up criteria (i.e., THg and MeHg concentrations at C1A, the interior monitoring site, were not statistically significantly greater than the corresponding inflow concentrations per two-tailed t test, $p < 0.05$) on November 26, 2002. However, an anomalously high THg concentration of 14.8 ng/L (verified by rework) was detected at C1A on January 23, 2003, but the high turbidity associated with the sample suggests that it was an artifact of the low water levels encountered at the time of sampling. The MeHg result for the same sampling event was low, which would not be inconsistent with the resuspension scenario, because the sediment MeHg concentration is typically several orders of magnitude lower than the THg concentration.

A minor increase in the THg concentrations in the interior of each STA-2 treatment cell occurred simultaneously in March and May 2003. The MeHg concentration profiles paralleled those of THg in the March 2003 event but not that of the May 2003 event. The increases in interior treatment cell THg in March and May 2003 were probably associated with rainfall events, but the increase in MeHg in March but not May 2003 could have been associated with detectable changes in water quality (e.g., rapid decrease in conductivity; rapid increase in water column DO) that preceded the March 2003 MeHg mini-anomaly in January 2003. An inspection of the G-330A outflow MeHg concentration trajectories indicates that the increase in outflow MeHg concentrations began following the February 6, 2003, outflow sampling event, peaked with the March 20, 2003, sampling event, declined rapidly to near baseline concentrations by April 3, 2003, and dipped below baseline conditions on April 17, 2003. The THg concentration monitored at the same location peaked two weeks earlier, suggesting that the excess MeHg was being produced internally from a fresh supply of bioavailable inorganic mercury introduced in the weeks immediately preceding these sampling events. Interestingly, the peak THg concentrations in Cell 2 and 3 outflows were reached two weeks before that of Cell 1, perhaps because the flow rates are higher and retention times are shorter in Cells 2 and 3 relative to Cell 1.

Mosquitofish THg concentrations tracked the water column MeHg concentrations. The build-up and decline of excess MeHg in water paralleled that in surficial soils in Cell 1, but not with the same spatial pattern. The rapid changes in soil chemistry that occurred following Cell 1 reflooding appear to be slowing and stabilizing, with the inverse correlation between acid volatile sulfide as a surrogate for pore water sulfide switching from weakly positive prior to reflooding to moderately negative in the last soil sampling campaign in April 2003. The results of the July 2003 soil sampling trip and the August 2003 plant sampling trip will be summarized in the next quarterly report.

Compliance

Exhibit E requires the District to file an expedited risk assessment report to the Department if the average THg concentrations in mosquitofish and sunfish collected at the STA-2 Cell 1 interior or downstream monitoring sites exceed their respective 95th percentile upper confidence level concentrations in the Everglades for the period of record. The expanded monitoring requires monitoring of THg in mosquitofish monthly at a representative, centrally located site interior to Cell 1 (i.e., Site C1CC) and quarterly at downstream sites WCA-2A-N4 and WCA-2A-Z4 and in sunfish collected semi-annually at a representative, centrally located interior site in Cell 1 (i.e., C1X) and annually at sites N4 and Z4. For the data collected through October 2002, those mosquitofish and sunfish triggers are: Grandmean of THg in downstream mosquitofish for POR (1998-02) ± 95%CI: 102 ± 18 ug/Kg wet wt (n = 64; Grandmean of site means of THg in downstream sunfish for POR (1998-02) ± 95%CI: 195 ± 40 ug/Kg wet wt (n = 57); and Grandmean of EHg3 calculated for downstream largemouth bass caught over the POR (1998-02) +/- 95%CI: 591 ± 116 (n = 32).

Following issuance of the modified permit in August 2002, at interior Site C1CC only the April 2003 mosquitofish did not exceed the trigger value. The average THg concentration in mosquitofish collected from this site again exceeded the trigger value in May 2002. Interestingly, for mosquitofish collected in the outflow canal just upstream of the pump station, only the October 2002 fish exceeded the trigger value, suggesting that, as with the water, the mosquitofish population discharged from Cell 1 is mixed with the populations discharged from Cells 2 and 3, “diluting” the average THg concentration in the Cell 1 mosquitofish population with the combined populations in the discharge collection canal. At site N4, in April 2003 the concentration of THg in mosquitofish exceeded the trigger value (163 vs 120 ug/Kg wet wt), but at site Z4 the trigger value has never been exceeded, and the average concentration of THg in mosquitofish collected at both sites in April 2003 was below the reporting threshold. The next mosquitofish collection will occur in September-October 2003.

After August 2002, for sunfish collected semi-annually at interior Site C1X, the THg concentration approached but did not exceed the trigger value in April 2003 (214 vs 235 ug/Kg wet wt). Sunfish collected annually from the discharge canal in October 2002 were well below the reporting threshold at 120 ug/Kg wet wt. No sunfish could be collected annually in October 2002 at N4, despite a documented good faith effort, because of the degraded conditions of habitat quantity and quality and water quality there that preceded the construction and operation of STA-2 (T. Lange, FGFWFC, personal communication). At Z4, the average concentration of THg in sunfish collected in October 2002 exceeded the reporting trigger value (272 vs 235 ug/Kg wet wt). The

October 2002 value is more than 2.5 times that of October 2001. However, as noted above, the corresponding average mosquitofish THg concentrations at site Z4 have been below the trigger value for the period of record. This suggests that the food chain structure at these two sites is very different, consistent with observed differences in habitat quantity and quality and water quality. The next sunfish collection will occur in September-October 2003.

Although the largemouth bass data are not used to trigger expedited risk reporting, it is important to note that the EHg3 for LMB at G335 was 1169 ± 233 in 2002 or more than twice the advisory threshold of 0.5 ppm. In addition, the unadjusted average outflow bass THg concentration was more than twice the concentration of the inflow bass. THg concentrations in bass from the discharge canal did not differ significantly between 2001 and 2002 (ANCOVA, df = 1, 37; $F = 0.01$, $P = 0.936$). (Note: G335 was the only STA-2 site in 2001 for which the collected bass had an age distribution suitable for establishing an age-concentration relationship, i.e., where an EHg3 was calculated and ANCOVA was run in 2002). The next largemouth bass collection will occur in September-October 2003.

Recommendations

Based on the continuing trend toward stabilization of Cell 1 soil chemistry and the steady decline in the concentration of soil MeHg through a year of post-reflooding dry and wet seasons (**Figure 19**), we recommend that Cell 1 continue to operate in flow-through mode through the end of the wet season and into the dry season to facilitate the build-up of pore water sulfide to inhibitory levels while diluting incoming rainfall $Hg(II)^{+2}$ and any excess MeHg production. Every effort should be made to keep Cell 1 wet during the dry season.

TABLES

Table 1. New Rain THg Data at FL99

FL99

Collection End Date	Precip. Hg Conc.
04/01/03	18.00 ng/L
04/08/03	Na
04/15/03	9.20 ng/L
04/22/03	16.60 ng/L
04/29/03	9.90 ng/L
05/06/03	12.80 ng/L
05/13/03	Na
05/20/03	22.20 ng/L
05/27/03	15.20 ng/L
06/03/03	9.20 ng/L

Table 2A. All Inflow and Outflow THg Data

THg	Inflow (G328B)	G328	FILTER INFLOW G328B	Cell 1 (G330A)	FILTER G330A	G330 B	C1A	Cell 2 (G332)	FiLTER Cell 2 (G332)	Cell 3 (G334)	FILTER cell3 (G334)	Outflow (G335) US	FILTERO utflow (G335) US	Outflow (G335) DS
10/4/2001	1.2	0.7		-			1.2	-		-		2.4		-
10/18/2001	0.89			-			1.1	-		-		6.4		-
11/1/2001	0.69			-			0.87	-		-		3.2		-
11/15/2001	0.75			5.8			0.9	2		1.2		3.4		-
11/29/2001	0.34			9.5			-	1.6		-		6.2		-
12/12/2001	1.3			7.8			1.3	2.4		2.7		4.4		-
12/27/2001	0.5			-			-	1.8		1		3.3		-
1/10/2002	0.5	0.41		-			-	1.7		0.59		1.3		1.6
1/24/2002	1.4	-		-			-	3.1		2.1		1.7		1.9
2/7/2002	0.88	-		-			-	1.5		0.81		1.4		1.4
2/21/2002	1.7	-		3.7			1.9	2		2		1.9		1.9
3/7/2002	1.4	-		3.4			-	1.6		0.66		1.3		1.2
3/21/2002	1.2	-		2.6			-	1.9		1.2		1.3		1.3
4/4/2002	0.84	-		-			-	1.7		1.2		1.3		1.3
4/18/2002	0.73	0.79		5.3			-	1.8		1.2		1.1		1
5/2/2002	0.72	-		-			-	1.5		1.1		1.3		1.2
5/16/2002	0.69	-		-			-	1.4		1.1		1.4		2.2
5/30/2002	0.83	-		-			-	1.2		0.99		1.3		1.4
6/12/2002	0.94	-		-			-	2.4		1.6		2		1.4
6/27/2002	1.9	-		4.4		5.1	4.4	1.9		1.1		1.7		1.9
7/11/2002	2.4	1.2		4.1			3.7	1.5		0.74		1.8		1.4
7/25/2002	3.1	-		6.3			10	4.1		3.4		3.2		3.2
8/7/2002	1.5	-		-			1.2	3.3		1.3		2.4		2.2
8/22/2002	2	-	0.62	11	9.8		6.2	3.2		1.9		3		2.8
9/5/2002	1.6	-		12			1.5	1.7		1.1		3.4		2.9
9/18/2002	0.96	-	0.5	18			1.2	1.5	1	0.82		7.3	5.4	4
10/3/2002	0.53	-		9.2			1.8	2.2		0.7		2.2		2.7
10/17/2002	0.69	-	0.45	11			0.92	2		0.89	0.6	5.9		6.5
10/31/2002	0.92	0.76		8.9			3	3.1		1.1		5		4.2
11/14/2002	0.61	-	0.4	8.1	6		0.74	1.8		0.9		1.7		2.2
11/26/2002	1.2	-		3.5		-	0.81	1.7		0.79		2.4		2.5
12/12/2002	0.92	-	0.53	3.3			0.68	0.99	0.76	0.51		1.9		1.4
12/30/2002	0.88	-		2.7			0.69	0.84		0.36		1.8		1.5
1/9/2003	0.55	-	0.29	2.9			0.74	0.69		0.43	0.41	1.7		1.6
1/23/2003	0.74	0.69		2.3			14.8	0.61		0.66			0.63	
1/30/2003	0.45	-		2.7			0.42	0.79		0.45		0.76		0.75
2/5/2003	2.3	-	0.53	3.8	3.5		0.6	1.2		0.79		1.7		2.1
2/20/2003	1.4	-		5.8			1.7	1.6		2.6		3.6		1.5
3/6/2003	0.73	-	0.56	7.5			2.7	1.6	1	0.91		2.2		1.1
3/20/2003	1.1	1.3		3.7			1	1.5		0.72		2		2
4/2/2003	1.4		0.58	2.2			0.64	0.88		0.59	0.31	1.2		1.4
4/17/2003	0.7	0.56		2.9			0.7	0.87		0.31		1.7		1.4
5/1/2003	1.7		0.87	3.7	2.6		0.8	0.7		0.59		1.1		0.95
5/14/2003	1			3.4			1.3	1.7		0.73		1.1		1.1
5/29/2003	2.9		1.3	2.3			0.6	0.77	0.51	1.1		1.3		1.2
6/12/2003	1.4			1.8			1.2	0.9		0.86		0.84		1.1
6/26/2003	1.6		0.87	1.2			1.4	1.1		1.2	0.77	0.99		1

Table 2B. All Inflow and Outflow MeHg Data

MeHg	Inflow (G328B)	G328	FILTER INFLOW G328B	Cell 1 (G330A)	FILTER G330A	G330 B	C1A	Cell 2 (G332)	FiILTER Cell 2 (G332)	Cell 3 (G334)	FILTER cell3 (G334)	Outflow (G335) US	FILTEROutflow (G335) US	Outflow (G335) DS
10/4/2001	0.15	0.07		-			0.31	-		-		0.76		-
10/18/2001	0.13	-		-			0.37	-		-		4.1		-
11/1/2001	0.14	-		-			0.16	-		-		1.2		-
11/15/2001	0.12	-		3.5			0.43	0.73		0.32		1.2		-
11/29/2001	0.084	-		7.2			0.44	1		0.3		4.4		-
12/12/2001	0.061	-		2			0.55	0.7		0.82		1.5		-
12/27/2001	0.057	-		-			-	0.34		0.11		0.94		-
1/10/2002	0.035	0.059		-			-	0.24		0.032		0.33		0.44
1/24/2002	0.092	-		-			-	0.71		0.25		0.44		0.46
2/7/2002	0.081	-		-			-	0.35		0.11		0.42		0.36
2/21/2002	0.13	-		1.4			0.59	0.22		0.15		0.31		0.29
3/7/2002	0.087	-		1.2			-	0.34		0.17		0.28		0.27
3/21/2002	0.18	-		1.2			-	0.76		0.33		0.31		0.31
4/4/2002	0.061	-		F*			-	F*		F*				
4/18/2002	0.11	0.9		0.76			-	0.41		0.33		0.25		0.2
5/2/2002	0.072	-		-			-	0.3		0.26		0.21		0.2
5/16/2002	0.09	-		-			-	0.21		0.22		0.2		0.12
5/30/2002	0.03	-		-			-	0.089		0.065		0.28		0.078
6/12/2002	0.057	-		-			-	0.35		0.19		0.23		0.12
6/27/2002	0.27	-		1.8		2.1	2.6	0.4		0.099		0.35		0.41
7/11/2002	0.3	0.33		2.1		-	1.8	0.41		0.12		0.36		0.34
7/25/2002	0.15	-		-		-	1.1	0.74		0.36		0.7		0.64
8/7/2002	0.25	-		-		-	0.32	1.2		0.24		0.73		0.68
8/22/2002	0.12	-	0.13	7.6	7.2		0.82	1		0.21		1		0.99
9/5/2002	0.15	-		8.4			0.39	0.38		0.14		2.0		1.6
9/19/2002	0.13	-	0.13	12			0.96	0.87	0.72	0.31		5.6	4.2	2.4
10/3/2002	0.092	-		7.8			0.75	1.2		0.15		1.4		1.7
10/17/2002	0.048	-	0.042	5.8			0.26	1.1		0.08	0.11	3.2		3.3
10/31/2002	0.057	0.086		4.2			0.26	1		0.15		1.8		1.5
11/14/2002	0.076	-	0.065	2.3	2.2		0.17	0.55		0.098		0.49		0.66
11/26/2002	0.081	-		0.76			0.088	0.17		0.07		0.51		0.48
12/12/2002	0.12	-	0.085	1.6			0.062	0.16	0.11	0.087		0.55		0.46
12/30/2002	0.023	-		0.98			0.14	0.14		0.077		0.58		0.43
1/9/2003	0.062	-	0.064	1.1			0.096	0.092		0.067	0.057	0.54		0.53
1/23/2003		0.039		0.72			0.05	0.048		0.05			0.13	
1/30/2003	0.032	-		0.97			0.068	0.035		0.041		0.081		0.072
2/5/2003	0.038	-	0.034	2	1.7		0.1	0.11		0.11		0.55		0.74
2/20/2003	0.07	-		4			0.9	0.56		0.86		1.7		0.53
3/6/2003	0.12	-	0.12	5.4			1.3	0.92	0.63	0.35		1.3		0.52
3/20/2003	0.16	0.22		1.8			0.4	0.48		0.12		0.81		0.59
4/2/2003	0.18	-	0.17	0.82			0.14	0.14		0.081	0.064	0.33		0.4
4/17/2003	0.15	0.27		1.5			0.14	0.36		0.1		0.88		0.62
5/1/2003	0.2	-	0.16	1.5	1.2		0.16	0.14		0.096		0.28		0.16
5/14/2003	0.10			1.40			0.14	0.58		0.12		0.24		0.26
5/29/2003	0.17		0.14	0.7			0.049	0.12	0.093	0.071		0.21		0.17
6/12/2003	0.21			0.38			0.15	0.088		0.092		0.1		0.1
6/26/2003	0.24		0.22	0.086			0.14	0.096		0.16	0.37	0.27		0.27

Table 2C. Interior Cell (Experimental) THg and MeHg Data

THg	STA2C 1AA	STA2 C1AA Filtered	STA2 C1BB	STA2 C1BB Filtered	STA2 C1CC	STA2 C1CC Filtered	STA2 C2A	STA2 C2A Filtered	STA2 C2B	STA2 C2B Filtered	STA2 C2C	STA2 C2C filtered	STA2 C3A	STA2 C3A Filtered	STA2 C3B	STA2 C3B Filtered	STA2 C3C	STA2 C3C Filtered
Aug-02	7.6	5.6	16	8.1	32	24		3.4		2.1		0.71		0.72		1		0.56
Sep-02		2.7		4.2		12	2.6	2	2.1	2.1	1.5	1.1		0.92		1.3		0.39
Oct-02		0.99		1.6		5		1.3		1.4		0.87	0.47	0.36	0.62	0.61	0.82	0.5
Nov-02	0.98	0.8	1.8	1.4	4	3		1.2		0.95		0.67		0.52		0.28		0.47
Dec-02		0.61		0.92		2.9	1.2	1.1	1.2	1	0.59	0.52		0.53		0.48		0.58
Jan-03		0.87		0.88		2.2		0.7		0.78		0.18	0.6	0.56	0.61	0.49	0.75	0.37
Feb-03	0.76	0.65	1.5	0.98	2.9	2.4		0.8		0.78		0.68		0.5		0.51		0.3
Mar-03		2.2		3.5		4.6	1.8	1.4	1.8	1	1.3	1.2		0.43		0.59		0.58
Apr-03		0.6		0.7		1.4		0.61		0.53		0.48	0.69	0.42	0.5	0.39	0.58	0.42
5/1/03	0.86	0.85	1.1	0.91	2.1	2		0.79		0.85		0.5		0.69		0.62		0.65
5/29/03		2.7		3.7		2.6	2.8	2.6	3	2.7	2.6	2.5		0.54		0.59		0.84
Jun-03		0.92		0.84		1.2		0.96		0.85		0.71	1.0	0.8	0.83	0.62	0.74	0.63

MeHg	STA2C 1AA	STA2C1AA Filtered	STA2 C1BB	STA2 C1BB Filtered	STA2 C1CC	STA2 C1CC Filtered	STA2 C2A	STA2 C2A Filtered	STA2 C2B	STA2 C2B Filtered	STA2 C2C	STA2 C2C filtered	STA2 C3A	STA2 C3A Filtered	STA2 C3B	STA2 C3B Filtered	STA2 C3C	STA2 C3C Filtered
Aug-02	2.6	2.7	8.6	7.4	20	20	-	0.57	-	0.33	-	0.034	-	0.045	-	0.049	-	0.100
Sep-02	-	2	-	3.5	-	7.8	0.7	0.69	0.7	0.76	0.2	0.18	-	0.11	-	0.067	-	0.12
Oct-02	-	0.24	-	0.57	-	2	-	0.22	-	0.16	-	0.13	0.13	0.053	0.079	0.049	0.052	0.08
Nov-02	0.26	0.25	0.64	0.59	1.1	1	-	0.17	-	0.18	-	0.17	-	0.038	-	0.04	-	0.1
Dec-02	-	0.064	-	0.16	-	0.81	0.1	0.099	0.17	0.15	0.03	0.024	-	0.056	-	0.041	-	0.04
Jan-03	-	0.12	-	0.19	-	0.41	-	0.065	-	0.1	-	0.051	0.07	0.062	0.049	0.043	0.043	0.05
Feb-03	0.12	0.12	0.46	0.41	1.1	1.1	-	0.07	-	0.074	-	0.058	-	0.055	-	0.099	-	0.08
Mar-03		1.1		1.5		2.4	0.8	0.64	0.86	0.62	0.64	0.44		0.082		0.11		0.2
Apr-03		0.1		0.19		0.31		0.18		0.1		0.091	0.09	0.07	0.058	0.06	0.058	0.05
5/1/03	0.14	0.12	0.26	0.18	0.59	0.51		0.18		0.13		0.011		0.11		0.058		0.1
5/29/03		0.041		0.12		0.32	0.1	0.12	0.087	0.14	0.01	0.011		0.086		0.051		0.07
Jun-03		0.011		0.079		0.11		0.13		0.088		0.011	0.18	0.12	0.64	0.086	0.6	0.07

Table 3. New Soil THg and MeHg Data from July 2003 Sampling Event

ST2D-07.16.03

Lab (	Field	Project	Sampling Da	Sampl	Station Code	Sampl	Progr	Collec	Matrix	Sampl	Parame	Storet	Meth	Analys	Anal	Pra	Metl	Result	Units	Batch
P157	P15	ST2D	20030716	910	STA2C1AA	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000434	mg/kg	MGH7030730
P157	P15	ST2D	20030716	943	STA2C1BB	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.00066	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1020	STA2C1CC	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000697	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1116	STA2C2A	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000376	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1145	STA2C2B	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000191	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1205	STA2C2C	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000135	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1305	STA2C3A	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000066	mg/kg	MHG1030827
P157	P15	ST2D	20030716	1339	STA2C3B	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000145	mg/kg	MHG1030827
P157	P15	ST2D	20030716	1416	STA2C3C	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000091	mg/kg	MGH7030730
P157	P15	ST2D	20030716	910	STA2C1AA	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	1.2	mg/kg	THG11030804
P157	P15	ST2D	20030716	943	STA2C1BB	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	1.26	mg/kg	THG11030804
P157	P15	ST2D	20030716	1020	STA2C1CC	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	1.08	mg/kg	THG11030804
P157	P15	ST2D	20030716	1116	STA2C2A	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.563	mg/kg	THG11030804
P157	P15	ST2D	20030716	1145	STA2C2B	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.5	mg/kg	THG11030804
P157	P15	ST2D	20030716	1205	STA2C2C	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.484	mg/kg	THG11030804
P157	P15	ST2D	20030716	1305	STA2C3A	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.346	mg/kg	THG11030804
P157	P15	ST2D	20030716	1339	STA2C3B	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.28	mg/kg	THG11030804
P157	P15	ST2D	20030716	1416	STA2C3C	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.306	mg/kg	THG11030804

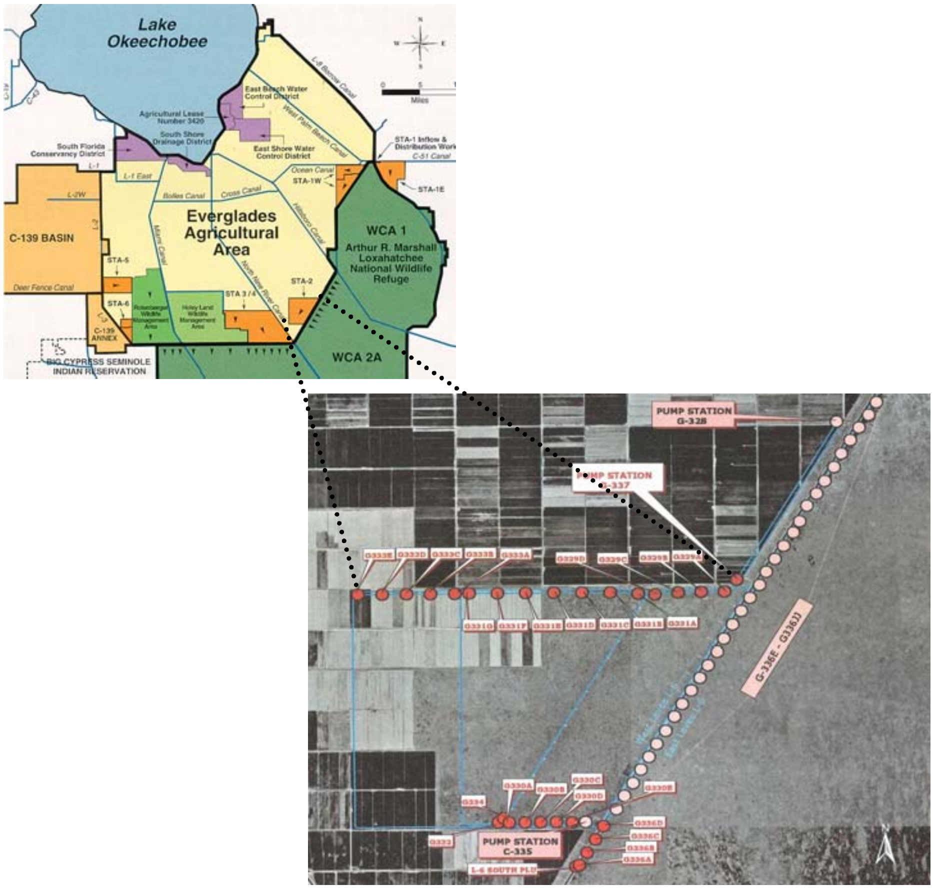
Table 4. New Mosquitofish THg Data

Tissue THg	C1A	C1AA	C1BB	C1CC	C1X	C2A	C2B	C2C	C3A	C3B	C3C
Oct-01	0.109				0.312	0.069			0.013		
Nov-01											
Dec-01											
Feb-02	0.186										
Mar-02	0.172				0.285	0.045			0.018		
Apr-02	0.154										
Jul-02	0.072										
Aug-02	0.197	0.107	0.33	0.213		0.056	0.063	0.032	0.01	0.011	0.028
Sep-02	0.147	0.107	0.43	0.39		0.079	0.046	0.023	0.012	0.021	0.031
Oct-02	0.079	0.087	0.257	0.397		0.031	0.022	0.013	0.004	0.008	0.016
Nov-02	0.137	0.127	0.277	0.237		0.028	0.027	0.019	0.006	0.018	0.016
Dec-03	0.076	0.110	0.243	0.190		0.034	0.017	0.011	0.004	0.014	0.016
Jan-03	0.063	0.037	0.117	0.120		0.037	0.025	0.014	0.006	0.013	0.020
Feb-03	0.095	0.065	0.157	0.153		0.032	0.018	0.009	0.002	0.011	0.013
Mar-03	0.040	0.053	0.092	0.16	0.1	0.032	0.023	0.011	0.006	0.018	0.020
Apr-03	0.062	0.048	0.113	0.113		0.036	0.032	0.017	0.007	0.018	0.022
May-03	0.053	0.041	0.099	0.163		0.032	0.013	0.011	0.006	0.019	0.018
Jun-03	0.077	0.048	0.153	0.193		0.026	0.013	0.008	0.006	0.014	0.017
02-Jul-03	0.034	0.024	0.076	0.117		0.024	0.007	0.005	0.004	0.006	0.010
30-Jul-03		0.039	0.053	0.093		0.015	0.004	0.004	0.004	0.008	0.010
Aug-03	0.032	0.029	0.053	0.103		0.013	0.008	0.005	0.004	0.008	0.007

Table 5. New Vegetation THg and MeHg Data for Winter Sampling Trip in January-February 2003

Vegetation Station Id	Date YYYYMMD	Sample Id	Species	Source	Latitude	Longitude	ash %	MOISTURI %	HG TS UT mg/Kg	MHG TIS mg/Kg
----------	--------	-------------		------	----------	----------	-----------	-----------	-----------	-----------
STA2C1AA	20030224	P14311-1	Typha	DBLB	262444.1	802951.6	7.1	79.08	0.001355	0.000015
STA2C1AA	20030224	P14311-2	Typha	FGS	262444.1	802951.6				
STA2C1AA	20030224	P14311-3	Cladium	DBLB	262444.1	802951.6	2.9	59.91	0.002352	0.000102
STA2C1AA	20030224	P14311-4	Cladium	FGS	262444.1	802951.6				
STA2C1AA	20030224	P14311-5	Polygonia	DBLB	262444.1	802951.6	9.08	86.54	0.00087	0.000326
STA2C1AA	20030224	P14311-6	Polygonia	FGS	262444.1	802951.6				
STA2C1AA	20030224	P14311-7	Periphyton	DBLB	262444.1	802951.6	57.2	94.32	0.002845	0.000456
STA2C1AA	20030224	P14311-8	Periphyton	FGS	262444.1	802951.6				
STA2C1BB	20030224	P14311-10	Typha	FGS	262406.2	803020.8	6.29	76.13	0.001385	0.000017
STA2C1BB	20030224	P14311-9	Typha	DBLB	262406.2	803020.8				
STA2C1BB	20030224	P14311-11	Cladium	DBLB	262406.2	803020.8	3.69	56.95	0.00339	0.00009
STA2C1BB	20030224	P14311-12	Cladium	FGS	262406.2	803020.8				
STA2C1BB	20030224	P14311-13	Ludwigia	DBLB	262406.2	803020.8	12.6	88.84	0.002832	0.000109
STA2C1BB	20030224	P14311-14	Ludwigia	FGS	262406.2	803020.8				
STA2C1BB	20030224	P14311-15	Periphyton	DBLB	262406.2	803020.8	26.4	96.68	0.00323	0.000173
STA2C1BB	20030224	P14311-16	Periphyton	FGS	262406.2	803020.8				
STA2C1CC	20030224	P14311-17	Typha	DBLB	262312	803052.9	9.08	80.82	0.001888	0.000023
STA2C1CC	20030224	P14311-18	Typha	FGS	262312	803052.9				
STA2C1CC	20030224	P14311-19	Cladium	DBLB	262312	803052.9	3.88	57	0.00354	0.00032
STA2C1CC	20030224	P14311-20	Cladium	FGS	262312	803052.9				
STA2C1CC	20030224	P14311-23	Ludwigia	DBLB	262312	803052.9	14.3	89	0.005303	0.001302
STA2C1CC	20030224	P14311-24	Ludwigia	FGS	262312	803052.9				
STA2C1CC	20030224	P14311-21	Nymphaea	DBLB	262312	803052.9	10.5	87	0.000947	0.00033
STA2C1CC	20030224	P14311-22	Nymphaea	FGS	262312	803052.9				
STA2C1CC	20030224	P14311-25	Periphyton	DBLB	262312	803052.9	28.2	95.88	0.011463	0.001938
STA2C1CC	20030224	P14311-26	Periphyton	FGS	262312	803052.9				
STA2C2A	20030224	P14311-27	Typha	DBLB	262434.1	803035.8	8.18	78.86	0.001066	0.000009
STA2C2A	20030224	P14311-28	Typha	FGS	262434.1	803035.8				
STA2C2A	20030224	P14311-29	Cladium	DBLB	262434.1	803035.8	4.2	58.05	0.00499	0.000042
STA2C2A	20030224	P14311-30	Cladium	FGS	262434.1	803035.8				
STA2C2A	20030224	P14311-31	Nymphaea	DBLB	262434.1	803035.8	9.6	87.09	0.00118	0.000044
STA2C2A	20030224	P14311-32	Nymphaea	FGS	262434.1	803035.8				
STA2C2A	20030224	P14311-35	Utricularia	DBLB	262434.1	803035.8	33.3	93.84	0.003089	0.000663
STA2C2A	20030224	P14311-36	Utricularia	FGS	262434.1	803035.8				
STA2C2A	20030224	P14311-33	Periphyton	DBLB	262434.1	803035.8	46.6	93.49	0.006128	0.000451
STA2C2A	20030224	P14311-34	Periphyton	FGS	262434.1	803035.8				
STA2C2B	20030224	P14311-37	Typha	DBLB	262422.8	803057.5	8.78	81.36	0.002651	0.00001
STA2C2B	20030224	P14311-38	Typha	FGS	262422.8	803057.5				
STA2C2B	20030224	P14311-39	Cladium	DBLB	262422.8	803057.5	3.09	58.23	0.004666	0.000052
STA2C2B	20030224	P14311-40	Cladium	FGS	262422.8	803057.5				
STA2C2B	20030224	P14311-41	Nymphaea	DBLB	262422.8	803057.5	11.9	89.28	0.000691	0.000045
STA2C2B	20030224	P14311-42	Nymphaea	FGS	262422.8	803057.5				
STA2C2B	20030224	P14311-43	Utricularia	DBLB	262422.8	803057.5	17.6	94.21	0.001166	0.000277
STA2C2B	20030224	P14311-44	Utricularia	FGS	262422.8	803057.5				
STA2C2B	20030224	P14311-45	green alga	DBLB	262422.8	803057.5	21.8	97.04	0.005224	0.000235
STA2C2B	20030224	P14311-46	green alga	FGS	262422.8	803057.5				
STA2C2C	20030224	P14311-47	Typha	DBLB	262358.3	803128.9	8.57	81.34	0.0015	
STA2C2C	20030224	P14311-48	Typha	FGS	262358.3	803128.9				
STA2C2C	20030224	P14311-49	Cladium	DBLB	262358.3	803128.9	4.71	60.67	0.002268	0.00011
STA2C2C	20030224	P14311-50	Cladium	FGS	262358.3	803128.9				
STA2C2C	20030224	P14311-51	Nymphaea	DBLB	262358.3	803128.9	9.42	85.67	0.000843	0.000053
STA2C2C	20030224	P14311-52	Nymphaea	FGS	262358.3	803128.9				
STA2C2C	20030224	P14311-53	Utricularia	DBLB	262358.3	803128.9	22.6	93.54	0.002034	0.000446
STA2C2C	20030224	P14311-54	Utricularia	FGS	262358.3	803128.9				
STA2C2C	20030224	P14311-55	green alga	DBLB	262358.3	803128.9	21.7	93.44	0.000934	0.000174
STA2C2C	20030224	P14311-56	green alga	FGS	262358.3	803128.9				
STA2C3A	20030225	P14312-1	Najas	DBLB	262439.5	803308.1	38.4	86.14	0.001136	0.000118
STA2C3A	20030225	P14312-2	Najas	FGS	262439.5	803308.1				
STA2C3A	20030225	P14312-3	Potamoget	DBLB	262439.5	803308.1	27.2	87.31	0.000448	0.000162
STA2C3A	20030225	P14312-4	Potamoget	FGS	262439.5	803308.1				
STA2C3B	20030225	P14312-5	Najas	DBLB	262350.7	803305	80.6	86.06	0.000225	0.000032
STA2C3B	20030225	P14312-6	Najas	FGS	262350.7	803305				
STA2C3B	20030225	P14312-7	Potamoget	DBLB	262350.7	803305	39.3	84.84	0.00038	0.00007
STA2C3B	20030225	P14312-8	Potamoget	FGS	262350.7	803305				
STA2C3C	20030225	P14312-10	Periphyton	FGS	262303.1	803307.9	72.1	86.54	0.000839	0.000088
STA2C3C	20030225	P14312-9	Periphyton	DBLB	262303.1	803307.9				
STA2C3C	20030225	P14312-11	Potamoget	DBLB	262303.1	803307.9	21.8	91.68	0.000366	0.000108
STA2C3C	20030225	P14312-12	Potamoget	FGS	262303.1	803307.9				
STA2C3C	20030225	P14312-13	Panicum	DBLB	262303.1	803307.9	9.12	82.17	0.000863	0.000154
STA2C3C	20030225	P14312-14	Panicum	FGS	262303.1	803307.9				
STA2C3C	20030225	P14312-15	Typha	DBLB	262303.1	803307.9	10	81.41	0.001922	0.000012

Figures



STA-2

Figure 1. STA-2 geographic location in South Florida and aerial photograph.

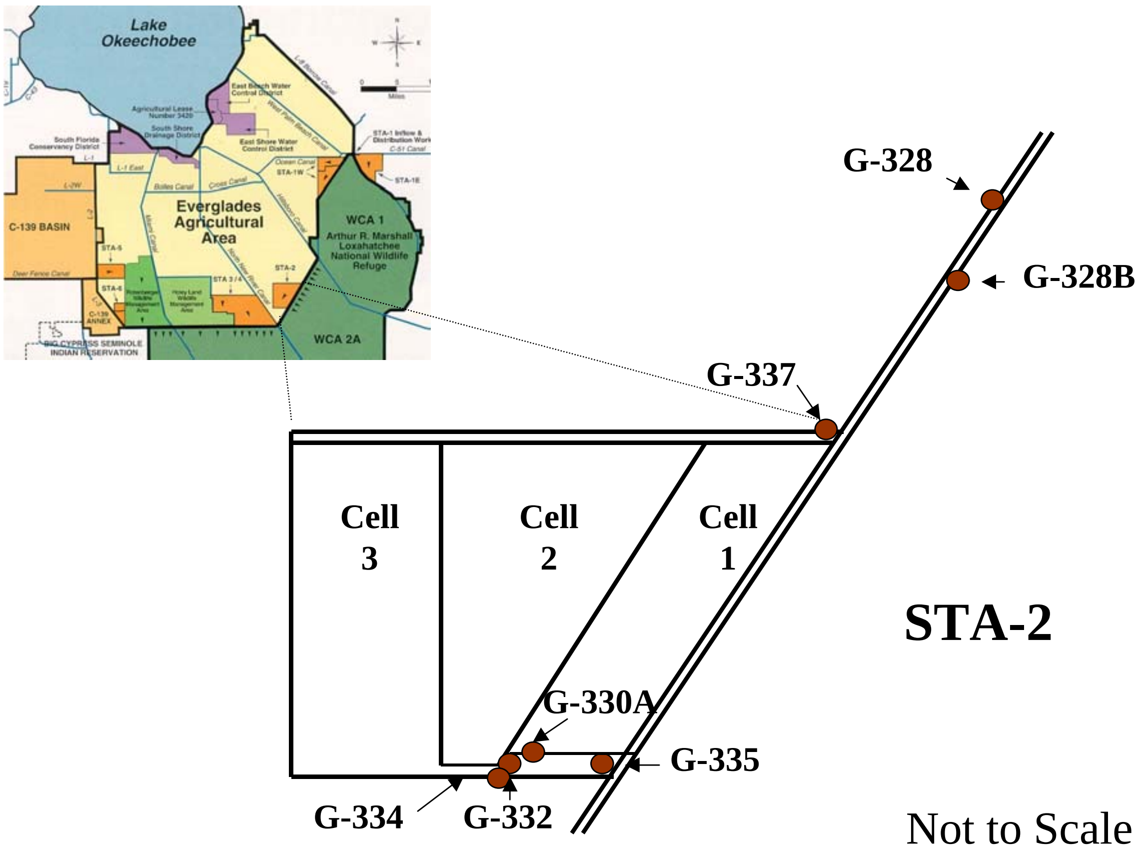


Figure 2. STA-2 graphic representation with inflow and outflow structures.

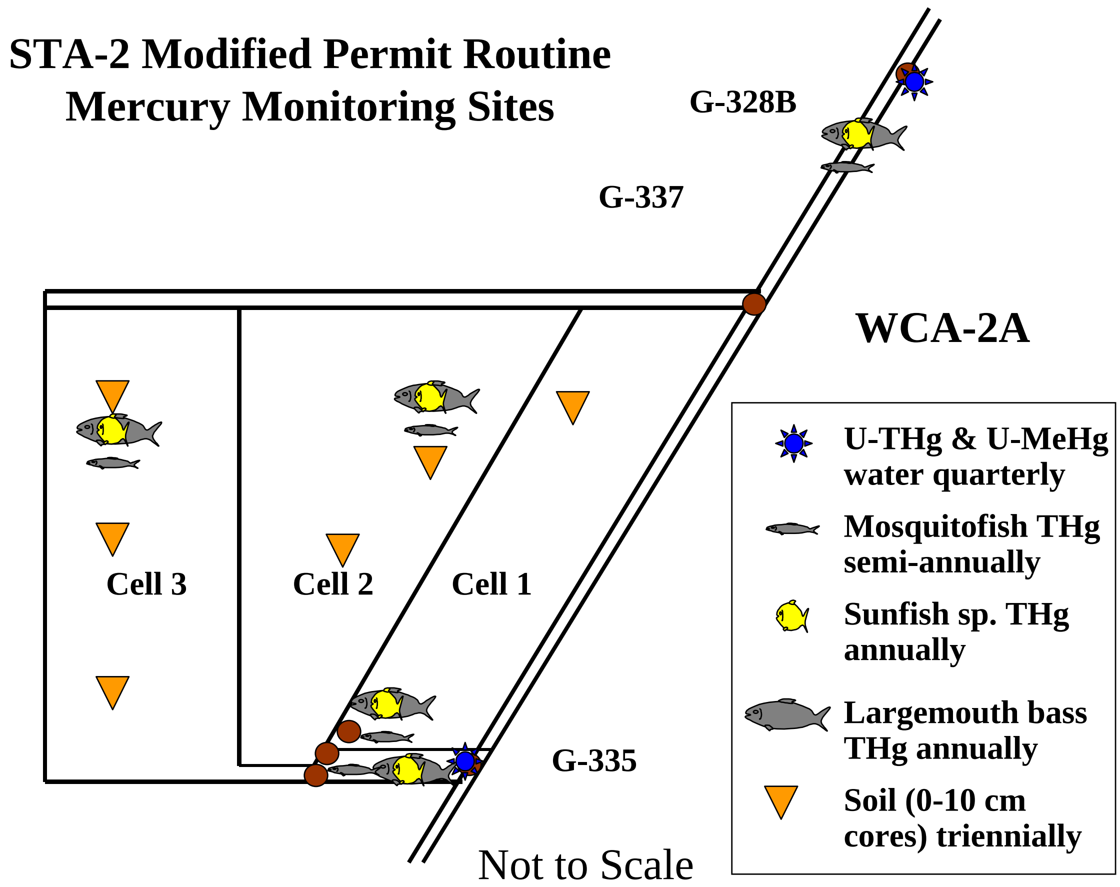


Figure 3. STA-2 routine mercury monitoring sites for original permit compliance.

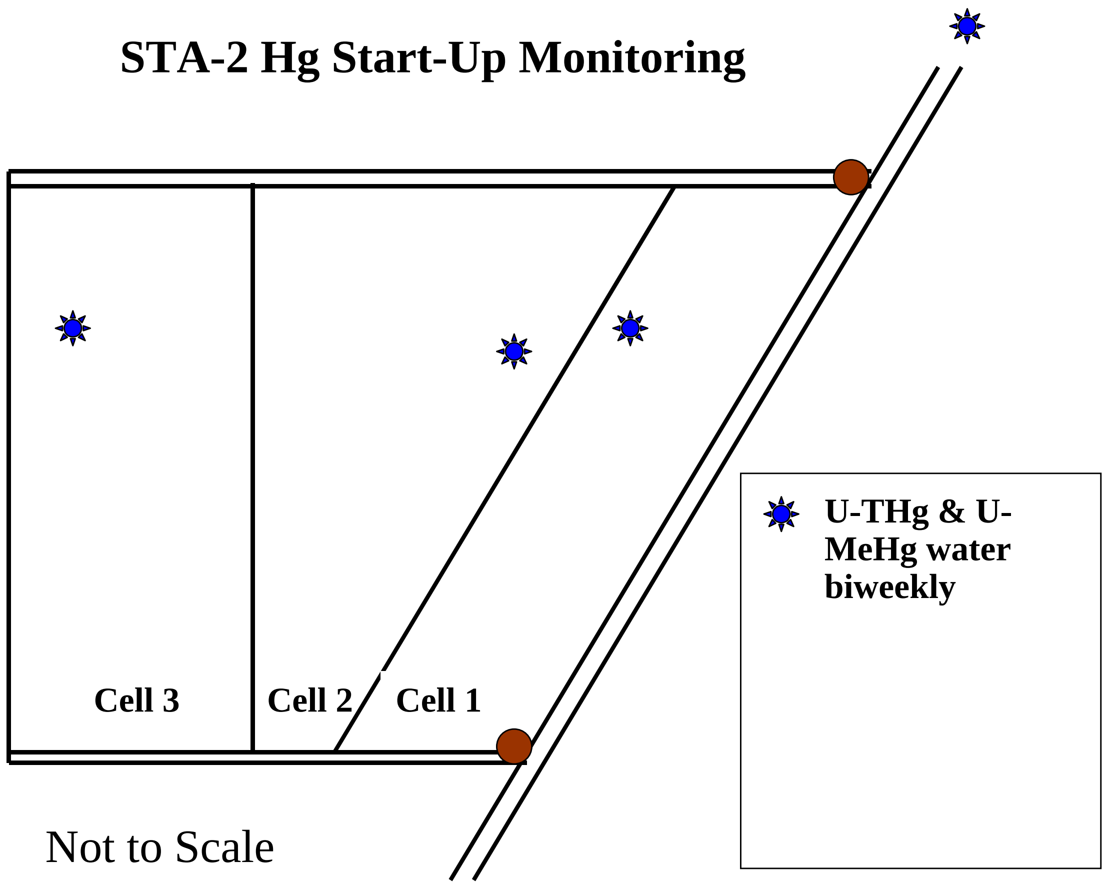


Figure 4. STA-2 start-up mercury monitoring sites for original permit compliance.

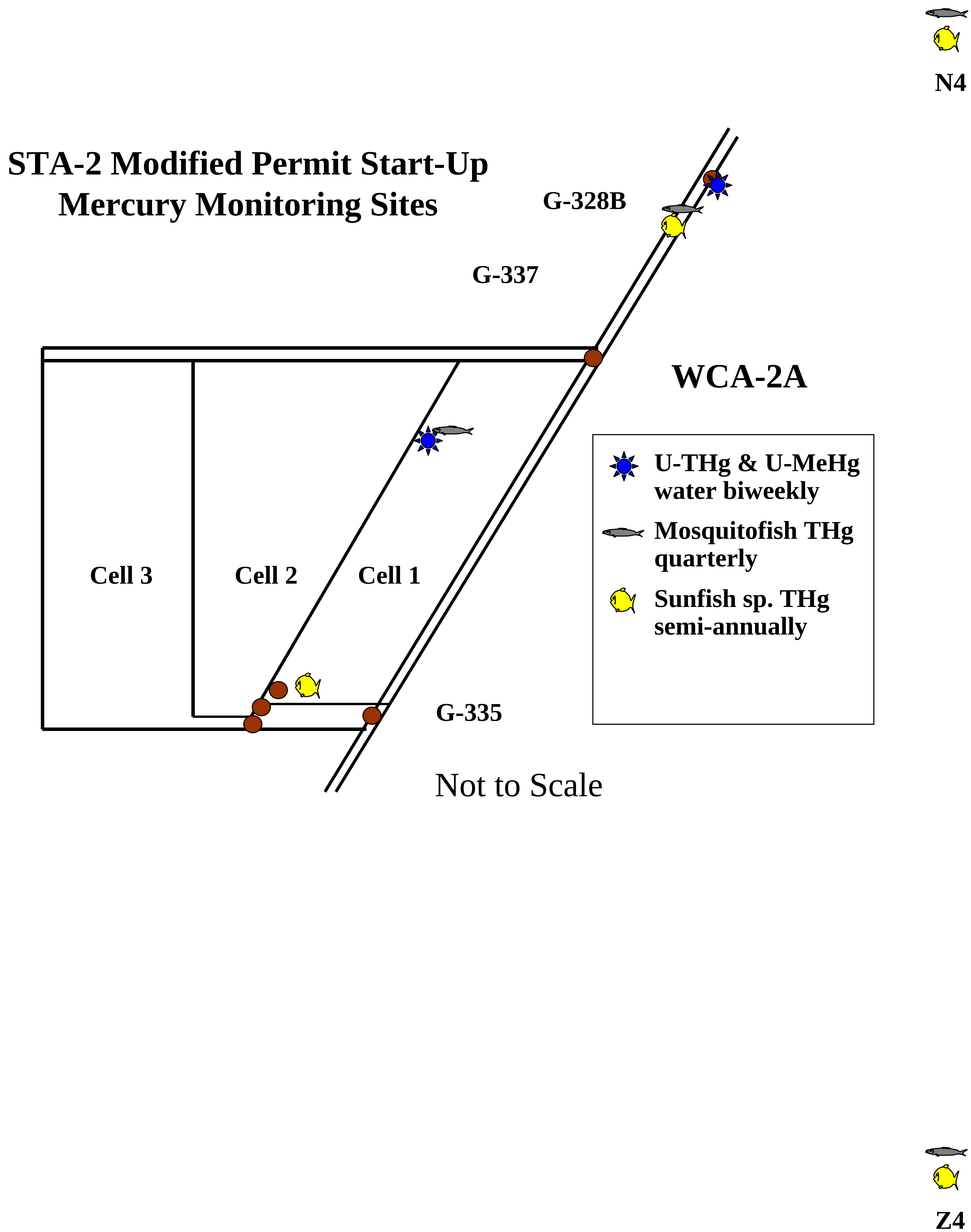


Figure 5. STA-2 start-up mercury monitoring sites for modified permit compliance.

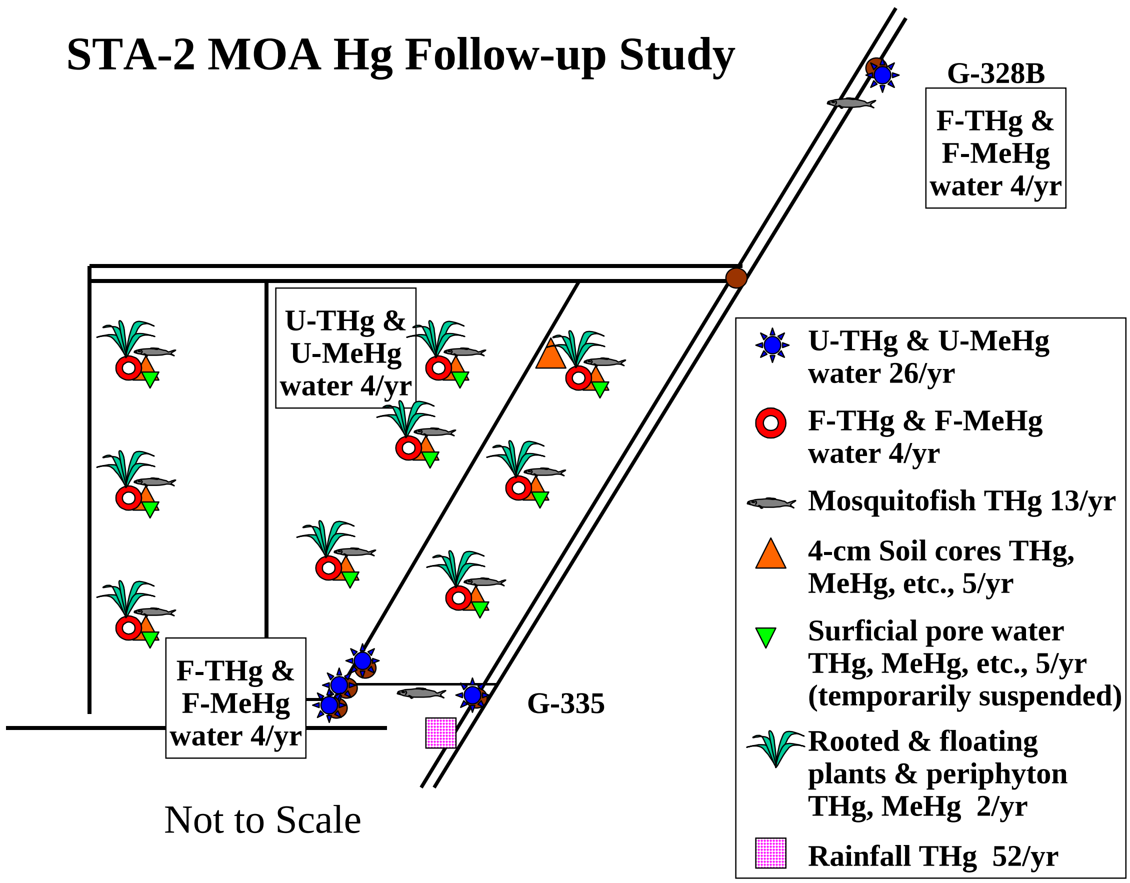


Figure 6. STA-2 expanded mercury monitoring sites for STA-2 Special Mercury Studies (MOA).

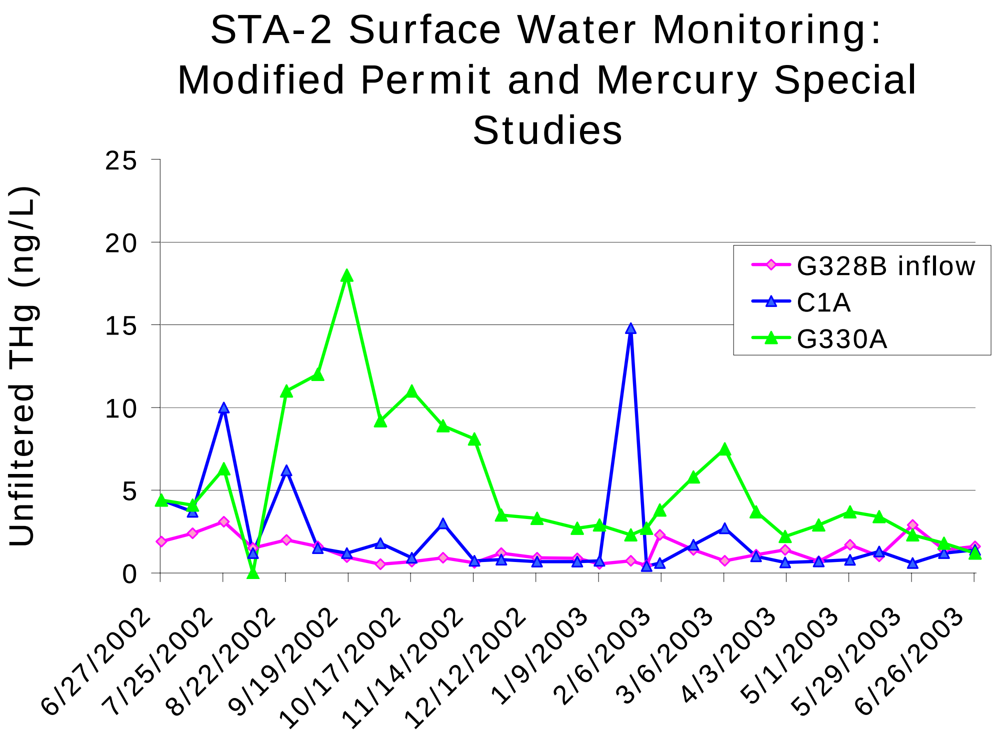


Figure 7. Inflow and interior surface water THg results for modified permit compliance monitoring (Exhibit E).

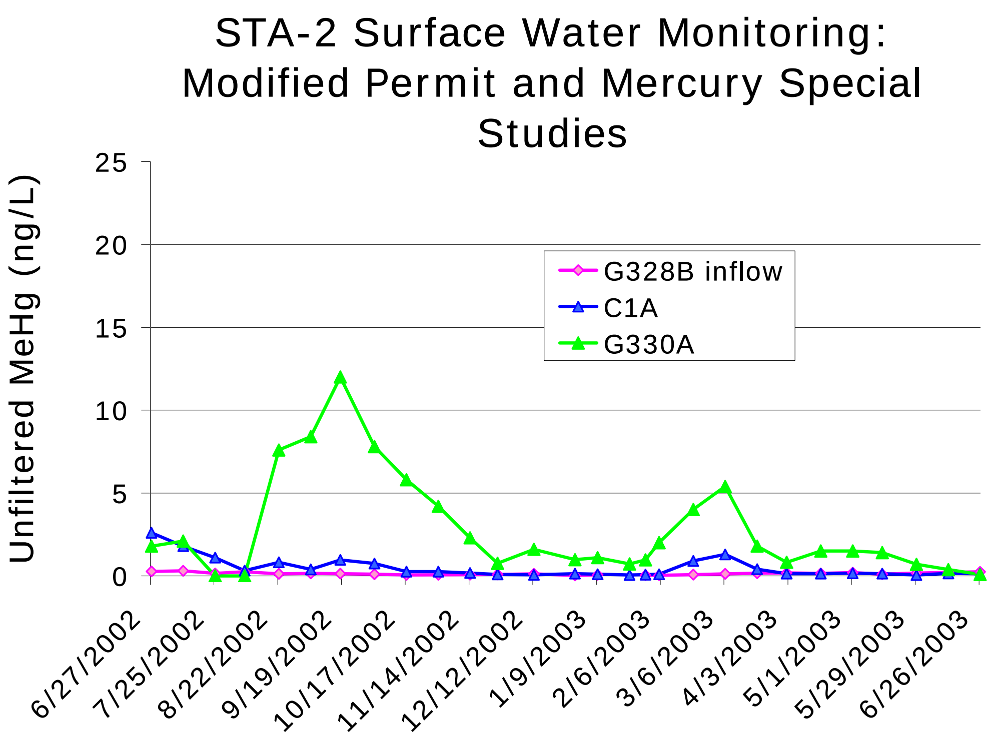


Figure 8. Inflow and interior surface water MeHg results for modified permit compliance monitoring (Exhibit E).

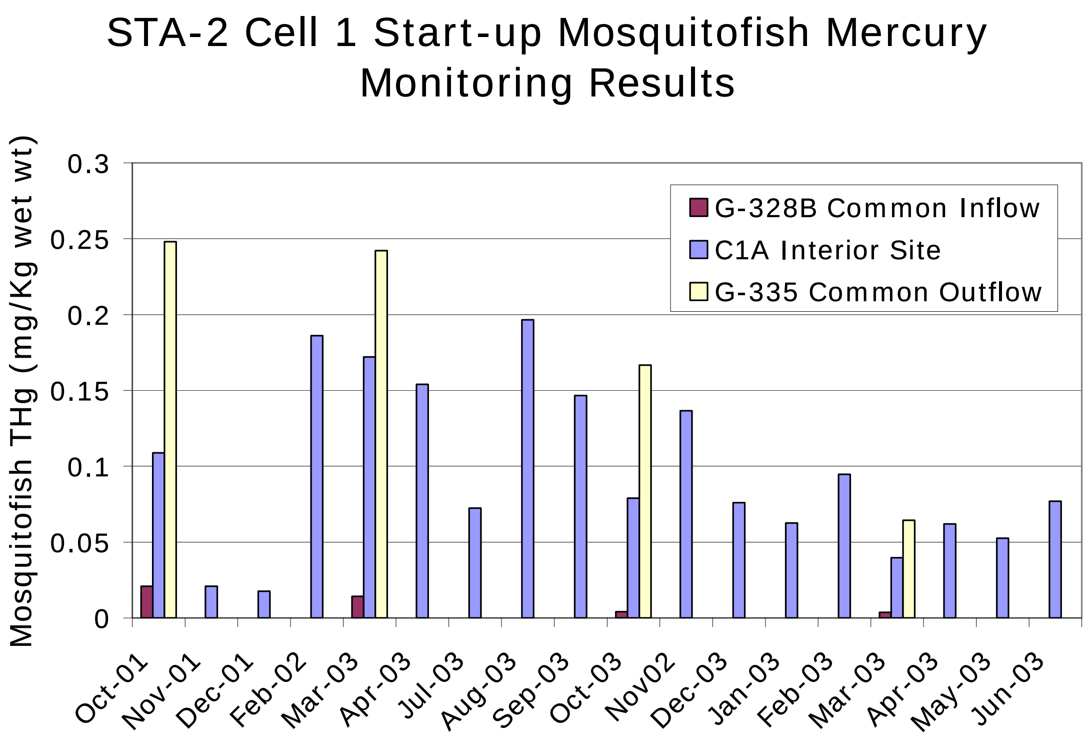


Figure 9. Interior STA-2 mosquitofish THg concentration results for modified permit start-up compliance monitoring (Exhibit E).

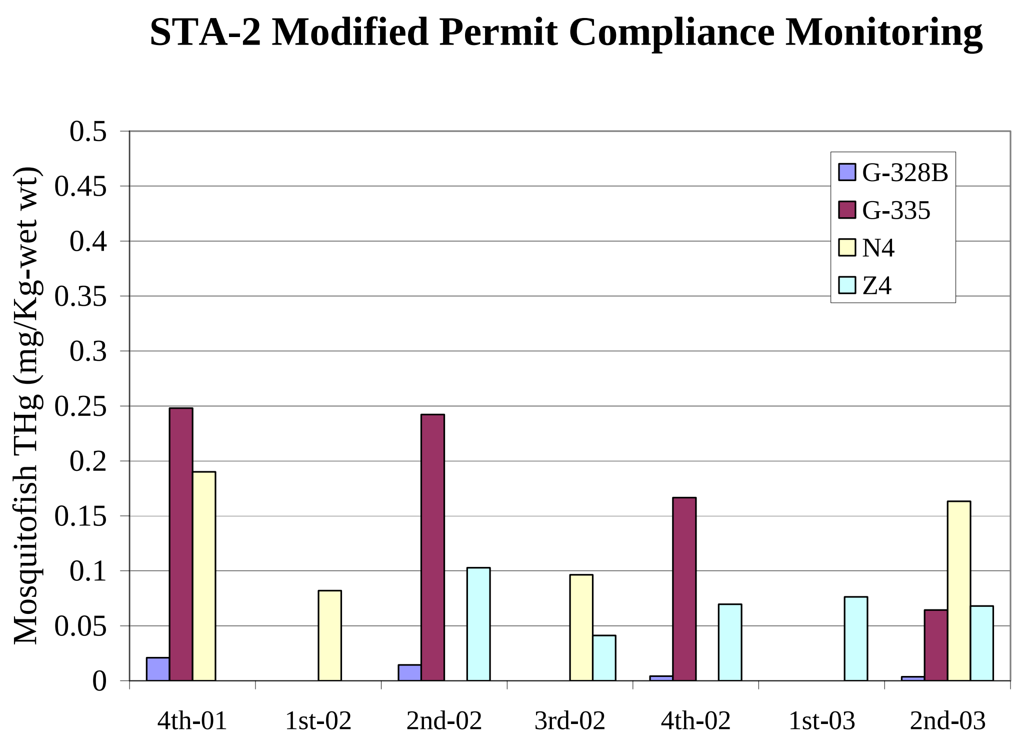


Figure 10. STA-2 downstream mosquitofish THg concentration results for modified permit compliance monitoring (Exhibit E).

STA-2 Modified Permit Hg Compliance Monitoring

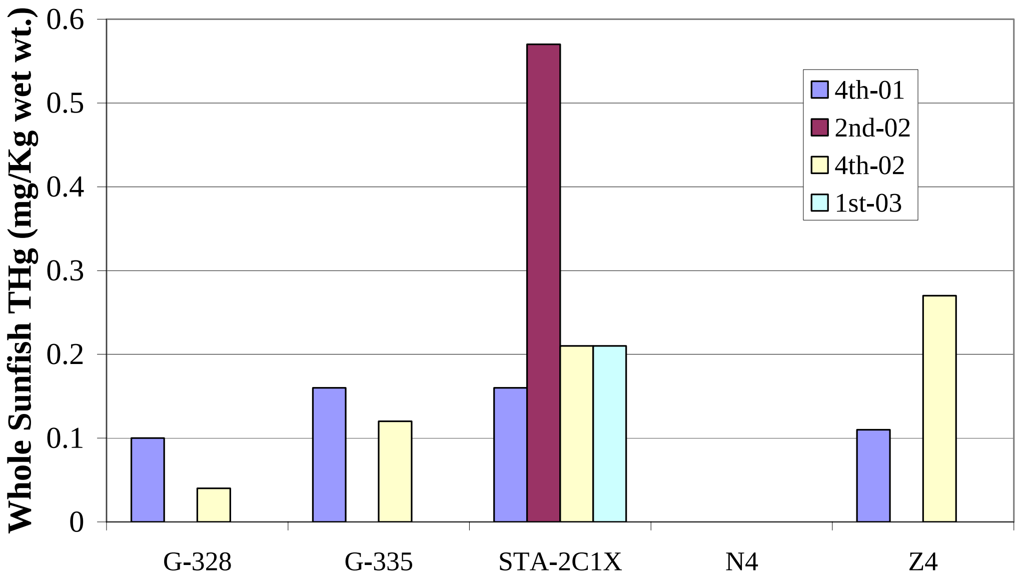


Figure 11. STA-2 sunfish THg monitoring results for modified permit compliance (Exhibit E).

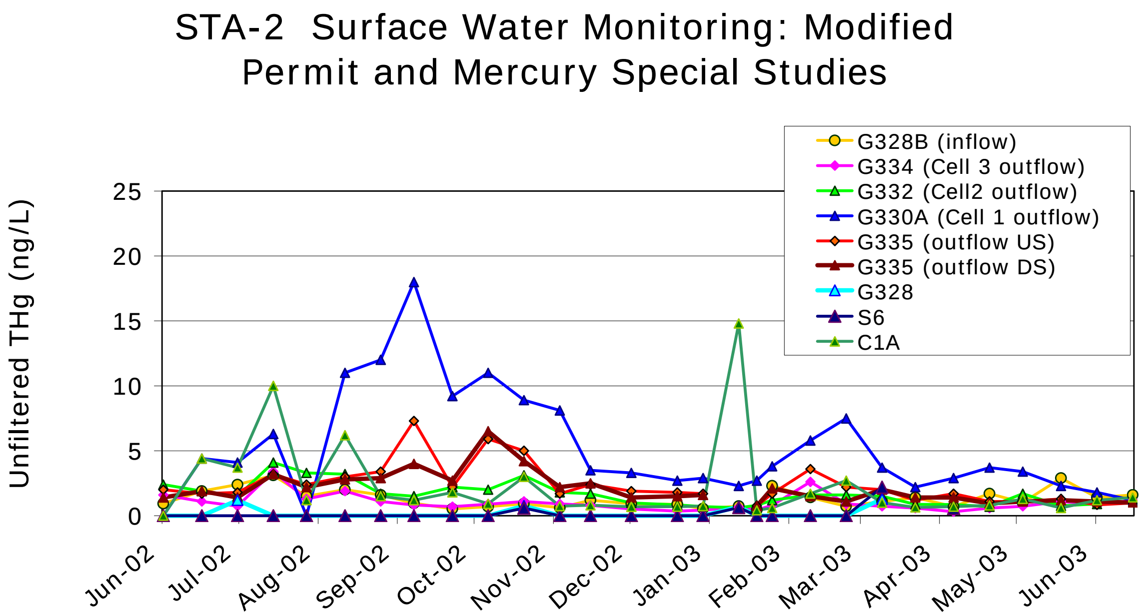


Figure 12. Surface water THg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

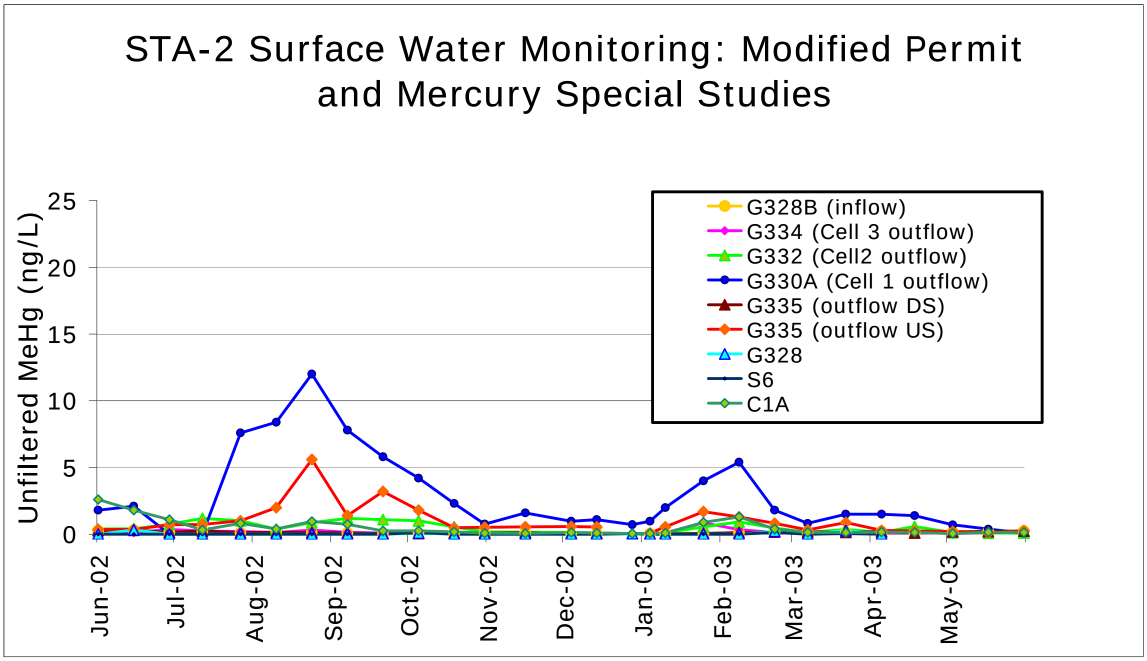


Figure 13. Surface water MeHg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

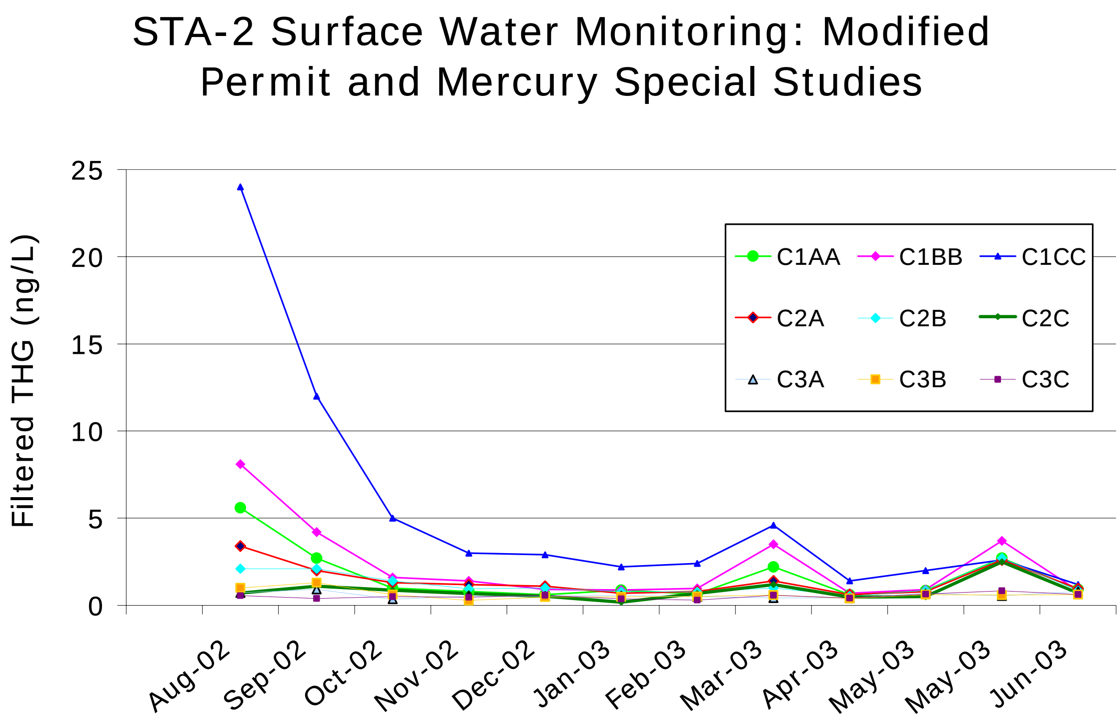


Figure 14. Interior filtered THg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

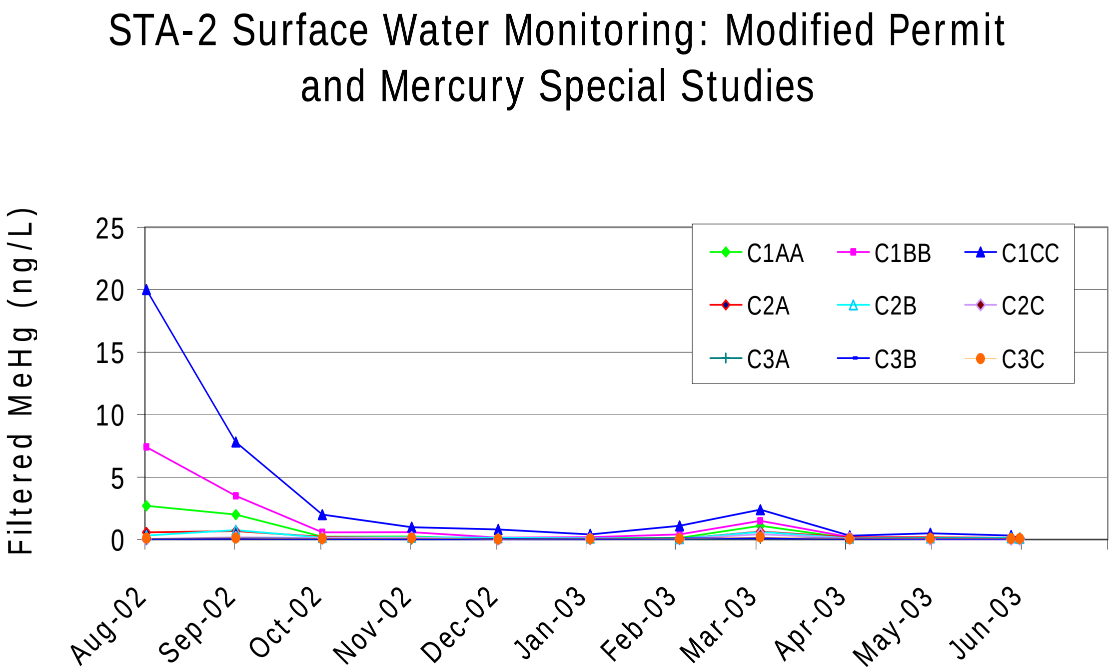


Figure 15. Interior filtered MeHg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

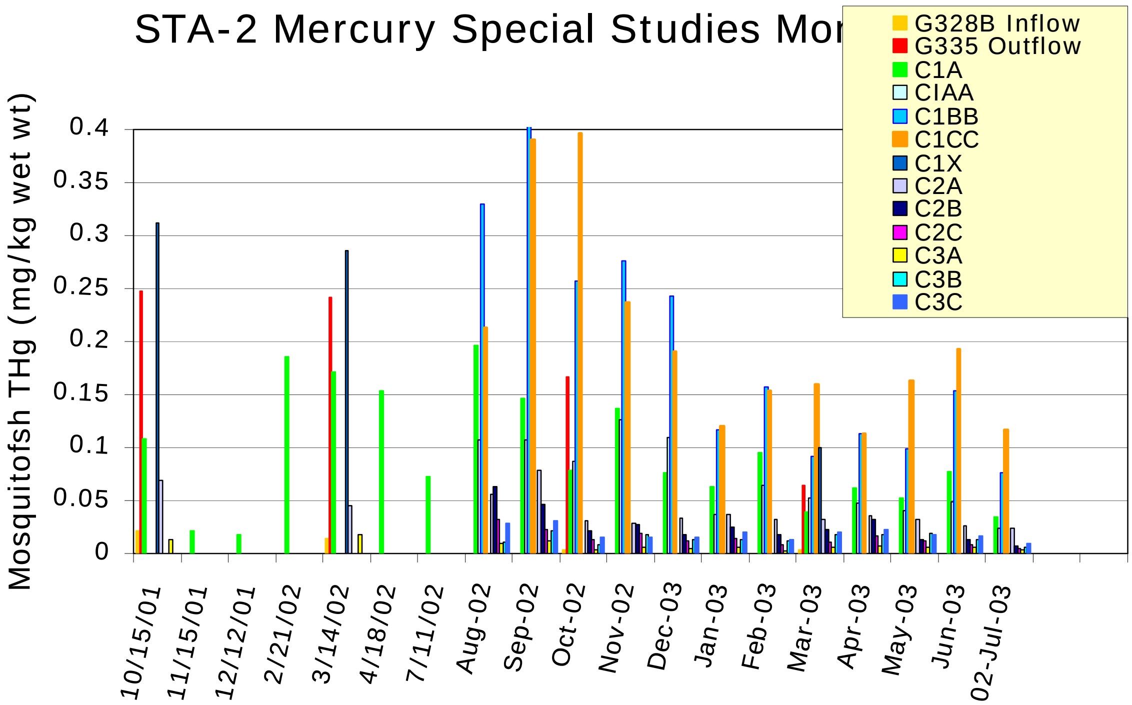


Figure 16. Mosquitofish THg concentration monitoring results for the STA-2 Mercury Special Studies Project (MOA).

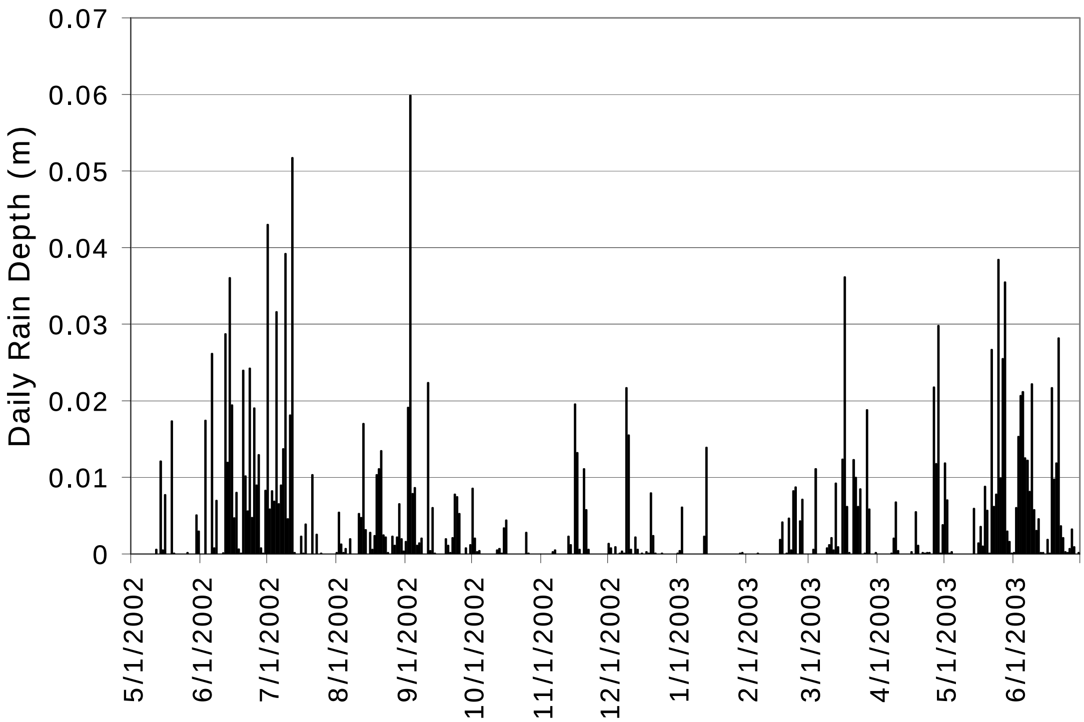


Figure 17. Daily rainfall depth (m) at STA-2 (average of measurements taken at EAA5, S6, and S7 rain gauges)

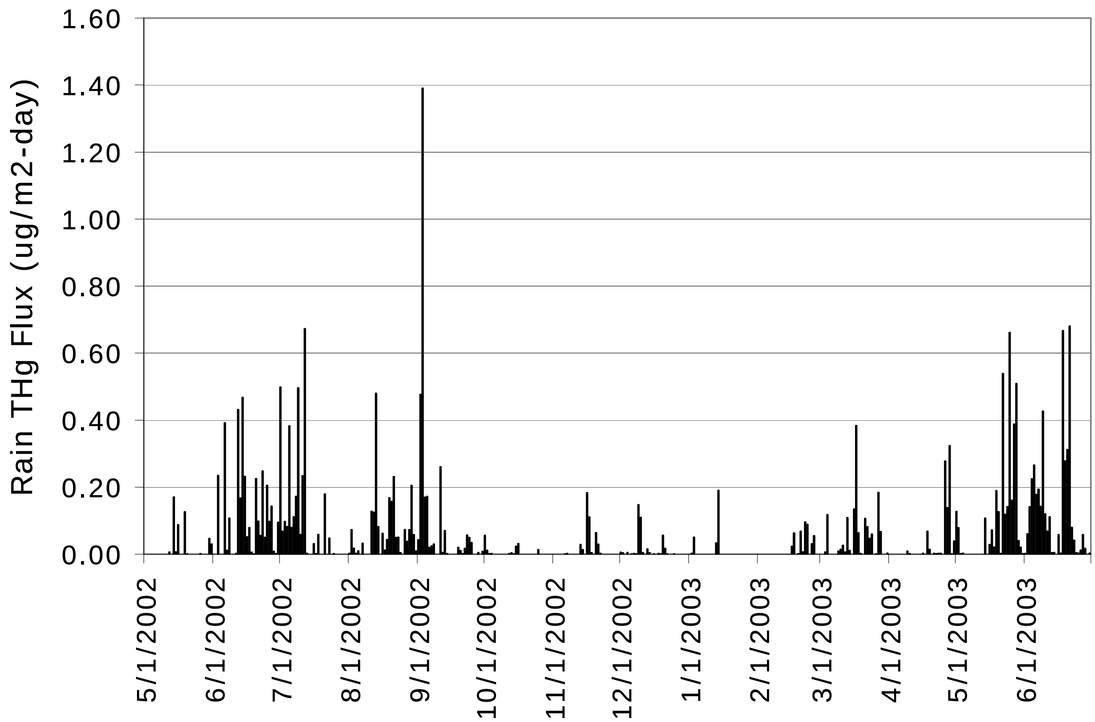


Figure 18. Weekly rain THg flux (ug/m2-day) at STA-2 calculated as product of weekly integrated rain THg concentration and corresponding rain depth for the same seven-day period.

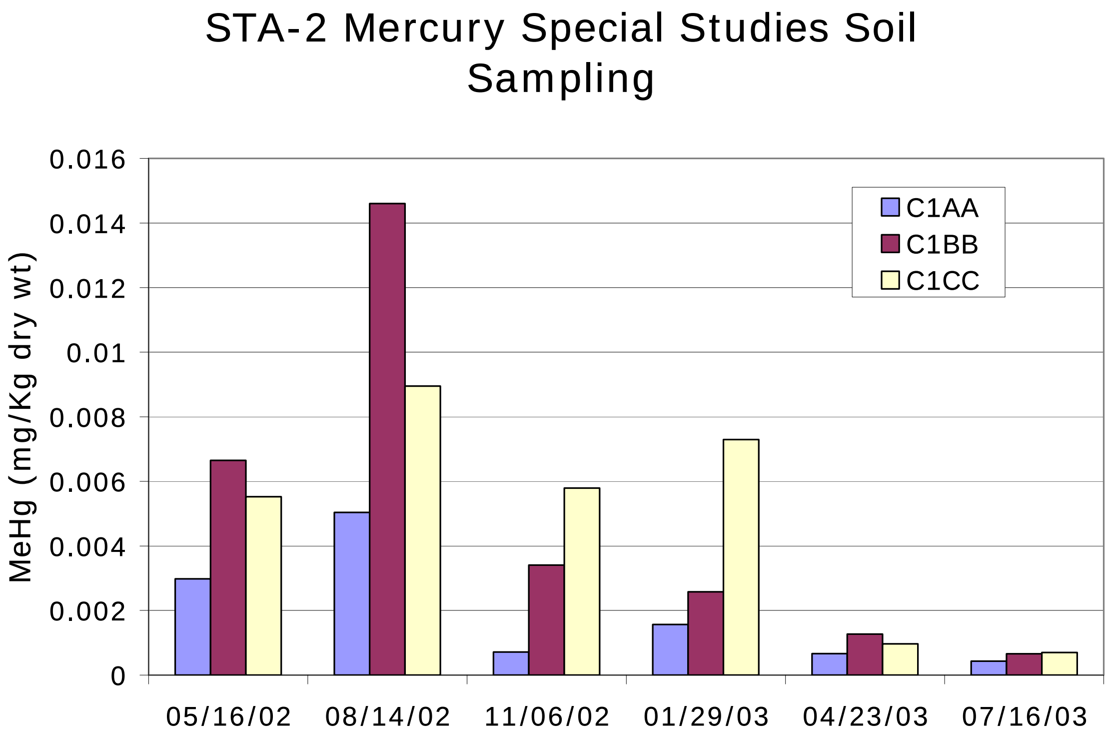


Figure 19. Soil MeHg concentration (0-4 cm cores) monitoring results to date for the STA-2 Mercury Special Studies Project (MOA).

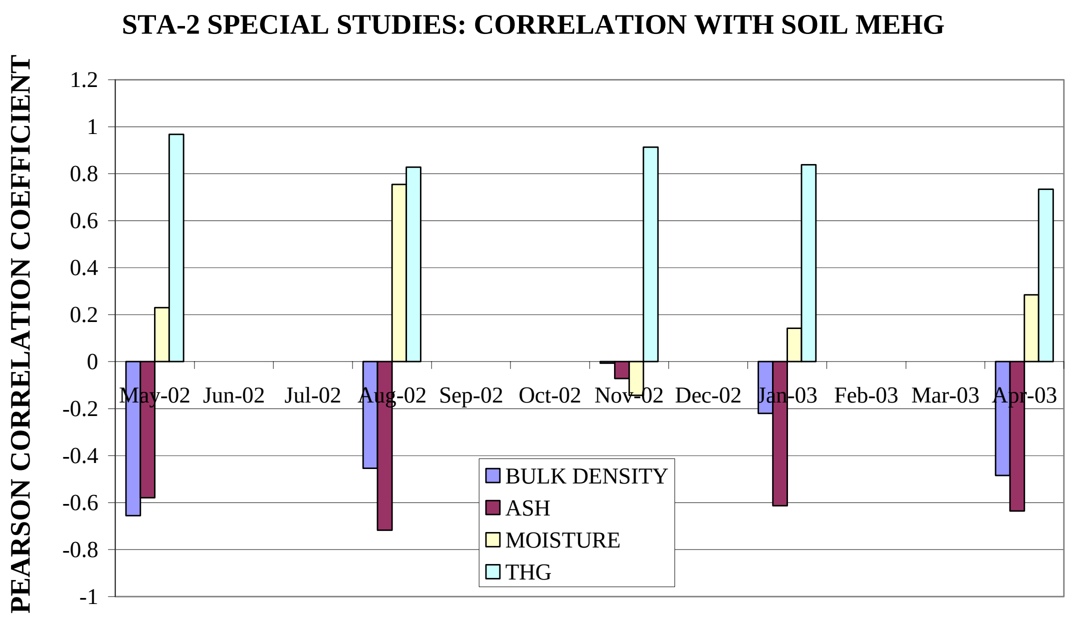


Figure 20A. Correlation between the methylmercury (MeHg) concentration in top 4 cm of peat soil and the parameter of interest for all nine interior sites for each sampling trip through April 2003.

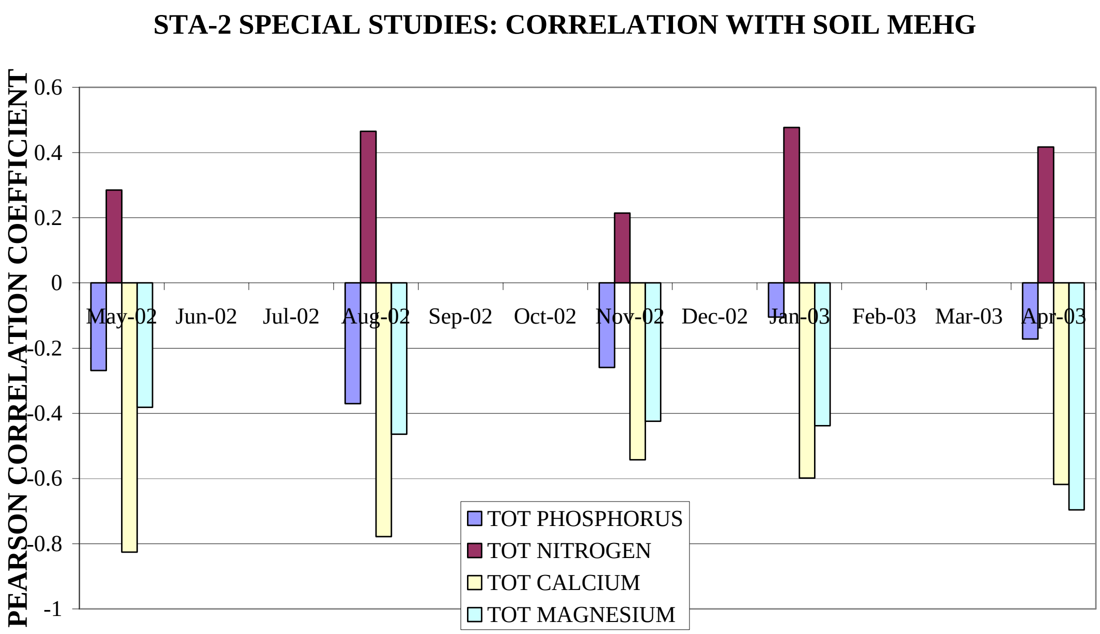


Figure 20B. Correlation between the methylmercury (MeHg) concentration in top 4 cm of peat soil and the parameter of interest for all nine interior sites for each sampling trip through April 2003.

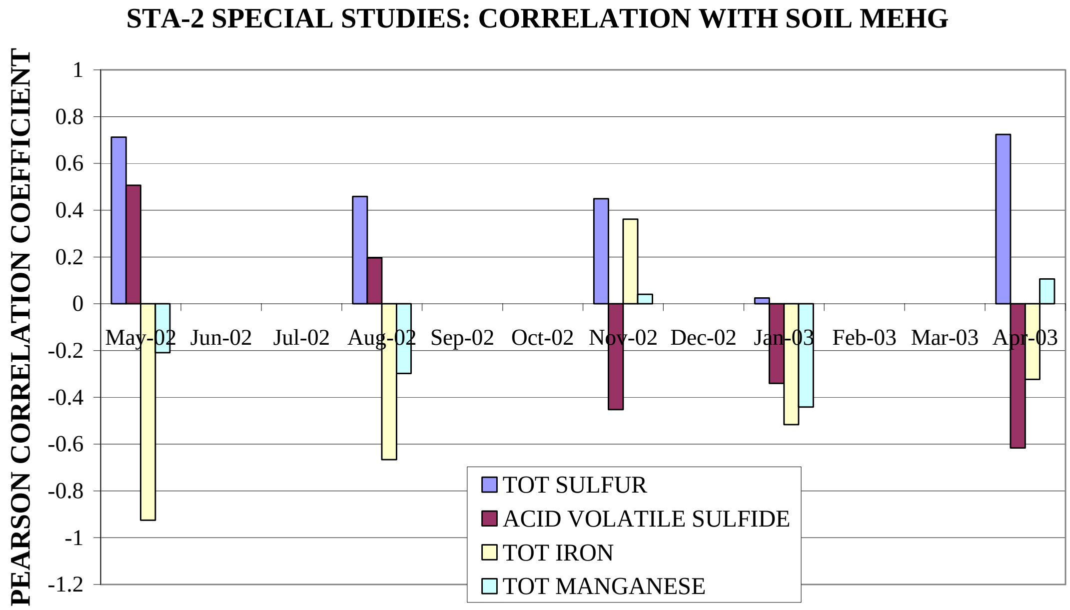


Figure 20C. Correlation between the methylmercury (MeHg) concentration in top 4 cm of peat soil and the parameter of interest for all nine interior sites for each sampling trip through April 2003.

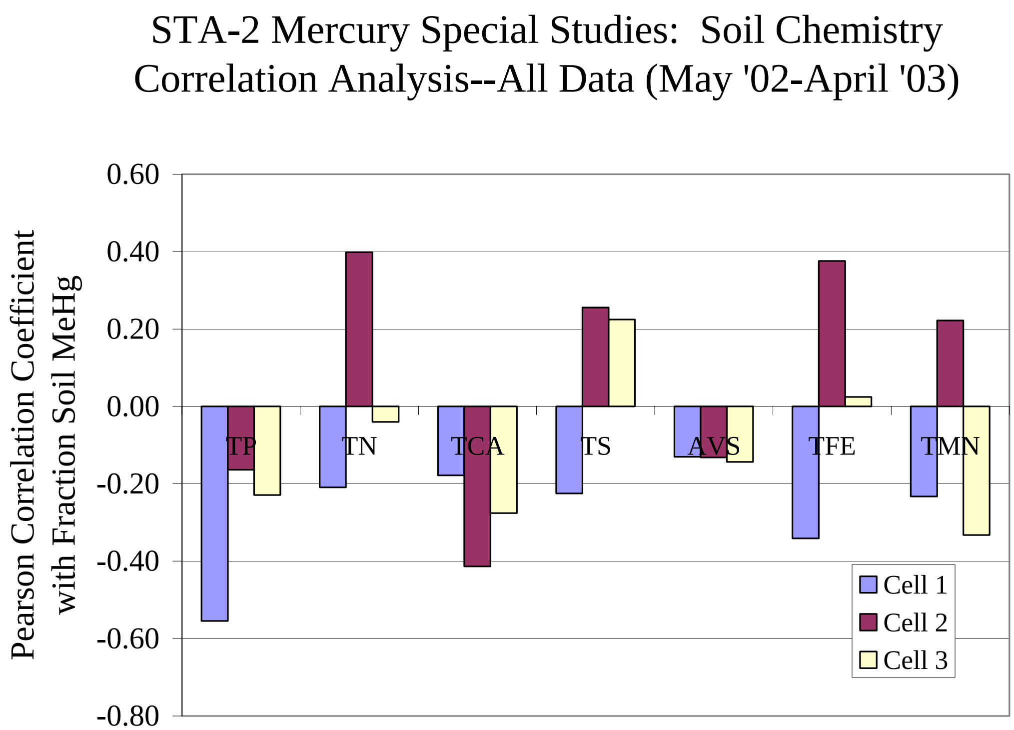


Figure 21. Correlation between the fraction of methylmercury (MeHg) in top 4 cm of peat soil ([MeHg]/[THg]) and the parameter of interest for each cell for all sampling trips through April 2003.

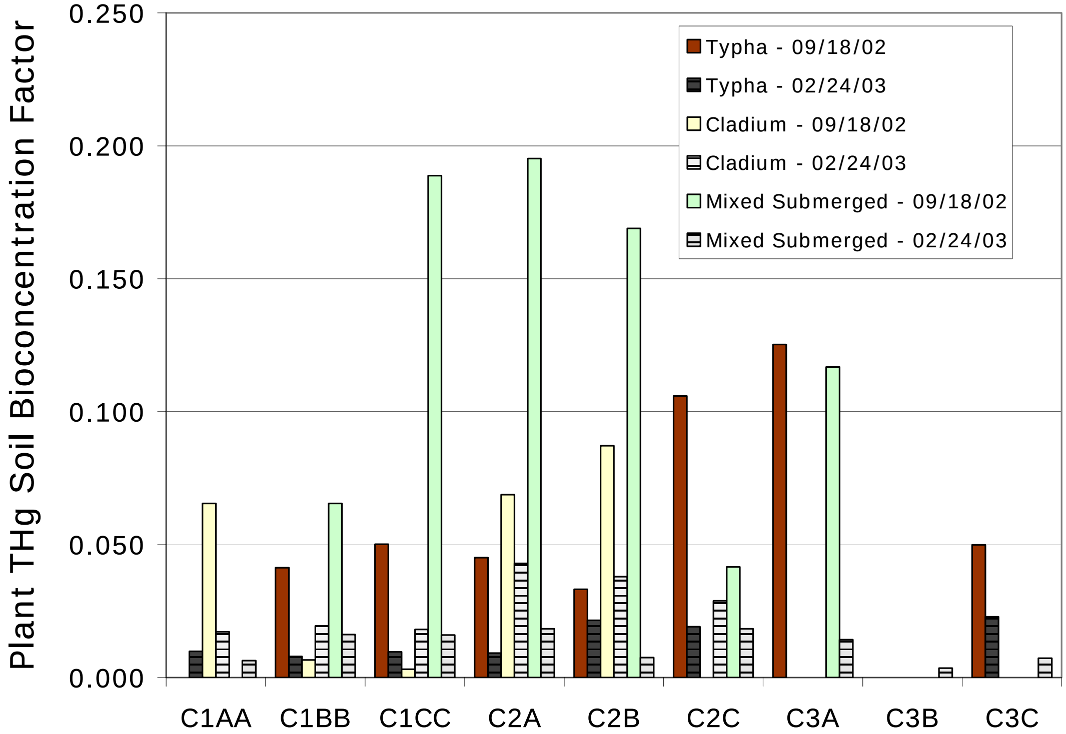


Figure 22A. THg soil bioconcentration factors (BCFs) for cattail (*Typha domingensis*), sawgrass (*Cladium Jamaicense*), and mixed submerged rooted macrophytes as the ratio of wet tissue concentrations to filtered water concentration in samples collected from the same site and time period. Samples were collected where available.

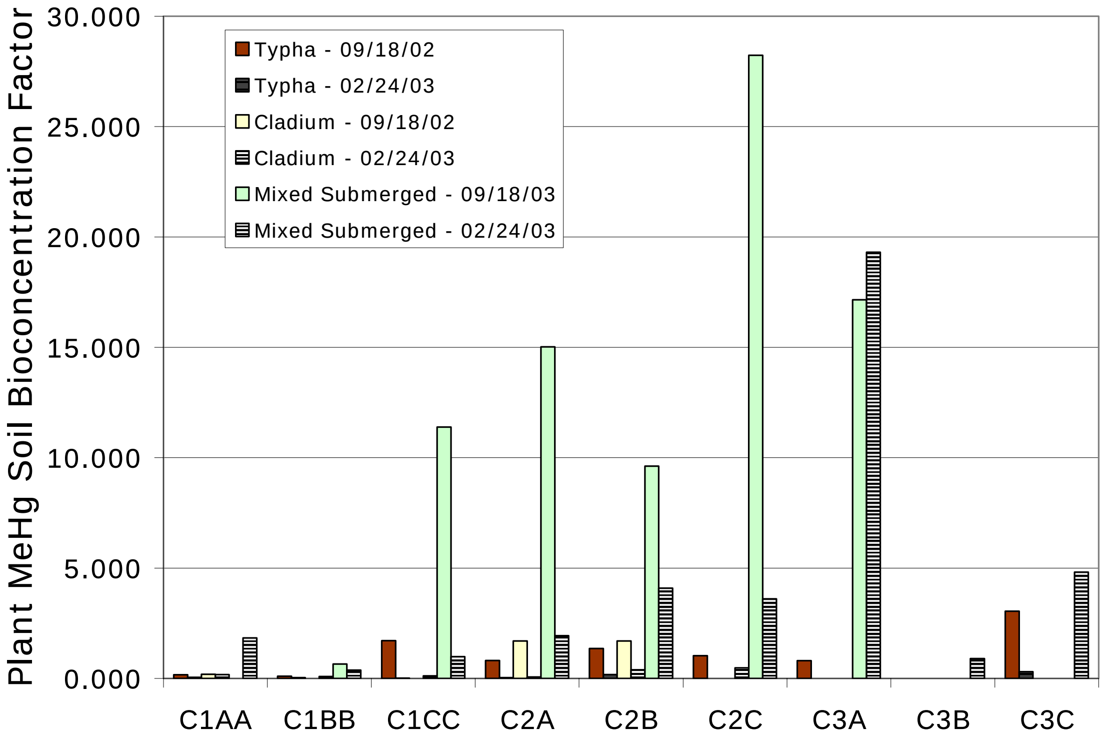


Figure 22B. THg soil bioconcentration factors (BCFs) for cattail (*Typha domingensis*), sawgrass (*Cladium Jamaicense*), and mixed submerged rooted macrophytes as the ratio of wet tissue concentrations to filtered water concentration in samples collected from the same site and time period. Samples were collected where available.

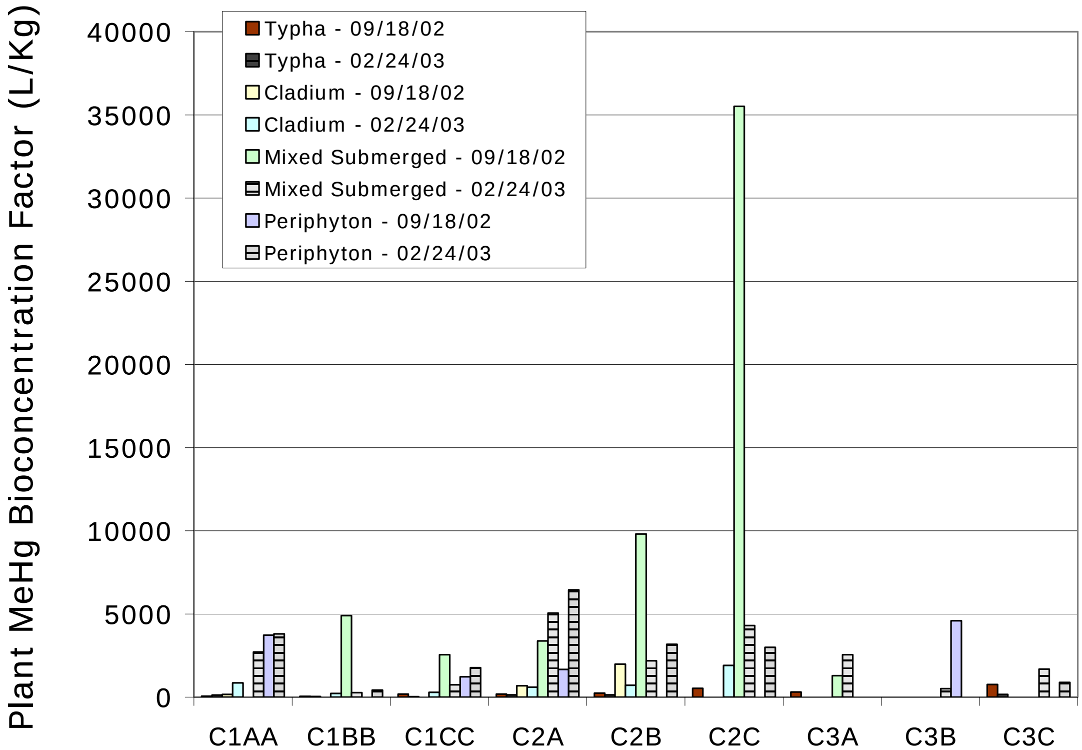


Figure 23A. THg bioconcentration factors (BCFs), as the ratio of wet tissue concentrations to filtered water concentration, in samples collected from the same site and time period for cattail (*Typha domingensis*), sawgrass (*Cladium jamaicense*), mixed submerged rooted macrophytes, and green algae mats (periphyton) at C1AA, C2A, C2C; blue-green periphyton at C3A; and blue-green and green periphyton, respectively, at C3C. Samples were collected where available.

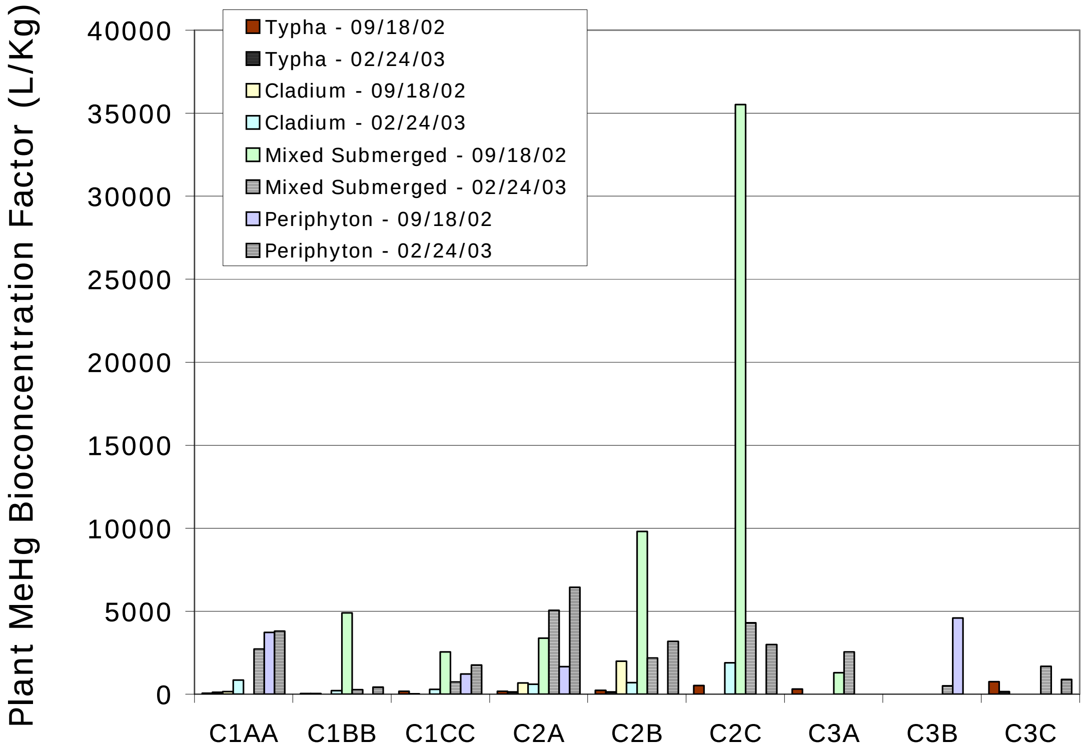


Figure 23B. MeHg bioconcentration factors (BCFs), as the ratio of wet tissue concentrations to filtered water concentration, in samples collected from the same site and time period for cattail (*Typha domingensis*), sawgrass (*Cladium Jamaicense*), mixed submerged rooted macrophytes, and green algae mats (periphyton) at C1AA, C2A, C2C; blue-green periphyton at C3A; and blue-green and green periphyton, respectively, at C3C. Samples were collected where available.

Attachment1: Invoices for Fourth Quarter FY '03

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

December 31, 2003

Temperince Morgan
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Exhibit E Report, Permit No. 0126704-001-GL
Stormwater Treatment Area 2 (STA-2)

Dear Ms. Morgan:

Enclosed is the fifth quarterly report required by Exhibit E of the subject permit for the period July 1, 2003 through September 30, 2003, based on data received through November 30, 2003. The trend in surface water, soil, and mosquitofish mercury levels continues downward in Cell 1. The processing and analysis of the fall collection of mosquitofish, sunfish, and largemouth bass in STA-2 has been expedited, and the data are expected to complete quality assurance review shortly. We are still scheduled to deliver the final probabilistic ecological risk assessment for methylmercury risks to representative wading birds in STA-2 Cell 1 and the downstream sites at N4 and Z4 by March 31, 2004. Please feel free to contact me at (561) 682-6291 if you have any questions or concerns.

Sincerely,

Ron Bearzotti

Ron Bearzotti
Senior Environmental Analyst
Operations Control, Engineering, and Vegetation Maintenance

RB/lf/m
Enclosure

c: Tom Atkeson, FDEP
Richard Harvey, USEPA 4 (w/o enclosure)
Dan Scheidt, USEPA 4

Status Report on STA-2 Start-Up and Routine Mercury Monitoring and Mercury Special Studies
Reporting Period: 07/01/03- 09/30/03
Final 123103

Executive Summary

STA-2 Cells 2 and 3 met their permit-mandated mercury start-up criteria in September and November 2000, respectively, while Cell 1 experienced anomalous mercury events in the fall of 2000 and 2001. Subsequently, the District applied for a permit modification that would allow flow-through operation to commence without meeting mercury start-up criteria. This was done in the belief that exposure to and/or export of MeHg could be reduced by the flowing water, because it would (1) keep Cell 1 wet, (2) dilute the fresh supply of inorganic mercury in atmospheric deposition, (3) dilute the MeHg produced internally, and (4) increase the sulfate load to the point that sulfide inhibition of MeHg production could occur. The application was submitted in July 2001 and, by letter dated August 9, 2001, FDEP notified the District that it had approved the modification.

The District commenced the expanded mercury monitoring program under the modified permit in August 2001. This was further expanded to include biweekly monitoring of the Cell 1, 2, and 3 outflows after the second anomalous MeHg event occurred in Cell 1 in October 2001. In anticipation that there would be insufficient water during the dry season to keep the water flowing through Cell 1, the District recommended that Cell 1 be dried out until the following wet season, and the Department concurred. This also provided the District with an opportunity to raise the Cell 1 outflow weirs so as to minimize the occurrence of dryouts in the future. Dryout was essentially complete by December 31, 2001, but some drainage continued through February 2002.

With the return of the wet season flows in August 2002, the District began a one-year special study to (1) characterize the THg and MeHg concentration trajectories in water, soil, vegetation, and mosquitofish over time, (2) quantify THg and MeHg mass budgets for each cell, and (3) evaluate the physical, chemical, and biological factors that influence the magnitude of MeHg export and bioaccumulation. The third anomalous mercury event, which was detected by this study and occurred on August 22, 2002, in STA-2 Cell 1, began to dissipate from the interior water column almost immediately. Cell 1 met its THg and MeHg start-up criteria (i.e., THg and MeHg concentrations at C1A, the interior monitoring site, were not statistically significantly greater than the corresponding inflow concentrations per one-tailed t test at the 95th percentile confidence level) on November 26, 2002. However, an anomalously high THg concentration of 14.8 ng/L (verified by rework) was detected at C1A on January 23, 2003, but the high turbidity associated with the sample suggests that it was an artifact of the low water levels encountered at the time of sampling. The MeHg result for the same sampling event was low, which would not be inconsistent with the resuspension scenario, because the sediment MeHg concentration is typically several orders of magnitude lower than the THg concentration. Thereafter, the interior surface water concentrations declined steadily to the point that the unfiltered THg and MeHg concentrations in the Cell 1 outflow were less than their corresponding inflow concentrations on

June 26, 2003. THg and MeHg interior and outflow concentrations remained generally low during the period July 1, 2003, to September 30, 2003.

Mosquitofish THg concentrations tracked the water column MeHg concentrations. The build-up and decline of excess MeHg in water paralleled that in surficial soils in Cell 1, but not with the same spatial pattern. The rapid changes in soil chemistry that occurred following Cell 1 reflooding appear to be slowing and stabilizing, with the inverse correlation between acid volatile sulfide as a surrogate for pore water sulfide switching from weakly positive prior to reflooding to moderately negative in the last soil sampling campaign in April 2003. The results of the July 2003 soil sampling trip and the August 2003 vegetation sampling trip will be summarized in the next quarterly report.

The District is required to prepare an ecological risk assessment after one year of monitoring or immediately if, at any time, the average concentrations of THg in mosquitofish and sunfish exceed their respective upper 95th percentile concentrations calculated using monitoring data collected at 12 representative interior marsh sites for the period of record. This did not occur in this reporting quarter. The District will complete its annual collection of mosquitofish, sunfish, and bass at the common inflow, each cell interior, and the common outflow, as well as downstream sites N4 and Z4, in October 2003. After the fish are processed, analyzed, and the data are received and quality assured, the District will complete the ecological risk assessment for wading birds foraging exclusively in STA-2 or downstream sites N4 or Z4. It is anticipated that the report will be available in March 2004.

The trend toward mercury stabilization of Cell 1 continued throughout the reporting period, as evidenced by a steady decline in the concentrations of MeHg in surface water, mosquitofish, and surficial soil during the wet season. We recommend that Cell 1 continue to operate in flow-through mode during the dry season to facilitate the build-up of pore water sulfide to inhibitory levels while diluting any excess MeHg production to the extent permitted by the available water supply.

Introduction

This is the fifth quarterly report on expanded mercury monitoring in Stormwater Treatment Area 2 (STA-2) under the modified permit FDEP No. 0126704-001-GL, Cooperative Agreement C-11900-A03, and the Memorandum of Agreement (MOA: C-13812) between the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD). It encompasses the period July 1, 2003, through September 30, 2003. **Attachment 1** is a summary of the procedure and data used to conclude that the interior site C1A THg and MeHg concentrations were not statistically significantly greater than the corresponding inflow concentrations on November 26, 2002. The modified SOW for WO #13A for the side-by-side pore water methods validation study is contained in **Attachment 2**.

All three tiers of the study are now under way. The soil samples collected in July 2003 were analyzed for THg and MeHg, but the results for the other analytes were not yet available as November 30, 2003. Vegetation samples collected in August 2003 had not yet been processed and analyzed as of November 30, 2003. Interior mosquitofish data were available through September 2003. Quarterly interior (C1X), outflow (G-335), and downstream (N4 and Z4) mosquitofish, semi-annual sunfish, and annual largemouth bass samples were collected in September and October 2003 but had not yet been processed and analyzed as of November 30, 2003.

Results

The results of the rain, surface water, soils, and mosquitofish data collected as of September 30, 2003, which were available as of November 30, 2003, are included in **Tables 1-4**. The results of treatment cell inflow and Cell 1 interior biweekly monitoring of surface water for unfiltered THg and MeHg are summarized in **Figures 7** and **8**. The inflow and interior mosquitofish THg results are depicted in **Figure 9**. The inflow, outflow, and downstream concentrations of THg in mosquitofish and sunfish are depicted in **Figures 10** and **11**, respectively. **Figures 12** and **13** illustrate the concentrations of unfiltered THg and MeHg in water samples collected from the expanded inflow and outflow monitoring sites from May 2002 through September 2003. Filtered THg and MeHg concentrations collected from the expanded interior monitoring sites for the same period are displayed in **Figures 14** and **15**, while **Figure 16** summarizes the mosquitofish THg concentrations. The weekly integrated rain THg concentrations for this reporting period are depicted in **Figure 17**. The MeHg concentrations in the top 4 cm of soil at Sites AA, BB, and CC in Cell 1 are displayed in **Figure 18**. The production of sulfide in pore water by sulfate-reducing bacteria from sulfate supplied by surface water is inferred from the strong correlation ($r^2 = 0.43$) of pore water sulfide vs the difference in surface water and pore water sulfate. This is plotted in **Figure 19**. The scatter plot of pore water MeHg vs pore water sulfide and the natural logarithm transformation of the ratio of pore water sulfide to pore water sulfate plus sulfide vs redox potential are depicted in **Figures 20 and 21,** respectively.

Discussion

Data

The third anomalous mercury event, which was detected by this study and occurred on August 22, 2002, in STA-2 Cell 1, began to dissipate from the interior water column almost immediately. Cell 1 met its THg and MeHg start-up criteria (i.e., THg and MeHg concentrations at C1A, the interior monitoring site, were not statistically significantly greater than the corresponding inflow concentrations per two-tailed t test, $p < 0.05$) on November 26, 2002. However, an anomalously high THg concentration of 14.8 ng/L (verified by rework) was detected at C1A on January 23, 2003, but the high turbidity associated with the sample suggests that it was an artifact of the low water levels encountered at the time of sampling. The MeHg result for the same sampling event was low, which would not be inconsistent with the resuspension scenario, because the sediment MeHg concentration is typically several orders of magnitude lower than the THg concentration.

A minor increase in the THg concentrations in the interior of each STA-2 treatment cell occurred simultaneously in March and May 2003. The MeHg concentration profiles paralleled those of THg in the March 2003 event but not that of the May 2003 event. The increases in interior treatment cell THg in March and May 2003 were probably associated with rainfall events, but the increase in MeHg in March but not May 2003 could have been associated with detectable changes in water quality (e.g., rapid decrease in conductivity; rapid increase in water column DO) that preceded the March 2003 MeHg mini-anomaly in January 2003. An inspection of the G-330A outflow MeHg concentration trajectories indicates that the increase in outflow MeHg concentrations began following the February 6, 2003, outflow sampling event, peaked with the March 20, 2003, sampling event, declined rapidly to near baseline concentrations by April 3, 2003, and dipped below baseline conditions on April 17, 2003. The THg concentration monitored at the same location peaked two weeks earlier, suggesting that the excess MeHg was being produced internally from a fresh supply of bioavailable inorganic mercury introduced in the weeks immediately preceding these sampling events. Interestingly, the peak THg concentrations in Cell 2 and 3 outflows were reached two weeks before that of Cell 1, perhaps because the flow rates are higher and retention times are shorter in Cells 2 and 3 relative to Cell 1.

Mosquitofish THg concentrations tracked the water column MeHg concentrations. The build-up and decline of excess MeHg in water paralleled that in surficial soils in Cell 1, but not with the same spatial pattern. The rapid changes in soil chemistry that occurred following Cell 1 reflooding appear to be slowing and stabilizing, with the inverse correlation between acid volatile sulfide as a surrogate for pore water sulfide switching from weakly positive prior to reflooding to moderately negative in the last soil sampling campaign in April 2003. The results of the July 2003 soil sampling trip and the August 2003 plant sampling trip will be summarized in the next quarterly report.

Compliance

Exhibit E requires the District to file an expedited risk assessment report to the Department if the average THg concentrations in mosquitofish and sunfish collected at the STA-2 Cell 1 interior or downstream monitoring sites exceed their respective 95th percentile upper confidence level concentrations in the Everglades for the period of record. The expanded monitoring requires monitoring of THg in mosquitofish monthly at a representative, centrally located site interior to Cell 1 (i.e., Site C1CC) and quarterly at downstream sites WCA-2A-N4 and WCA-2A-Z4 and in sunfish collected semi-annually at a representative, centrally located interior site in Cell 1 (i.e., C1X) and annually at sites N4 and Z4. For the data collected through October 2002, those mosquitofish and sunfish triggers are: Grandmean of THg in downstream mosquitofish for POR (1998-02) ± 95%CI: 102 ± 18 ug/Kg wet wt (n = 64; Grandmean of site means of THg in downstream sunfish for POR (1998-02) ± 95%CI: 195 ± 40 ug/Kg wet wt (n = 57); and Grandmean of EHg3 calculated for downstream largemouth bass caught over the POR (1998-02) +/- 95%CI: 591 ± 116 (n = 32).

Following issuance of the modified permit in August 2002, at interior Site C1CC only the April 2003 mosquitofish did not exceed the trigger value. The average THg concentration in mosquitofish collected from this site again exceeded the trigger value in May 2002. Interestingly, for mosquitofish collected in the outflow canal just upstream of the pump station, only the October 2002 fish exceeded the trigger value, suggesting that, as with the water, the mosquitofish population discharged from Cell 1 is mixed with the populations discharged from

Cells 2 and 3, "diluting" the average THg concentration in the Cell 1 mosquitofish population with the combined populations in the discharge collection canal. At site N4, in April 2003 the concentration of THg in mosquitofish exceeded the trigger value (163 vs 120 ug/Kg wet wt), but at site Z4 the trigger value has never been exceeded, and the average concentration of THg in mosquitofish collected at both sites in April 2003 was below the reporting threshold. The next mosquitofish collection occurred in September-October 2003. The results were not yet available as of November 30, 2003, but will be reported in the next quarterly report.
.
After August 2002, for sunfish collected semi-annually at interior Site C1X, the THg concentration approached but did not exceed the trigger value in April 2003 (214 vs 235 ug/Kg wet wt). Sunfish collected annually from the discharge canal in October 2002 were well below the reporting threshold at 120 ug/Kg wet wt. No sunfish could be collected annually in October 2002 at N4, despite a documented good faith effort, because of the degraded conditions of habitat quantity and quality and water quality there that preceded the construction and operation of STA-2 (T. Lange, FGFWFC, personal communication). At Z4, the average concentration of THg in sunfish collected in October 2002 exceeded the reporting trigger value (272 vs 235 ug/Kg wet wt). The October 2002 value is more than 2.5 times that of October 2001. However, as noted above, the corresponding average mosquitofish THg concentrations at site Z4 have been below the trigger value for the period of record. This suggests that the food chain structure at these two sites is very different, consistent with observed differences in habitat quantity and quality and water quality. The next sunfish collection occurred in September-October 2003. The results were not yet available as of November 30, 2003, but will be reported in the next quarterly report.

Although the largemouth bass data are not used to trigger expedited risk reporting, it is important to note that the EHg3 for LMB at G335 was 1169 ± 233 in 2002 or more than twice the advisory threshold of 0.5 ppm. In addition, the unadjusted average outflow bass THg concentration was more than twice the concentration of the inflow bass. THg concentrations in bass from the discharge canal did not differ significantly between 2001 and 2002 (ANCOVA, df = 1, 37; $F = 0.01$, $P = 0.936$). (Note: G335 was the only STA-2 site in 2001 for which the collected bass had an age distribution suitable for establishing an age-concentration relationship, i.e., where an EHg3 was calculated and ANCOVA was run in 2002). The next largemouth bass collection occurred in September-October 2003. The results were not yet available as of November 30, 2003, but will be reported in the next quarterly report.

Methods Development

The USGS "sipper" method for soil and sediment pore water extraction was modified by adding a 0.75 m diameter disk that separates surface water from surficial soil to ensure that there is no breakthrough of surface water into the pore water sample. This allowed the collection of much larger volumes of pore water, avoiding the need for the use of microanalytical technique, which is generally unavailable commercially. Because the pore water is collected over a much larger ellipsoid of withdrawal, the sample integrates out microheterogeneities that could confound the extraction of relationships between pore water and soil chemistries. The modified sipper is hung with standard weights to ensure a standard compression, resulting in the collection of the pore water sample at a depth with the same bulk modulus at each site. Blanks are generally low for both THg and MeHg, so there does not appear to be a systematic source of contamination from the materials used in the construction of the modified *in situ* sipper. All pore water redox measurements are well below those in surface water measured at the same time, and, in general, the proportion of sulfide in pore water is high where redox is low (**Figure 21**), so the method appears to be preserving redox potential and redox-sensitive species such as sulfide. The scatter plot of MeHg vs pore water sulfide suggests that where pore water sulfide concentrations are high, MeHg concentrations are low, and *vice versa*, although the inverse correlation is weak, perhaps because other factors, such as the concentration of $Fe(II)^{+2}$, also affect sulfide speciation and $Hg(II)^{+2}$ bioavailability for MeHg production. A multivariate regression analysis of the data should await the completion of the study at the end of January 2004.

<u>Tier 1 and Tier 2/3 Pore Water Monitoring Status Update</u>

For the quarter ending September 30, 2003, the District has made further progress in acquiring a viable field pore water sampling capability under Tier 1 for implementation in Tiers 2 and 3. Firm bids were received and accepted from Tetra Tech for implementation of the Tier 1 pore water methods development study and the Tier 2/3 "routine" pore water collection at nine interior pore water characterization sites and one pore water variability study site. Unavoidable delays in issuance of the pore water SOWs translated into a delay in initiating pore water sample collection with the modified sipper. The first set of samples for the reconnaissance task were collected in August 2003. The first set of routine pore water samples were collected in September 2003. The Tier 1 sipper vs centrifugation side-by-side validation study was conducted in the last week in September 2003.

Unexpectedly, the volume of pore water generated by centrifugation was overestimated and the time to extract the pore water was underestimated, resulting in completion of only one-half (Part A) of the study in the time available: the one-time, nine-site survey of pore water chemistry via centrifugation extraction of 4-cm cores of surficial soil/sediment. In addition, the demarcation between peat soil surface and surface water was uncertain due to the existence of a thick floc layer, and this uncertainty increased as a result of surface agitation during soil core transport, so the results of the centrifugation study appear to have been inadvertently compromised by mixing floc layer surface water with true pore water. Unfortunately, this may be an inherent limitation of the centrifugation method when applied to poorly consolidated sediments.

To address the question of where in the soil horizon the 4-cm section should be taken to be equivalent to the sipper extraction horizon, the side-by-side validation study had to be modified to include the evaluation of soil and pore water chemistries as a function of depth by taking soil cores in two cm sections from 0 to 10 cm. The effect of bulk density was to be taken into account by carrying out the sampling at three different sites. This pre-study is now proposed as Tier 1 Part B-1. The second half of the study (Tier 1 Part B-2), the side-by-side validation of the *in situ* sipper vs centrifugation, had to be redesigned to adopt the equivalent stratum identified in Part A. The revised SOW is contained in **Attachment 2**. Without the pre-study, there is no way to know whether observed differences in the means and standard deviations of the pore water chemistry results generated by the sipper and centrifugation methods in the side-by-side validation study are real or an artifact of the inappropriate choice of equivalent soil stratum for pore water extraction via centrifugation. Completion of Parts A and B is now scheduled for

January 2004. However, these problems and expenses were unanticipated, and, as a result, there are no funds budgeted or available for the implementation of the modified study design in FY ’04. If outside funding cannot be obtained, it is unlikely that this element of the study can be implemented.

Recommendations

Based on the continuing trend toward stabilization of Cell 1 soil chemistry and the steady decline in the concentration of soil MeHg through a year of post-reflooding dry and wet seasons (**Figure 18**), we recommend that Cell 1 continue to operate in flow-through mode through the dry season to facilitate the build-up of pore water sulfide to inhibitory levels while diluting incoming rainfall $Hg(II)^{+2}$ and any excess MeHg production. Every effort should be made to keep Cell 1 wet during the dry season to the extent permitted by the available water supply.

TABLES

Table 1. New Rain THg Data at FL99 (all concentrations in units of ng/L)

Rain Total Mercury from FL #99

Sampling Date	MDL	[THg] (ng/L)
20030701	0.111	18.6
20030708	0.111	22
20030715	0.111	28.3
20030722	0.047	24.691
20030729	0.047	23.712
20030805	0.047	38.021
20030812	0.047	31.082
20030819	0.047	11.631
20030826	0.047	18.436
20030902	0.047	11.559
20030909	0.061	15.5
20030916	0.061	24.1
20030923	0.061	22.5
20030930	0.061	11.1

Table 2A. All Inflow and Outflow THg Data (all concentrations in units of ng/L)

THg	S6	G328	Inflow G328B	FILTER INFLOW G328B	C1A	Cell 1 G330A	FILTER G330A	Cell 2 G332	FiILTER Cell 2 G332	Cell 3 G334	FILTER Cell3 G334	Outflow G335 US	FILTERO utflow G335 US	Outflow G335 DS
10/4/01	0.00	0.7	1.2		1.2	-		-		-		2.4		-
10/18/01			0.89		1.1	-		-		-		6.4		-
11/1/01			0.69		0.87	-		-		-		3.2		-
11/15/01			0.75		0.9	5.8		2		1.2		3.4		-
11/29/01			0.34		-	9.5		1.6		-		6.2		-
12/12/01			1.3		1.3	7.8		2.4		2.7		4.4		-
12/27/01			0.5		-	-		1.8		1		3.3		-
1/10/02	0.00	0.41	0.5		-	-		1.7		0.59		1.3		1.6
1/24/02	-	-	1.4		-	-		3.1		2.1		1.7		1.9
2/7/02	-	-	0.88		-	-		1.5		0.81		1.4		1.4
2/21/02	-	-	1.7		1.9	3.7		2		2		1.9		1.9
3/7/02	-	-	1.4		-	3.4		1.6		0.66		1.3		1.2
3/21/02	-	-	1.2		-	2.6		1.9		1.2		1.3		1.3
4/4/02		-	0.84		-	-		1.7		1.2		1.3		1.3
4/18/02	0.00	0.79	0.73		-	5.3		1.8		1.2		1.1		1
5/2/02	-	-	0.72		-	-		1.5		1.1		1.3		1.2
5/16/02	-	-	0.69		-	-		1.4		1.1		1.4		2.2
5/30/02	-	-	0.83		-	-		1.2		0.99		1.3		1.4
6/12/02	-	-	0.94		-	-		2.4		1.6		2		1.4
6/27/02	-	-	1.9		4.4	4.4		1.9		1.1		1.7		1.9
7/11/02	0.00	1.2	2.4		3.7	4.1		1.5		0.74		1.8		1.4
7/25/02	-	-	3.1		10	6.3		4.1		3.4		3.2		3.2
8/7/02	-	-	1.5		1.2	-		3.3		1.3		2.4		2.2
8/22/02	-	-	2	0.62	6.2	11	9.8	3.2		1.9		3		2.8
9/5/02	-	-	1.6		1.5	12		1.7		1.1		3.4		2.9
9/18/02	-	-	0.96	0.5	1.2	18		1.5	1	0.82		7.3	5.4	4
10/3/02	-	-	0.53		1.8	9.2		2.2		0.7		2.2		2.7
10/17/02	-	-	0.69	0.45	0.92	11		2		0.89	0.6	5.9		6.5
10/31/02	0.59	0.76	0.92		3	8.9		3.1		1.1		5		4.2
11/14/02	-	-	0.61	0.4	0.74	8.1	6	1.8		0.9		1.7		2.2
11/26/02	-	-	1.2		0.81	3.5		1.7		0.79		2.4		2.5
12/12/02	-	-	0.92	0.53	0.68	3.3		0.99	0.76	0.51		1.9		1.4
12/30/02	-	-	0.88		0.69	2.7		0.84		0.36		1.8		1.5
1/9/03	-	-	0.55	0.29	0.74	2.9		0.69		0.43	0.41	1.7		1.6
3 RESAMPLED	0.62	0.69	0.74		14.8	2.3		0.61		0.66				0.63
1/30/03	-	-	0.45		0.42	2.7		0.79		0.45		0.76		0.75
2/5/03	-	-	2.3	0.53	0.6	3.8	3.5	1.2		0.79		1.7		2.1
2/20/03	-	-	1.4		1.7	5.8		1.6		2.6		3.6		1.5
3/6/03	-	-	0.73	0.56	2.7	7.5		1.6	1	0.91		2.2		1.1
3/20/03	2.2	1.3	1.1		1	3.7		1.5		0.72		2		2
4/2/03			1.4	0.58	0.64	2.2		0.88		0.59	0.31	1.2		1.4
4/17/03	0.56	0.56	0.7		0.7	2.9		0.87		0.31		1.7		1.4
5/1/03			1.7	0.87	0.8	3.7	2.6	0.7		0.59		1.1		0.95
5/14/03			1		1.3	3.4		1.7		0.73		1.1		1.1
5/29/03			2.9	1.3	0.6	2.3		0.77	0.51	1.1		1.3		1.2
6/12/03			1.4		1.2	1.8		0.9		0.86		0.84		1.1
6/26/03			1.6	0.87	1.4	1.2		1.1		1.2	0.77	0.99		1
7/9/03					1.5	2.7		1.3		0.75		1.6		1.7
7/24/03			1.8	1	0.98	2.2	1.7	1.2		1.1		1.7		1.8
8/7/03			1.2		1	1.8		0.62		0.48		0.69		0.7
8/25/03			1.7	0.86	0.92	1.6		1	0.52	0.68		1.3		0.85
9/4/03			0.78		0.76	1.3		1.1		0.96		1		1
9/18/03			0.61	0.41	0.85	1.8		1.5		1	0.81	1.7		discontinue
Project Ave.	0.99		1.19	0.65	1.74	4.84	4.72	1.36	0.76	0.87	0.58	2.16	5.40	1.88
P.O.R. Ave.	0.50		1.17	0.65	1.97	4.96	4.72	1.62	0.76	1.06	0.58	2.28	5.40	1.80

Table 2B. All Inflow and Outflow MeHg Data (all concentrations in units of ng/L)

MeHg	S6	G328	Inflow G328B	FILTER INFLOW G328B	C1A	Cell 1 G330A	FILTER G330A	Cell 2 G332	FiILTER Cell 2 G332	Cell 3 G334	FILTER Cell3 G334	Outflow G335 US	FILTERO utflow G335 US	Outflow G335 DS
10/4/01	-	0.07	0.15		0.31	-		-		-		0.76		-
10/18/01	-	-	0.13		0.37	-		-		-		4.1		-
11/1/01	-	-	0.14		0.16	-		-		-		1.2		-
11/15/01	-	-	0.12		0.43	3.5		0.73		0.32		1.2		-
11/29/01		-	0.084		0.44	7.2		1		0.3		4.4		-
12/12/01		-	0.061		0.55	2		0.7		0.82		1.5		-
12/27/01		-	0.057		-	-		0.34		0.11		0.94		-
1/10/02		0.059	0.035		-	-		0.24		0.032		0.33		0.44
1/24/02		-	0.092		-	-		0.71		0.25		0.44		0.46
2/7/02		-	0.081		-	-		0.35		0.11		0.42		0.36
2/21/02		-	0.13		0.59	1.4		0.22		0.15		0.31		0.29
3/7/02		-	0.087		-	1.2		0.34		0.17		0.28		0.27
3/21/02		-	0.18		-	1.2		0.76		0.33		0.31		0.31
4/4/02	-	-	0.061		-	F*		F*		F*		F*		F*
4/18/02	-	0.9	0.11		-	0.76		0.41		0.33		0.25		0.2
5/2/02	-	-	0.072		-	-		0.3		0.26		0.21		0.2
5/16/02	-	-	0.09		-	-		0.21		0.22		0.2		0.12
5/30/02	-	-	0.03		-	-		0.089		0.065		0.28		0.078
6/12/02	-	-	0.057		-	-		0.35		0.19		0.23		0.12
6/27/02	-	-	0.27		2.6	1.8		0.4		0.099		0.35		0.41
7/11/02	-	0.33	0.3		1.8	2.1		0.41		0.12		0.36		0.34
7/25/02	-	-	0.15		1.1	-		0.74		0.36		0.7		0.64
8/7/02	-	-	0.25		0.32	-		1.2		0.24		0.73		0.68
8/22/02	-	-	0.12	0.13	0.82	7.6	7.2	1		0.21		1		0.99
9/5/02	-	-	0.15		0.39	8.4		0.38		0.14		2.0		1.6
9/19/02	-	-	0.13	0.13	0.96	12		0.87	0.72	0.31		5.6	4.2	2.4
10/3/02	-	-	0.092		0.75	7.8		1.2		0.15		1.4		1.7
10/17/02	-	-	0.048	0.042	0.26	5.8		1.1		0.08	0.11	3.2		3.3
10/31/02	0.13	0.086	0.057		0.26	4.2		1		0.15		1.8		1.5
11/14/02	-	-	0.076	0.065	0.17	2.3	2.2	0.55		0.098		0.49		0.66
11/26/02	-	-	0.081		0.088	0.76		0.17		0.07		0.51		0.48
12/12/02	-	-	0.12	0.085	0.062	1.6		0.16	0.11	0.087		0.55		0.46
12/30/02	-	-	0.023		0.14	0.98		0.14		0.077		0.58		0.43
1/9/03	-	-	0.062	0.064	0.096	1.1		0.092		0.067	0.057	0.54		0.53
3 RESAMPLED	0.056	0.039			0.05	0.72		0.048		0.05		-		0.13
1/30/03	-	-	0.032		0.068	0.97		0.035		0.041		0.081		0.072
2/5/03	-	-	0.038	0.034	0.1	2	1.7	0.11		0.11		0.55		0.74
2/20/03	-	-	0.07		0.9	4		0.56		0.86		1.7		0.53
3/6/03	-	-	0.12	0.12	1.3	5.4		0.92	0.63	0.35		1.3		0.52
3/20/03	0.14	0.22	0.16		0.4	1.8		0.48		0.12		0.81		0.59
4/2/03	-	-	0.18	0.17	0.14	0.82		0.14		0.081	0.064	0.33		0.4
4/17/03	0.053	0.27	0.15		0.14	1.5		0.36		0.1		0.88		0.62
5/1/03	-	-	0.2	0.16	0.16	1.5	1.2	0.14		0.096		0.28		0.16
5/14/03	-	-	0.10		0.14	1.40		0.58		0.12		0.24		0.26
5/29/03	-	-	0.17	0.14	0.049	0.7		0.12	0.093	0.071		0.21		0.17
6/12/03	-	-	0.21		0.15	0.38		0.088		0.092		0.1		0.1
6/26/03	-	-	0.24	0.22	0.14	0.086		0.096		0.16	0.37	0.27		0.27
7/9/03	0.12	0.14	0.079		0.32	1.3		0.48		0.22		0.78		0.78
7/24/03	-	-	0.12	0.13	0.08	0.43	0.37	0.2		0.17		0.24		0.25
8/5/03	-	-	0.21		0.12	0.2		0.033		0.046		0.084		0.052
8/25/03	-	-	0.18	0.21	0.08	0.22		0.054	0.058	0.065		0.078		0.073
9/4/03	-	-	0.1		0.096	0.14		0.12		0.15		0.11		0.18
9/18/03	-	-	0.09	0.087		0.46		0.3		0.14	0.14	0.24		discontinue

Table 2C. Interior Cell (Experimental) THg and MeHg Data (all concentrations in units of ng/L)

THg	STA2 C1AA	C1AA Filtered	STA2 C1BB	C1BB Filtered	STA2 C1CC	C1CC Filtered	STA2 C2A	C2A Filtered	STA2 C2B	C2B Filtered	STA2 C2C	C2C filtered	STA2 C3A	C3A Filtered	STA2 C3B	C3B Filtered	STA2 C3C	C3C Filtered
Aug-02	7.6	5.6	16.00	8.10	32.00	24		3.4		2.1		0.71		0.72		1		0.56
Sep-02		2.7		4.2		12	2.6	2	2.1	2.1	1.5	1.1		0.92		1.3		0.39
Oct-02		0.99		1.6		5		1.3		1.4		0.87	0.47	0.36	0.62	0.61	0.82	0.5
Nov-02	0.98	0.8	1.8	1.4	4	3		1.2		0.95		0.67		0.52		0.28		0.47
Dec-02		0.61		0.92		2.9	1.2	1.1	1.2	1	0.59	0.52		0.53		0.48		0.58
Jan-03		0.87		0.88		2.2		0.7		0.78		0.18	0.6	0.56	0.61	0.49	0.75	0.37
Feb-03	0.76	0.65	1.5	0.98	2.9	2.4		0.8		0.78		0.68		0.5		0.51		0.3
Mar-03		2.2		3.5		4.6	1.8	1.4	1.8	1	1.3	1.2		0.43		0.59		0.58
Apr-03		0.6		0.7		1.4		0.61		0.53		0.48	0.69	0.42	0.5	0.39	0.58	0.42
May-03	0.86	0.85	1.1	0.91	2.1	2		0.79		0.85		0.5		0.69		0.62		0.65
May-03		2.7		3.7		2.6	2.8	2.6	3	2.7	2.6	2.5		0.54		0.59		0.84
Jun-03		0.92		0.84		1.2		0.96		0.85		0.71	1.0	0.8	0.83	0.62	0.74	0.63
Jul-03	0.85	0.62	1.1	1	1.1	1.1		1		0.81		0.64		0.62		0.86		0.83
Aug-03		0.81		0.74		1.2	1.7	1.1	1.2	0.6	0.86	0.69		0.78		0.91		0.7
Sep-03		0.54		0.61		1.3		1.1		0.7		1	0.52	0.35	0.94	0.89	0.84	0.81
Project Ave.	2.21	1.4307	4.3	2.00533	8.42	4.46	2.02	1.33733	1.86	1.14333	1.37	0.83	0.66	0.58267	0.7	0.676	0.75	0.57533

MeHg	C1AA	C1AA Filtered	STA2 C1BB	C1BB Filtered	STA2 C1CC	C1CC Filtered	STA2 C2A	C2A Filtered	STA2 C2B	C2B Filtered	STA2 C2C	C2C filtered	STA2 C3A	C3A Filtered	STA2 C3B	C3B Filtered	STA2 C3C	C3C Filtered
Aug-02	2.6	2.7	8.6	7.4	20	20		0.57		0.33		0.034		0.045		0.049		0.100
Sep-02	-	2		3.5		7.8	0.68	0.69	0.7	0.76	0.2	0.18		0.11		0.067		0.12
Oct-02	-	0.24		0.57		2		0.22		0.16		0.13	0.13	0.053	0.08	0.049	0.05	0.078
Nov-02	0.26	0.25	0.64	0.59	1.1	1		0.17		0.18		0.17		0.038		0.04		0.1
Dec-02	-	0.064		0.16		0.81	0.09	0.099	0.17	0.15	0.03	0.024		0.056		0.041		0.037
Jan-03	-	0.12		0.19		0.41		0.065		0.1		0.051	0.07	0.062	0.05	0.043	0.04	0.048
Feb-03	0.12	0.12	0.46	0.41	1.1	1.1		0.07		0.074		0.058		0.055		0.099		0.078
Mar-03		1.1		1.5		2.4	0.83	0.64	0.86	0.62	0.64	0.44		0.082		0.11		0.2
Apr-03		0.1		0.19		0.31		0.18		0.1		0.091	0.09	0.07	0.06	0.06	0.06	0.052
May-03	0.14	0.12	0.26	0.18	0.59	0.51		0.18		0.13		0.011		0.11		0.058		0.099
May-03		0.041		0.12		0.32	0.14	0.12	0.087	0.14	0.01	0.011		0.086		0.051		0.067
Jun-03		0.011		0.079		0.11		0.13		0.088		0.011	0.18	0.12	0.64	0.086	0.6	0.066
Jul-03	0.076	0.067	0.21	0.22	0.17	0.15		0.13		0.14		0.085		0.062		0.05		0.1
Aug-03		0.046		0.052		0.29	0.33	0.36	0.16	0.14	0.12	0.071		0.2		0.052		0.077
Sep-03		0.11		0.038		0.19		0.35		0.18		0.12	0.1	0.073	0.16	0.14	0.1	0.097
Project Ave.	0.639	0.4726	2.034	1.01327	4.592	2.49333	0.41	0.26493	0.395	0.21947	0.2	0.0991	0.11	0.08147	0.2	0.06633	0.17	0.08793

Table 3. New Soil THg and MeHg Data from July 2003 Sampling Event (all concentrations in mg/Kg dry wt)

ST2D-07.16.03

Lab (	Fielc	Project	Sampling Da	Sampl	Station Code	Sampl	Progr	Collec	Matrix	Sampl	Parame	Storet	Meth	Analys	Anal	Pra	Metl	Result	Units	Batch
P157	P15	ST2D	20030716	910	STA2C1AA	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000434	mg/kg	MGH7030730
P157	P15	ST2D	20030716	943	STA2C1BB	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.00066	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1020	STA2C1CC	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000697	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1116	STA2C2A	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000376	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1145	STA2C2B	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000191	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1205	STA2C2C	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000135	mg/kg	MGH7030730
P157	P15	ST2D	20030716	1305	STA2C3A	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000066	mg/kg	MHG1030827
P157	P15	ST2D	20030716	1339	STA2C3B	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000145	mg/kg	MHG1030827
P157	P15	ST2D	20030716	1416	STA2C3C	SAMP	EXP	CIC	SE	0.04	TMHG	####	FGS-	#####	###	0	0	0.000091	mg/kg	MGH7030730
P157	P15	ST2D	20030716	910	STA2C1AA	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	1.2	mg/kg	THG11030804
P157	P15	ST2D	20030716	943	STA2C1BB	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	1.26	mg/kg	THG11030804
P157	P15	ST2D	20030716	1020	STA2C1CC	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	1.08	mg/kg	THG11030804
P157	P15	ST2D	20030716	1116	STA2C2A	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.563	mg/kg	THG11030804
P157	P15	ST2D	20030716	1145	STA2C2B	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.5	mg/kg	THG11030804
P157	P15	ST2D	20030716	1205	STA2C2C	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.484	mg/kg	THG11030804
P157	P15	ST2D	20030716	1305	STA2C3A	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.346	mg/kg	THG11030804
P157	P15	ST2D	20030716	1339	STA2C3B	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.28	mg/kg	THG11030804
P157	P15	ST2D	20030716	1416	STA2C3C	SAMP	EXP	CIC	SE	0.04	THG	####	FGS-	#####	###	0	0	0.306	mg/kg	THG11030804

Table 4. Mosquitofish THg Data for the Period of Record (all concentrations in mg/Kg wet wt)

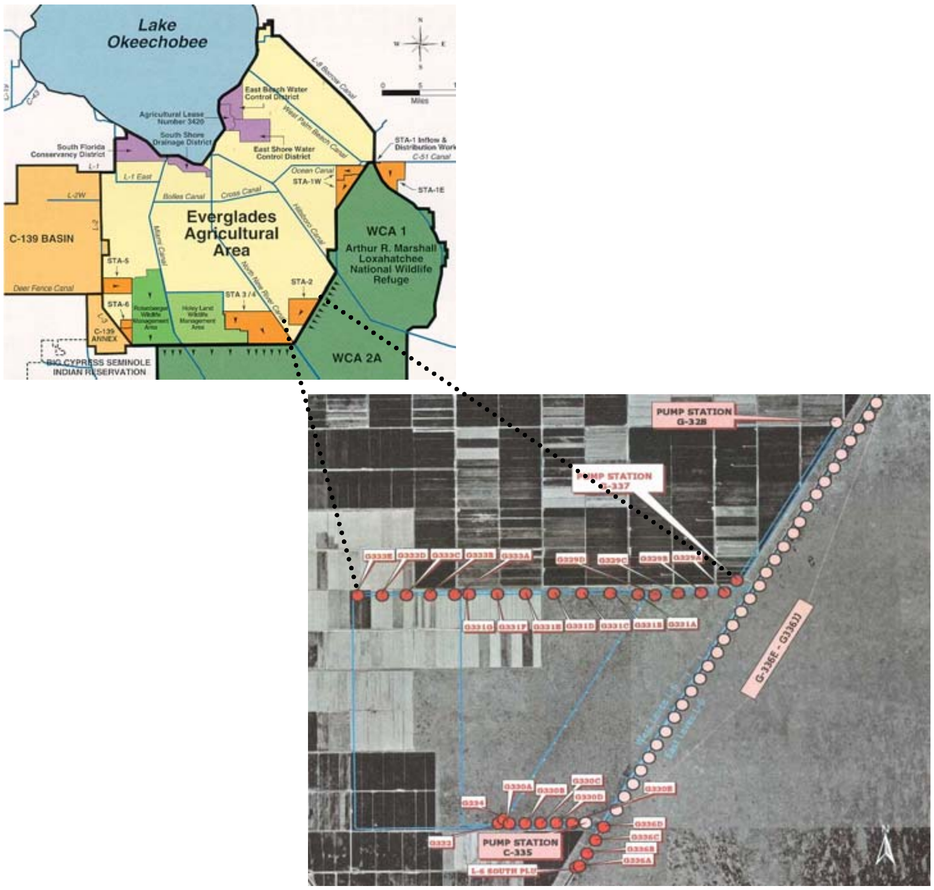
	G328B inflow	G335 outflow	C1A	C1AA	C1BB	C1CC	C1X	C2A	C2B	C2C	C3A	C3B	C3C
Oct-03	0.021	0.248	0.109				0.312	0.069			0.013		
Nov-03			0.021										
Dec-03			0.018										
Feb-03			0.186										
Mar-03	0.014	0.242	0.172				0.285	0.045			0.018		
Apr-03			0.154										
Jul-03			0.072										
Aug-03			0.197	0.107	0.33	0.213		0.056	0.063	0.032	0.0097	0.011	0.028
Sep-03			0.147	0.107	0.43	0.39		0.079	0.046	0.023	0.012	0.021	0.031
Oct-02	0.004	0.167	0.079	0.087	0.257	0.397		0.031	0.022	0.013	0.004	0.008	0.016
Nov-02			0.137	0.1267	0.277	0.237		0.028	0.027	0.019	0.006	0.018	0.016
Dec-03			0.076	0.110	0.243	0.190		0.034	0.017	0.011	0.004	0.014	0.016
Jan-03			0.063	0.037	0.117	0.120		0.037	0.025	0.014	0.006	0.013	0.020
Feb-03			0.095	0.065	0.157	0.153		0.032	0.018	0.009	0.002	0.011	0.013
Mar-03	0.0037	0.064	0.040	0.053	0.092	0.16	0.1	0.032	0.023	0.011	0.006	0.018	0.020
Apr-03			0.062	0.048	0.113	0.113		0.036	0.032	0.017	0.007	0.018	0.022
May-03			0.053	0.041	0.099	0.163		0.032	0.013	0.011	0.006	0.019	0.018
Jun-03			0.077	0.048	0.153	0.193		0.026	0.013	0.008	0.006	0.014	0.017
02-Jul-03			0.034	0.024	0.076	0.117		0.024	0.007	0.005	0.004	0.006	0.010
30-Jul-03				0.039	0.053	0.093		0.015	0.004	0.004	0.004	0.008	0.010
Aug-03			0.032	0.029	0.053	0.103		0.013	0.008	0.005	0.004	0.008	0.007
Sep-03				0.010	0.024	0.042		0.0054	0.0032	0.0026	0.0029	0.0052	0.0193
11-Sep-03	0.0050	0.0077	0.0103				0.0513				0.0051		

Table 5. Pore Water Sampling Results for Methods Development through 9/30/03

Pore Water Sampling Results for Methods Development

Date	Type	Depth	Temp	pH	Cond	Redox	DOC	MG	CA	TOTFE	TOTMN	CL	SO4	Hg	MeHg	S2-	Fe(II)
8/18/03	PW	0.04	30.1	7.30	802	-267.8								8.99	0.507	9660	21
8/18/03	PW	0.04	32.2	7.11	1471	-224.7								6.04	0.286	480	10
8/18/03	PW	0.04	32.9	7.05	730	-284.5								6.68	0.472	5200	10
8/19/03	PW	0.04	32.0	6.86	1617	-216.1							37.4	10.2	0.498	1610	99
8/19/03	PW	0.04	28.5	7.03	1496	-286.7							51.5	4.57	0.271	12800	12
8/19/03	PW	0.04	30.1	6.92	1426	-272.1							51.8	8.77	0.115	8040	44
8/25/03	PW	0.04	30.3	7.37	1450	-300.8	43.7	44.7	120	25	46	186	76.3	7.47	0.251	14100	21
8/25/03	SW						40.4	42.6	118	31	25.4	174	116				
8/25/03	PW	0.04	31.2	7.19	1618	-223.5	43.3	45.3	117	14	79.6	214	121	4.46	0.088	1180	9
8/25/03	SW						43.4	47.3	119	12	32.6	220	133				
8/26/03	PW	0.04					50.0	40.6	107	18	68.4	173	56.2	5.99	0.428	4490	5
8/26/03	SW		29.4	7.58	1388	-167.4	42.6	41.8	106	8	28	172	96.0				
8/26/03	PW	0.04	32.0	7.47	1658	-207.7	41.8	46.3	118	48	52.1	218	132	5.99	0.037	142	13
8/26/03	PW	0.04	32.0	7.47	1658	-207.7	41.8	46.6	117	64	41.8	217	131	3.25	0.037	135	13
8/26/03	PW	0.04	32.0	7.47	1658	-207.7	42.8	46.4	117	43	52.4	218	131	2.32	0.042	158	11
8/26/03	SW		29.6	7.68	1668	-129.9	41.7	47.1	118	64	9.9	217	131				
8/27/03	PW	0.04		6.80		-255	45.5	46.7	129	397	444	184	70.3	12.3	0.489	3860	16
8/27/03	SW		27.4	7.44	1521	-124.6	43.1	44.8	122	28	163	183	110				
8/27/03	PW	0.04				-325	57.1	45.3	136	120	269	179	35.3	5.86	0.163	9860	44
8/27/03	SW		28.9	7.59	1476	-136.3	43.8	45.3	117	23	71.2	176	119				
8/27/03	PW	0.04				-336	45.0	43.6	120	50	42.6	184	81.5	5.86	0.227	5330	8
8/27/03	SW		30.5	7.65	1499	-113.7	42.6	44.3	118	19	2.4	182	115				
8/28/03	PW	0.04				-198	45.8	46.9	125	40	22.4	162	97.3	2.98	0.17	834	12
8/28/03	SW		28.5	7.61	1420	28.3	45.8	47.6	129	34	9.4	161	102				
8/28/03	PW	0.04				-307	58.5	45.6	120	333	43	173	49.5	27.2	0.135	772	49
8/28/03	SW		29.3	8.03	1428	-13.2	45.2	48	126	23	2.5	170	107				
8/28/03	PW	0.04				-322	45.3	46.3	99.4	36	10.9	180	61.4	5.37	0.051	9540	16
8/28/03	SW		29.9	8.04	1393	-0.8	44.5	46.7	107	17	0.6	174	116				
9/8/03	SW						40	42.1	112	40	18.3	175	100				
9/8/03	PW	0.04	29.5	6.75	1504	-280	48	41.2	117	9	60.9	181	24.5	6.108	0.095	9860	5
9/8/03	SW						41	42.9	110	8	28.4	180	91.1				
9/8/03	PW	0.04	30.8	7.26	1417	-231	42	42.4	109	8	43.2	179	88.4	4.986	0.074	174	3
9/8/03	SW						44	43.1	108	10	31.9	182	105				
9/8/03	PW	0.04	32.4	6.81	1455	-336	53	41	110	35	107	181	63.1	8.704	0.184	5120	20
9/9/03	SW						42	42.7	107	6	14.9	178	94.6				
9/9/03	PW	0.04	30.9	7.12	1425	-290	43	40	111	3	47.1	179	40.1	6.598	0.040	14400	3
9/9/03	PW	0.04	30.9	7.17	1425	-337	42	40	110	4	47.5	178	40.2	3.732	0.026	14200	
9/9/03	PW	0.04	30.9	7.19	1425	-333	43	40	111	4	46.8	178	41.9	4.181	0.025	13800	
9/10/03	SW						43	42.7	104	17	34.7	177	96.6				
9/10/03	PW	0.04	30.4	6.81	1642	-254	72		151	129	232	187	22.5	5.4	0.561	3110	77
9/10/03	SW						44	42.2	105	11	46.9	163	93.3				
9/10/03	PW	0.04	31.3	6.94	1425	-301	58	40.4	120	80	180	178	55.5	2.689	0.092	3550	59
9/10/03	SW						43	45.1	100	18	6.3	183	114				
9/10/03	PW	0.04	32.3	6.97	1440	-305	52	38.2	114	29	78.6	177	38.9	3.432	0.063	9210	15
9/11/03	SW						44	39.7	98.9	14	3	152	93.0				
9/11/03	PW	0.04	28.8	7.03	1358	-321	43	41.1	99.8	3	46.7	166	23.8	2.587	0.019	17100	3
9/11/03	SW						43	40.7	86.9	17	4.9	169	98.2				
9/11/03	PW	0.04	33.0	6.89	1569	-317	45	46.9	119	10	31.1	177	7.1	2.725		17100	7
9/11/03	SW						44	45	64	11	0.6	191	117				
9/11/03	PW	0.04	31.7	7.3	1311	-284	44	43.9	78.5	32	20.8	177	60.3	8.887	0.644	4190	31

Figures



STA-2

Figure 1. STA-2 geographic location in South Florida and aerial photograph.

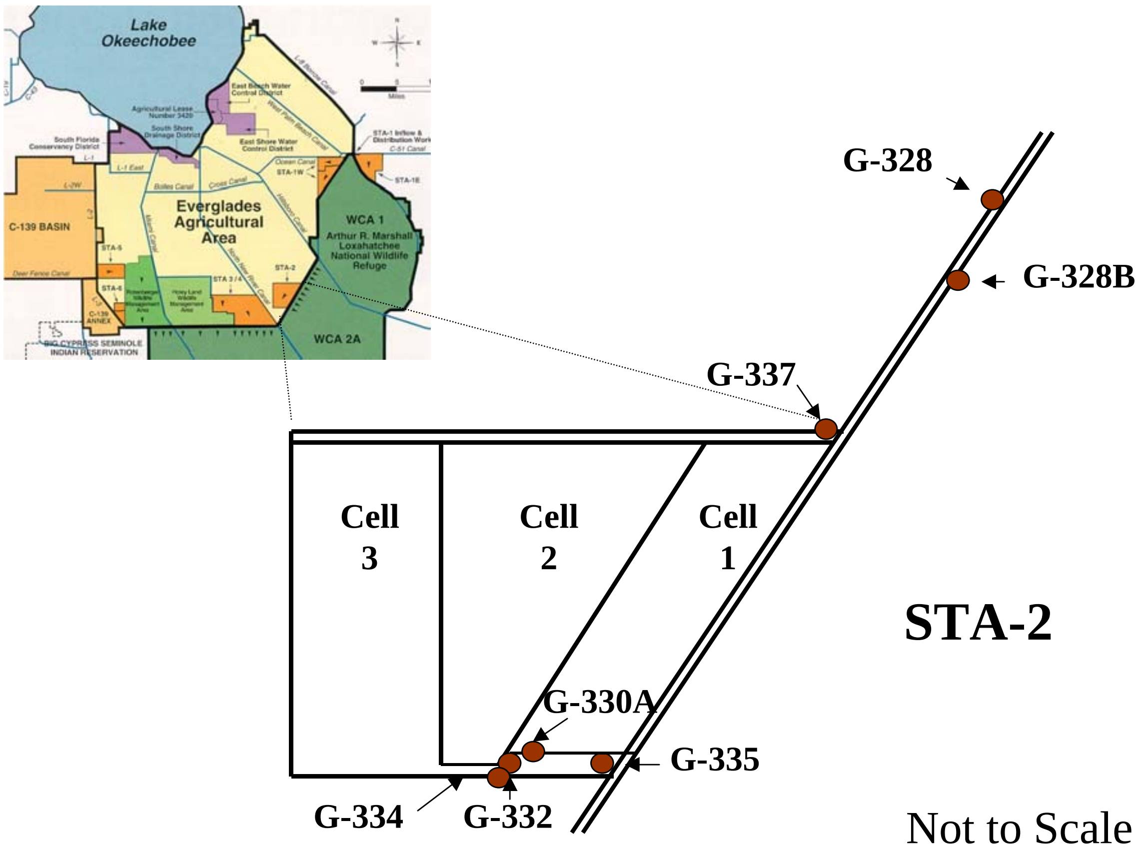


Figure 2. STA-2 graphic representation with inflow and outflow structures.

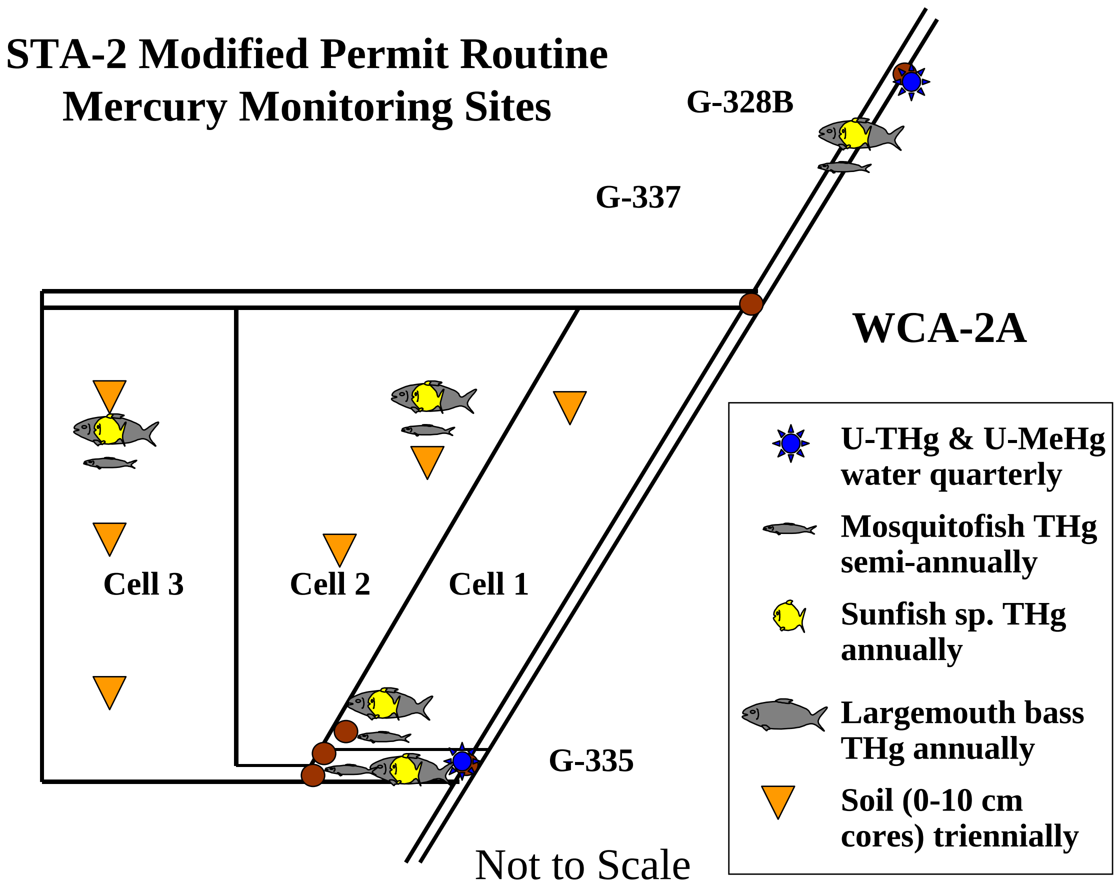


Figure 3. STA-2 routine mercury monitoring sites for original permit compliance.

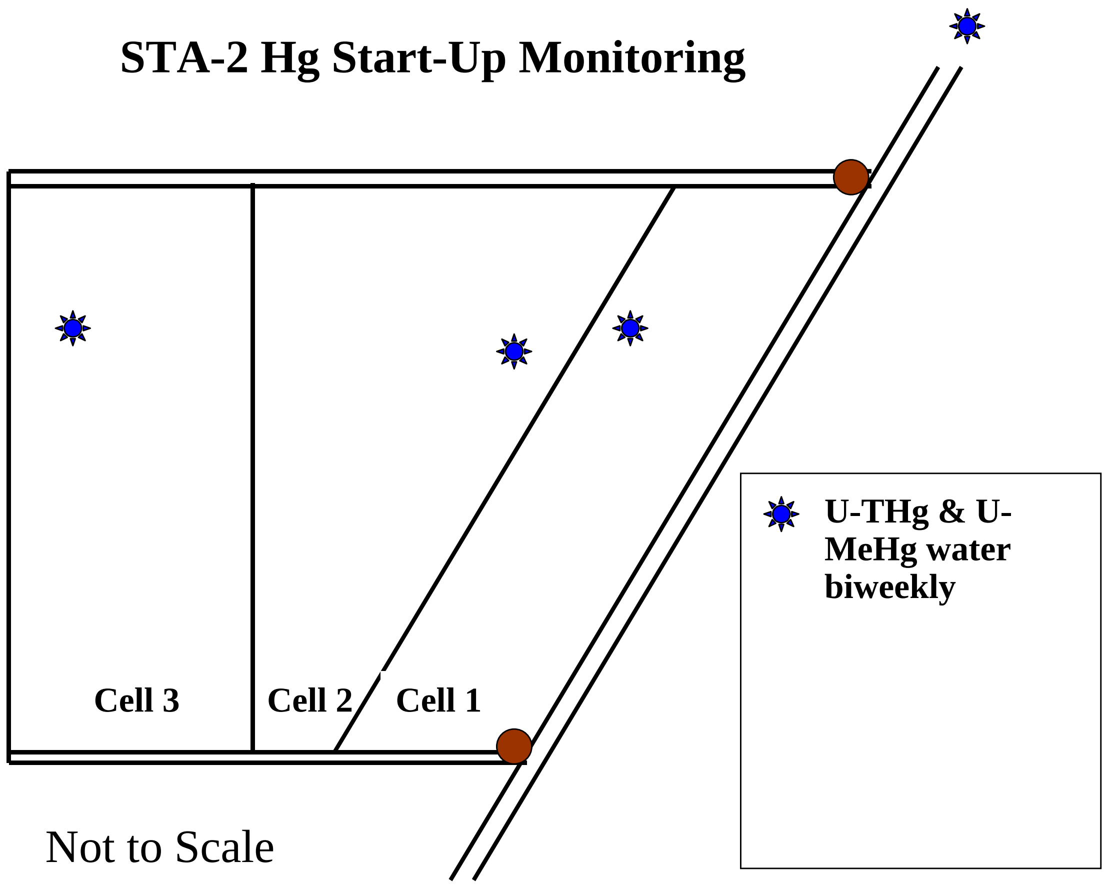


Figure 4. STA-2 start-up mercury monitoring sites for original permit compliance.

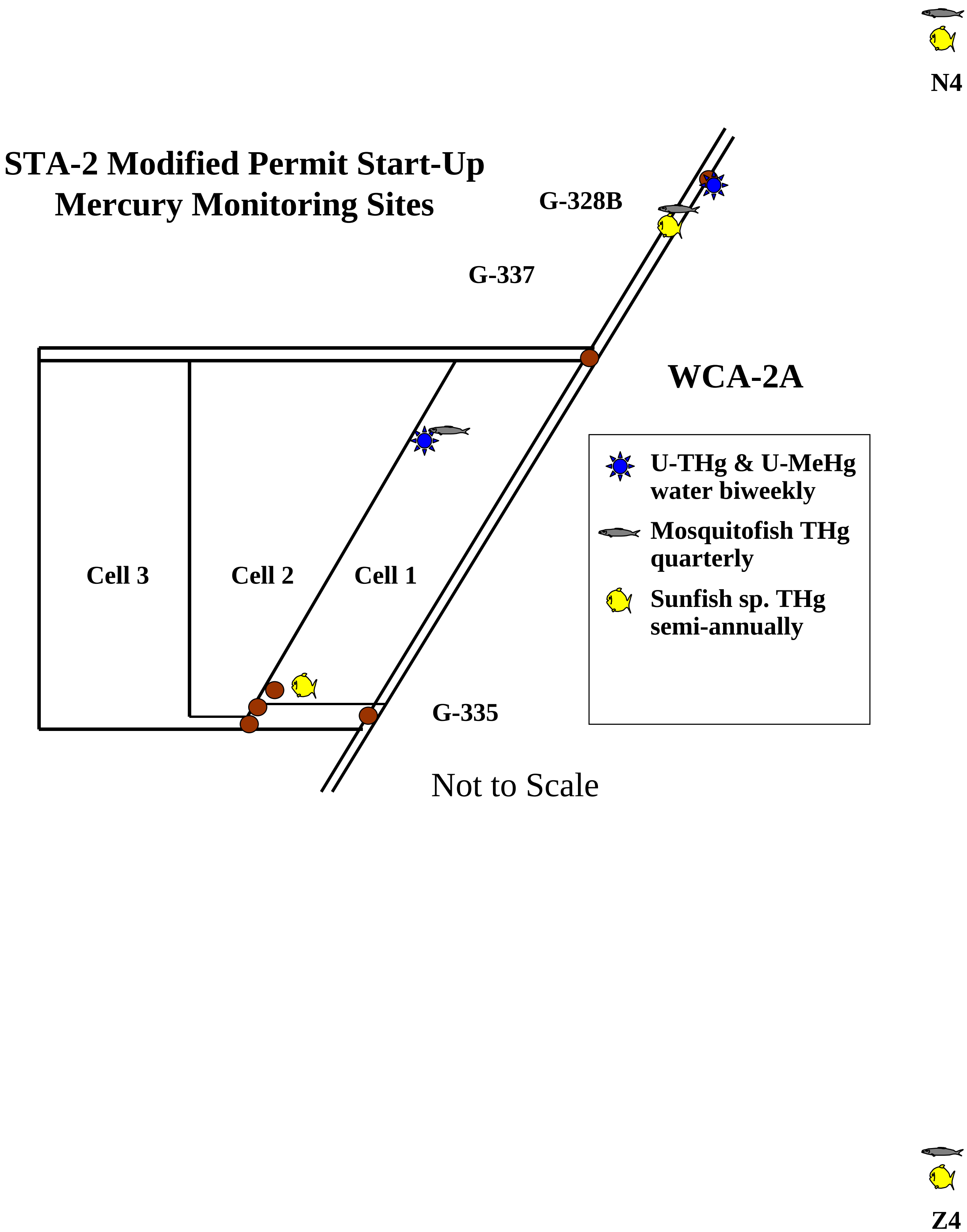


Figure 5. STA-2 start-up mercury monitoring sites for modified permit compliance.

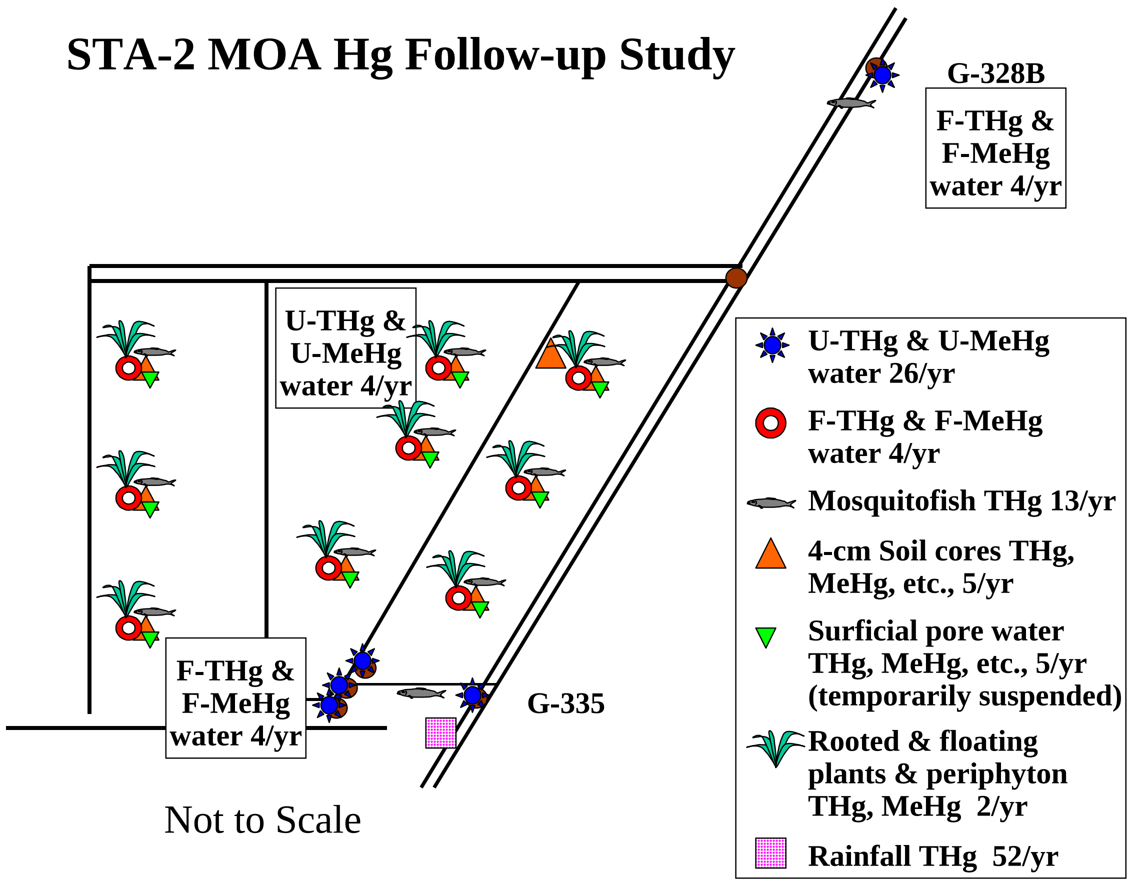


Figure 6. STA-2 expanded mercury monitoring sites for STA-2 Special Mercury Studies (MOA).

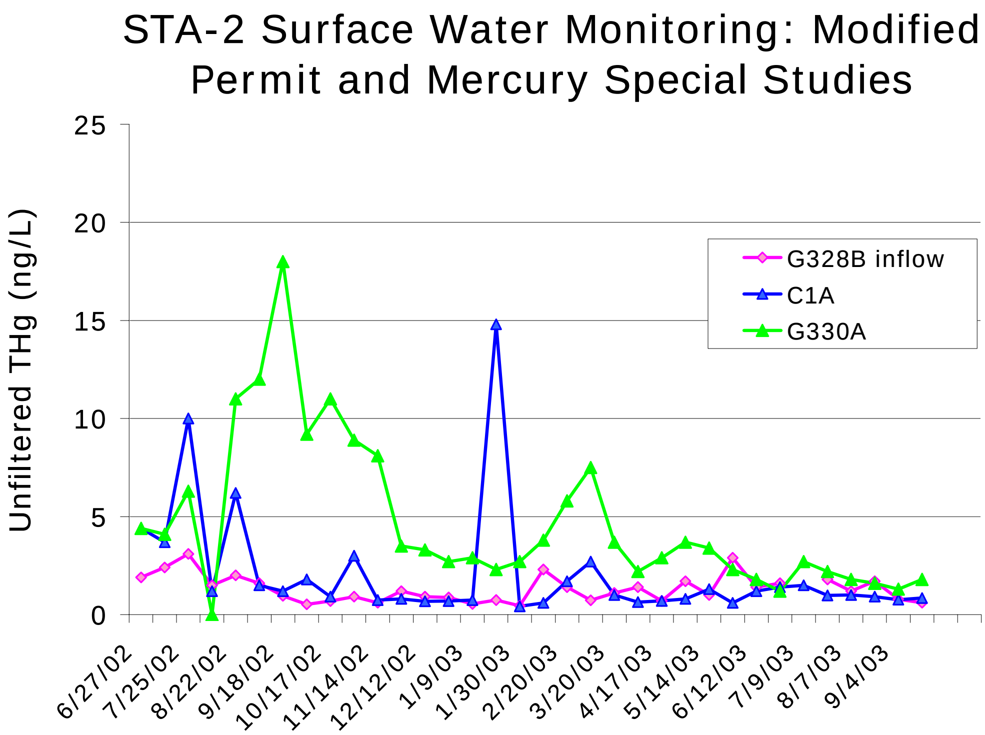


Figure 7. Inflow and interior surface water THg results for modified permit compliance monitoring (Exhibit E).

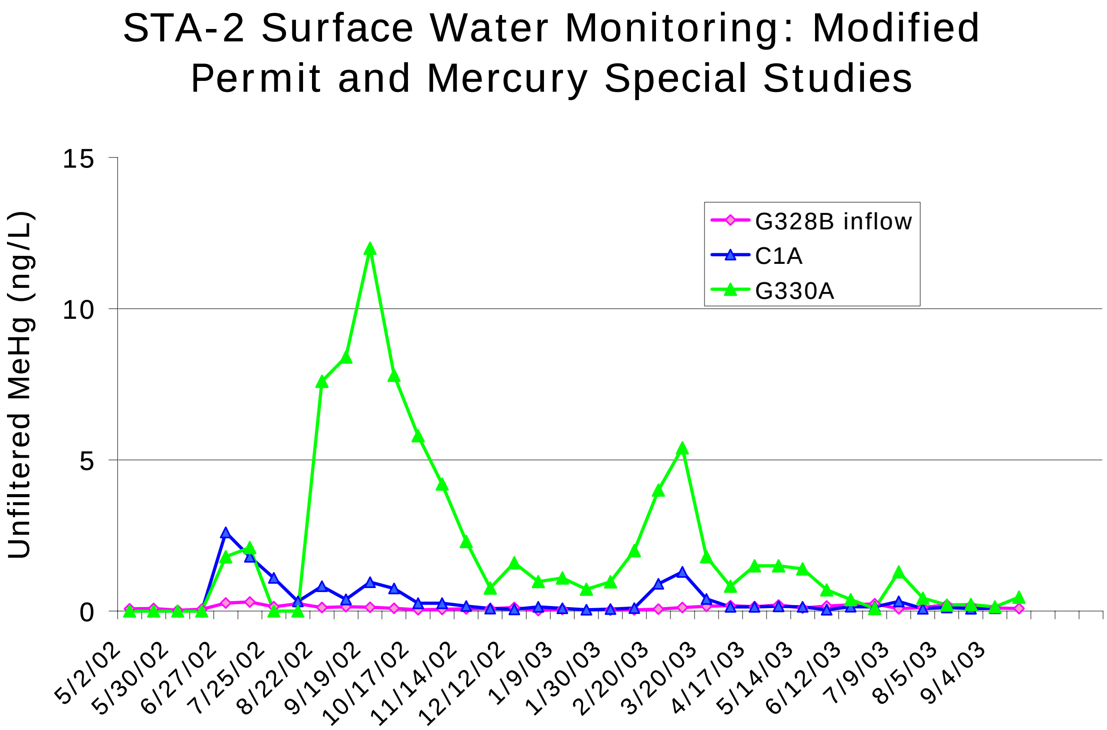


Figure 8. Inflow and interior surface water MeHg results for modified permit compliance monitoring (Exhibit E).

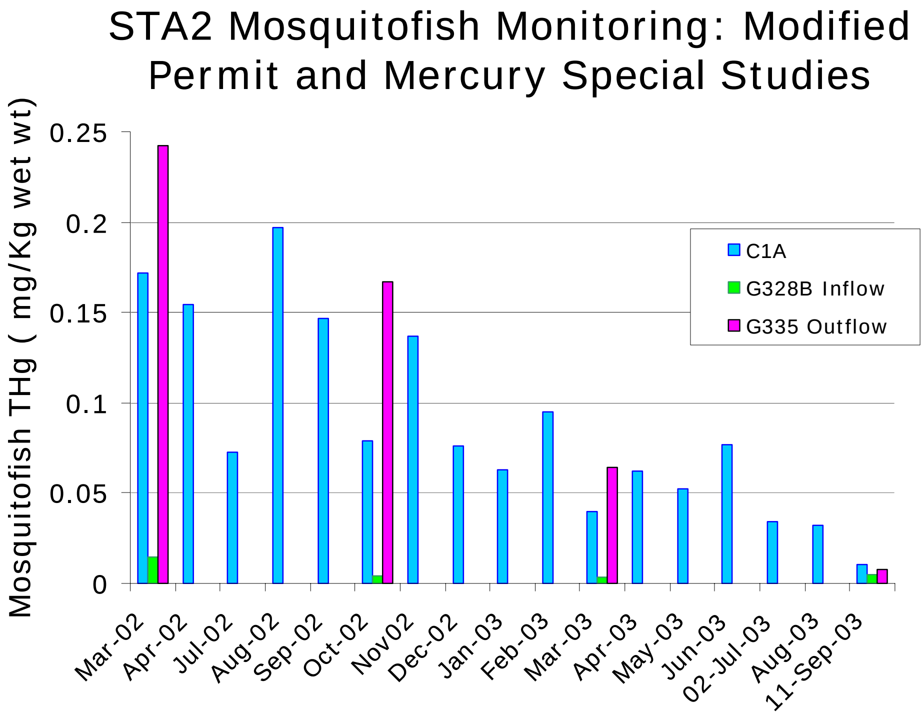


Figure 9. Interior STA-2 mosquitofish THg concentration results for modified permit start-up compliance monitoring (Exhibit E).

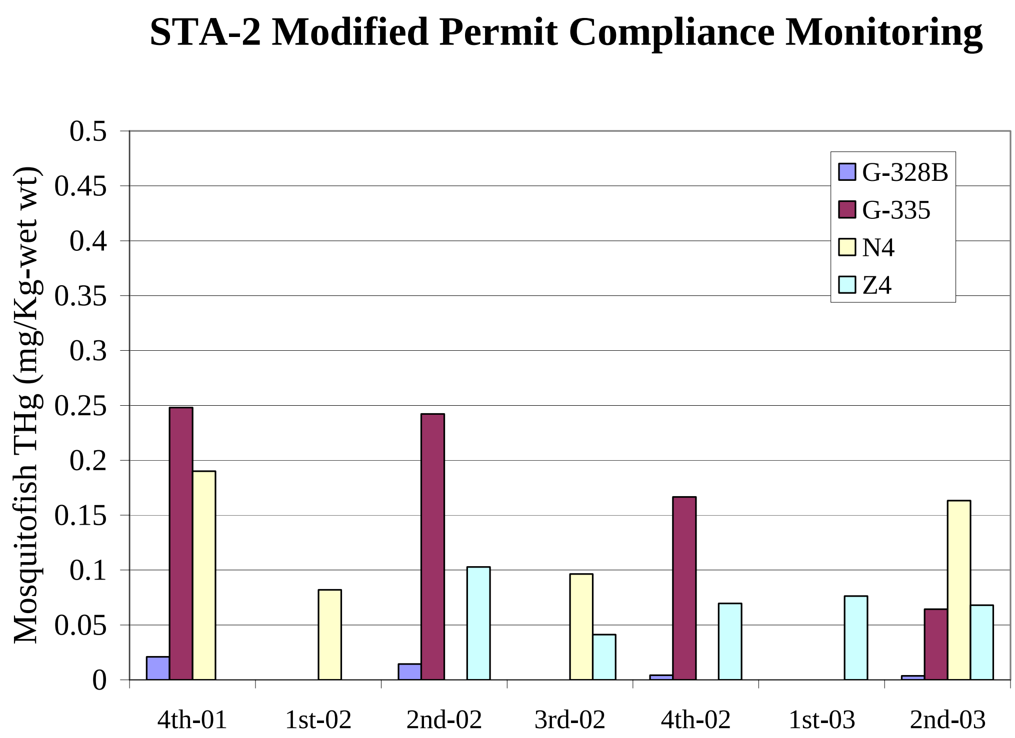


Figure 10. STA-2 downstream mosquitofish THg concentration results for modified permit compliance monitoring (Exhibit E).

STA-2 Modified Permit Hg Compliance Monitoring

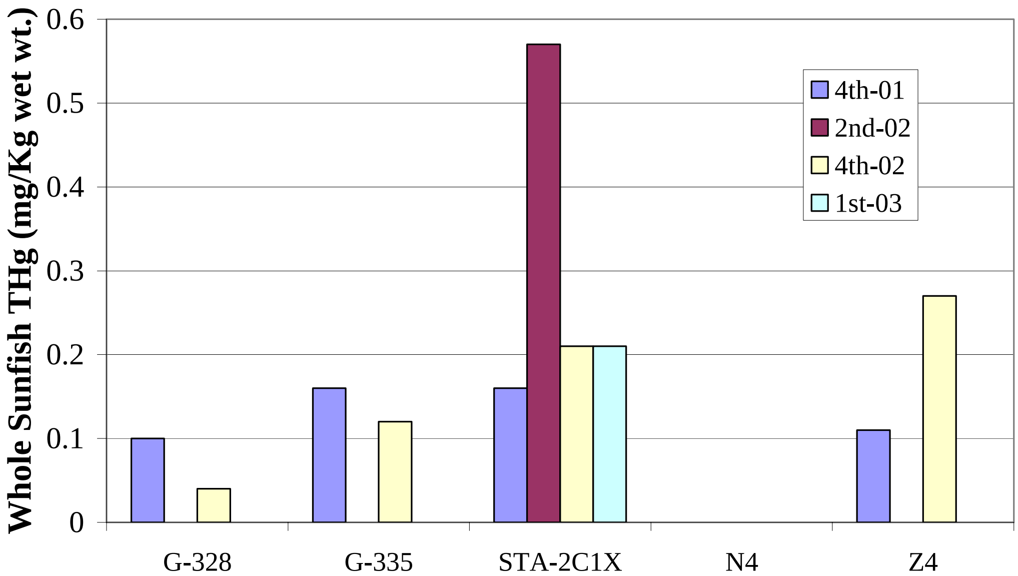


Figure 11. STA-2 sunfish THg monitoring results for modified permit compliance (Exhibit E).

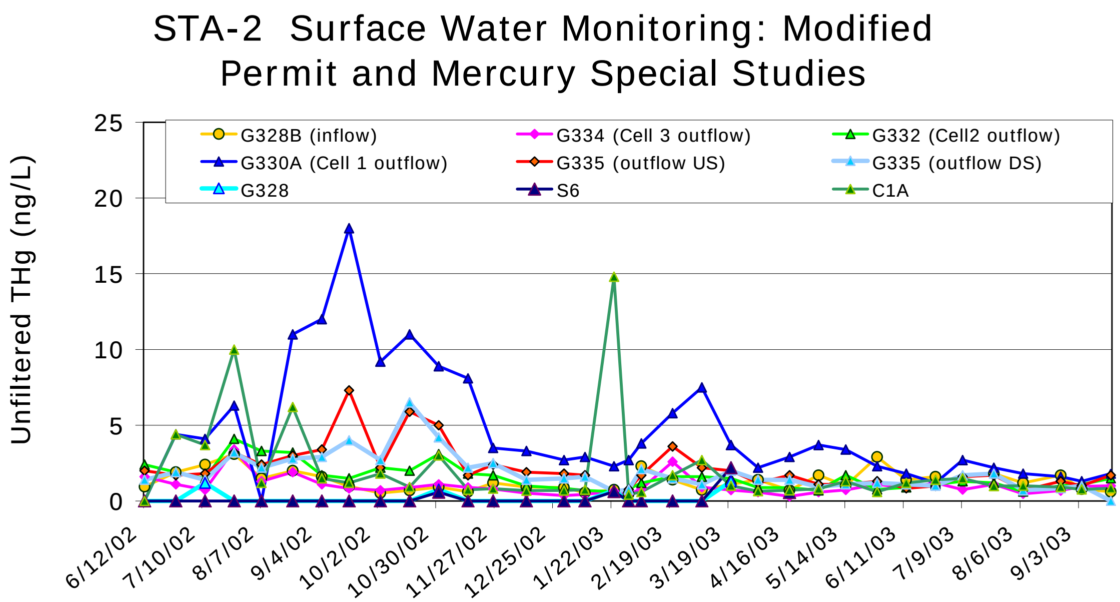


Figure 12. Surface water THg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

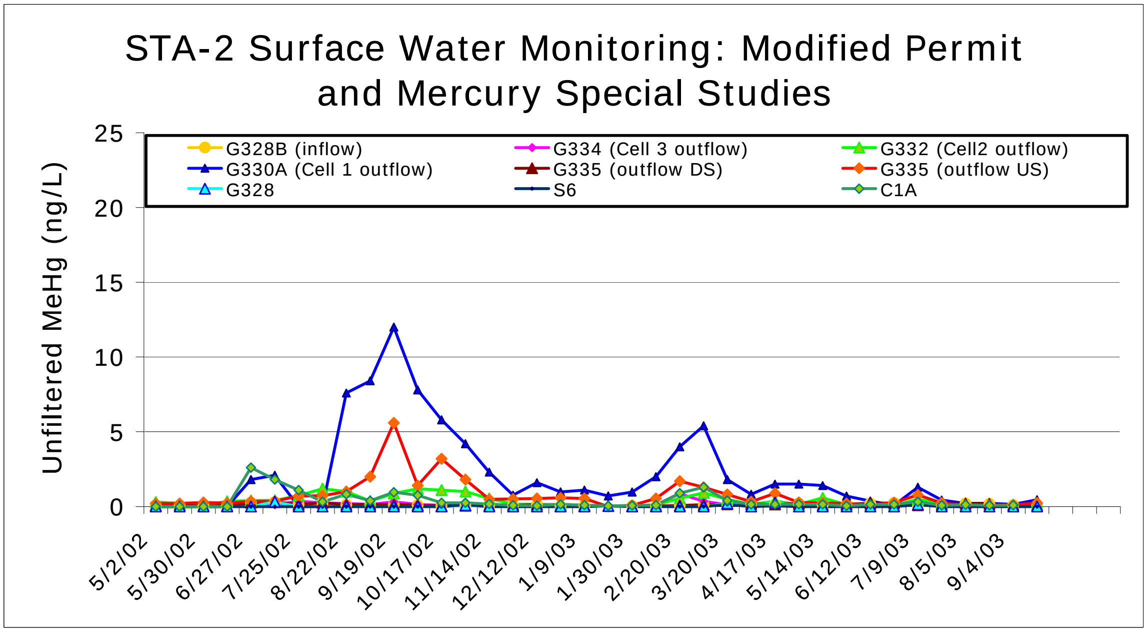


Figure 13. Surface water MeHg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

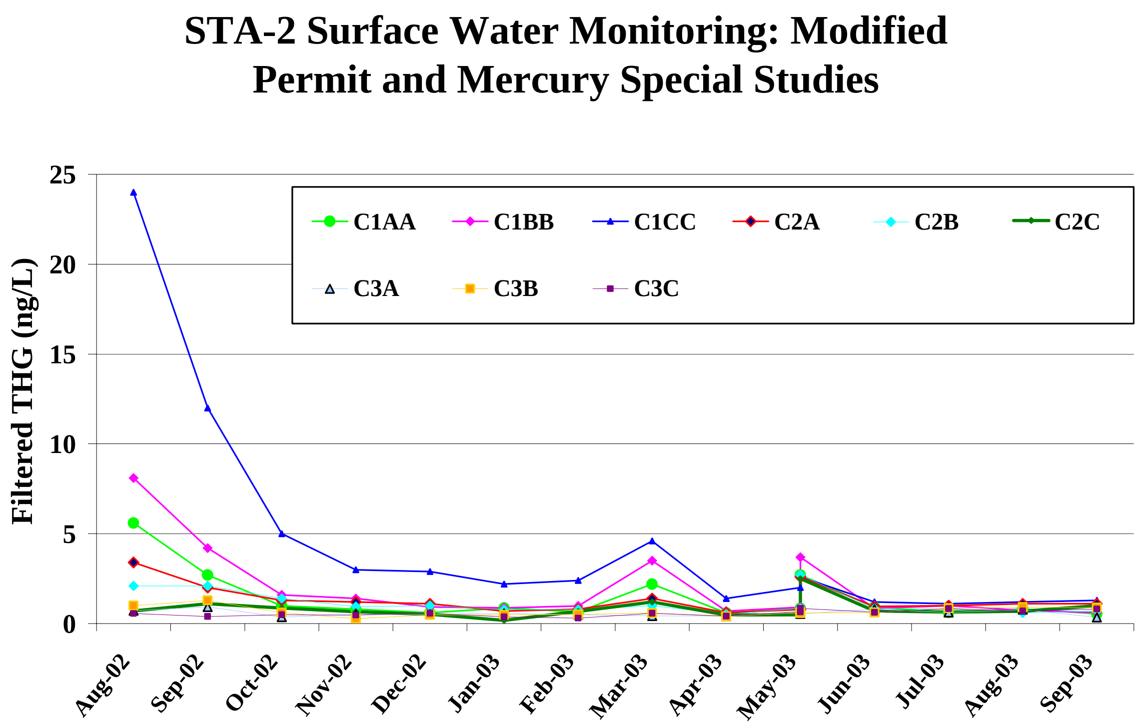


Figure 14. Interior filtered THg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

STA-2 Surface Water Monitoring: Modified Permit and Mercury Special Studies

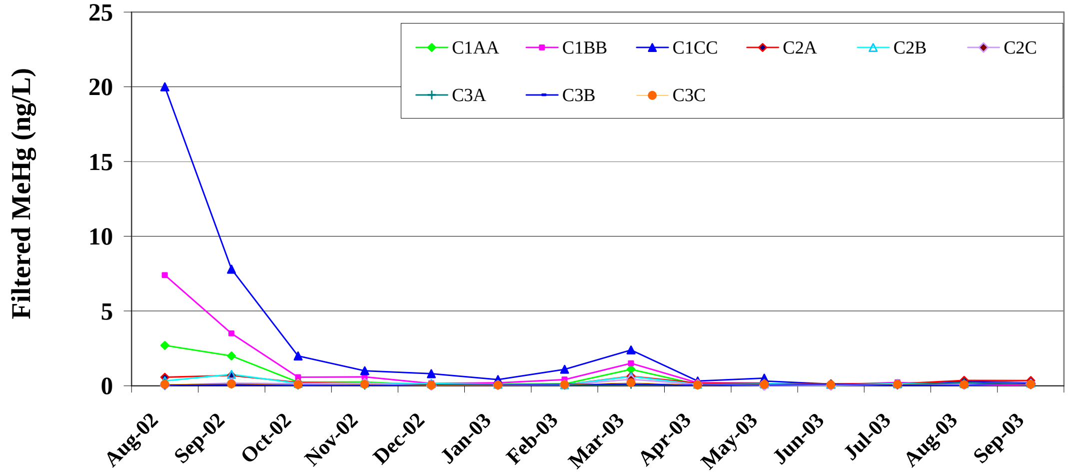


Figure 15. Interior filtered MeHg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

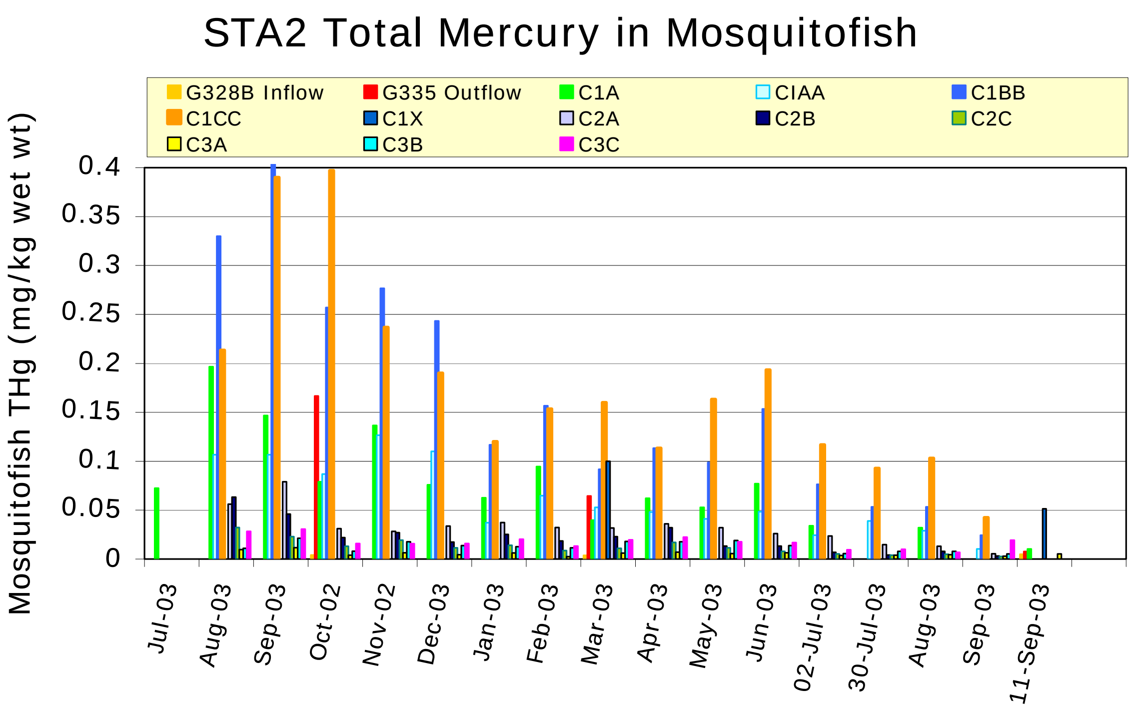


Figure 16. Mosquitofish THg concentration monitoring results for the STA-2 Mercury Special Studies Project (MOA).

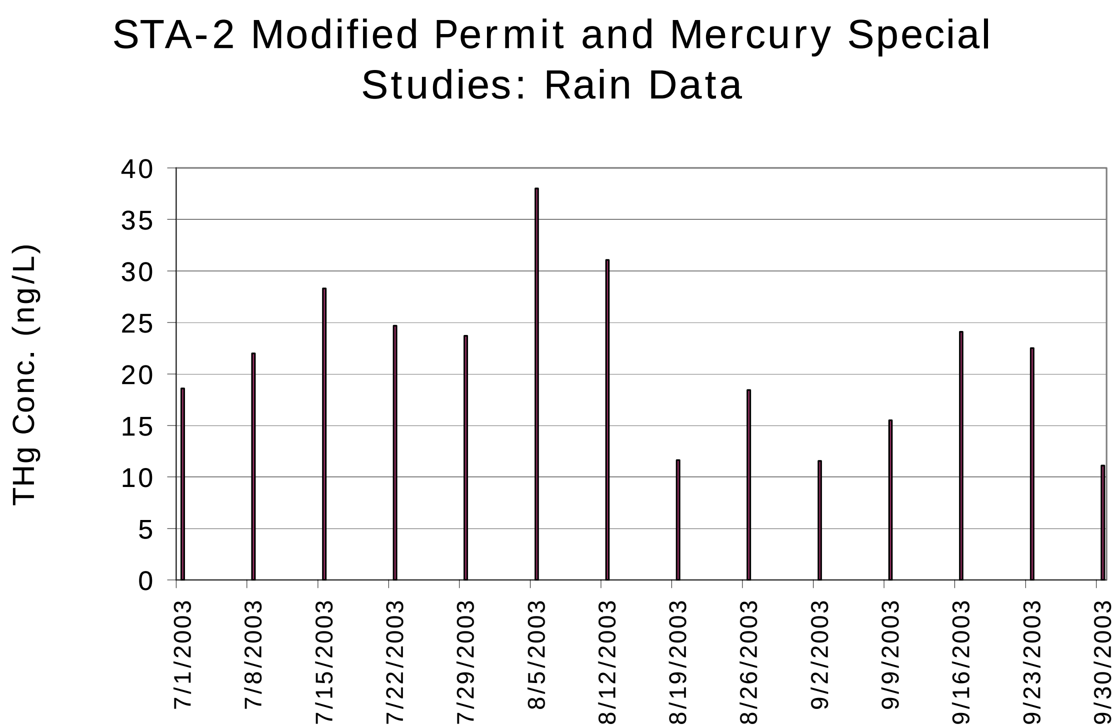


Figure 17. Weekly integrated rainfall THg concentration (ng/L) at STA-2 for the period 07/01/03 to 09/30/03

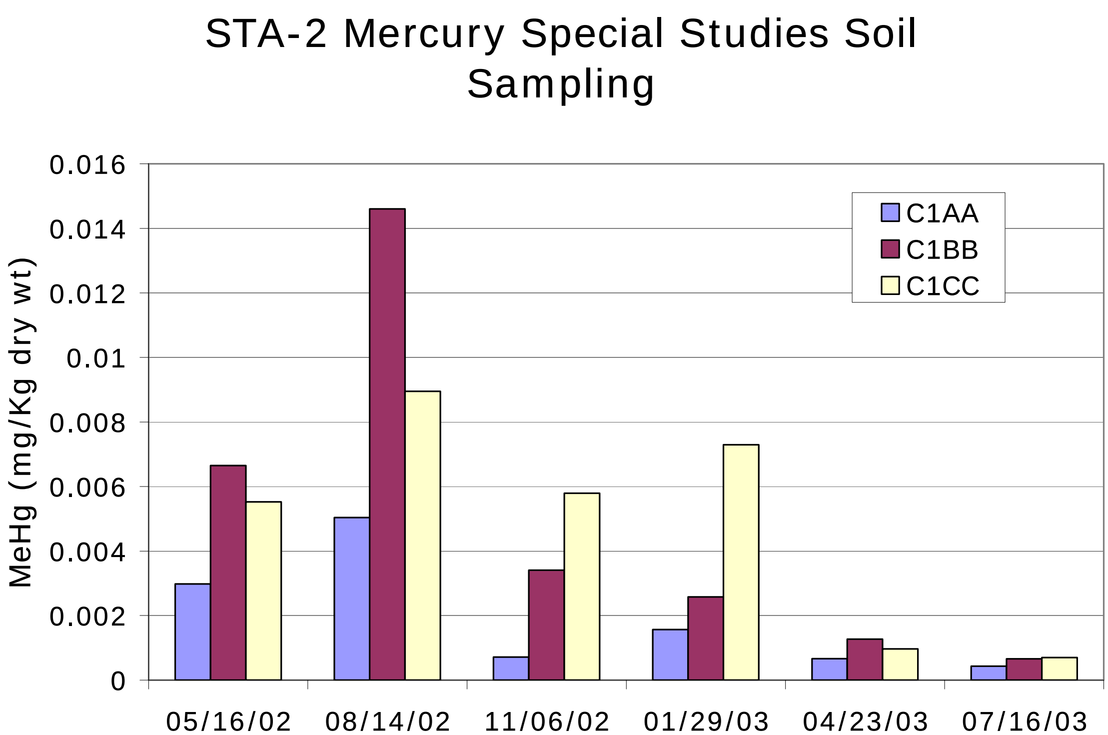


Figure 18. Soil MeHg concentration (0-4 cm cores) monitoring results to date for the STA-2 Mercury Special Studies Project (MOA).

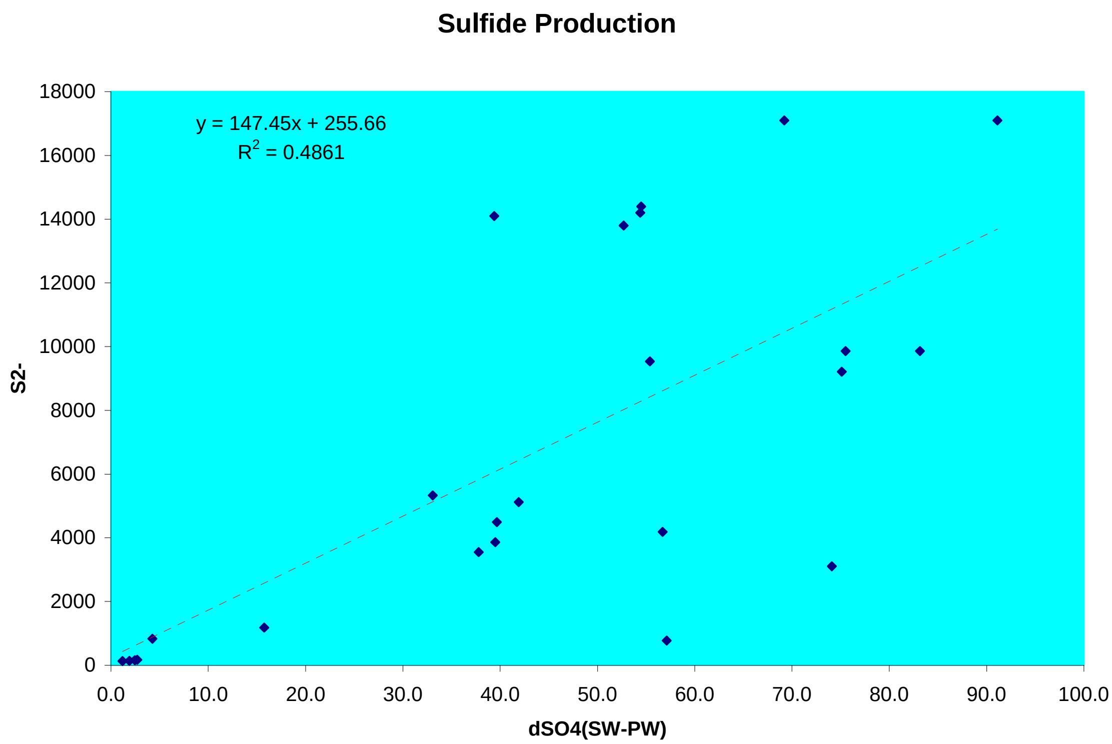


Figure 19. Inferred sulfide production from sulfate displayed as pore water sulfide as a function of the difference in surface water and pore water sulfate

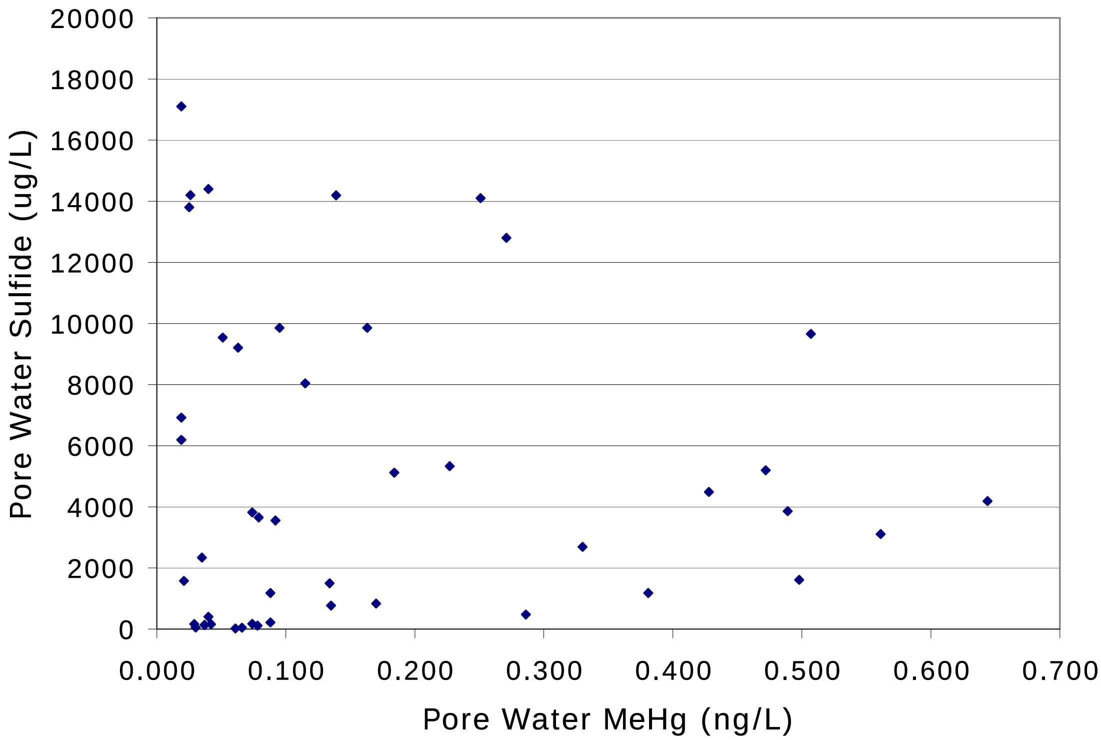


Figure 20. Scatter plot of pore water MeHg (ng/L) vs pore water sulfide (ug/L) in samples collected via in situ sipper method at 0-4 cm depth.

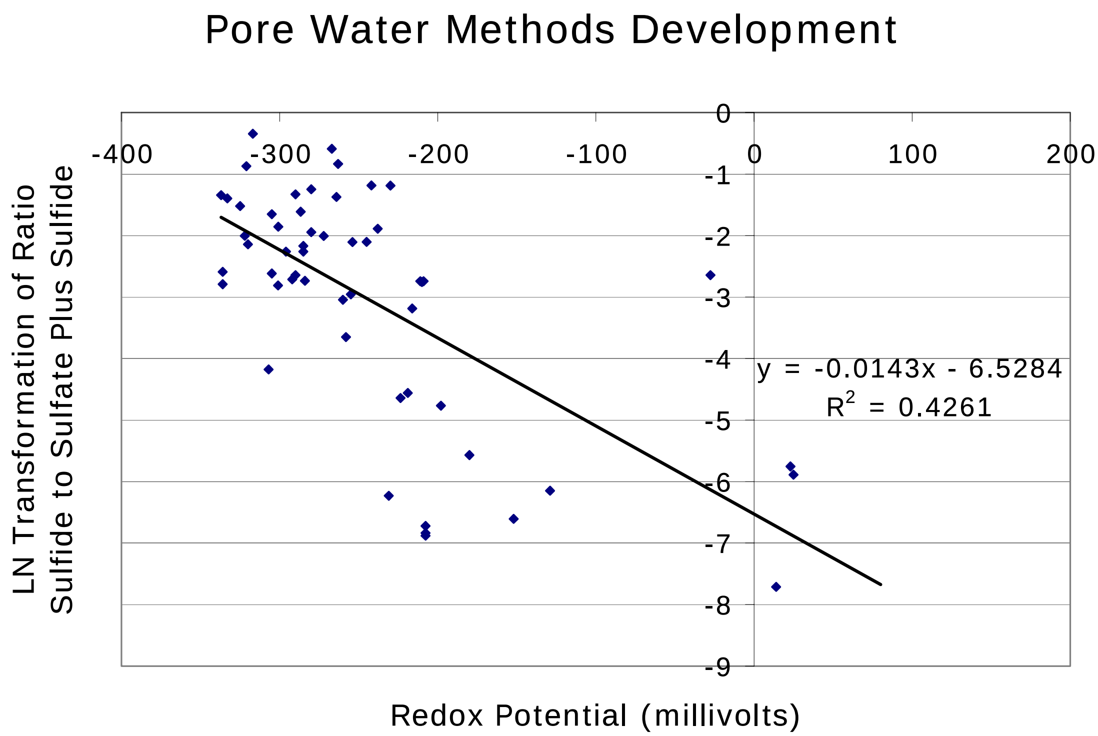


Figure 21. Scatter plot of natural log transformation of fraction pore water sulfide vs redox potential

Attachment 1

Summary of the Procedure Used to Establish Compliance with the Mercury Start-Up Criteria for STA-2 Cell 1

The biweekly start-up mercury monitoring in the STA-2 Cell 1 interior and the STA-2 common outflow at G-335 allowed the District to track the rate of recovery of Cell 1 and the STA-2 outflow back to the reference condition after the occurrence of the anticipated first-flush methylmercury (MeHg) anomaly in Cell 1, which happened following the reflooding of Cell 1 in August 2002. The reference condition was defined by inflow monitoring. Consistent with the Exhibit E requirements, we used a one-tailed, paired t test at the 95th percentile confidence level to evaluate the statistical significance of the difference between the interior and inflow water quality. When the unfiltered concentrations of total mercury (THg) and MeHg at the representative interior site were not statistically significantly greater than their corresponding inflow concentrations at the 95th percentile confidence level, the District could cease the biweekly monitoring of the common inflow, representative interior site, and common outflow set forth in Exhibit E of the modified permit and revert to routine quarterly monitoring of the common inflow and common outflow under Exhibit D of the original permit.

For the purpose of evaluating compliance with the mercury start-up criteria, we used the moving average of three consecutive biweekly concentration values for THg and MeHg at the Cell 1 interior site (C1A) and compared that average to the average of the corresponding values at the common inflow (G-328B). Three was the smallest number of values that could be used to approximate instantaneous conditions in STA-2 Cell 1 relative to instantaneous or long-term average conditions at the inflow and still perform the statistical test of significance. We then repeated the comparison with the G-328B cumulative average values. We then repeated both analyses using the natural log transformation of the data. Based on these approaches, the Cell 1 interior unfiltered THg and MeHg concentrations were not statistically significantly greater than their corresponding average inflow concentrations for samples collected on November 26, 2002, and the two subsequent biweekly sampling events in December 2002. To ensure the robustness of this conclusion, we then performed a nonparametric Wilcoxon Rank Sum test using both approaches. The nonparametric results supported the conclusion based on the parametric results.

During the monitoring period of interest following reflooding in August 2002, the median retention time for flowing-water conditions in Cell 1, calculated as a moving 7-day average, 14-day average, or 28-day average, was approximately 28 days, 21 days, or 18 days, respectively. The proper pairing of inflow and outflow would then associate the inflow sample collected at $t = 0$ and the outflow sample collected $t = 18$ to $t = 28$ days later. (One can also substitute the geometric mean for the median Cell 1 retention time values for the 7-, 14-, and 28-day averaging periods, i.e., 35, 32, and 23 days, respectively). The median time for inflow water to reach the center of Cell 1 would then typically be in the range of half the median retention time for the entire cell. By using the average of samples collected at $t = 0$ days, $t = 14$ days, and $t = 28$ days at Site C1A, we bracketed the typical range of median travel times under flowing water conditions in Cell 1 between the STA-2 common inflow and the Cell 1 interior for proper pairing of the inflow and interior sampling site values for purposes of evaluating the degree of recovery of Cell 1 from the first-flush MeHg anomaly relative to the upstream reference condition.

An increase in the power of the test of significance can only be purchased at the price of longer averaging periods that would carry over more of the memory of antecedent conditions that were not relevant to the conditions in the interior of the Cell 1 relative to the reference conditions at the common inflow one to two weeks earlier.

The MeHg peak concentration in the Cell 1 interior was reached in three biweekly sampling periods and the bulk of the MeHg anomaly was flushed out of Cell 1 in three biweekly periods. The numerical averaging period the District chose for purposes of confirming the return to reference conditions in Cell 1 also reflects that physical reality.

<u>Attachment 2</u>

Contract Number C-12452-WO#13A

Statement of Work

BACKGROUND

This Statement of Work (SOW) is an amendment to existing work order C-12452-WO13, Pore Water Sampling Pilot Study. An amendment is necessary because the side by side validation study called for in the original work order under Task 9 needs to be redesigned in response to what has been learned to date in performing the other tasks. First, the time allotted was not sufficient to conduct the study. Second, the volume of pore water generated by the centrifugation method of pore water collection produced less than predicted based on the results of an earlier pre-study. Third, the results obtained to date using the centrifugation method of pore water extraction indicate that the chemistry of pore water extracted by centrifugation is a sensitive function of soil depth and bulk density. Fourth, the depth at which the *in situ* sipper method extracts pore water is uncertain. A three day pre-study (Task 9A) is proposed to determine if the optimum number of soil cores, time, and sampling depth for the side-by-side comparison (Task 9B) of the in situ and centrifugation methods of pore water collection. Task 9 under the original WO SOW is replaced by Tasks 9A and 9B.

OBJECTIVE

This information is required to determine the number of sediment cores and length of time needed to conduct the side by side validation study called for under C-12452-WO13 task #9. The three-day pre-study would also allow us to evaluate the optimum depth for coring, as the present method produced results that suggest too much mixing with the surface water.

PROJECT LOCATION

Stormwater Treatment Area 2 (STA-2) is located within Sections 25, 26, 27, the eastern ¾ of Sections 28 and 33, and Sections 34, 35, and 36, Township 46 South, Range 38 East and a western portion of Section 30, the far northwestern tip of Section 31, Township 46 South, range 39 east, and the northwest corner of Section 1, Sections 2, 3, 4, Township 47 South, range 38 East and Section Government Lot 5, Township 43.5, range 40 east in Palm Beach County, Florida.

SCOPE OF WORK

The objective of this revised Task 9 is to (1) optimize the depth at which the 4-cm soil cores will be collected for the modified side-by-side validation study of the *in situ* sipper *vs.* the centrifugation method based on the change in soil and pore water chemistries with depth at three different sites with different bulk densities; and (2) complete the side-by-side validation study at that optimum depth. The sites where the Task 9A pre-validation study will be carried out are sites STA2C1C, STA2C2C, and STA2C3C. The work will be carried out by two, two-person teams, one of which, the sample processing team, will work a 12-hr day and the other of which, the sample collection team, will work a 6-hr day. This optimization is to be accomplished by (1) emplacing the *in situ* sipper device at the sampling site; (2) collecting sixteen, 10-cm cores roughly equally distributed in an annulus defined by an inner circle with a radius of 0.75/2 m (the outer circumference of the sipper disk) and an outer circle with a radius of 1.5/2 m (see Diagram 1); (3) using the second, two-person sampling team, transporting the first set of sixteen, 10-cm cores to the portable lab for extrusion into the nitrogen glove box and processing concurrently with the subsequent steps under this task; (4) using the emplaced sipper, document if the pore water volumes required for the analyses of S=, Fe(II), SO4, THg, MeHg, TFe, TMn, Mg, Ca, DOC and Cl can be collected; (5) following the collection of pore water using the emplaced sipper, collecting another set of roughly equally spaced, nineteen, 10-cm cores in the same outer annulus; (6) transporting this second set of soil cores to the field laboratory for processing per steps (3) through (5); (7) reserving three, 10-cm cores for replicate BD and moisture analysis by 2-cm stratum by DB Labs and the remaining sixteen cores for subsequent sectioning, compositing by stratum, and subsampling in triplicate for subsequent analysis by FGS for THg and MeHg analysis and DB Labs for BD, ash, moisture, TS, TFe, and AVS analysis. Thereafter, the pore water chemical analysis results will be reduced, analyzed, and evaluated as to the best match between the chemistry of the pore water in each 2-cm stratum generated using the centrifugation method and the integrated pore water sample collected using the sipper method. This will define the optimum depth at which the 4-cm cores will be collected at Site C1C for the side-by-side validation study detailed in Task 9B of C-12452-WO13A. Task 9B will be conducted only after the optimization analysis is completed and the requisite information regarding the optimum coring depth is supplied by the Project Manager to the Contractor. Task 9B will repeat steps (1) through (6) at STA-2 Cell 1 Site C1C for sixteen cores on Day 1 and sixteen cores on Day 2. Although the study is projected to be completed in five 12-hr days, a 6^{th} day has been added as a contingency to address unforeseen difficulties and the exigencies of inclement weather or equipment failure.

Task 9A. Optimization of Soil Sampling Depth for Task 9B.

On Day 1, the first sixteen, 10-cm cores shall be collected per Diagram 1 at Site C3C, transported to the field laboratory, extruded into the glove box under nitrogen, subsectioned into five, 2-cm cores, and each stratum shall be centrifuged, filtered, composited, and subsampled for subsequent preservation for analysis of S=, Fe(II), SO4, and Cl. Filtration shall be accomplished using four individual pumps and 0.45 micron filters concurrently to ensure that all of the cores are extracted in an eight-hour period for subsequent transport to the District lab prior to closing. The filters will be acid-cleaned in the glove box prior to use according to the procedures set forth in the SOP prepared per Task 3 and used for Task 10. The first set of soil core samples collected at each site shall be processed for pore water extraction under nitrogen each day for three consecutive days. The second set of nineteen, 10-cm cores will be stored on ice without freezing for subsequent transmittal in a timely fashion to DB Labs in tact. Three of the nineteen soil cores will be subsectioned by DB Labs into five, 2-cm cores for analysis of BD and moisture content, while the remaining sixteen, in tact cores will be subsectioned into five, 2-cm cores, composited by stratum per Diagram 2, homogenized, and subsampled n = 3 times for replicate analysis of TS, TFe, and AVS by DB Labs and THg and MeHg by FGS. To accomplish the latter, DB Labs will ship the appropriate subsamples to FGS using FGS's shipper code for THg and MeHg analysis under the District contract. Record all relevant information in the appropriate field and laboratory notebooks. On Days 2 and 3 this procedure shall be repeated for Sites C2C and C1C.

Task 9B. Side-By-Side Validation Study for In Situ Sipper vs Soil Centrifugation

Once the Task 9A study has been completed and the optimum depth at which the cores will be sectioned determined, new Task 9B of C-12452-WO13A shall be initiated. Using the same two, 2-person teams and scheduling as detailed above, on Day 4 collect the samples per Diagram 1 and process sixteen, 4-cm cores at Site C1C at the optimum depth prior to and sixteen, 4-cm cores following sipper pore water sample collection on Day 1 using the same protocol as detailed above. The extrusion of sediment cores into the glove box under nitrogen shall progress and be processed as per Task 9A, except that the composite pore water collected each day shall be subsampled n = 4 times, preserved as required, and analyzed for S=, Fe(II), THg, MeHg, SO4, TFe, TMn, DOC, and Cl. Repeat the procedure on Day 5. Record all relevant information in the appropriate field and laboratory notebooks.

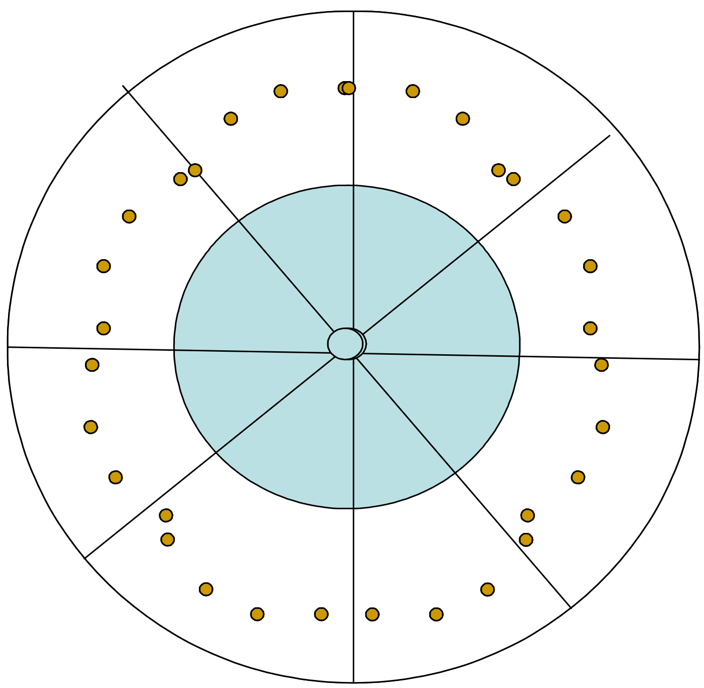


Diagram 1. Placement of Core For Sediment Collection

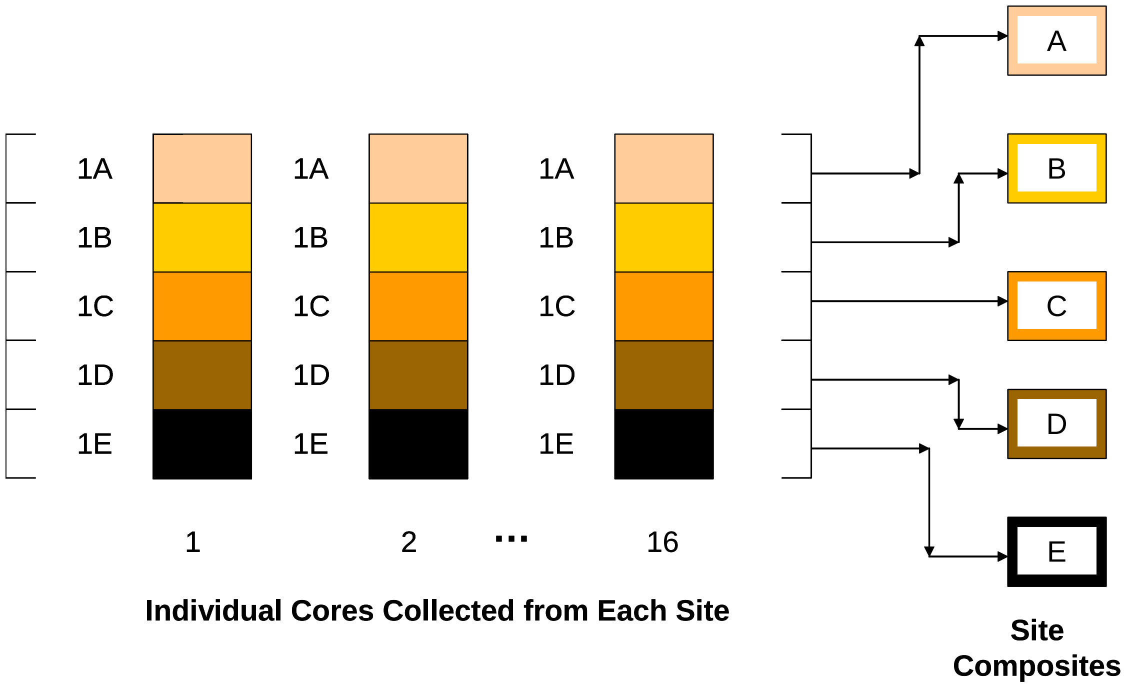


Diagram 2. Soil Compositing Scheme Across Strata at Each Site

COST ESTIMATES

Replace the Task 9 cost estimate with the following:

Cost Estimate - Tier I Pore Water Sampling Add-on

Activity	**Hours**	**Estimated Cost ($)**
Labor		
Three day Pre-Study C1CC		
(4 Field Persons)	132	8,380
Side by Side Validation Study		
(4 Field Persons)	98	6,262
Frontier (Equip. Purchase)		1,900
Lab Set-Up w/N Tanks		1340
AirBoat USA (5 days)		2,809
Coordinate & Manage	24	2,384
Sub total	*254*	*23,075*
Travel		358
Directs		500
Sub total		*23,933*
Contingency @ 5%		1196
Lump Sum Total	**254**	**$ 25,129**
Add: Contingency Day		
Labor		
Additional Field Day		
(4 Field Persons)	42	2,671
AirBoat USA (1 day)		562
Sub total	*42*	*3,233*
Travel		72
Directs		100
Sub total		*3,405*
Contingency @ 5%		170
Lump Sum Total	**42**	**$ 3,575**
Grand Total	**296**	**$ 28,704**

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

PRO ECP

April 6, 2004

Ms. Temperince Morgan
Water Quality Standards and Special Projects Program
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 3560
Tallahassee, FL 32399-3560

Dear Ms. Morgan:

Subject: Stormwater Treatment Area 2, Exhibit E, Permit No. 0126704-001-GL Sixth Quarterly Report

Attached is the sixth and final quarterly report required by Exhibit E of the subject permit covering the period October 1, 2003 through December 31, 2003. Since August 2002, anomalous mercury conditions have not reappeared in STA-2 Cell 1 surface water. Moreover, the methylmercury (MeHg) and total mercury (THg) concentration trends in water, soil, and fish have been steadily downward since Cell 1 outflow THg and MeHg concentrations were less than their corresponding inflow concentrations in June 2003

The South Florida Water Management District (SFWMD) submitted the Exhibit E ecological risk assessment for STA-2, dated March 31, 2004, under separate cover. In it the SFWMD concludes that, following the third Cell 1 MeHg anomaly in August 2002, it is highly unlikely that a wading or predatory bird foraging exclusively in STA-2 Cell 1 would be at an unacceptable risk of toxic effects at any life stage from exposure to the observed concentrations of THg as MeHg in Cell 1 fish. Nevertheless, the SFWMD will continue to operate STA-2 Cell 1 to avoid another MeHg anomaly there to the maximum practicable extent.

If you have any questions regarding this submittal, please call Mr. Larry Fink at Suncom 229-6749 or email <lfink@sfwmd.gov>.

Sincerely,

For

Ronald Bearzotti
Senior Environmental Analyst
Program Coordination Section
Ecosystem Restoration Department

RB/LF/pav
Enclosure

c: Thomas Atkeson, FDEP, w/encl.
Larry Fink, SFWMD, w/encl.
Richard Harvey, USEPA, w/o encl.
Daniel Scheidt, USEPA , w/encl.

Status Report on STA-2 Start-Up and Routine Mercury Monitoring and Mercury Special Studies
Reporting Period: 10/01/03- 012/31/03
Final 033104

Executive Summary

This sixth quarterly report submitted per Exhibit E of the modified STA-2 permit covers the period 10/1/03-12/31/03. The final report is scheduled for submittal by 9/30/04.

STA-2 Cells 2 and 3 met their permit-mandated mercury start-up criteria in September and November 2000, respectively, while Cell 1 experienced anomalous mercury events in the fall of 2000 and 2001. Subsequently, the District applied for a permit modification that would allow flow-through operation to commence without meeting mercury start-up criteria. The application was submitted in July 2001 and, by letter dated August 9, 2001, FDEP notified the District that it had approved the modification.

The District commenced the expanded mercury monitoring program under the modified permit in August 2001. This was further expanded to include biweekly monitoring of the Cell 1, 2, and 3 outflows after the second anomalous MeHg event occurred in Cell 1 in October 2001. In anticipation that there would be insufficient water during the dry season to keep the water flowing through Cell 1, the District recommended that Cell 1 be dried out until the following wet season, and the Department concurred. This also provided the District with an opportunity to raise the Cell 1 outflow weirs so as to minimize the occurrence of dryouts in the future. Dryout was essentially complete by December 31, 2001, but some drainage continued through February 2002.

With the return of the wet season flows in August 2002, the District began a one-year special study to (1) characterize the THg and MeHg concentration trajectories in water, soil, vegetation, and mosquitofish over time, (2) quantify THg and MeHg mass budgets for each cell, and (3) evaluate the physical, chemical, and biological factors that influence the magnitude of MeHg export and bioaccumulation. The third anomalous mercury event, which was detected by this study and occurred on August 22, 2002, in STA-2 Cell 1, began to dissipate from the interior water column almost immediately. Cell 1 met its THg and MeHg start-up criteria (i.e., THg and MeHg concentrations at C1A, the interior monitoring site, were not statistically significantly greater than the corresponding inflow concentrations per one-tailed t test at the 95th percentile confidence level) on November 26, 2002.

Subsequently, an anomalously high THg concentration of 14.8 ng/L (verified by rework) was detected at C1A on January 23, 2003. This was probably the result of resuspension of flocculant sediment caused by low water levels encountered at the time of sampling. This supposition is supported by the observation that the sample was more turbid than usual at the time of sampling. The MeHg result for the same sampling event was low, which would not be inconsistent with the resuspension scenario, because the sediment MeHg concentration is typically several orders of magnitude lower than the THg concentration. Thereafter, the interior surface water concentrations declined steadily to

the point that the unfiltered THg and MeHg concentrations in the Cell 1 outflow were less than their corresponding inflow concentrations on June 26, 2003. THg and MeHg interior and outflow concentrations remained generally low during the period July 1, 2003, to September 30, 2003. However, another anomalous event occurred at C1A for THg (8.3 ng/L) but not MeHg on October 16, 2003, again associated with high turbidity. The biweekly surface water monitoring of unfiltered THg and MeHg at interior site C1A ceased on October 16, 2003.

Mosquitofish THg concentrations tracked the water column MeHg concentrations. The build-up and decline of excess MeHg in water paralleled that in surficial soils in Cell 1. The results of the July and October 2003 soil sampling trips and the September 2003 vegetation sampling trip were unremarkable, except to note that the MeHg concentrations in Cell 1 surficial soil had leveled off. The results of the complete set of time- and space-dependent intra- and inter-correlation analyses for surface water, pore water, vegetation, and mosquitofish will be presented and discussed in the final report.

Per Exhibit E of the modified permit, the District is required to prepare an ecological risk assessment after one year of monitoring or immediately if, at any time, the average concentrations of THg in mosquitofish and sunfish exceed their respective upper 95th percentile concentrations calculated using monitoring data collected at 12 representative interior Everglades marsh sites for the period of record. In October 2003 the District completed its annual collection of mosquitofish, sunfish, and bass at the common inflow, each cell interior, and the common outflow, as well as downstream sites N4 and Z4, in October 2003. Unfortunately, the trigger concentrations for mosquitofish and sunfish could not yet be updated for 2003, because all of the mosquitofish and sunfish from the interior Everglades marsh sites had not yet been processed, analyzed, and quality assured by February 29, 2004. Therefore, the trigger concentrations are still based on data collected through the fall of 2002.

THg concentrations in mosquitofish collected within and downstream of Cell 1 during the reporting period were below last year's trigger. While the sunfish THg concentration at Z4 declined from a value slightly above that trigger (235 mg/Kg wet wt) in the fall 2002 (239 mg/Kg wet wt) to less than half that value in the fall 2003 (129 ug/Kg wet wt), the THg concentration in sunfish at site C1X at the bottom of STA-2 Cell 1 increased from slightly below the trigger value in the winter 2003 (214 ug/Kg wet wt) to slightly above that trigger (254 ug/K wet wt) in the fall 2003. However, this was less than half the peak concentration encountered in the winter of 2002 (567 ug/Kg wet wt). However, based on the ecological risk assessment required by Exhibit E, which has been submitted under separate cover on March 31, 2004, the risk of MeHg toxic effects to any life stage of a wading bird or raptor foraging exclusively in Cell 1 should not warrant corrective action.

The last Exhibit E mosquitofish samples are scheduled to be collected at sites C1C, G-335, N4, and Z4 in March 2004. The last special studies samples for the Section 319 Grant Project (SP-524) and the MOA were collected in January 2004. The validation study of the modified "sipper" method of pore water extraction is scheduled to be completed in April 2004.

Introduction

This is the sixth quarterly report on expanded mercury monitoring in Stormwater Treatment Area 2 (STA-2) under the modified permit FDEP No. 0126704-001-GL, Cooperative Agreement C-11900-A03 (SP524), and the Memorandum of Agreement (MOA: C-13812) between the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD). It encompasses the period October 1, 2003, through December 31, 2003. **Attachment 1** is a summary of the procedure the U.S. Geological Survey follows for the collection of pore water via the *in situ* "sipper" method. The District modified the USGS apparatus and procedure to allow for the collection of much larger pore water sample volumes that do not require microanalytical capability for constituents of interest. The summary of these modifications is contained in **Attachment 2**. The final revised SOP for these modifications is being produced under a separate contract.

The side-by-side validation study comparing the modified *in situ* sipper and centrifugation methods of pore water sample collection is being conducted by Tetra Tech for the District. The Tier 1 Part B pre-study has been completed and some of the pore water data have been obtained for both the centrifugation and the sipper methods. The sipper and centrifugation method results will then be paired by 2-cm strata from 0 to 10 cm soil depth to determine the optimum 4-cm soil sampling depth for the subsequent side-by-side validation study. The design of the Tier 1 Part B study was discussed in the executed SOW contained in **Attachment 1** of the fifth quarterly report submitted in December 2003.

Results

The results of the rain, surface water, soils, and mosquitofish data collected as of January 31, 2004, and available as of February 29, 2004, are included in **Tables 1-4**. The results of treatment cell inflow and Cell 1 interior biweekly monitoring of surface water for unfiltered THg and MeHg are summarized in **Figures 7** and **8**. The inflow and interior mosquitofish THg results are depicted in **Figure 9**. The inflow, outflow, and downstream concentrations of THg in mosquitofish and sunfish are depicted in **Figures 10** and **11**, respectively. **Figures 12** and **13** illustrate the concentrations of unfiltered THg and MeHg in water samples collected from the expanded inflow and outflow monitoring sites from May 2002 through September 2003. Filtered THg and MeHg concentrations collected from the expanded interior monitoring sites for the same period are displayed in **Figures 14** and **15**, while **Figure 16** summarizes the mosquitofish THg concentrations. The weekly integrated rain THg concentrations for this reporting period are depicted in **Figure 17**. The MeHg concentrations in the top 4 cm of soil at Sites AA, BB, and CC in Cell 1 are displayed in **Figure 18**.

Discussion

Data

The third anomalous mercury event, which was detected by this study and occurred on August 22, 2002, in STA-2 Cell 1, began to dissipate from the interior water column almost immediately. Cell 1 met its THg and MeHg start-up criteria (i.e., THg and MeHg concentrations at C1A, the interior monitoring site, were not statistically significantly greater than the corresponding inflow concentrations per one-tailed t test, $p < 0.05$) on November 26, 2002. However, an anomalously high THg concentration of 14.8 ng/L (verified by rework) was detected at C1A on January 23, 2003, but the high turbidity associated with the sample suggests that it was an artifact of the low water levels encountered at the time of sampling. The MeHg result for the same sampling event was low, which would not be inconsistent with the resuspension scenario, because the sediment MeHg concentration is typically several orders of magnitude lower than the THg concentration.

A minor increase in the THg concentrations in the interior of each STA-2 treatment cell occurred simultaneously in March and May 2003. The MeHg concentration profiles paralleled those of THg in the March 2003 event but not that of the May 2003 event. The increases in interior treatment cell THg in March and May 2003 were probably associated with rainfall events, but the increase in MeHg in March but not May 2003 could have been associated with detectable changes in water quality (e.g., rapid decrease in conductivity; rapid increase in water column DO) that preceded the March 2003 MeHg mini-anomaly in January 2003. An inspection of the G-330A outflow MeHg concentration trajectories indicates that the increase in outflow MeHg concentrations began following the February 6, 2003, outflow sampling event, peaked with the March 20, 2003, sampling event, declined rapidly to near baseline concentrations by April 3, 2003, and dipped below baseline conditions on April 17, 2003. The THg concentration monitored at the same location peaked two weeks earlier, suggesting that the excess MeHg was being produced internally from a fresh supply of bioavailable inorganic mercury introduced in the weeks immediately preceding these sampling events. Interestingly, the peak THg concentrations in Cell 2 and 3 outflows were reached two weeks before that of Cell 1, perhaps because the flow rates are higher and retention times are shorter in Cells 2 and 3 relative to Cell 1.

Mosquitofish THg concentrations tracked the water column MeHg concentrations. The build-up and decline of excess MeHg in water paralleled that in surficial soils in Cell 1, but not with the same spatial pattern. The rapid changes in soil chemistry that occurred following Cell 1 reflooding appear to be slowing and stabilizing, with the inverse correlation between acid volatile sulfide as a surrogate for pore water sulfide switching from weakly positive prior to reflooding to moderately negative in the last soil sampling campaign in April 2003. The results of the July 2003 soil sampling trip and the August 2003 plant sampling trip will be summarized in the next quarterly report.

Compliance

Exhibit E requires the District to file an expedited risk assessment report to the Department if the average THg concentrations in mosquitofish and sunfish collected at the STA-2 Cell 1 interior or downstream monitoring sites exceed their respective 95th percentile upper confidence level concentrations in the Everglades for the period of record. The expanded monitoring requires monitoring of THg in mosquitofish monthly at a representative, centrally located site interior to Cell 1 (i.e., Site C1CC) and quarterly at downstream sites WCA-2A-N4 and WCA-2A-Z4 and in sunfish collected semi-annually at a representative, centrally located interior site in Cell 1 (i.e., C1X) and annually at sites N4 and Z4. For the data collected through October 2002, those mosquitofish and sunfish triggers are: Grand mean of THg in downstream mosquitofish for POR (1998-02) ± 95%CI: 102 ± 18 ug/Kg wet wt (n = 64; Grandmean of site means of THg in downstream sunfish for POR (1998-02) ± 95%CI: 195 ± 40 ug/Kg wet wt (n = 57); and Grandmean of EHg3 calculated for downstream largemouth bass caught over the POR (1998-02) +/- 95%CI: 591 ± 116 (n = 32).

Following issuance of the modified permit in August 2002, at interior Site C1CC only the April 2003 mosquitofish did not exceed the trigger value (Figures 9 and 10). The average THg concentration in mosquitofish collected from this site again exceeded the trigger value in May 2003. However, the trigger value has not been exceeded since June 2003 (193 relative to 120 ug/Kg wet wt) and had declined by almost 20-fold by January 2004 (10 ug/Kg wet wt). Interestingly, for mosquitofish collected in the outflow canal just upstream of the pump station, only the October 2002 fish exceeded the trigger value, suggesting that, as with the water, the mosquitofish population discharged from Cell 1 is mixed with the populations discharged from Cells 2 and 3, "diluting" the average THg concentration in the Cell 1 mosquitofish population with the combined populations in the discharge collection canal. At site N4, in April 2003 the concentration of THg in mosquitofish exceeded the trigger value (163 vs 120 ug/Kg wet wt), but at site Z4 the trigger value has never been exceeded, and the average concentration of THg in mosquitofish collected at both sites in April 2003 was below the reporting threshold. In the fall 2003, the mosquitofish at N4 and Z4 were both about half the trigger threshold.
.

As illustrated in Figure 11, after August 2002, for sunfish collected semi-annually at interior Site C1X, the THg concentration approached but did not exceed the trigger value in April 2003 (214 vs 235 ug/Kg wet wt). Sunfish collected annually from the discharge canal in October 2002 were well below the reporting threshold at 120 ug/Kg wet wt. No sunfish could be collected annually in October 2002 at N4, despite a documented good faith effort, because of the degraded conditions of habitat quantity and quality and water quality there that preceded the construction and operation of STA-2 (T. Lange, FGFWFC, personal communication). At Z4, the average concentration of THg in sunfish collected in October 2002 exceeded the reporting trigger value (272 vs 235 ug/Kg wet wt). The October 2002 value is more than 2.5 times that of October 2001. However, as noted above, the corresponding average mosquitofish THg concentrations at site Z4 have been below the trigger value for the period of record. This suggests that the food chain structure at these two sites is very different, consistent with observed differences in habitat quantity and quality and water quality.

The next sunfish collection occurred in September-October 2003. While the sunfish THg concentration at Z4 declined from a value slightly above that trigger in the fall 2002 (239 relative to 235 mg/Kg wet wt) to less than half that value in the fall 2003 (129 ug/Kg wet wt), the THg concentration in sunfish at site C1X at the bottom of STA-2 Cell 1 increased from slightly below the trigger value in the winter 2003 (214 relative to 235 ug/Kg wet wt) to slightly above that trigger (254 ug/K wet wt) in the fall 2003. This was less than half the peak concentration encountered in the winter of 2002, however (567 ug/Kg wet wt).

Although the largemouth bass data are not used to trigger expedited risk reporting, it is important to note that the EHg3 for LMB at G335 was 1169 ± 233 in 2002 or more than twice the advisory threshold of 0.5 ppm. In addition, the unadjusted average outflow bass THg concentration was more than twice the concentration of the inflow bass. THg concentrations in bass from the discharge canal did not differ significantly between 2001 and 2002 (ANCOVA, $df = 1, 37$; $F = 0.01$, $P = 0.936$). (Note: G335 was the only STA-2 site in 2001 for which the collected bass had an age distribution suitable for establishing an age-concentration relationship, i.e., where an EHg3 was calculated and ANCOVA was run in 2002). The next largemouth bass collection occurred in September-October 2003. Not all of the results were available as of February 28, 2004, so it was not yet possible to derive the EHg3 relationship for all sites of interest. Those results will be reported in the next quarterly report.

Methods Development

The USGS "sipper" method for soil and sediment pore water extraction was modified by adding a 0.75 m diameter disk that separates surface water from surficial soil to ensure that there is no breakthrough of surface water into the pore water sample. This allowed the collection of much larger volumes of pore water, avoiding the need for the use of microanalytical technique, which is generally unavailable commercially. Because the pore water is collected over a much larger ellipsoid of withdrawal, the sample integrates out microheterogeneities that could confound the extraction of relationships between pore water and soil chemistries. The modified sipper is hung with standard weights to ensure a standard compression, resulting in the collection of the pore water sample at a depth with the same bulk modulus at each site. Blanks are generally low for both THg and MeHg, so there does not appear to be a systematic source of contamination from the materials used in the construction of the modified *in situ* sipper. All pore water redox measurements are well below those in surface water measured at the same time, and, in general, the proportion of sulfide in pore water is high where redox is low, so the method appears to be preserving redox potential and redox-sensitive species such as sulfide. The scatter plot of MeHg vs pore water sulfide suggests that where pore water sulfide concentrations are high, MeHg concentrations are low, and *vice versa*, although the inverse correlation is weak, perhaps because other factors, such as the concentration of $Fe(II)^{+2}$, also affect sulfide speciation and $Hg(II)^{+2}$ bioavailability for MeHg production.

A multivariate regression analysis of the data must await the completion of the study at the end of April 2004.

Tier 1 and Tier 2/3 Pore Water Monitoring Status Update

For the quarter ending December 31, 2003, the District has made further progress in acquiring a viable field pore water sampling capability under Tier 1 for implementation in Tiers 2 and 3. Firm bids were received and accepted from Tetra Tech for implementation of the Tier 1 pore water methods development study and the Tier 2/3 "routine" pore water collection at nine interior pore water characterization sites and one pore water variability study site. Unavoidable delays in issuance of the pore water SOWs translated into a delay in initiating pore water sample collection with the modified sipper. The first set of samples for the reconnaissance task were collected in August 2003. The first set of routine pore water samples were collected in September 2003. The Tier 1 sipper vs centrifugation side-by-side validation study was conducted in the last week in September 2003.

Unexpectedly, the volume of pore water generated by centrifugation was overestimated and the time to extract the pore water was underestimated, resulting in completion of only one-half (Part A) of the study in the time available: the one-time, nine-site survey of pore water chemistry via centrifugation extraction of 4-cm cores of surficial soil/sediment. In addition, the demarcation between peat soil surface and surface water was uncertain due to the existence of a thick floc layer, and this uncertainty increased as a result of surface agitation during soil core transport, so the results of the centrifugation study appear to have been inadvertently compromised by mixing floc layer surface water with true pore water. Unfortunately, this may be an inherent limitation of the centrifugation method when applied to poorly consolidated sediments.

To address the question of where in the soil horizon the 4-cm section should be taken to be equivalent to the sipper extraction horizon, the side-by-side validation study had to be modified to include the evaluation of soil and pore water chemistries as a function of depth by taking soil cores in two cm sections from 0 to 10 cm. The effect of bulk density was to be taken into account by carrying out the sampling at three different sites. This pre-study is now proposed as Tier 1 Part B-1. The second half of the study (Tier 1 Part B-2), the side-by-side validation of the *in situ* sipper vs centrifugation, had to be redesigned to adopt the equivalent stratum identified in Part A. Without the pre-study, there is no way to know whether observed differences in the means and standard deviations of the pore water chemistry results generated by the sipper and centrifugation methods in the side-by-side validation study are real or an artifact of the inappropriate choice of equivalent soil stratum for pore water extraction via centrifugation. Following resolution of funding issues, completion of Part A occurred in February 2004 (outside the reporting period). Part B will be completed in April 2004. The summary of the results of these studies will be contained in the Seventh and final quarterly report.

Recommendations

Based on the decline and stabilization of the concentration of soil MeHg through a year of post-reflooding dry and wet seasons (**Figure 18**), we recommend that Cell 1 continue to operate in flow-through mode through the second consecutive dry season. This should ensure that the conditions continue to favor the depletion of factors limiting MeHg production and the accumulation of pore water sulfide to inhibitory levels while diluting incoming rainfall $Hg(II)^{+2}$ and any excess MeHg production.

TABLES

FL99

Collection End Date	Precip. Hg Conc. (ng/L)
09/03/02	23.23
09/10/02	11.64
09/17/02	11.62
09/24/02	6.61
10/01/02	6.60
10/15/02	6.90
10/22/02	8.20
10/29/02	1.42
11/05/02	1.94
11/12/02	13.30
11/19/02	6.40
11/26/02	2.10
12/03/02	5.00
12/10/02	7.10
12/17/02	6.80
12/23/02	7.40
12/31/02	2.07
01/07/03	19.80
01/14/03	13.90
01/21/03	2.84
01/28/03	4.69
02/04/03	3.70
02/11/03	8.70
02/18/03	18.30
02/25/03	7.40
03/04/03	10.70
03/11/03	13.30
03/18/03	10.30
03/25/03	6.60
04/01/03	18.00
04/08/03	8.34
04/15/03	9.20
04/22/03	16.60
04/29/03	9.90
05/06/03	13.60
05/13/03	1.74
05/20/03	22.20
05/27/03	15.20

FL99

Collection End Date	Precip. Hg Conc. (ng/L)
06/03/03	9.20
06/10/03	20.90
06/17/03	33.00
06/24/03	17.50
07/01/03	18.90
07/08/03	22.00
07/15/03	28.40
07/22/03	26.40
07/29/03	27.10
08/05/03	39.30
08/12/03	32.10
08/19/03	12.60
08/26/03	19.00
09/02/03	12.00
09/09/03	15.50
09/16/03	24.10
09/23/03	22.50
09/30/03	11.10
10/07/03	2.15
10/14/03	41.10
10/21/03	6.00
10/28/03	8.40
11/04/03	3.20
11/12/03	6.70
11/18/03	32.30
11/25/03	2.79
12/02/03	25.10
12/09/03	11.50
12/16/03	4.20
12/23/03	5.80
12/30/03	3.02
01/06/04	2.38
01/13/04	2.45
01/20/04	3.88
01/27/04	3.65

Table 2A. All Inflow and Outflow THg Data (all concentrations in units of ng/L)

THg	S6	G328	Inflow (G328B)	FILTER INFLOW G328B	RATIO	Cell 1 (G330A)	FILTER G330A	RATIO	G330B	C1A	Cell 2 (G332)	FiILTER Cell 2 (G332)	RATIO	Cell 3 (G334)	FILTER cell3 (G334)
10/4/01	0.00	0.7	1.2			-				1.2	-			-	
10/18/01			0.89			-				1.1	-			-	
11/1/01			0.69			-				0.87	-			-	
11/15/01			0.75			5.8				0.9	2			1.2	
11/29/01			0.34			9.5				-	1.6			-	
12/12/01			1.3			7.8				1.3	2.4			2.7	
12/27/01			0.5			-				-	1.8			1	
1/10/02	0.00	0.41	0.5			-				-	1.7			0.59	
1/24/02	-	-	1.4			-				-	3.1			2.1	
2/7/02	-	-	0.88			-				-	1.5			0.81	
2/21/02	-	-	1.7			3.7				1.9	2			2	
3/7/02	-	-	1.4			3.4				-	1.6			0.66	
3/21/02	-	-	1.2			2.6				-	1.9			1.2	
4/4/02		-	0.84			-				-	1.7			1.2	
4/18/02	0.00	0.79	0.73			5.3				-	1.8			1.2	
5/2/02	-	-	0.72			-				-	1.5			1.1	
5/16/02	-	-	0.69			-				-	1.4			1.1	
5/30/02	-	-	0.83			-				-	1.2			0.99	
6/12/02	-	-	0.94			-				-	2.4			1.6	
6/27/02	-	-	1.9			4.4			5.1	4.4	1.9			1.1	
7/11/02	0.00	1.2	2.4			4.1				3.7	1.5			0.74	
7/25/02	-	-	3.1			6.3				10	4.1			3.4	
8/7/02	-	-	1.5			-				1.2	3.3			1.3	
8/22/02	-	-	2	0.62	0.31	11	9.8	0.89		6.2	3.2			1.9	
9/5/02	-	-	1.6			12				1.5	1.7			1.1	
9/18/02	-	-	0.96	0.5	0.52	18				1.2	1.5	1	0.67	0.82	
10/3/02	-	-	0.53			9.2				1.8	2.2			0.7	
10/17/02	-	-	0.69	0.45	0.65	11				0.92	2			0.89	0.6
10/31/02	0.59	0.76	0.92			8.9				3	3.1			1.1	
11/14/02	-	-	0.61	0.4	0.66	8.1	6	0.74		0.74	1.8			0.9	
11/25/02	-	-	1.2			3.5			-	0.81	1.7			0.79	
12/12/02	-	-	0.92	0.53	0.58	3.3				0.68	0.99	0.76	0.77	0.51	
12/30/02	-	-	0.88			2.7				0.69	0.84			0.36	
1/9/03	-	-	0.55	0.29	0.53	2.9				0.74	0.69			0.43	0.41
1/23/03	0.62	0.69	0.74			2.3				14.8	0.61			0.66	
1/30/03	-	-	0.45			2.7				0.42	0.79			0.45	
2/5/03	-	-	2.3	0.53	0.23	3.8	3.5	0.92		0.6	1.2			0.79	
2/20/03	-	-	1.4	-		5.8	-			1.7	1.6	-		2.6	-
3/6/03	-	-	0.73	0.56	0.77	7.5	-			2.7	1.6	1	0.63	0.91	-
3/20/03	2.2	1.3	1.1	-		3.7	-			1	1.5	-		0.72	-
4/2/03			1.4	0.58	0.41	2.2	-			0.64	0.88	-		0.59	0.31
4/17/03	0.56	0.56	0.7	-		2.9	-			0.7	0.87	-		0.31	-
5/1/03	-	-	1.7	0.87	0.51	3.7	2.6	0.70		0.8	0.7	-		0.59	-
5/14/03	-	-	1	-		3.4	-			1.3	1.7	-		0.73	-
5/29/03	-	-	2.9	1.3	0.45	2.3	-			0.6	0.77	0.51	0.66	1.1	-
6/12/03	-	-	1.4	-		1.8	-			1.2	0.9	-		0.86	-
6/26/03	-	-	1.6	0.87	0.54	1.2	-			1.4	1.1	-		1.2	0.77
7/9/03	-	-		-		2.7	-			1.5	1.3	-		0.75	-
7/24/03	-	-	1.8	1	0.56	2.2	1.7	0.77		0.98	1.2	-		1.1	-
8/7/03	-	-	1.2	-		1.8	-			1	0.62	-		0.48	-
8/25/03	-	-	1.7	0.86	0.51	1.6	-			0.92	1	0.52	0.52	0.68	-
9/4/03	-	-	0.78	-		1.3	-			0.76	1.1	-		0.96	-
9/18/03	-	-	0.61	0.41	0.67	1.8	-			0.85	1.5	-		1	0.81
10/2/03	-	-	1.2	-		1.3	-			0.59	0.77	-		0.57	-
10/16/03	-	-	0.79	0.4	0.51	1.9	1.4	0.74		8.3	1.8	-		0.71	-
10/31/03	-	-	0.69	-		2.1	-			discontinued	1.8	-		0.81	-
11/13/03	-	-	1.5	0.38	0.25	1.6	-				1.4	0.97	0.69	0.49	-
11/25/03	0.31	0.07	0.41	-		1.3	-				0.92	-		0.52	-
12/11/03	-	-	0.48	0.24	0.50	1.1	-				0.81	-		0.66	0.43
12/23/03	-	-	0.66	-		0.95	-				0.64	-		0.39	-
1/8/04	-	-	0.5	0.37	0.74	1.4	0.89	0.64			0.92	-		0.56	-
1/22/04	0.63	0.75	0.69	-		1.6					0.92	-		0.75	-

Table 2B. All Inflow and Outflow MeHg Data (all concentrations in units of ng/L)

MeHg	S6	G328	Inflow (G328B)	FILTER INFLOW G328B	RATIO	Cell 1 (G330A)	FILTER G330A	RATIO	G330B	C1A	Cell 2 (G332)	FiILTER Cell 2 (G332)	RATIO	Cell 3 (G334)	FILTER cell3 (G334)
10/4/01	-	0.07	0.15			-				0.31	-			-	
10/18/01	-	-	0.13			-				0.37	-			-	
11/1/01	-	-	0.14			-				0.16	-			-	
11/15/01	-	-	0.12			3.5				0.43	0.73			0.32	
11/29/01	-	-	0.084			7.2				0.44	1			0.3	
12/12/01	-	-	0.061			2				0.55	0.7			0.82	
12/27/01	-	-	0.057			-				-	0.34			0.11	
1/10/02	-	0.059	0.035	-		-	-			-	0.24	-		0.032	-
1/24/02	-	-	0.092	-		-	-			-	0.71	-		0.25	-
2/7/02	-	-	0.081	-		-	-			-	0.35	-		0.11	-
2/21/02	-	-	0.13	-		1.4	-			0.59	0.22	-		0.15	-
3/7/02	-	-	0.087	-		1.2	-			-	0.34	-		0.17	-
3/21/02	-	-	0.18	-		1.2	-			-	0.76	-		0.33	-
4/4/02	-	-	0.061	-		F*	-			-	F*	-		F*	-
4/18/02	-	0.9	0.11	-		0.76	-			-	0.41	-		0.33	-
5/2/02	-	-	0.072	-		-	-			-	0.3	-		0.26	-
5/16/02	-	-	0.09	-		-	-			-	0.21	-		0.22	-
5/30/02	-	-	0.03	-		-	-			-	0.089	-		0.065	-
6/12/02	-	-	0.057	-		-	-			-	0.35	-		0.19	-
6/27/02	-	-	0.27	-		1.8	-		2.1	2.6	0.4	-		0.099	-
7/11/02	-	0.33	0.3	-		2.1	-		-	1.8	0.41	-		0.12	-
7/25/02	-	-	0.15	-		-	-		-	1.1	0.74	-		0.36	-
8/7/02	-	-	0.25	-		-	-		-	0.32	1.2	-		0.24	-
8/22/02	-	-	0.12	0.13	**1.08**	7.6	7.2	0.95		0.82	1	-		0.21	-
9/5/02	-	-	0.15	-		8.4	-			0.39	0.38	-		0.14	-
9/19/02	-	-	0.13	0.13	**1.00**	12	-			0.96	0.87	0.72	0.83	0.31	-
10/3/02	-	-	0.092	-		7.8	-			0.75	1.2	-		0.15	-
10/17/02	-	-	0.048	0.042	0.88	5.8	-			0.26	1.1	-		0.08	0.11
10/31/02	0.13	0.086	0.057	-		4.2	-			0.26	1	-		0.15	-
11/14/02	-	-	0.076	0.065	0.86	2.3	2.2	0.96		0.17	0.55	-		0.098	-
11/26/02	-	-	0.081	-		0.76	-			0.088	0.17	-		0.07	-
12/12/02	-	-	0.12	0.085	0.71	1.6	-			0.062	0.16	0.11	0.69	0.087	-
12/30/02	-	-	0.023	-		0.98	-			0.14	0.14	-		0.077	-
1/9/03	-	-	0.062	0.064	**1.03**	1.1	-			0.096	0.092	-		0.067	0.057
1/23/03	0.056	0.039		-		0.72	-			0.05	0.048	-		0.05	-
1/30/03	-	-	0.032	-		0.97	-			0.068	0.035	-		0.041	-
2/5/03	-	-	0.038	0.034	0.89	2	1.7	0.85		0.1	0.11	-		0.11	-
2/20/03	-	-	0.07	-		4	-			0.9	0.56	-		0.86	-
3/6/03	-	-	0.12	0.12	**1.00**	5.4	-			1.3	0.92	0.63	0.68	0.35	-
3/20/03	0.14	0.22	0.16	-		1.8	-			0.4	0.48	-		0.12	-
4/2/03	-	-	0.18	0.17	0.94	0.82	-			0.14	0.14	-		0.081	0.064
4/17/03	0.053	0.27	0.15	-		1.5	-			0.14	0.36	-		0.1	-
5/1/03	-	-	0.2	0.16	0.80	1.5	1.2	0.80		0.16	0.14	-		0.096	-
5/14/03	-	-	0.10	-		1.40	-			0.14	0.58	-		0.12	-
5/29/03	-	-	0.17	0.14	0.82	0.7	-			0.049	0.12	0.093	0.78	0.071	-
6/12/03	-	-	0.21	-		0.38	-			0.15	0.088	-		0.092	-
6/26/03	-	-	0.24	0.22	0.92	0.086	-			0.14	0.096	-		0.16	0.37
7/9/03	0.12	0.14	0.079	-		1.3	-			0.32	0.48	-		0.22	-
7/24/03	-	-	0.12	0.13	**1.08**	0.43	0.37	0.86		0.08	0.2	-		0.17	-
8/5/03	-	-	0.21	-		0.2	-			0.12	0.033	-		0.046	-
8/25/03	-	-	0.18	0.21	**1.17**	0.22	-			0.08	0.054	0.058	**1.07**	0.065	-
9/4/03	-	-	0.1	-		0.14	-			0.096	0.12	-		0.15	-
9/18/03	-	-	0.09	0.087	0.97	0.46	-				0.3	-		0.14	0.14
10/2/03	-	-	0.21	-		0.15	-			0.032	0.05	-		0.43	-
10/16/03	-	-	0.086	0.099	**1.15**	0.98	0.94	0.96		0.07	1.2	-		0.16	-
10/29/03	-	-	0.059	-		0.85	-			discontinued	0.88	-		0.077	-
11/13/03	-	-	0.095	0.072	0.76	0.43	-			-	0.53	0.47	0.89	0.1	-
11/25/03	0.089	0.07	0.051	-		0.33	-			-	0.32	-		0.093	-
12/11/03	-	-	0.039	0.048	**1.23**	0.19	-			-	0.14	-		0.056	0.05
12/23/03	-	-	0.038	-		0.12	-			-	0.056	-		0.14	-
1/8/04	-	-	0.042	0.036	0.86	0.28	0.24	0.86		-	0.24	-		0.059	-
1/22/04	0,075	0.064	0.054	-		0.25	-			-	0.13	-		0.1	-
flagged means	0.10	0.23	0.12	0.12		1.97	2.27			0.42	0.42	0.35		0.17	0.15

Table 2C. Interior Cell (Experimental) THg and MeHg Data (all concentrations in units of ng/L)

THg	C1AA	C1AA Filtered	Ratio	STA2 C1BB	C1BB Filtered	Ratio	STA2 C1CC	C1CC Filtered	Rati	STA2 C2A	C2A Filtered	Ratio	STA2 C2B	C2B Filtered	Ratio	STA2 C2C	C2C filtered	Ratio
Aug-02	7.6	5.6	0.74	16.00	8.10	0.51	32.00	24	##		3.4			2.1			0.71	
Sep-02		2.7			4.2			12		2.6	2	0.77	2.1	2.1	1.00	1.5	1.1	0.73
Oct-02		0.99			1.6			5			1.3			1.4			0.87	
Nov-02	0.98	0.8	0.82	1.8	1.4	0.78	4	3	##		1.2			0.95			0.67	
Dec-02		0.61			0.92			2.9		1.2	1.1	0.92	1.2	1	0.83	0.59	0.52	0.88
Jan-03		0.87			0.88			2.2			0.7			0.78			0.18	
Feb-03	0.76	0.65	0.86	1.5	0.98	0.65	2.9	2.4	##		0.8			0.78			0.68	
Mar-03		2.2			3.5			4.6		1.8	1.4	0.78	1.8	1	0.56	1.3	1.2	0.92
Apr-03		0.6			0.7			1.4			0.61			0.53			0.48	
May-03	0.86	0.85	0.99	1.1	0.91	0.83	2.1	2	##		0.79			0.85			0.5	
May-03		2.7			3.7			2.6		2.8	2.6	0.93	3	2.7	0.90	2.6	2.5	0.96
Jun-03		0.92			0.84			1.2			0.96			0.85			0.71	
Jul-03	0.85	0.62	0.73	1.1	1	0.91	1.1	1.1	##		1			0.81			0.64	
Aug-03		0.81			0.74			1.2		1.7	1.1	0.65	1.2	0.6	0.50	0.86	0.69	0.80
Sep-03		0.54			0.61			1.3			1.1			0.7			1	
Oct-03	1	0.84	0.84	2.70	1.5	0.56	2.1	1.7	##		1			1.1			1.4	
Nov-03		0.34			0.49			0.62		1.3	1.1	0.85	0.9	0.64	0.71	0.69	0.43	0.62
Dec-03		0.41			0.67			0.8			0.7			0.41			0.39	
Jan-04	0.85	0.67	0.79	1.00	0.83	0.83	1.2	1	##		0.54			0.82			0.64	
	last updated 3/01/04																	
MHG			**Ratio**			**Ratio**			**Ratio**			**Ratio**			**Ratio**			**Ratio**
Aug-02	2.6	2.7	1.04	8.6	7.4	0.86	20	20	##		0.57			0.33			0.034	
Sep-02	-	2			3.5			7.8		0.68	0.69	1.01	0.7	0.76	1.09	0.2	0.18	0.90
Oct-02	-	0.24			0.57			2			0.22			0.16			0.13	
Nov-02	0.26	0.25	0.96	0.64	0.59	0.92	1.1	1	##		0.17			0.18			0.17	
Dec-02	-	0.064			0.16			0.81		0.085	0.099	1.16	0.17	0.15	0.88	0.03	0.024	0.80
Jan-03	-	0.12			0.19			0.41			0.065			0.1			0.051	
Feb-03	0.12	0.12	1.00	0.46	0.41	0.89	1.1	1.1	##		0.07			0.074			0.058	
Mar-03		1.1			1.5			2.4		0.83	0.64	0.77	0.86	0.62	0.72	0.64	0.44	0.69
Apr-03		0.1			0.19			0.31			0.18			0.1			0.091	
May-03	0.14	0.12	0.86	0.26	0.18	0.69	0.59	0.51	##		0.18			0.13			0.011	
May-03		0.041			0.12			0.32		0.14	0.12	0.86	0.087	0.14	1.61	0.011	0.011	1.00
Jun-03		0.011			0.079			0.11			0.13			0.088			0.011	
Jul-03	0.076	0.067	0.88	0.21	0.22	1.05	0.17	0.15	##		0.13			0.14			0.085	
Aug-03		0.046			0.052			0.29		0.33	0.36	1.09	0.16	0.14	0.88	0.12	0.071	0.59
Sep-03		0.11			0.038			0.19			0.35			0.18			0.12	
Oct-03	0.2	0.21	1.05	0.33	0.43	1.30	0.062	0.062	##		0.24			0.43			0.35	
Nov-03		0.14			0.11			0.27		0.14	0.12	0.86	0.21	0.12	0.57	0.14	0.15	1.07
Dec-03		0.053			0.086			0.12			0.047			0.056			0.067	
Jan-04	0.2	0.18	0.90	0.2	0.16	0.80	0.23	0.22	##		0.063			0.063			0.11	

Table 3. All Soil THg and MeHg Data (all concentrations in mg/Kg dry wt)

STATION_ID	DATE	BD	TCA	TFE	TMG	TMN	THG	MEHG	TN	%ASH	TP	MOIST	TS
STA2S1	4/21/99						0.0408	0.0004					
STA2S2	4/21/99						0.0866	0.0032					
STA2S3	4/21/99						0.0718	0.0002					
STA2S4	4/21/99						0.1034	0.0019					
STA2S5	4/21/99						0.1025	0.0026					
STA2S6	4/21/99						0.1388	0.005					
STA2C1C	12/14/00	0.19										81.73	
STA2C1C	12/14/00			2400						16.4			5200
STA2C1C	12/14/00						0.0971	0.0014					
STA2C1B	12/14/00	0.16										85.55	
STA2C1B	12/14/00			1800						13.1			7000
STA2C1B	12/14/00						0.168	0.0032					
STA2C1A	12/14/00	0.22										79.74	
STA2C1A	12/14/00			1300						18.9			4800
STA2C1A	12/14/00						0.143	0.0094					
STA2C1A	12/14/00	0.2										78.41	
STA2C1A	12/14/00			1300						15.1			4900
STA2C1A	12/14/00						0.116	0.004					
STA2C2A	12/19/00	0.17										81.04	
STA2C2A	12/19/00			2800						16.5			5000
STA2C2A	12/19/00						0.139	0.0011					
STA2C2A	12/19/00	0.18										81.48	
STA2C2A	12/19/00			2500						15.4			3800
STA2C2A	12/19/00						0.131	0.0009					
STA2C2B	12/19/00	0.23										83.56	
STA2C2B	12/19/00			3700						27.3			4000
STA2C2B	12/19/00						0.122	0.0021					
STA2C2C	12/19/00	0.25										76.36	
STA2C2C	12/19/00			2300						15.1			2600
STA2C2C	12/19/00						0.09	0.0014					
STA2S2	12/19/00	0.2										78.89	
STA2S2	12/19/00			3000						16.6			4000
STA2S2	12/19/00						0.106	0.0016					
STA2C1A	4/29/02						0.137	0.0053					
STA2C2A	4/29/02						0.0691	0.0003					
STA2C2C	4/29/02						0.0673	0.0006					
STA2C3A	4/29/02						0.126	0.0005					
STA2C3C	4/29/02						0.113	0.0005					
STA2C3D	4/29/02						0.0336	0.0003					
STA2C1AA	5/16/02						0.125	0.003					
STA2C1AA	5/16/02	0.104	33000	2200	4100	89			33000	11.8	606	77.66	9200
STA2C1AA	5/16/02												
STA2C1BB	5/16/02						0.216	0.0067					
STA2C1BB	5/16/02	0.158	30000	1200	4100	130			32500	12.2	432	78.55	8200
STA2C1BB	5/16/02												
STA2C1CC	5/16/02						0.188	0.0055					
STA2C1CC	5/16/02	0.157	30000	1500	4000	80			32600	10.5	452	69.21	6100
STA2C1CC	5/16/02												
STA2C2C	5/16/02						0.113	0.0011					
STA2C2C	5/16/02	0.236	37000	2700	4100	190			30000	13	496	77.54	3800
STA2C2C	5/16/02												
STA2C2B	5/21/02						0.099	0.0006					
STA2C2B	5/21/02	0.213							31900	12	634	75.26	3700
STA2C2B	5/21/02												
STA2C2A	5/21/02						0.0996	0.0005					
STA2C2A	5/21/02	0.218	47000	2300	4100	160			30500	14.2	496	76.59	4100
STA2C2A	5/21/02												
STA2C3A	5/21/02						0.0599	-5E-05					
STA2C3A	5/21/02	0.22	35000	2300	5800	220			27800	13.2	518	67.25	6000
STA2C3A	5/21/02												
STA2C3B	5/21/02						0.0531	0.0002					
STA2C3B	5/21/02	0.215	37000	2600	6500	55			35300	12	366	69.86	5500
STA2C3B	5/21/02												
STA2C3C	5/21/02						0.0805	0.0003					
STA2C3C	5/21/02	0.318	43000	3200	4000	140			27300	15	564	67.3	3000
STA2C3C	5/21/02												

STATION_ID	DATE	BD	TCA	TFE	TMG	TMN	THG	MEHG	TN	%ASH	TP	MOIST	TS
STA2C1C	8/14/02						0.148	0.0122					
STA2C1C	8/14/02	0.2	39000	1700	4800	120			28900	14.9	362	80.93	4400
STA2C1CC	8/14/02						0.151	0.009					
STA2C1CC	8/14/02	0.19	31000	1500	4000	110			30100	12.2	414	79.52	4000
STA2C1BB	8/14/02						0.147	0.0146					
STA2C1BB	8/14/02	0.12	29000	830	3500	82			30900	10.7	378	86.21	4900
STA2C1AA	8/14/02						0.129	0.005					
STA2C1AA	8/14/02	0.16	30000	1800	3400	73			35400	13.3	408	81.19	7200
STA2C2A	8/14/02	0.19	41000	4100	3800	340			31700	20.3	690	78.51	3800
STA2C2A	8/14/02						0.0776	0.0009					
STA2C2B	8/14/02						0.098	0.0006					
STA2C2B	8/14/02	0.2	42000	2100	3500	240			29200	16	478	78.61	3100
STA2C3A	8/20/02						0.0838	0.0002					
STA2C3A	8/20/02	0.17	49000	1700	6700	82			27200	18.8	366	74.7	4200
STA2C3B	8/20/02						0.0428	0.0011					
STA2C3B	8/20/02	0.15	49000	2300	6200	72			26400	18	420	79.66	3300
STA2C3C	8/20/02						0.0801	0.0002					
STA2C3C	8/20/02	0.26	44000	2500	6000	88			26600	18.5	558	68.99	3000
STA2C1C	8/28/02						0.1	0.0018					
STA2C1C	8/28/02	0.11	36000	1600	4000	180			31500	14.3	426	79.37	5200
STA2C2C	8/28/02						0.086	0.0003					
STA2C2C	8/28/02	0.14	36000	2400	3900	120			23300	28.9	392	74.13	3300
STA2C1C	9/11/02						0.203	0.0096					
STA2C1C	9/11/02	0.18	32000	1300	4200	110			31500	13.8	464	77.82	4700
STA2C1C	10/9/02						0.111	0.0007					
STA2C1C	10/9/02	0.183	40000	2100	4500	220			32100	16.7	410	80.81	3800
STA2C1AA	11/6/02						0.108	0.0007					
STA2C1AA	11/6/02	0.13	31000	1300	3600	89			31000	13.2	578	82.52	7200
STA2C1BB	11/6/02						0.172	0.0034					
STA2C1BB	11/6/02	0.14	27000	1400	3500	160			32000	12.4	512	82.37	6400
STA2C1CC	11/6/02						0.187	0.0058					
STA2C1CC	11/6/02	0.19	29000	3600	4300	120			25900	27.2	552	79.76	6400
STA2C2A	11/6/02						0.075	0.0008					
STA2C2A	11/6/02	0.14	36000	2200	4000	200			29500	16.5	492	85.25	6700
STA2C2B	11/6/02						0.055	0.0003					
STA2C2B	11/6/02	0.12	49000	1700	3900	200			28200	18.2	1250	87.15	6000
STA2C2C	11/6/02						0.041	0.0003					
STA2C2C	11/6/02	0.14	60000	1600	4600	160			26900	22.4	688	86.11	5000
STA2C3A	11/6/02						0.033	5E-05					
STA2C3A	11/6/02	0.2	96000	2000	6600	140			21200	35.9	802	78.95	4300
STA2C3B	11/6/02						0.079	0.0001					
STA2C3B	11/6/02	0.18	47000	3300	6500	51			25300	29	342	81.41	5200
STA2C3C	11/6/02						0.076	0.0002					
STA2C3C	11/6/02	0.26	47000	2600	7200	89			26100	19.9	636	75.26	4700
STA2C1C	12/4/02						0.112	0.0008					
STA2C1C	12/4/02	0.13	39000	1300	4900	170			30200	15.8	440	84.22	5800
STA2C1AA	1/29/03						0.1366	0.0016					
STA2C1AA	1/29/03	0.15	33000	2400	3700	120			34200	15.7	714	85.11	1E+05
STA2C1BB	1/29/03						0.1748	0.0026					
STA2C1BB	1/29/03	0.15	30000	1500	4000	110			31600	12.9	376	84.51	4900
STA2C1CC	1/29/03						0.1956	0.0073					
STA2C1CC	1/29/03	0.18	28000	1700	3800	70			31700	12.4	646	81.3	9200
STA2C2A	1/29/03						0.1162	0.0016					
STA2C2A	1/29/03	0.16	39000	2900	4200	220			31300	17.7	624	84.38	7800
STA2C2B	1/29/03						0.123	0.0003					
STA2C2B	1/29/03	0.16	46000	2000	3800	270			30200	17.9	648	83.66	6100
STA2C2C	1/29/03						0.0786	0.0006					
STA2C2C	1/29/03	0.18	42000	2800	3600	190			30400	18.9	608	83.4	7400
STA2C3A	1/29/03						0.0557	6E-05					
STA2C3A	1/29/03	0.2	93000	2200	7500	180			22800	35.1	762	79.89	3900
STA2C3B	1/29/03						0.0851	0.0005					
STA2C3B	1/29/03	0.17	63000	2400	6600	58			25400	22.6	398	81.55	3600
STA2C3C	1/29/03						0.0843	0.0002					
STA2C3C	1/29/03	0.29	63000	3600	6100	110			26500	23.7	750	74.97	3800

STATION_ID	DATE	BD	TCA	TFE	TMG	TMN	THG	MEHG	TN	%ASH	TP	MOIST	TS
STA2C1C	3/26/03						0.151	0.0004					
STA2C1C	3/26/03	0.19	46000	2500	4400	200			29200	18.8	506	82.13	7800
STA2C1AA	4/23/03						0.124	0.0007					
STA2C1AA	4/23/03	0.13	31000	1900	3900	86			33600	15.3	610	86.47	10500
STA2C1BB	4/23/03						0.128	0.0013					
STA2C1BB	4/23/03	0.13	29000	1900	3800	150			31400	15	530	84.86	9200
STA2C1CC	4/23/03						0.184	0.001					
STA2C1CC	4/23/03	0.15	29000	1900	3700	81			31900	12.7	585	82.78	9300
STA2C2A	4/23/03						0.084	0.0009					
STA2C2A	4/23/03	0.12	38000	2200	4000	150			30000	16.9	460	87.16	5700
STA2C2B	4/23/03						0.102	0.0004					
STA2C2B	4/23/03	0.17	35000	3400	3900	250			29400	19.9	635	82.48	4300
STA2C2C	4/23/03						0.075	0.0003					
STA2C2C	4/23/03	0.19	41000	2400	3800	130			30200	18.4	650	82.19	7400
STA2C3A	4/23/03						0.046	4E-05					
STA2C3A	4/23/03	0.14	120000	2100	7500	140			32400	44.3	740	86.36	2400
STA2C3B	4/23/03						0.039	0.0002					
STA2C3B	4/23/03	0.16	42000	2000	6400	31			16600	17.6	320	81.43	3400
STA2C3C	4/23/03						0.026	0.0004					
STA2C3C	4/23/03	0.2	51000	2900	6100	58			25000	25.3	575	80.41	7100
STA2C1AA	7/16/03						1.2	0.0004					
STA2C1AA	7/16/03	0.13	31000	1600	3300	83			33700	14.8	496	85.48	9600
STA2C1BB	7/16/03						1.26	0.0007					
STA2C1BB	7/16/03	0.13	29000	1400	3800	110			29500	13.4	516	84.01	9100
STA2C1CC	7/16/03						1.08	0.0007					
STA2C1CC	7/16/03	0.13	29000	1600	3500	80			29700	12.3	752	84.35	7400
STA2C2A	7/16/03						0.563	0.0004					
STA2C2A	7/16/03	0.15	36000	2300	3900	170			30500	15.6	412	83.97	6300
STA2C2B	7/16/03						0.5	0.0002					
STA2C2B	7/16/03	0.25	41000	2300	3200	210			30100	15.8	418	74.79	4400
STA2C2C	7/16/03						0.484	0.0001					
STA2C2C	7/16/03	0.18	42000	1900	4200	110			28400	16.6	468	81.19	5500
STA2C3A	7/16/03						0.346	7E-05					
STA2C3A	7/16/03	0.12	88000	1700	5800	140			22100	32.9	672	79.72	5900
STA2C3B	7/16/03						0.28	0.0001					
STA2C3B	7/16/03	0.2	66000	3800	6600	49			22300	34.1	372	79.18	6400
STA2C3C	7/16/03						0.306	9E-05					
STA2C3C	7/16/03	0.24	49000	2500	5500	73			25500	21.7	616	73.03	6400
STA2C1AA	10/6/03						0.137	0.0008					
STA2C1AA	10/6/03	0.079	38000	2500	4300	90			31500	17.8	1100	90.91	14300
STA2C1BB	10/6/03						0.129	0.0006					
STA2C1BB	10/6/03	0.11	34000	2100	3700	170			33900	14.9	524	86.3	12600
STA2C1CC	10/7/03						0.196	0.0009					
STA2C1CC	10/7/03	0.064	65000	1700	4500	130			24700	22.9	802	93.33	8500
STA2C1C	10/7/03						0.097	0.0006					
STA2C1C	10/7/03	0.085	94000	3200	8900	120			23800	35.8	466	91.69	8000
STA2C2A	10/8/03						0.091	0.0004					
STA2C2A	10/8/03	0.14	38000	2600	4100	200			32100	17.8	496	86.33	9000
STA2C2B	10/8/03						0.098	0.0003					
STA2C2B	10/8/03	0.14	35000	2000	3500	220			30700	13.7	620	85.91	8900
STA2C2C	10/9/03						0.099	0.0004					
STA2C2C	10/9/03	0.1	46000	2100	4300	110			31200	19.6	682	89.24	8700
STA2C3A	10/9/03						0.058	0.0002					
STA2C3A	10/9/03	0.16	65000	2000	6200	210			19500	45.8	828	84.28	6100
STA2C3B	10/10/03						0.059	0.0001					
STA2C3B	10/10/03	0.19	65000	3100	7000	56			18400	53.2	376	81.71	2800
STA2C3C	10/10/03						0.035	5E-05					
STA2C3C	10/10/03	0.097	220000	1100	8300	52			12600	68.3	580	89.15	1200

STATION_ID	DATE	BD	TCA	TFE	TMG	TMN	THG	MEHG	TN	%ASH	TP	MOIST	TS
STA2C1AA	11/4/03						0.117	0.0003					
STA2C1AA	11/4/03	0.13	35000	1800	4700	73			32300	16.3	478	86.56	10300
STA2C1BB	11/4/03						0.145	0.001					
STA2C1BB	11/4/03	0.11	37000	1500	4700	150			31800	16	542	89.28	11600
STA2C1CC	11/5/03						0.138	0.0008					
STA2C1CC	11/5/03	0.12	42000	2300	4600	190			31100	17.3	484	88.39	10400
STA2C2A	11/5/03						0.096	0.0004					
STA2C2A	11/5/03	0.1	45000	1500	4600	120			29900	17.4	700	89.3	11000
STA2C2B	11/7/03						0.106	0.0003					
STA2C2B	11/7/03	0.2	22000	2100	4800	210			30300	14.2	514	79.38	9400
STA2C2C	11/7/03						0.043	0.0002					
STA2C2C	11/7/03	0.086	43000	1700	4500	120			28800	18.9	636	91.33	8700
STA2C3A	11/7/03						0.056	4E-05					
STA2C3A	11/7/03	0.16	84000	2200	7900	150			22200	35.3	728	84.58	8400
STA2C3B	11/11/03						0.095	0.0001					
STA2C3B	11/11/03	0.18	82000	2200	6200	68			24700	27.2	366	82.71	5200
STA2C3C	11/11/03						0.08	0.0001					
STA2C3C	11/11/03	0.2	71000	2400	6800	61			25800	23.6	552	80.79	9300
STA2C1C	11/11/03						0.073	0.0004					
STA2C1C	11/11/03	0.095	94000	2400	9100	120			22500	39	508	90.8	5000
STA2C1AA	12/1/03						0.136	0.0003					
STA2C1AA	12/1/03	0.11	45000	1800	4400	84			31400	17	915	89.3	7400
STA2C1BB	12/1/03						0.165	0.0008					
STA2C1BB	12/1/03	0.13	31000	1100	4000	130			31400	13.6	485	86.04	8100
STA2C1CC	12/2/03						0.156	0.001					
STA2C1CC	12/2/03	0.13	31000	1500	4100	89			30700	15.2	660	87.47	5700
STA2C1C	12/2/03						0.089	0.0003					
STA2C1C	12/2/03	0.059	150000	2700	20000	130			20000	44.5	565	93.88	2800
STA2C2B	12/3/03						0.119	0.0003					
STA2C2B	12/3/03	0.14	34000	1500	3800	140			28100	12.4	735	86.23	6100
STA2C2C	12/3/03						0.069	0.0001					
STA2C2C	12/3/03	0.043	54000	1600	5000	78			33000	23.1	1280	95.29	6500
STA2C2A	12/3/03						0.104	0.0005					
STA2C2A	12/3/03	0.13	43000	2500	4400	220			31800	17.4	495	85.94	5800
STA2C3A	12/4/03						0.073	6E-05					
STA2C3A	12/4/03	0.23	75000	1900	6800	160			24100	32	780	74.82	3200
STA2C3B	12/4/03						0.068	0.0001					
STA2C3B	12/4/03	0.19	91000	2100	6600	56			24600	31	420	81.94	2900
STA2C3C	12/4/03						0.077	0.0001					
STA2C3C	12/4/03	0.19	63000	2100	5900	65			26100	24.7	615	81.68	3500
STA2C1AA	12/29/03						0.128	0.0006					
STA2C1AA	12/29/03	0.1	52000	2000	4300	89			30700	20.3	926	89.33	6900
STA2C1BB	12/29/03						0.12	0.0009					
STA2C1BB	12/29/03	0.13	35000	1800	4100	160			32200	15.8	532	86.46	11000
STA2C1CC	12/29/03						0.175	0.0016					
STA2C1CC	12/29/03	0.15	37000	1600	4000	98			30700	14.2	656	83.9	10200
STA2C1C	12/30/03						0.102	0.0007					
STA2C1C	12/30/03	0.16	160000	3500	11000	160			18100	51.4	596	83.55	2400
STA2C2A	1/5/2004 1						0.093	0.0009					
STA2C2A	1/5/2004 1	0.13	43000	2200	4100	110			30900	15.8	348	85.77	4400
STA2C2B	1/5/2004 1						0.113	0.0001					
STA2C2B	1/5/2004 1	0.12	34000	2800	4200	180			30700	17.8	682	87.57	9100
STA2C2C	1/5/2004 1						0.105	0.0003					
STA2C2C	1/5/2004 1	0.13	46000	1900	3800	48			28700	15.4	416	86.37	2900
STA2C3A	1/6/2004 9						0.044	1E-04					
STA2C3A	1/6/2004 1	0.25	190000	2000	6600	160			24500	33.1	832	73.91	3400
STA2C3B	1/6/2004 1						0.052	0.0007					
STA2C3B	1/6/2004 1	0.2	61000	2700	6600	55			21100	43.2	446	81.24	2200
STA2C3C	1/6/2004 1						0.058	0.0001					
STA2C3C	1/6/2004 1	0.18	70000	2500	6500	61			26900	26.5	682	81.53	3700

Table 4. Mosquitofish THg Data for the Period of Record (all concentrations in mg/Kg wet wt)

	G328B inflow	G335 outflow	C1A	C1AA	C1BB	C1CC	C1X	C2A	C2B	C2C	C3A	C3B	C3C
10/15/01	0.021	0.248	0.109				0.312	0.069			0.013		
11/15/01			0.021										
12/12/01			0.018										
2/21/02			0.186										
3/14/02	0.014	0.242	0.172				0.285	0.045			0.018		
4/18/02			0.154										
7/11/02			0.072										
Aug-02			0.197	0.107	0.33	0.213		0.056	0.063	0.032	0.0097	0.011	0.028
Sep-02			0.147	0.107	0.43	0.39		0.079	0.046	0.023	0.012	0.021	0.031
Oct-02	0.004	0.167	0.079	0.087	0.257	0.397		0.031	0.022	0.013	0.004	0.008	0.016
Nov-02			0.137	0.12666667	0.277	0.237		0.028	0.027	0.019	0.006	0.018	0.016
Dec-03			0.076	0.110	0.243	0.190		0.034	0.017	0.011	0.004	0.014	0.016
Jan-03			0.063	0.037	0.117	0.120		0.037	0.025	0.014	0.006	0.013	0.020
Feb-03			0.095	0.065	0.157	0.153		0.032	0.018	0.009	0.002	0.011	0.013
Mar-03	0.0037	0.064	0.040	0.053	0.092	0.16	0.1	0.032	0.023	0.011	0.006	0.018	0.020
Apr-03			0.062	0.048	0.113	0.113		0.036	0.032	0.017	0.007	0.018	0.022
May-03			0.053	0.041	0.099	0.163		0.032	0.013	0.011	0.006	0.019	0.018
Jun-03			0.077	0.048	0.153	0.193		0.026	0.013	0.008	0.006	0.014	0.017
02-Jul-03			0.034	0.024	0.076	0.117		0.024	0.007	0.005	0.004	0.006	0.010
30-Jul-03				0.039	0.053	0.093		0.015	0.004	0.004	0.004	0.008	0.010
Aug-03			0.032	0.029	0.053	0.103		0.013	0.008	0.005	0.004	0.008	0.007
Sep-03				0.010	0.024	0.042		0.0054	0.0032	0.0026	0.0029	0.0052	0.0193
11-Sep-03	0.0050	0.0077	0.0103				0.0513				0.0051		
Oct-03			0.0450	0.004	0.037	0.022		0.007	0.004	0.003	0.0078	0.0061	0.011
Nov-03			0.0127	0.0078	0.012	0.012		0.0064	0.0029	0.0034	0.0038	0.0028	0.0070
Dec-03			0.0233	0.0093	0.0089	0.0147		0.006	0.004	0.0038	0.005133	0.013	0.016333
Jan-04			0.0293	0.003	0.022	0.010		0.006	0.003	0.004	0.008	0.008	0.019

Table 5. Routine Pore Water Sampling Results for Period of Record from 08/03 through 01/04

STATION_ID	DATE	TCA	DOC	CL	DEPTH	DO	HARD	TFE	TMG	TMN	THG	MeHg	pH	SPCON	SULFATE	TEMP
STA2C1AA	09/30/03				0.96						1.95		8.04			
STA2C1AA	09/30/03				0.96								8.04			
STA2C1AA	09/30/03											0.03				
STA2C1BB	09/30/03				0.84								7.49			
STA2C1BB	09/30/03											0.011				
STA2C1BB	09/30/03				0.84						2.13		7.49			
STA2C1CC	09/30/03				0.94						3.46		7.93			
STA2C1CC	09/30/03				0.94							0.088	7.93			
STA2C2A	10/01/03				0.87						2.16		8.07			
STA2C2A	10/01/03				0.87								8.07			
STA2C2A	10/01/03											0.066				
STA2C2B	10/01/03				0.77								8.21			
STA2C2B	10/01/03											0.061				
STA2C2B	10/01/03				0.77						1.68		8.21			
STA2C2C	10/02/03				0.81						2.8		7.84			
STA2C2C	10/02/03				0.81								7.84			
STA2C2C	10/02/03											0.029				
STA2C3A	10/02/03				0.79						1.16		8.09			
STA2C3A	10/02/03				0.79								8.09			
STA2C3A	10/02/03											0.021				
STA2C3B	10/03/03				0.61								7.99			
STA2C3B	10/03/03											0.035				
STA2C3B	10/03/03				0.61						1.63		7.99			
STA2C3C	10/03/03				0.57						3.17		7.71			
STA2C3C	10/03/03				0.57								7.71			
STA2C3C	10/03/03											0.074				

Table 5. Pore Water Sampling Results for Period of Record from 08/03 through 01/04 (continued)

STATION_ID	DATE	TCA	DOC	CL	DEPTH	DO	HARD	TFE	TMG	TMN	THG	MeHg	pH	SPCON	SULFATE	TEMP
STA2C1AA	10/06/03	122	49	202	0.67	0.49	500	33	45.6	24.4			7.37	1529	120	25.9
STA2C1AA	10/06/03										0.34					
STA2C1AA	10/06/03											-0.001				
STA2C1AA	10/06/03		1													
STA2C1AA	10/06/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1AA	10/06/03				0.67						2.52					
STA2C1AA	10/06/03				0.67							0.33				
STA2C1AA	10/06/03	122	51	198	0.67		500	17	45.6	47.4			7.32		101	
STA2C1AA	10/06/03															
STA2C1BB	10/06/03	115	47	212	0.57	2.09	500		44.2	14.7			7.42	1497	115	26.6
STA2C1BB	10/06/03							9								
STA2C1BB	10/06/03				0.87						0.86					
STA2C1BB	10/06/03				0.57											
STA2C1BB	10/06/03											0.04				
STA2C1BB	10/06/03	113	48	206	0.57		400		42.6	69.5			7.28		106	
STA2C1BB	10/06/03							7								
STA2C1BB	10/06/03															
STA2C1BB	10/06/03										0.31					
STA2C1BB	10/06/03											-0.001				
STA2C1BB	10/06/03		1													
STA2C1BB	10/06/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1CC	10/07/03	103	44	197	0.64	0.16	400	13	40.2	54.2			7.36	1419	87.7	26.3
STA2C1CC	10/07/03															
STA2C1CC	10/07/03										-0.123					
STA2C1CC	10/07/03											-0.006				
STA2C1CC	10/07/03		1													
STA2C1CC	10/07/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1CC	10/07/03				0.64						2.45					
STA2C1CC	10/07/03				0.64							0.381				
STA2C1CC	10/07/03	106	52	195	0.64		400	26	39.8	108			7.1		70.9	
STA2C1CC	10/07/03															
STA2C2A	10/08/03	117	46	209	0.57	0.2	500	17	43.6	27.5			7.4	1548	102	24.8
STA2C2A	10/08/03															
STA2C2A	10/08/03										-0.03					
STA2C2A	10/08/03											-0.009				
STA2C2A	10/08/03		2							0.2						
STA2C2A	10/08/03	-0.2					-0.1	-3	-0.1							
STA2C2A	10/08/03			1.2											0.6	
STA2C2A	10/08/03				0.57						2.15					
STA2C2A	10/08/03				0.57							0.134				
STA2C2A	10/08/03	173	91	185			600	437	53.1	335			6.72		9	
STA2C2A	10/08/03															
STA2C2B	10/08/03	107	44	197	0.59	0.31	400	13	40.5	83			7.34	1438	88.8	25.3
STA2C2B	10/08/03															
STA2C2B	10/08/03				0.59						0.85					
STA2C2B	10/08/03				0.59							0.078				
STA2C2B	10/08/03	112	48	196			400	52	39	152			7.21		81.3	
STA2C2B	10/08/03															
STA2C2B	10/08/03										-0.107					
STA2C2B	10/08/03											-0.009				
STA2C2B	10/08/03		1													
STA2C2B	10/08/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C2C	10/09/03	112	48	208	0.67	0.09	500	22	44	25.4			7.43	1533	111	25.3
STA2C2C	10/09/03															
STA2C2C	10/09/03										0.18					
STA2C2C	10/09/03											-0.009				
STA2C2C	10/09/03		2													
STA2C2C	10/09/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C2C	10/09/03				0.67						3.75					
STA2C2C	10/09/03				0.67							0.449				
STA2C2C	10/09/03	116	50	198	0.67		500		43.3	47.6			7.07		68	
STA2C2C	10/09/03							12								
STA2C2C	10/09/03															
STA2C3A	10/09/03	107	47	210	0.85	6.4	500	18	46.9	2			7.85	1544	126	26.8
STA2C3A	10/09/03				0.85						1.47					
STA2C3A	10/09/03				0.85							0.079				
STA2C3A	10/09/03	110	50	193	0.85		400		42.7	89.1			7		26.3	
STA2C3A	10/09/03							8								
STA2C3A	10/09/03															
STA2C3A	10/09/03										0.12					
STA2C3A	10/09/03											0.009				
STA2C3A	10/09/03		1													
STA2C3A	10/09/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C3B	10/10/03	91.1	48	210	0.75	3.82	400	13	47.2	0.9			7.75	1500	127	26.7
STA2C3B	10/10/03										-0.05					
STA2C3B	10/10/03											-0.013				
STA2C3B	10/10/03		2													
STA2C3B	10/10/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C3B	10/10/03				0.75						2.96					
STA2C3B	10/10/03				0.75											
STA2C3B	10/10/03											-0.016				
STA2C3B	10/10/03	107	51	187	0.75		500		51.2	22.8					14.7	
STA2C3B	10/10/03							5								
STA2C3C	10/10/03	77.4	47	206	0.95	6.13	400		45.1				7.91	1402	123	27.2
STA2C3C	10/10/03							10		0.4						
STA2C3C	10/10/03															
STA2C3C	10/10/03				0.95						3.75					
STA2C3C	10/10/03				0.95							0.139				

Table 5. Pore Water Sampling Results for Period of Record from 08/03 through 01/04 (continued)

STATION_ID	DATE	TCA	DOC	CL	DEPTH	DO	HARD	TFE	TMG	TMN	THG	MeHg	pH	SPCON	SULFATE	TEMP
LABQC	11/04/03										0.133					
LABQC	11/04/03											-0.002				
STA2C1AA	11/04/03	101	53	226	0.53	0.52	400		45.4	9.2			7.43	1553	97.1	23.6
STA2C1AA	11/04/03															
STA2C1AA	11/04/03							20								
STA2C1AA	11/04/03										-0.081					
STA2C1AA	11/04/03											-0.01				
STA2C1AA	11/04/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1AA	11/04/03		2													
STA2C1AA	11/04/03				0.53						3.74					
STA2C1AA	11/04/03				0.53							0.161				
STA2C1AA	11/04/03	108	51	221	0.53		400	80	42.8	51.9			7.06		69.4	
STA2C1AA	11/04/03															
STA2C1BB	11/04/03	91	48	208	0.42	0.99	400		42.5	36.8			7.46	1428	95.6	24.2
STA2C1BB	11/04/03															
STA2C1BB	11/04/03							7								
STA2C1BB	11/04/03				0.42						2.563					
STA2C1BB	11/04/03				0.42							0.405				
STA2C1BB	11/04/03	91.2	52	208	0.42		400		41	115			7.31		82.4	
STA2C1BB	11/04/03															
STA2C1BB	11/04/03							9								
STA2C1BB	11/04/03										0.052					
STA2C1BB	11/04/03											-0.007				
STA2C1CC	11/04/03	-0.2		-0.1			-0.1		-0.1	-0.2					-0.1	
STA2C1CC	11/04/03		2					6								
STA2C1CC	11/05/03	86.7	46	214	0.55		400	18	40.3	108			7.27	1411	88	23.3
STA2C1CC	11/05/03					0.18										
STA2C1CC	11/05/03															
STA2C1CC	11/05/03										-0.021					
STA2C1CC	11/05/03											-0.002				
STA2C1CC	11/05/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1CC	11/05/03		2													
STA2C1CC	11/05/03				0.55						3.182					
STA2C1CC	11/05/03				0.55							0.669				
STA2C1CC	11/05/03	104	60	212	0.55		400	26	41.4	127			7		46.7	
STA2C1CC	11/05/03															
STA2C2A	11/05/03	94	41	198	0.62		400	16	39.2	9.9			7.3	1365	37.9	23.9
STA2C2A	11/05/03					0.65										
STA2C2A	11/05/03															
STA2C2A	11/05/03				0.62						1.635					
STA2C2A	11/05/03				0.62											
STA2C2A	11/05/03											0.07				
STA2C2A	11/05/03	184	98	226	0.62		700	489	55.5	203			6.73		1.3	
STA2C2A	11/05/03															
STA2C2A	11/05/03										-0.039					
STA2C2A	11/05/03											-0.007				
STA2C2A	11/05/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C2A	11/05/03		2													
STA2C2B	11/07/03										0.18					
STA2C2B	11/07/03											-0.011				
STA2C2B	11/07/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C2B	11/07/03		1													
STA2C2B	11/07/03	72.9	48	202	0.61	0.77	300		37.2	10.2			7.44	1305	89.2	24.8
STA2C2B	11/07/03							8								
STA2C2B	11/07/03															
STA2C2B	11/07/03				0.61						2.09					
STA2C2B	11/07/03				0.61							0.274				
STA2C2B	11/07/03	118	65	226	0.61		500		46	127			6.88		29.7	
STA2C2B	11/07/03							10								
STA2C2B	11/07/03															
STA2C2C	11/07/03	74.2	45	207	0.7	1.24	400		42.8	7.6			7.43	1376	108	25.2
STA2C2C	11/07/03							12								
STA2C2C	11/07/03				0.7						2.021					
STA2C2C	11/07/03				0.7							0.226				
STA2C2C	11/07/03	102	51	207	0.7		400		42.8	57.2			6.99		44.2	
STA2C2C	11/07/03							8								
STA2C2C	11/07/03															
STA2C3A	11/07/03	94.6	36	198	0.81	5.52	400	18	32.4	2.4			7.77	1333	63.7	27.1
STA2C3A	11/07/03				0.81						0.922					
STA2C3A	11/07/03				0.81											
STA2C3A	11/07/03											-0.019				
STA2C3A	11/07/03	99.1	46	216	0.81		400		40.3	55.3			7		19.9	
STA2C3A	11/07/03							-3								
STA2C3A	11/07/03										0.089					
STA2C3A	11/07/03											-0.004				
STA2C3A	11/07/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C3A	11/07/03		2													
STA2C3B	11/11/03										0.184					
STA2C3B	11/11/03											-0.006				
STA2C3B	11/11/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C3B	11/11/03		2													
STA2C3B	11/11/03	85.6	36	206	0.74	6.65	400		34.5				8.01	1329	66.7	24.7
STA2C3B	11/11/03							7		0.4						
STA2C3B	11/11/03				0.74						3.773					
STA2C3B	11/11/03				0.74							0.357				
STA2C3B	11/11/03	88.4	45	210	0.74		400		41.9	17.3			7.23		24.3	
STA2C3B	11/11/03							4								
STA2C3B	11/11/03															

Table 5. Pore Water Sampling Results for Period of Record from 08/03 through 01/04 (continued)

STATION_ID	DATE	TCA	DOC	CL	DEPTH	DO	HARD	TFE	TMG	TMN	THG	MeHg	pH	SPCON	SULFATE	TEMP
STA2C1AA	12/01/03										0.07					
STA2C1AA	12/01/03											0.064				
STA2C1AA	12/01/03	-0.2					-0.1	-3	-0.1	-0.2						
STA2C1AA	12/01/03		1	0.3											0.2	
STA2C1AA	12/01/03	101	39	219	0.52		400	15	37.7	9.8			7.42	1417	66.7	15.8
STA2C1AA	12/01/03					1.36										
STA2C1AA	12/01/03															
STA2C1AA	12/01/03				0.52						4.57					
STA2C1AA	12/01/03				0.52							0.381				
STA2C1AA	12/01/03	99.4	122	212	0.52		400		37.5	29			7.51		45.6	
STA2C1AA	12/01/03							5								
STA2C1AA	12/01/03															
STA2C1BB	12/01/03	86.6	42	226	0.35		400		40.7	11.1			7.57	1416	66.9	18.3
STA2C1BB	12/01/03							5								
STA2C1BB	12/01/03					3.76										
STA2C1BB	12/01/03															
STA2C1BB	12/01/03				0.35						1.25					
STA2C1BB	12/01/03				0.35							0.121				
STA2C1BB	12/01/03	87.2	41	220	0.35		400		40.4	28.9			8.08		62.5	
STA2C1BB	12/01/03							-3								
STA2C1BB	12/01/03										0.09					
STA2C1BB	12/01/03											-0.011				
STA2C1BB	12/01/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1BB	12/01/03		1													
STA2C1CC	12/02/03										0.18					
STA2C1CC	12/02/03	90.4	43	232	0.45	0.42	400	19	41.1	40.7			7.11	1434	69.1	16.2
STA2C1CC	12/02/03															
STA2C1CC	12/02/03											-0.005				
STA2C1CC	12/02/03	-0.2	-1	-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1CC	12/02/03				0.45						1.06					
STA2C1CC	12/02/03				0.45											
STA2C1CC	12/02/03											0.153				
STA2C1CC	12/02/03	90.6	44	219	0.45		400		40.3	62.4			7.55		64.2	
STA2C1CC	12/02/03							10								
STA2C1CC	12/02/03															
STA2C2B	12/03/03	96.4	47	236	0.36		400		43.9	16.6			7.28	1502	75	16.1
STA2C2B	12/03/03							11								
STA2C2B	12/03/03					1.11										
STA2C2B	12/03/03															
STA2C2B	12/03/03										0.08					
STA2C2B	12/03/03											-0.003				
STA2C2B	12/03/03	-0.2	-1				-0.1	-3	-0.1	-0.2						
STA2C2B	12/03/03			0.3											0.2	
STA2C2B	12/03/03				0.36						0.9					
STA2C2B	12/03/03				0.36							0.234				
STA2C2B	12/03/03	148	79	272	0.36		600		57.4	104			7.28		33.3	
STA2C2B	12/03/03							11								
STA2C2B	12/03/03															
STA2C2C	12/03/03	92.5	44	234	0.52		400	44	47.6	7.7			7.42	1507	92.6	17.3
STA2C2C	12/03/03					3.65										
STA2C2C	12/03/03															
STA2C2C	12/03/03				0.52						1.47					
STA2C2C	12/03/03				0.52											
STA2C2C	12/03/03											0.069				
STA2C2C	12/03/03	114	51	207	0.52		400	13	41.5	49.7			7.19		20.8	
STA2C2C	12/03/03															
STA2C2A	12/03/03	107	40	206	0.37		400	13	43	7.4			7.58	1389	21.1	17
STA2C2A	12/03/03					3.02										
STA2C2A	12/03/03															
STA2C2A	12/03/03				0.37						1.16					
STA2C2A	12/03/03				0.37											
STA2C2A	12/03/03											-0.009				
STA2C2A	12/03/03	124	51	199	0.37		500	164	42.4	240			7.35		6	
STA2C2A	12/03/03															
STA2C2A	12/03/03										0.24					
STA2C2A	12/03/03											-0.02				
STA2C2A	12/03/03	-0.2					-0.1	-3	-0.1	-0.2						
STA2C2A	12/03/03		1	0.3											0.2	
STA2C3A	12/04/03	83.8	34	221	0.96	8.08	400	27	39.9	4.4			8.31	1371	61.7	19.2
STA2C3A	12/04/03										0.07					
STA2C3A	12/04/03											-0.009				
STA2C3A	12/04/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C3A	12/04/03		1													
STA2C3A	12/04/03				0.96						1.48					
STA2C3A	12/04/03				0.96											
STA2C3A	12/04/03											-0.016				
STA2C3A	12/04/03	84.6	36	212	0.96		400		36.8	89.7			7.34		40	
STA2C3A	12/04/03							5								
STA2C3A	12/04/03															
STA2C3B	12/04/03	72.3	35	224	1.1	9.87	300		40.2				8.29	1320	65.4	19.9
STA2C3B	12/04/03							9		0.6						
STA2C3B	12/04/03				1.1						5.69					
STA2C3B	12/04/03				1.1							1.66				
STA2C3B	12/04/03	83.1	38	111	1.1		400		42.9	56.9			7.84		23.6	
STA2C3B	12/04/03							4								
STA2C3B	12/04/03															
STA2C3C	12/04/03	49.4	36	222	1	10.1	300		38.6				8.52	1226	73.3	20.4
STA2C3C	12/04/03							4		0.2						

Table 5. Pore Water Sampling Results for Period of Record from 08/03 through 01/04 (continued)

STATION_ID	DATE	TCA	DOC	CL	DEPTH	DO	HARD	TFE	TMG	TMN	THG	MeHg	pH	SPCON	SULFATE	TEMP
STA2C1AA	12/29/03	90.6	32	198	0.6	3.43	400		32.9	6.9			7.52	1307	57.6	16.4
STA2C1AA	12/29/03							11								
STA2C1AA	12/29/03															
STA2C1AA	12/29/03										-0.02					
STA2C1AA	12/29/03											-0.002				
STA2C1AA	12/29/03	-0.2	-1	-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1AA	12/29/03				0.6						1.5					
STA2C1AA	12/29/03				0.6							0.151				
STA2C1AA	12/29/03	91.2	40	200	0.6		400	352	32.1	80.6			8.02		25.6	
STA2C1AA	12/29/03															
STA2C1BB	12/29/03	91.1	33	205	0.52	3.21	400	33	34.1	45.3			7.53	1344	58.5	18.1
STA2C1BB	12/29/03															
STA2C1BB	12/29/03				0.52											
STA2C1BB	12/29/03										0.8					
STA2C1BB	12/29/03				0.52							0.126				
STA2C1BB	12/29/03	90.6	35	204	0.52		400		34	40.8			7.87		52.2	
STA2C1BB	12/29/03							5								
STA2C1BB	12/29/03															
STA2C1CC	12/29/03	88.3	36	210	0.5	1.52	400		36.2	49.5			7.41	1364	56.7	16.9
STA2C1CC	12/29/03							10								
STA2C1CC	12/29/03															
STA2C1CC	12/29/03				0.5						1.83					
STA2C1CC	12/29/03				0.5							0.406				
STA2C1CC	12/29/03	95.8	45	209	0.5		400	71	37.9	64.1			7.81		40.9	
STA2C1CC	12/29/03															
STA2C1CC	12/29/03										-0.01					
STA2C1CC	12/29/03											-0.007				
STA2C1CC	12/29/03	-0.2	-1	-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C2A	01/05/04	111	41	209	0.55	1.66	400	528	41.4	105			7.66	1442	20.1	17.3
STA2C2A	01/05/04										-0.07					
STA2C2A	01/05/04											-0.008				
STA2C2A	01/05/04		1													
STA2C2A	01/05/04	-0.2					-0.1	-3	-0.1	-0.2					-0.1	
STA2C2A	01/05/04			0.3												
STA2C2A	01/05/04				0.55						1.69					
STA2C2A	01/05/04				0.55							0.316				
STA2C2A	01/05/04	141	63	180	0.55		500	118	47.9	203			7.36		4.7	
STA2C2A	01/05/04															
STA2C2B	01/05/04	97.7	46	223	0.54	1.51	400	30	39.4	47			7.47	1479	59.2	18.1
STA2C2B	01/05/04															
STA2C2B	01/05/04				0.54						1.81					
STA2C2B	01/05/04				0.54							0.352				
STA2C2B	01/05/04	171	86	241	0.54		600	48	54.8	274			7.56		8.9	
STA2C2B	01/05/04															
STA2C2C	01/05/04	89	36	212	0.7	2.52	400	54	37.1	20.6			7.59	1385	56.9	19.3
STA2C2C	01/05/04															
STA2C2C	01/05/04				0.7						1.7					
STA2C2C	01/05/04				0.7							0.241				
STA2C2C	01/05/04	101	45	211	0.7		400	58	35.5	62.6			7.78		28.2	
STA2C2C	01/05/04															
STA2C2C	01/05/04										-0.02					
STA2C2C	01/05/04											-0.011				
STA2C2C	01/05/04	-0.2	-1	-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C3A	01/06/04	79.8	34	189	0.89	5.75	300	13	35	3.3			8.1	1251	59.9	22.1
STA2C3A	01/06/04										0.09					
STA2C3A	01/06/04											-0.001				
STA2C3A	01/06/04	-0.2	-1				-0.1	-3	-0.1	-0.2						
STA2C3A	01/06/04			0.2											0.2	
STA2C3A	01/06/04				0.89						0.37					
STA2C3A	01/06/04				0.89											
STA2C3A	01/06/04											-0.002				
STA2C3A	01/06/04	81.6	36	190	0.89		300		34.2	54.3			7.85		38	
STA2C3A	01/06/04							-3								
STA2C3B	01/06/04	62.9	34	199	0.82	7.11	300		35.6	3.6			8.08	1231	60	23.4
STA2C3B	01/06/04							11								
STA2C3B	01/06/04				0.82						4.11					
STA2C3B	01/06/04				0.82							2.145				
STA2C3B	01/06/04	80.7	38	197	0.82		300		35.2	18.5			8.08		35.4	
STA2C3B	01/06/04							7								
STA2C3B	01/06/04															
STA2C3C	01/06/04	47.5	32	208	0.99	9.12	300		34.5				8.33	1191	60	22.6
STA2C3C	01/06/04							7		0.4						
STA2C3C	01/06/04				0.99						3.98					
STA2C3C	01/06/04				0.99							0.81				
STA2C3C	01/06/04	75.7	37	208	0.99		300		37.9	7.7			7.75		21.5	
STA2C3C	01/06/04							4								
STA2C3C	01/06/04															
STA2C3C	01/06/04										0.13					
STA2C3C	01/06/04											-0.008				
STA2C3C	01/06/04	-0.2	-1				-0.1	-3	-0.1	-0.2						
STA2C3C	01/06/04			0.3											0.2	

Table 5. Pore Water Sampling Results for Period of Record from 08/03 through 01/04: Replicate Site C1C

STATION_ID	DATE	TCA	DOC	CL	DEPTH	DO	HARD	TFE	TMG	TMN	THG	MeHg	pH	SPCON	SULFATE	TEMP
STA2C1C	09/09/03										0.254					
STA2C1C	09/09/03											-0.006				
STA2C1C	09/09/03				0.73						6.598					
STA2C1C	09/09/03										3.732					
STA2C1C	09/09/03										4.181					
STA2C1C	09/09/03				0.73											
STA2C1C	09/09/03											0.04				
STA2C1C	09/09/03											0.026				
STA2C1C	09/09/03											0.025				
STA2C1C	10/07/03	112	44	208	0.69	0.14	400		43	9.2			7.4	1523	106	25.9
STA2C1C	10/07/03							6								
STA2C1C	10/07/03															
STA2C1C	10/07/03	112	44	209	0.69	0.14	400		43.2	9.2			7.4	1523	107	25.9
STA2C1C	10/07/03							6								
STA2C1C	10/07/03															
STA2C1C	10/07/03	111	45	209	0.69	0.14	400		43.2	6.9			7.4	1523	106	25.9
STA2C1C	10/07/03							6								
STA2C1C	10/07/03															
STA2C1C	10/07/03				0.69						4.64					
STA2C1C	10/07/03										2.86					
STA2C1C	10/07/03										2.12					
STA2C1C	10/07/03				0.69											
STA2C1C	10/07/03											0.035				
STA2C1C	10/07/03											0.019				
STA2C1C	10/07/03											-0.008				
STA2C1C	10/07/03	103	42	191	0.69		400		39.9	72.1			7.33		53.6	
STA2C1C	10/07/03							-3								
STA2C1C	10/07/03	103	43	191	0.69		400		39.8	73.7			7.35		53.2	
STA2C1C	10/07/03							-3								
STA2C1C	10/07/03	102	43	191	0.69		400		39.2	73.6			7.36		52.9	
STA2C1C	10/07/03							-3								
STA2C1C	10/07/03										-0.117					
STA2C1C	10/07/03											-0.008				
STA2C1C	10/07/03		1													
STA2C1C	10/07/03	-0.2		-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1C	11/11/03	77.5	36	207	0.75	0.49	400		40.1	3.2			7.42	1351	67.4	24.4
STA2C1C	11/11/03															
STA2C1C	11/11/03							6								
STA2C1C	11/11/03	76.9	36	207	0.75	0.49	400		39.7	3.9			7.42	1351	67.9	24.4
STA2C1C	11/11/03															
STA2C1C	11/11/03							6								
STA2C1C	11/11/03	77.5	37	208	0.75	0.49	400		40	3.7			7.42	1351	67.8	24.4
STA2C1C	11/11/03															
STA2C1C	11/11/03							7								
STA2C1C	11/11/03				0.75						0.916					
STA2C1C	11/11/03										1.191					
STA2C1C	11/11/03										0.788					
STA2C1C	11/11/03				0.75											
STA2C1C	11/11/03											0.034				
STA2C1C	11/11/03											0.039				
STA2C1C	11/11/03											0.03				
STA2C1C	11/11/03	88.3	42	208	0.75		400		37.6	59.1			7.32		64.8	
STA2C1C	11/11/03															
STA2C1C	11/11/03							4								
STA2C1C	11/11/03	88.8	42	206	0.75		400		37.7	59.4			7.23		64.5	
STA2C1C	11/11/03															
STA2C1C	11/11/03							4								
STA2C1C	11/11/03	87.8	41	204	0.75		400		37.2	60.1			7.24		63.8	
STA2C1C	11/11/03															
STA2C1C	11/11/03							4								
STA2C1C	11/11/03										-0.091					
STA2C1C	11/11/03											-0.006				
STA2C1C	11/11/03						0.9									
STA2C1C	11/11/03								-0.1						-0.1	
STA2C1C	11/11/03	0.4	2	0.2				184		0.4						

Table 5. Pore Water Sampling Results for Period of Record from 08/03 through 01/04: Replicate Site C1C (continued)

STATION_ID	DATE	TCA	DOC	CL	DEPTH	DO	HARD	TFE	TMG	TMN	THG	MeHg	pH	SPCON	SULFATE	TEMP
STA2C1C	12/02/03	78.4	34	212	0.54	1.08	400		42	4.4			7.38	1369	68.3	16.2
STA2C1C	12/02/03							7								
STA2C1C	12/02/03	78.3	34	222	0.54	1.08	400		42	3.2			7.38	1369	71.9	16.2
STA2C1C	12/02/03							6								
STA2C1C	12/02/03	78	34	214	0.54	1.08	400		41.9				7.38	1369	68.9	16.2
STA2C1C	12/02/03							5		0.5						
STA2C1C	12/02/03				0.54						1.44					
STA2C1C	12/02/03										1.24					
STA2C1C	12/02/03										0.86					
STA2C1C	12/02/03				0.54											
STA2C1C	12/02/03											0.044				
STA2C1C	12/02/03											-0.015				
STA2C1C	12/02/03											-0.012				
STA2C1C	12/02/03	84.9	35	212	0.54		400		40.3	38.3			7.92		57.1	
STA2C1C	12/02/03							-3								
STA2C1C	12/02/03	84.6	35	212	0.54		400		40.2	37			7.9		57	
STA2C1C	12/02/03							-3								
STA2C1C	12/02/03	85.3	35	212	0.54		400		40.5	36			7.87		56.5	
STA2C1C	12/02/03							3								
STA2C1C	12/02/03															
STA2C1C	12/02/03										0.15					
STA2C1C	12/02/03											-0.005				
STA2C1C	12/02/03	-0.2	-1	-0.1			-0.1	-3	-0.1	-0.2					-0.1	
STA2C1C	12/30/03										-0.07					
STA2C1C	12/30/03											-0.002				
STA2C1C	12/30/03														0.1	
STA2C1C	12/30/03	-0.2	-1				-0.1	-3	-0.1	-0.2						
STA2C1C	12/30/03			0.2												
STA2C1C	12/30/03	86.4	32	208	0.77	1.48	400		35.6	5			7.33	1358	56.1	17.1
STA2C1C	12/30/03															
STA2C1C	12/30/03							5								
STA2C1C	12/30/03	85.9	32	209	0.77	1.48	400		35.5	4.9			7.33	1358	59	17.1
STA2C1C	12/30/03															
STA2C1C	12/30/03							4								
STA2C1C	12/30/03	86.1	32	207	0.77	1.48	400		35.4	4.9			7.33	1358	58.5	17.1
STA2C1C	12/30/03															
STA2C1C	12/30/03							5								
STA2C1C	12/30/03				0.77						3.33					
STA2C1C	12/30/03										2.7					
STA2C1C	12/30/03										2.36					
STA2C1C	12/30/03				0.77							0.409				
STA2C1C	12/30/03											0.462				
STA2C1C	12/30/03											0.361				
STA2C1C	12/30/03	85.8	34	211	0.77		400		37.1	32.6			7.57		42.2	
STA2C1C	12/30/03							-3								
STA2C1C	12/30/03	86.5	34	207	0.77		400		37.2	32.7			7.59		39.7	
STA2C1C	12/30/03							-3								
STA2C1C	12/30/03	87	34	209	0.77		400		37.4	33.1			7.6		40.6	
STA2C1C	12/30/03							-3								
STA2C1C	12/30/03										-0.01					
STA2C1C	12/30/03											-0.007				
STA2C1C	12/30/03														0.1	
STA2C1C	12/30/03	-0.2	-1				-0.1		-0.1	-0.2						
STA2C1C	12/30/03			0.2				4								

Table 6. STA-2 Hg Special Studies Vegetation Data for Project (all concentrations in mg/Kg dry wt)

STATION_ID	DATE_COLLECTE	MERCURY,TOT	METHYL MERC	PERCENT ASI	SOIL MOISTU	SPECIES			
STA2C3A	9/16/2002	0.005	0.00206	70.5	88.26	Southern Naiad			
STA2C3A	9/16/2002	0.00593	0.000186	76.1	81.31	Calcareous Periphyton			
STA2C3A	9/16/2002	0.0105	0.000024	6.9	77.65	Cattail			
STA2C3A	9/16/2002	-0.0073	0.000473	15.1	93.46	Duck-Potato			
STA2C3B	9/16/2002	0.00414	0.000599	51.7	82.39	Potamogeton			
STA2C3B	9/16/2002			44.4	89.71	Southern Naiad			
STA2C3C	9/16/2002	0.004	0.000083	10	82	Cattail			
STA2C3C	9/16/2002	0.00481	0.000142	10.1	69.27	Panicum			
STA2C3C	9/16/2002	0.00752	0.00203	66.2	88.96	Southern Naiad			
STA2C3C	9/16/2002	0.00349	0.000574	77.5	84.12	Calcareous Periphyton			
STA2C3C	9/16/2002	0.00804	0.000574	69.3	86.24	Filamentous Algea			
STA2C3A	9/16/2002	0.00698	0.000436			SOUTHERN NAIAD			
STA2C2A	9/17/2002	0.00325	0.00013	9.52	81.31	Typha			
STA2C2A	9/17/2002	0.00833	0.000181	4.49	63.13	Cladium			
STA2C2A	9/17/2002	0.0104	0.000764	66.6	92.82	Calcareous Periphyton			
STA2C2A	9/17/2002	0.0199	0.00218	65.7	95.34	Utricularia			
STA2C2B	9/17/2002	0.00674	0.000371	3.49	62.5	Cladium			
STA2C2B	9/17/2002	0.021	0.00221	23.3	94.03	Ludwigia			
STA2C2B	9/17/2002	0.0279	0.00147	65.5	93.2	Calcareous Periphyton			
STA2C2B	9/17/2002			10.1	86.26	Typha			
STA2C2C	9/17/2002	0.00911	0.000056	14.7	85.24	Typha			
STA2C2C	9/17/2002	0.0035	0.000117	4.2	64.36	Cladium			
STA2C2C	9/17/2002	0.01	0.000179	71.9	92.08	Calcareous Periphyton			
STA2C2C	9/17/2002	0.0151	0.0017	24	94.37	Ludwigia			
STA2C2A	9/17/2002	0.0075	0.000212			TYPHA			
STA2C1AA	9/18/2002	0.00878	0.00063	8.57	84.11	Typha			
STA2C1AA	9/18/2002	0.00845	0.000372	4.21	61.22	Cladium			
STA2C1AA	9/18/2002	0.0185	0.00876	59.8	93.08	Periphyton			
STA2C1BB	9/18/2002	0.0382	0.0267	10.5	89.63	Ludwigia			
STA2C1BB	9/18/2002	0.00607	0.000238	10	83.55	Typha			
STA2C1BB	9/18/2002			4.48	58.67	Cladium			
STA2C1CC	9/18/2002	0.00757	0.00256	12.6	86.75	Typha			
STA2C1CC	9/18/2002	0.0102	0.000902	4.6	56.91	Cladium			
STA2C1CC	9/18/2002	0.048	0.0227	12.8	89.97	Diodia			
STA2C1CC	9/18/2002	-0.0028	0.000141			DIODIA			

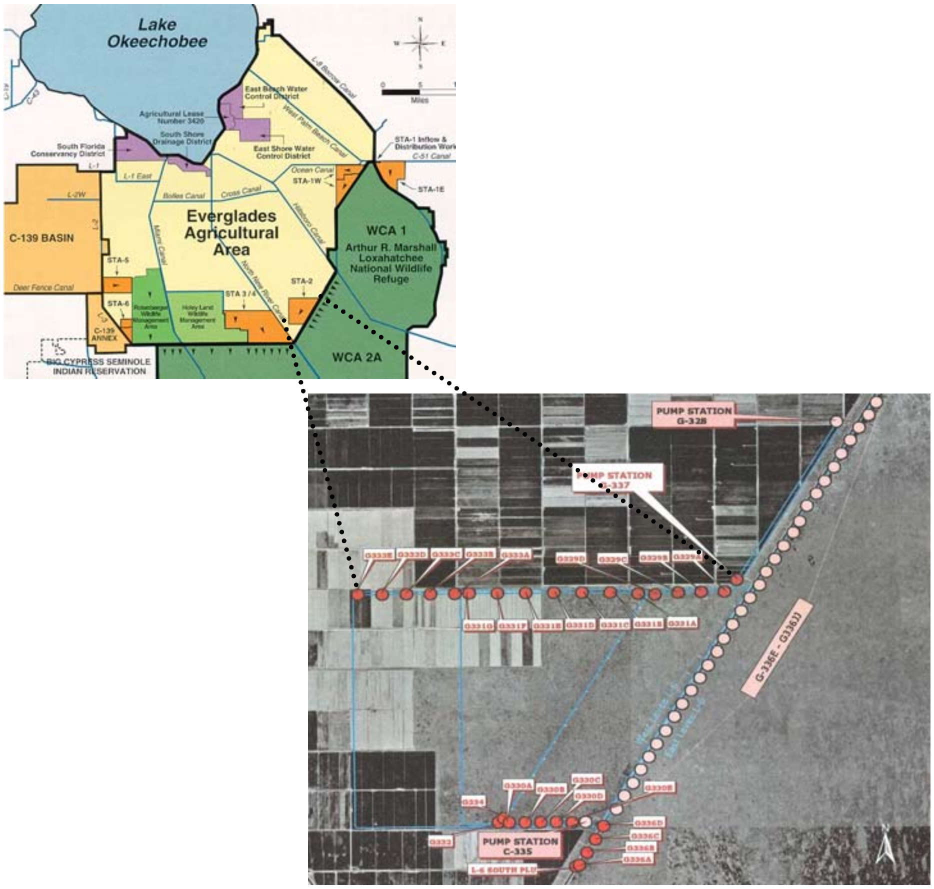
Table 6. STA-2 Hg Special Studies Vegetation Data for Project (continued) (all concentrations in mg/Kg dry wt)

STATION_ID	DATE_COLLECTE	MERCURY,TOT	METHYL MERC	PERCENT ASI	SOIL MOISTU	SPECIES
STA2C1AA	2/24/2003	0.001385	0.000017	7.1	79.08	Cattail (Typha domingensis)
STA2C1AA	2/24/2003	0.00354	0.00032			Cattail (Typha domingensis)
STA2C1AA	2/24/2003	0.00499	0.000042	2.9	59.91	Sawgrass (Cladium jamaicense)
STA2C1AA	2/24/2003	0.004666	0.000052			Sawgrass (Cladium jamaicense)
STA2C1AA	2/24/2003	0.002268	0.00011	9.08	86.54	Smartweed (Polygonum hydropiperoides)
STA2C1AA	2/24/2003	0.002845	0.000456	57.2	94.32	Periphyton (Calcareous)
STA2C1BB	2/24/2003			6.29	76.13	Cattail (Typha domingensis)
STA2C1BB	2/24/2003	0.00339	0.00009	3.69	56.95	Sawgrass (Cladium jamaicense)
STA2C1BB	2/24/2003	0.002832	0.000109	12.6	88.84	Red Ludwigia (Ludwigia repens)
STA2C1BB	2/24/2003	0.00323	0.000173	26.4	96.68	Periphyton (filamentous green algae)
STA2C1CC	2/24/2003	0.001888	0.000023	9.08	80.82	Cattail (Typha domingensis)
STA2C1CC	2/24/2003	0.001355	0.000015	3.88	57	Sawgrass (Cladium jamaicense)
STA2C1CC	2/24/2003	0.005303	0.001302	14.3	89	Red Ludwigia (Ludwigia repens)
STA2C1CC	2/24/2003	0.000947	0.00033	10.5	87	Fragrant Water Lily (Nymphaea odorata)
STA2C1CC	2/24/2003	0.011463	0.001938	28.2	95.88	Periphyton (Calcareous)
STA2C2A	2/24/2003	0.001066	0.000009	8.18	78.86	Cattail (Typha domingensis)
STA2C2A	2/24/2003			4.2	58.05	Sawgrass (Cladium jamaicense)
STA2C2A	2/24/2003	0.00118	0.000044	9.6	87.09	Fragrant Water Lily (Nymphaea odorata)
STA2C2A	2/24/2003	0.003089	0.000663	33.3	93.84	Bladderwort (Utricularia fibrosa)
STA2C2A	2/24/2003	0.006128	0.000451	46.6	93.49	Periphyton (Calcareous)
STA2C2B	2/24/2003	0.002651	0.00001	8.78	81.36	Cattail (Typha domingensis)
STA2C2B	2/24/2003	0.002352	0.000102	3.09	58.23	Sawgrass (Cladium jamaicense)
STA2C2B	2/24/2003	0.000691	0.000045	11.9	89.28	Fragrant Water Lily (Nymphaea odorata)
STA2C2B	2/24/2003	0.001166	0.000277	17.6	94.21	Bladderwort (Utricularia fibrosa)
STA2C2B	2/24/2003	0.005224	0.000235	21.8	97.04	Periphyton (filamentous green algae)
STA2C2C	2/24/2003	0.0015	0.000004	8.57	81.34	Cattail (Typha domingensis)
STA2C2C	2/24/2003			4.71	60.67	Sawgrass (Cladium jamaicense)
STA2C2C	2/24/2003	0.000843	0.000053	9.42	85.67	Fragrant Water Lily (Nymphaea odorata)
STA2C2C	2/24/2003	0.002034	0.000446	22.6	93.54	Bladderwort (Utricularia fibrosa)
STA2C2C	2/24/2003	0.000934	0.000174	21.7	93.44	Periphyton (filamentous green algae)
STA2C2C	2/24/2003	0.00087	0.000326			Periphyton (filamentous green algae)
STA2C3A	2/25/2003	0.000839	0.000088	38.4	86.14	Southern Naiad (Najas guadalupensis)
STA2C3A	2/25/2003	0.000448	0.000162	27.2	87.31	Illinois Pondweed (Potamogeton illinoensis)
STA2C3B	2/25/2003	0.000225	0.000032	80.6	86.06	Southern Naiad (Najas guadalupensis)
STA2C3B	2/25/2003	0.00038	0.00007	39.3	84.84	Illinois Pondweed (Potamogeton illinoensis)
STA2C3C	2/25/2003			72.1	86.54	Periphyton (Calcareous)
STA2C3C	2/25/2003	0.000366	0.000108	21.8	91.68	Illinois Pondweed (Potamogeton illinoensis)
STA2C3C	2/25/2003	0.000863	0.000154	9.12	82.17	Torpedograss (Panicum repens)
STA2C3C	2/25/2003	0.001922	0.000012	10	81.41	Cattail (Typha domingensis)
STA2C3C	2/25/2003	0.001136	0.000118			Cattail (Typha domingensis)

Table 6. STA-2 Hg Special Studies Vegetation Data for Project (continued) (all concentrations in mg/Kg dry wt)

STATION_ID	DATE_COLLECTE	MERCURY,TOT	METHYL MERC	PERCENT ASI	SOIL MOISTU	SPECIES			
STA2C1AA	9/15/2003	0.002616	0.000007	7.91	84.28	Cattail (Typha domingensis)			
STA2C1AA	9/15/2003	0.000845	0.000011			Cattail (Typha domingensis)			
STA2C1AA	9/15/2003	0.000545	0.00001	5.71	64.52	Sawgrass (Cladium jamaicense)			
STA2C1AA	9/15/2003	0.001533	0.000007			Sawgrass (Cladium jamaicense)			
STA2C1AA	9/15/2003	0.002232	0.000049	55.5	94.9	Common Salvinia (Salvinia sp.)			
STA2C1AA	9/15/2003	0.000316	0.000119			Common Salvinia (Salvinia sp.)			
STA2C1AA	9/15/2003	0.000783	0.000146	63.4	94.9	Periphyton			
STA2C1BB	9/15/2003			8.27	86.43	Cattail (Typha domingensis)			
STA2C1BB	9/15/2003	0.001932	0.000105	4.4	68.24	Sawgrass (Cladium jamaicense)			
STA2C1BB	9/15/2003	0.002316	0.000038	56.5	92.24	Red Ludwigia (Ludwigia repens)			
STA2C1BB	9/15/2003	0.000724	0.000018	9.08	89.2	Fragrant Water Lily (Nymphaea oderata)			
STA2C1BB	9/15/2003	0.001897	0.000028	59.7	94.53	Periphyton			
STA2C1CC	9/15/2003	0.001364	0.000035	8.67	82.27	Cattail (Typha domingensis)			
STA2C1CC	9/15/2003	0.003384	0.000185	5.58	67.34	Sawgrass (Cladium jamaicense)			
STA2C1CC	9/15/2003	0.00303	0.000064	42	94.45	Bladderwort (Utricularia sp.)			
STA2C1CC	9/15/2003	0.000973	0.000033	10.2	86.9	Fragrant Water Lily (Nymphaea oderata)			
STA2C1CC	9/15/2003	0.001502	0.000007	68.1	91.96	Periphyton			
STA2C2A	9/15/2003			10.8	86.15	Cattail (Typha domingensis)			
STA2C2A	9/15/2003	0.002125	0.000037	3.6	64.57	Sawgrass (Cladium jamaicense)			
STA2C2A	9/15/2003	0.000591	0.000036	70.6	86.51	Fragrant Water Lily (Nymphaea oderata)			
STA2C2A	9/15/2003	0.001105	0.000042	45.2	95.25	Bladderwort (Utricularia sp.)			
STA2C2A	9/15/2003	0.001508	0.000021	47.6	90.99	Periphyton			
STA2C2B	9/15/2003	0.002456	0.000063	10.7	84.12	Cattail (Typha domingensis)			
STA2C2B	9/15/2003	0.003997	0.000047	3.9	61.92	Sawgrass (Cladium jamaicense)			
STA2C2B	9/15/2003	0.000803	0.000069	14.1	88.54	Fragrant Water Lily (Nymphaea oderata)			
STA2C2B	9/15/2003	0.001786	0.000038	38	91.93	Periphyton			
STA2C2C	9/15/2003	0.000645	0.000013	9.78	86.88	Cattail (Typha domingensis)			
STA2C2C	9/15/2003			3.39	60.93	Sawgrass (Cladium jamaicense)			
STA2C2C	9/15/2003	0.000734	0.000035	9.16	86.46	Fragrant Water Lily (Nymphaea oderata)			
STA2C2C	9/15/2003	0.001481	0.000083	20.3	96.66	Filamentors green algae			
STA2C3A	9/15/2003	0.001053	0.000206	53.8	86.69	Southern Naiad (Najas guadalupensis)			
STA2C3A	9/15/2003	0.00062	0.000144	48.3	84.6	Illinios Pondweed (Potamogeton illinoensis)			
STA2C3A	9/15/2003	0.000497	0.000051	24.3	96.67	Common Salvinia (Salvinia sp.)			
STA2C3A	9/15/2003	0.00077	0.00037	45.8	90.31	Filamentous Green Algae			
STA2C3B	9/15/2003	0.000393	0.000024	26.9	92.42	Southern Naiad (Najas guadalupensis)			
STA2C3B	9/15/2003	0.00066	0.000074	36.4	88.15	Illinois Pondweed (Potamogeton illinoensis)			
STA2C3C	9/15/2003	0.000592	0.000089	43.3	91.01	Southern Naiad (Najas guadalupensis)			
STA2C3C	9/15/2003			51.3	87.28	Illinois Pondweed (Potamogeton illinoensis)			
STA2C3C	9/15/2003	0.000804	0.000032	12	84.24	Torpedograss (Panicum repens)			
STA2C3C	9/15/2003	0.00085	0.000036	75.7	89.36	Periphyton			
STA2C3C	9/15/2003	0.001298	0.000043			Periphton			

Figures



STA-2

Figure 1. STA-2 geographic location in South Florida and aerial photograph.

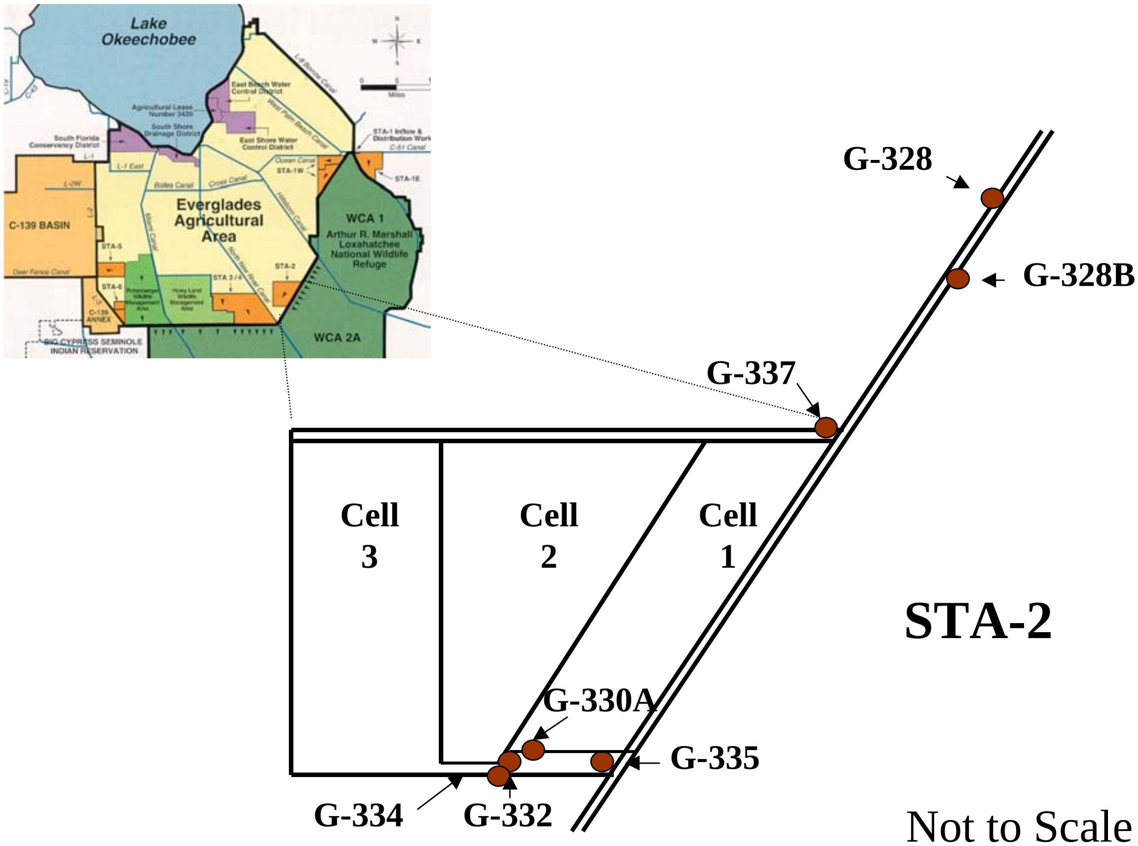


Figure 2. STA-2 graphic representation with inflow and outflow structures.

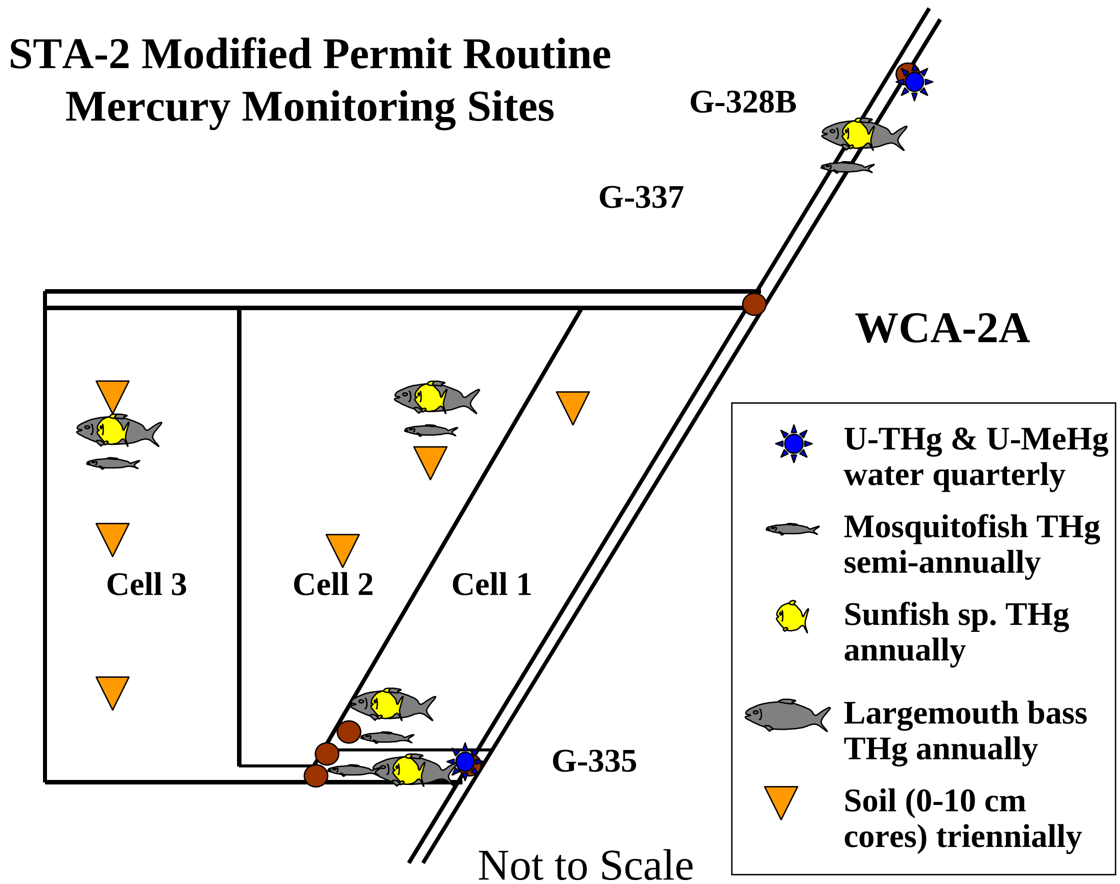


Figure 3. STA-2 routine mercury monitoring sites for original permit compliance.

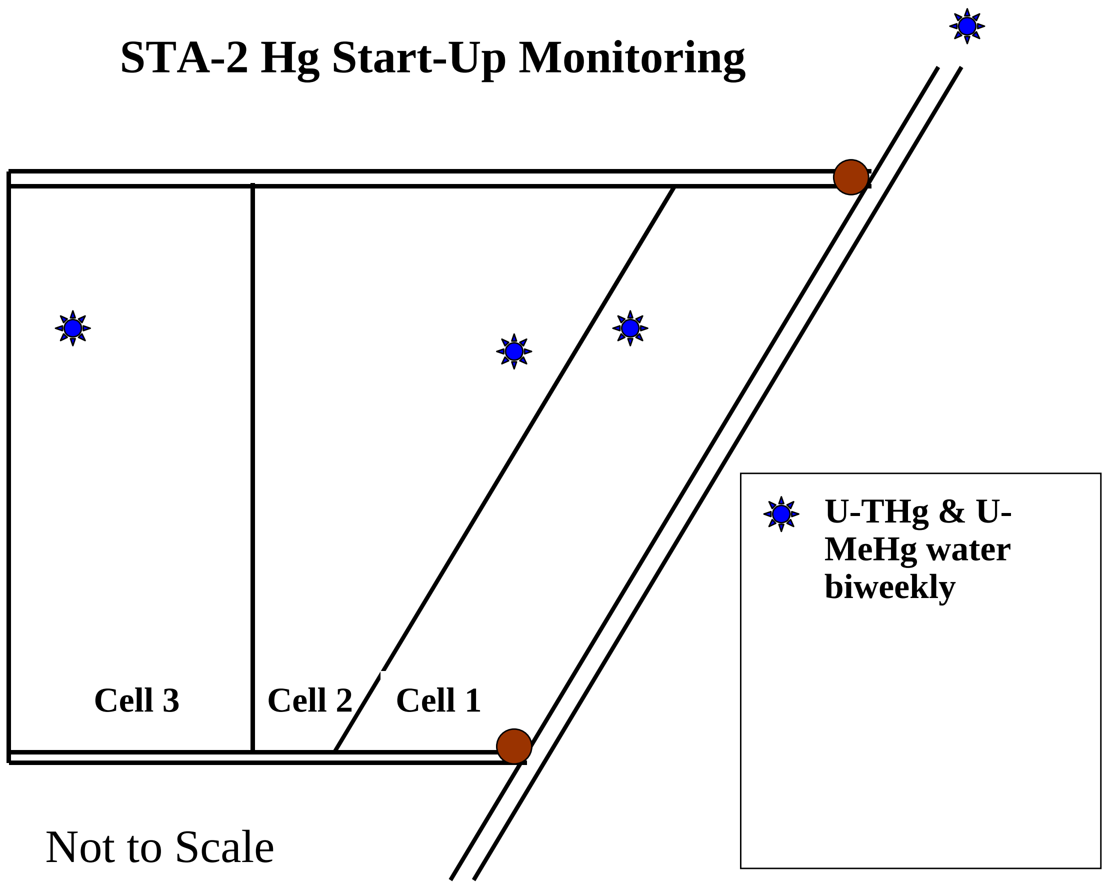


Figure 4. STA-2 start-up mercury monitoring sites for original permit compliance.

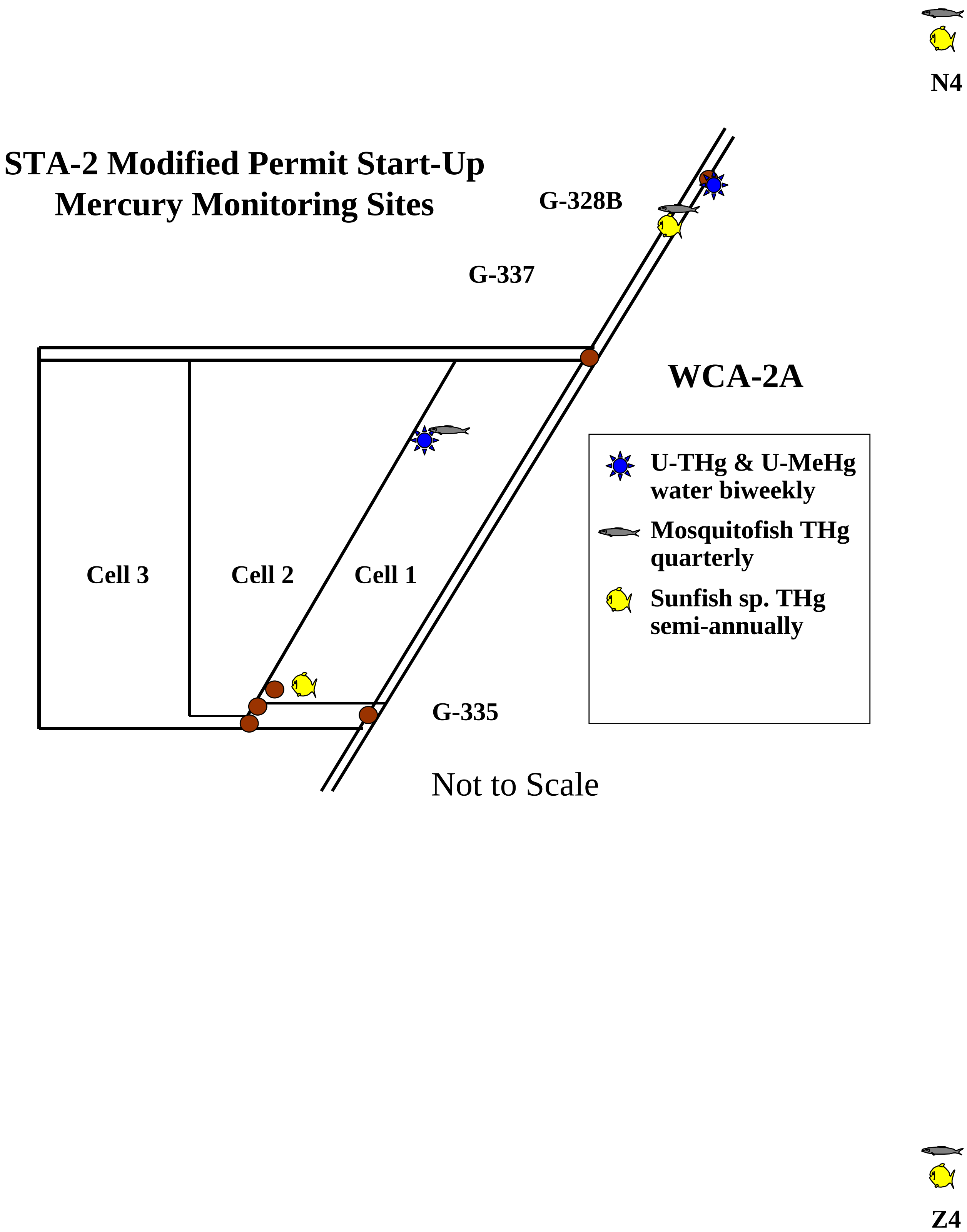


Figure 5. STA-2 start-up mercury monitoring sites for modified permit compliance.

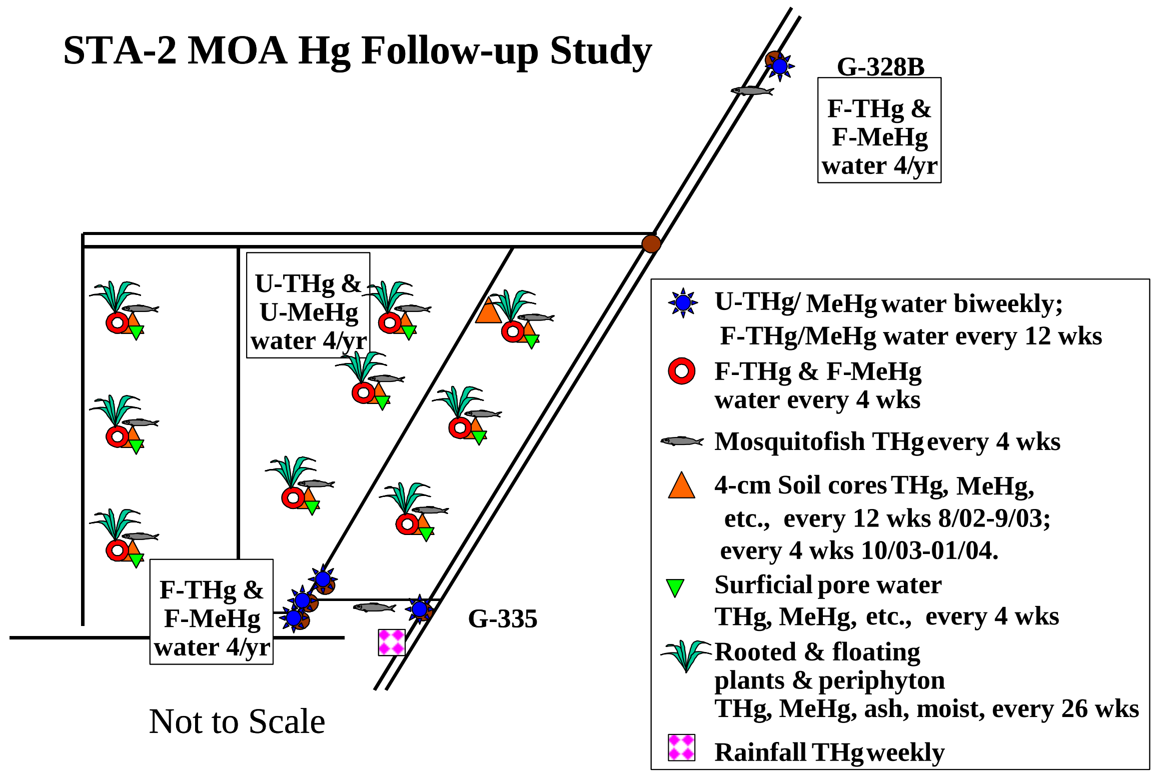


Figure 6. STA-2 expanded mercury monitoring sites for STA-2 Special Mercury Studies (MOA).

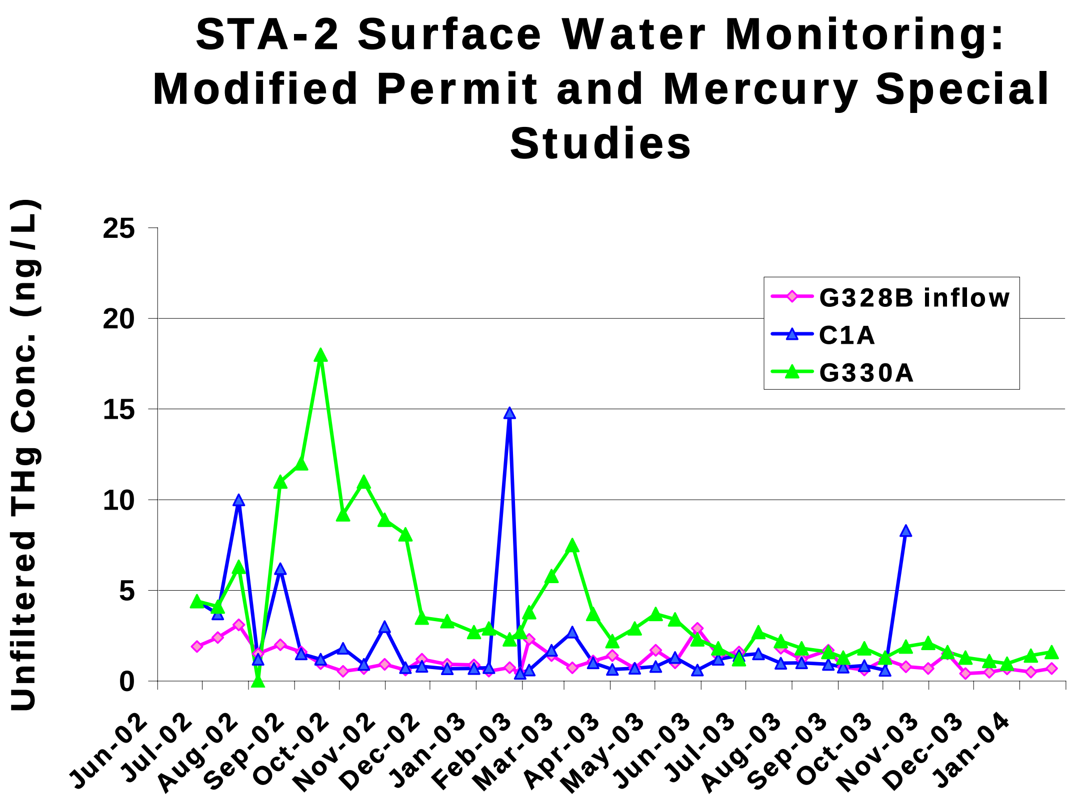


Figure 7. Inflow and interior surface water THg results for modified permit compliance monitoring (Exhibit E).

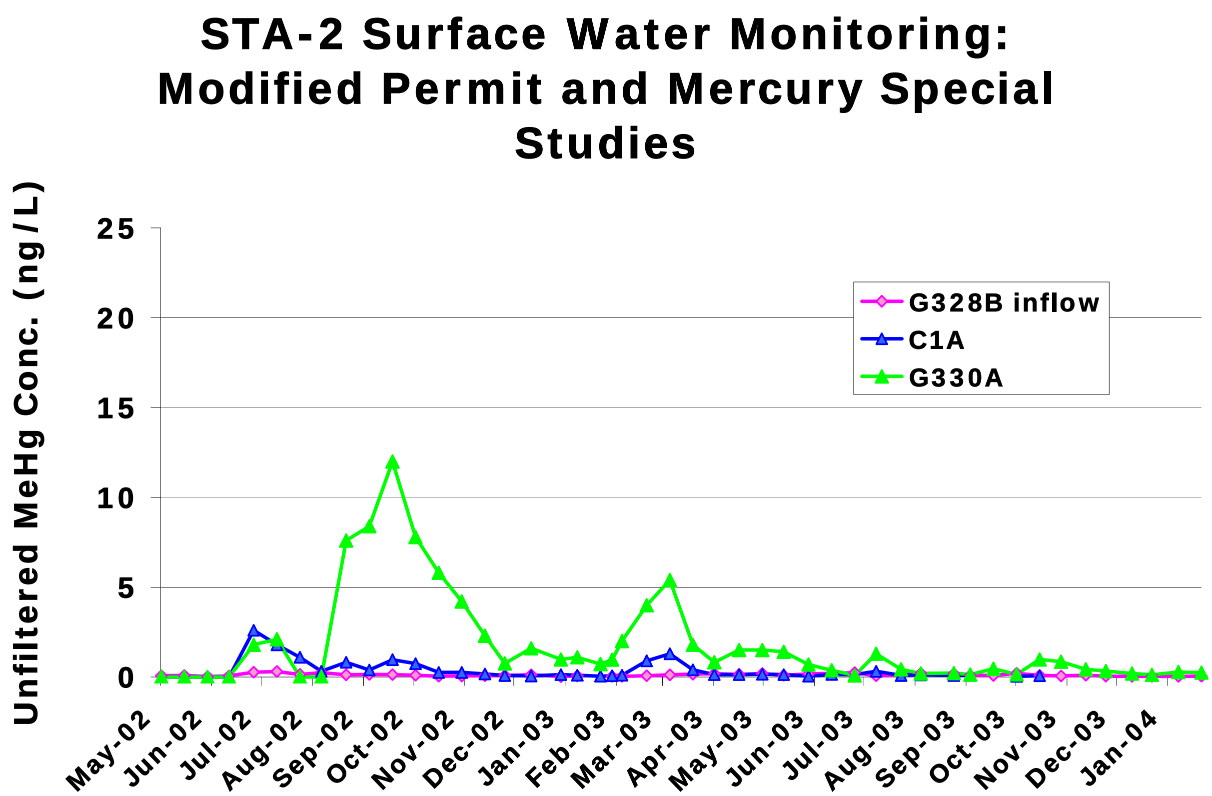


Figure 8. Inflow and interior surface water MeHg results for modified permit compliance monitoring (Exhibit E).

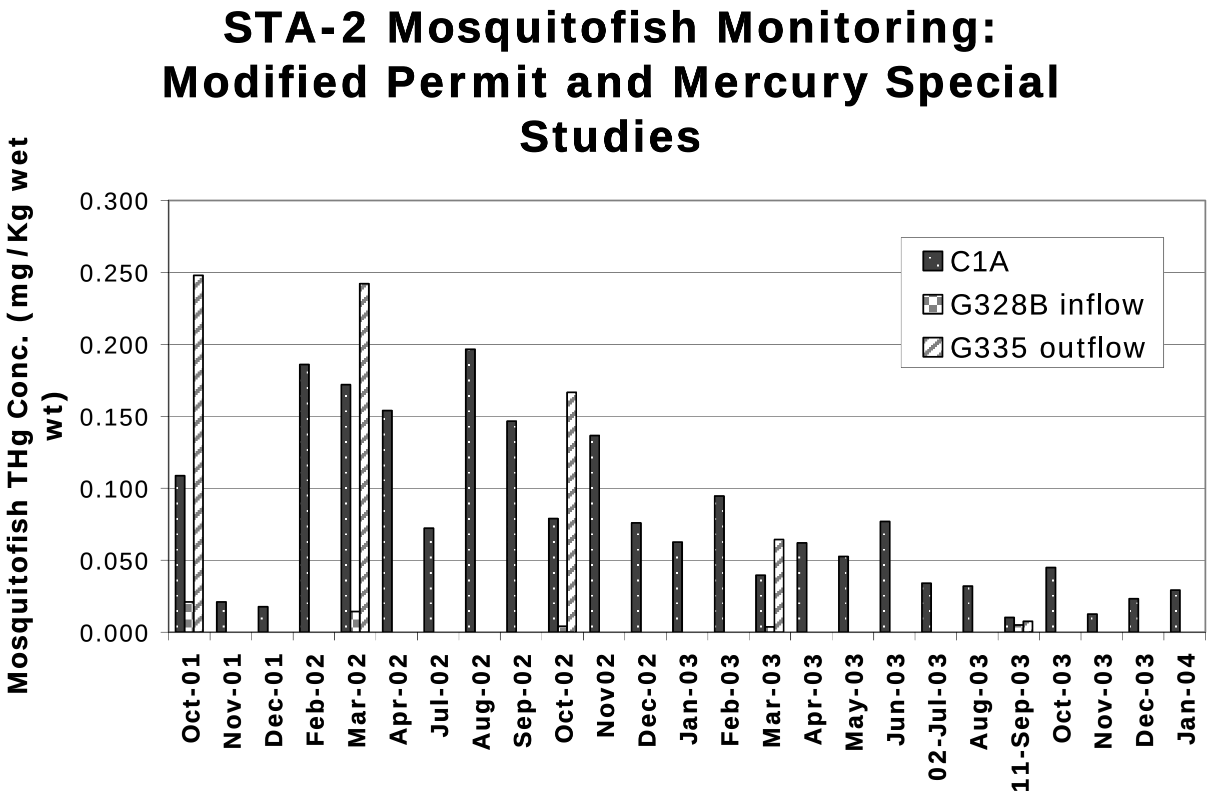


Figure 9. Interior STA-2 mosquitofish THg concentration results for modified permit start-up compliance monitoring (Exhibit E).

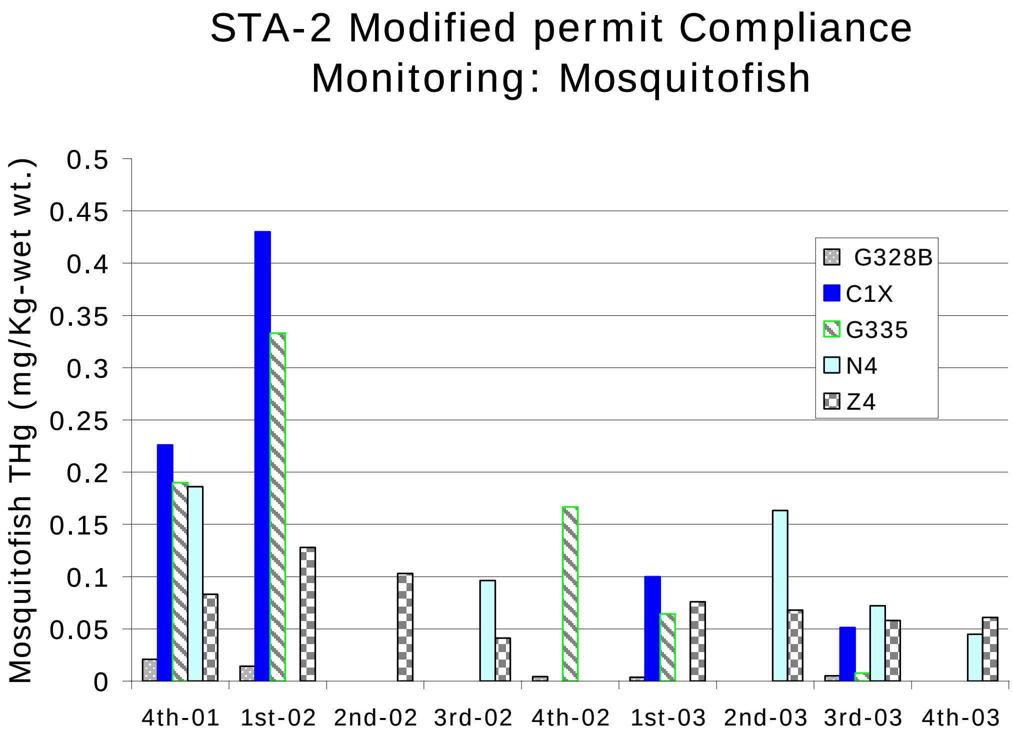


Figure 10. STA-2 downstream mosquitofish THg concentration results for modified permit compliance monitoring (Exhibit E).

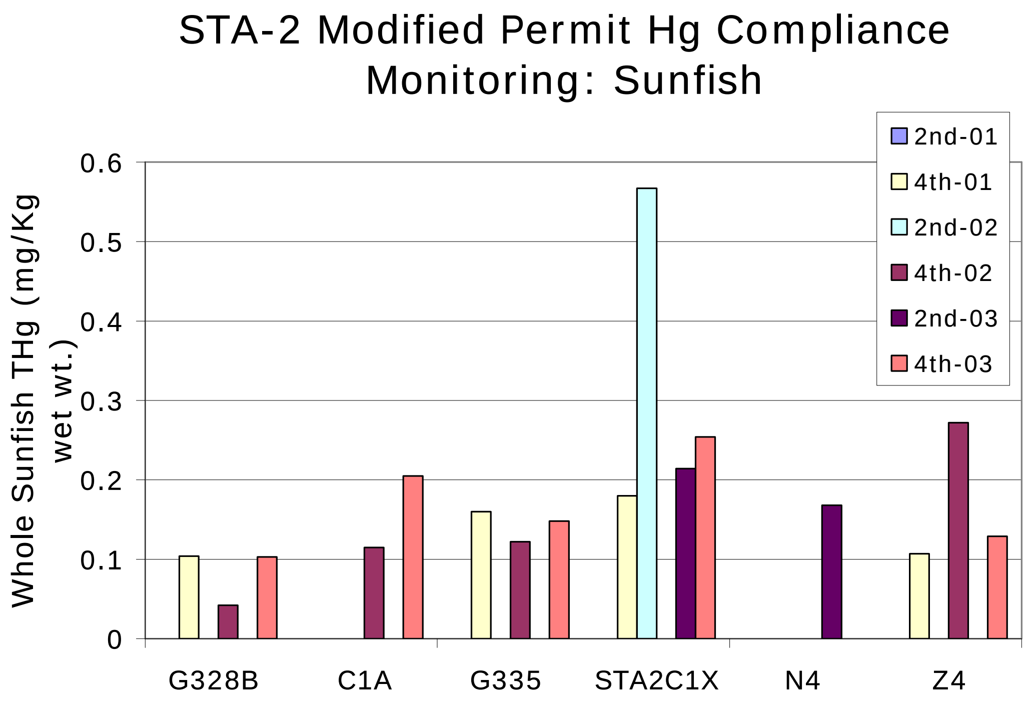


Figure 11. STA-2 sunfish THg monitoring results for modified permit compliance (Exhibit E).

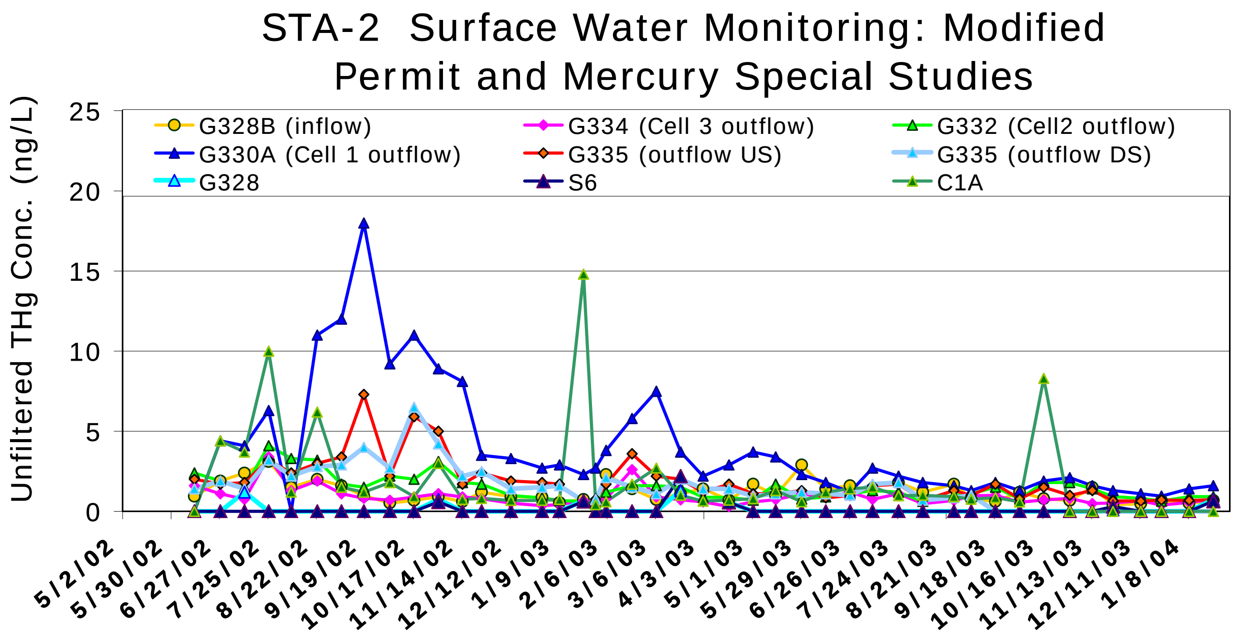


Figure 12. Surface water THg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

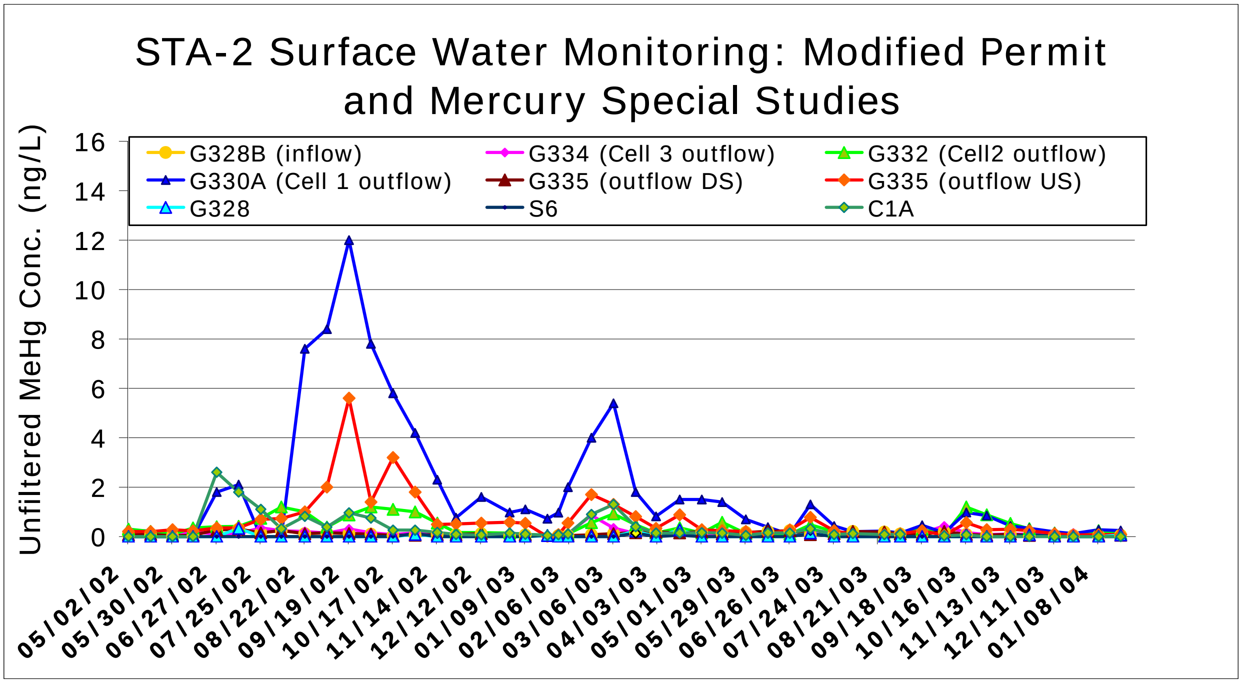


Figure 13. Surface water MeHg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

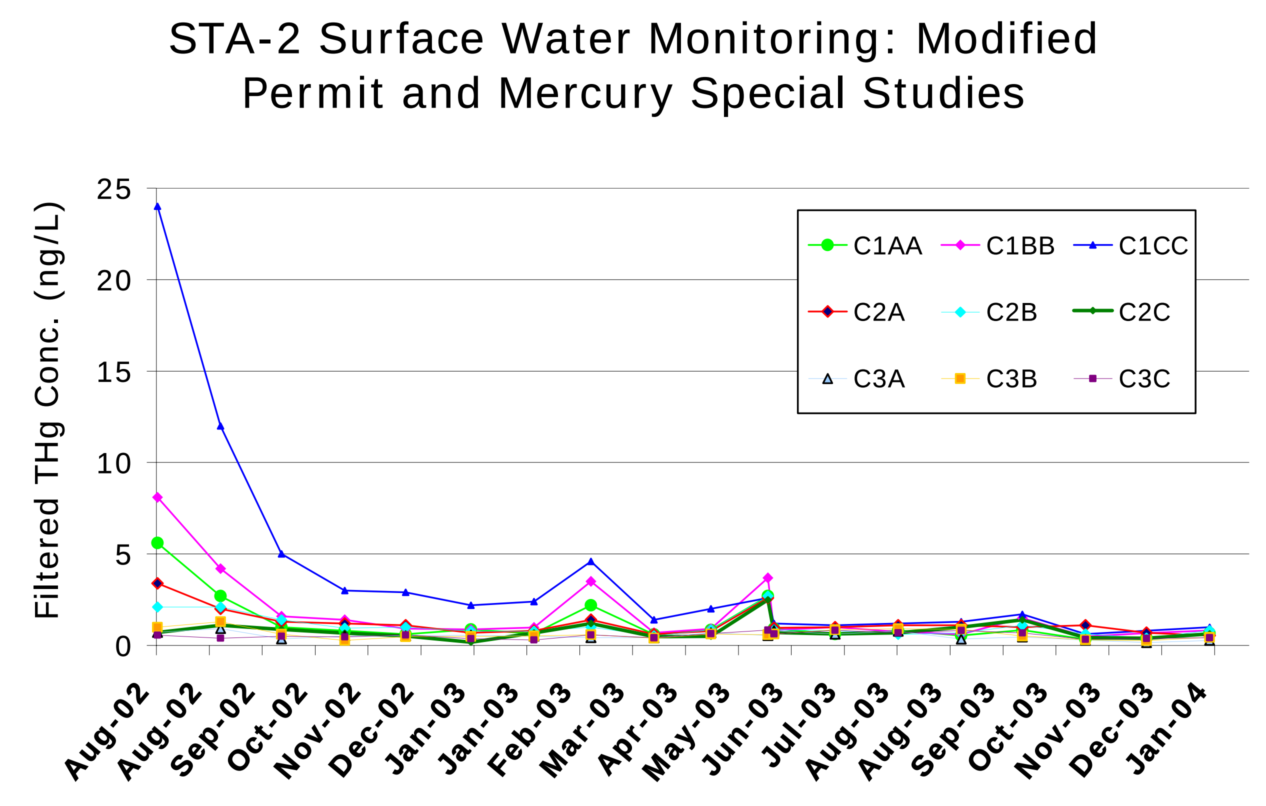


Figure 14. Interior filtered THg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

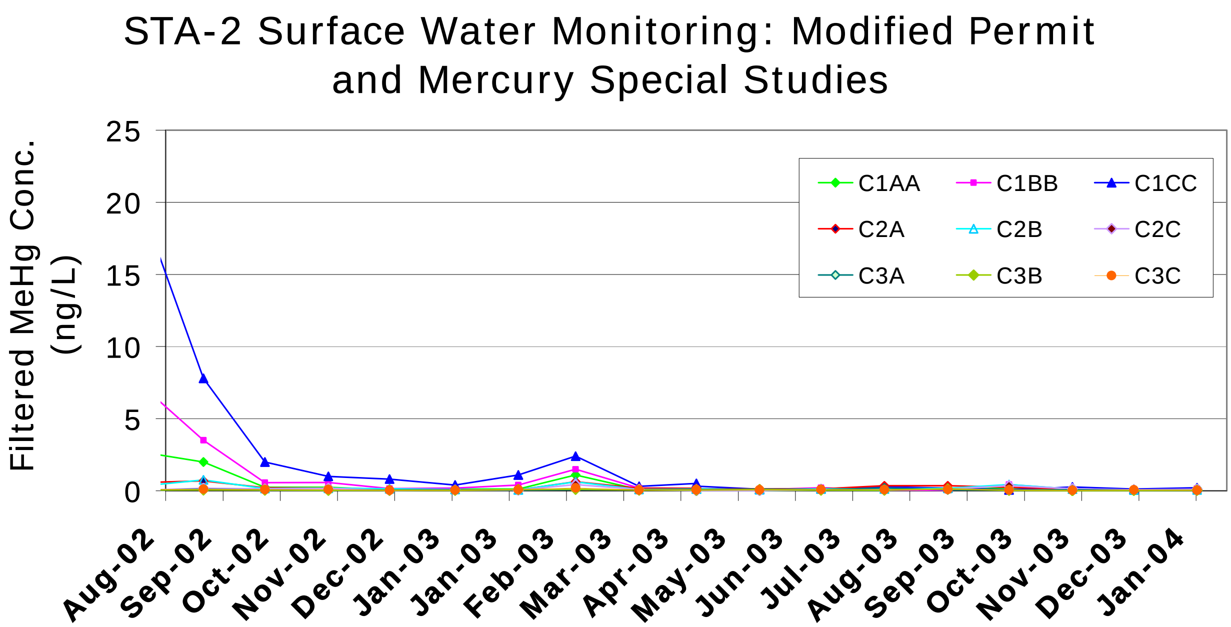


Figure 15. Interior filtered MeHg monitoring results for the STA-2 Mercury Special Studies Project (Exhibit E).

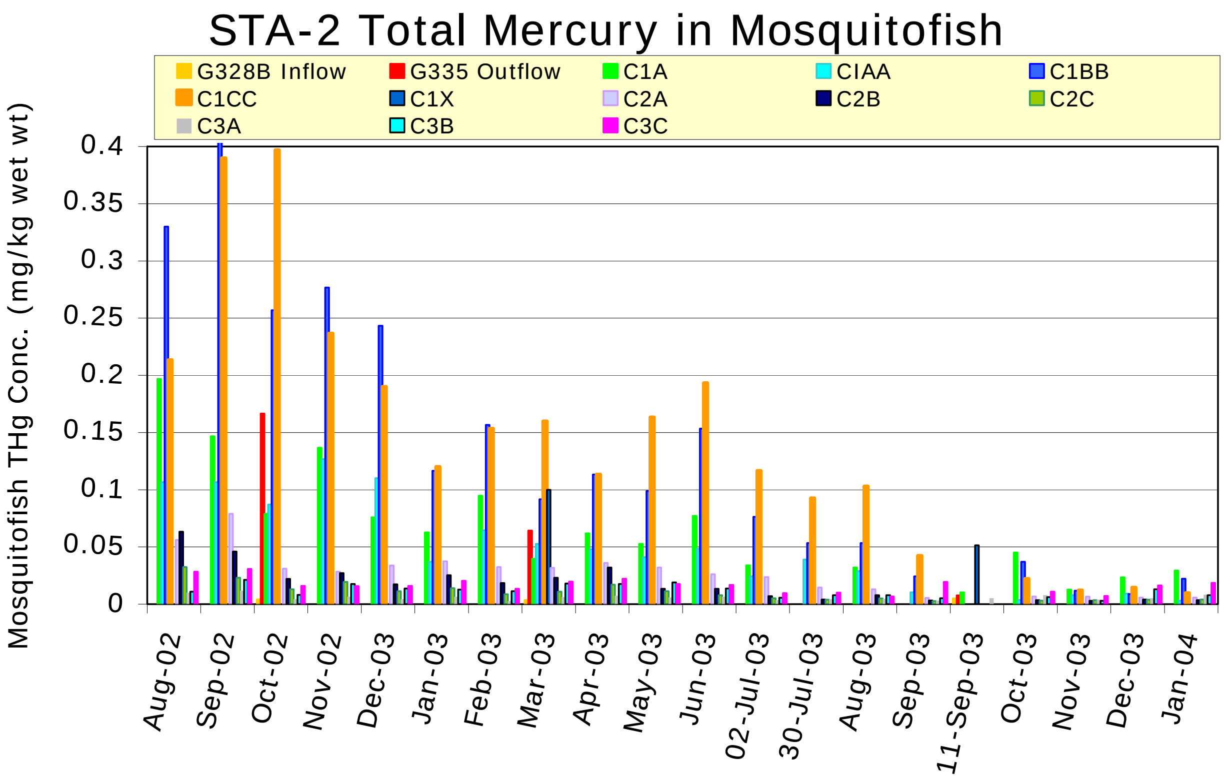


Figure 16. Mosquitofish THg concentration monitoring results for the STA-2 Mercury Special Studies Project (MOA).

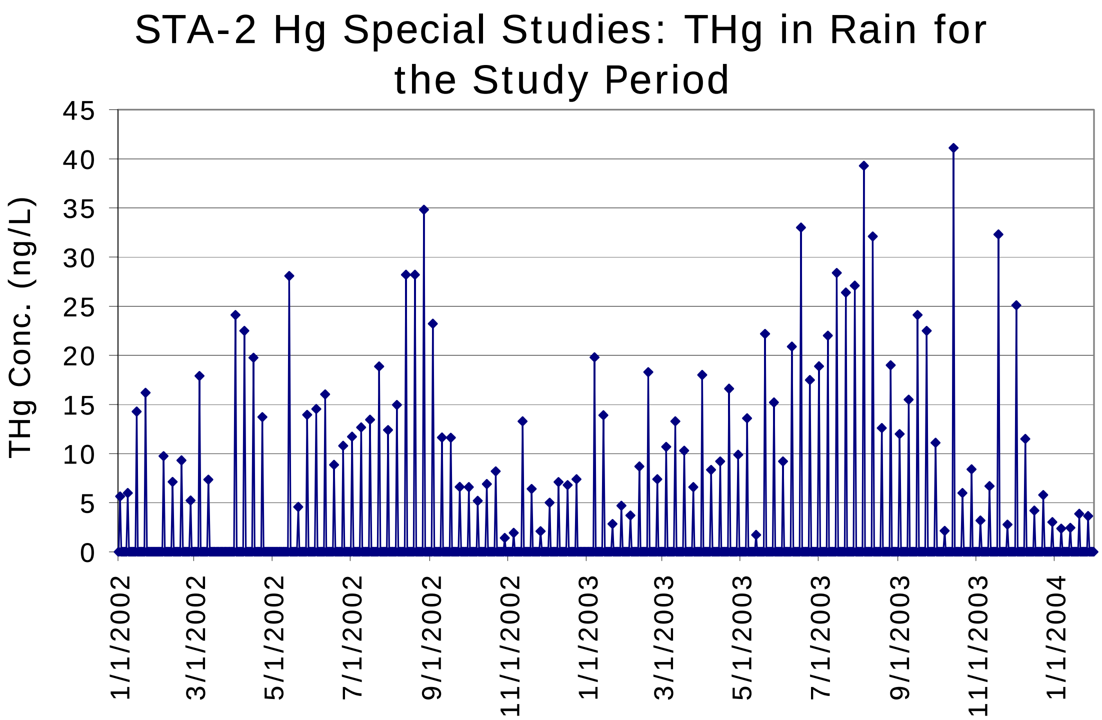


Figure 17. Weekly integrated rainfall THg concentration (ng/L) at STA-2 for the period 01/01/02 through 01/31/04

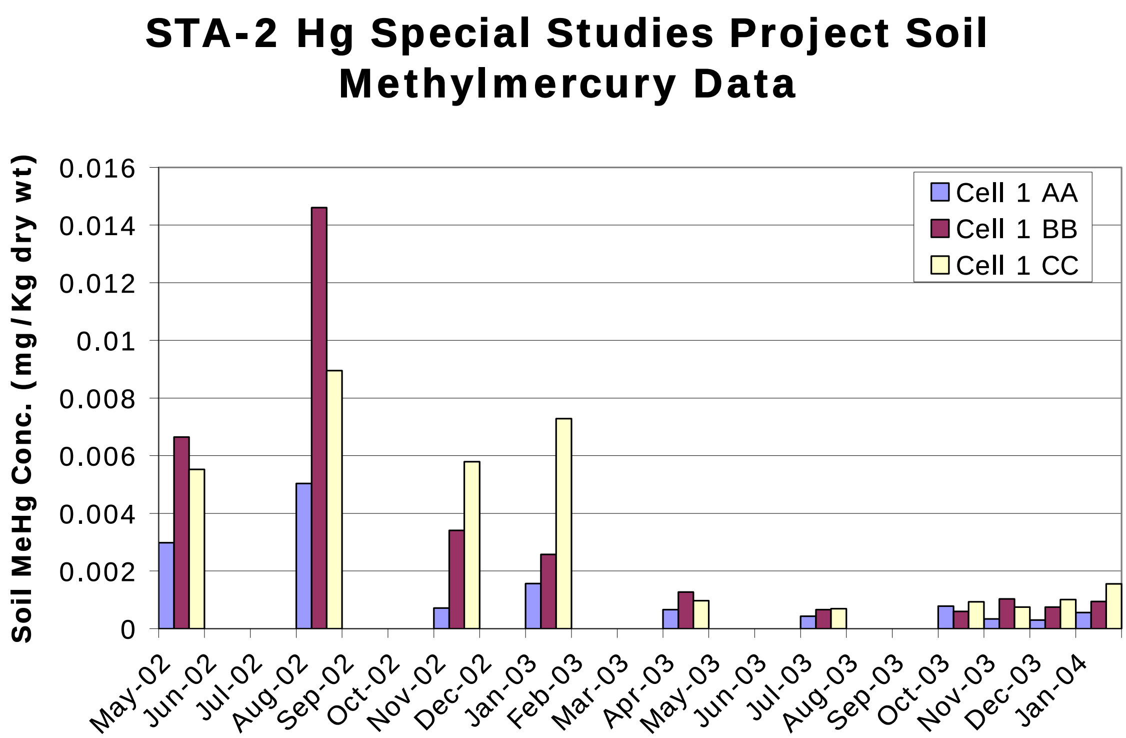


Figure 18. Soil MeHg concentration (0-4 cm cores) monitoring results to date for the STA-2 Mercury Special Studies Project (MOA)

ATTACHMENTS

Attachment 1

Porewater Collection Protocols for The NAWQA Mercury Study

By: Dennis Wentz, Mark Brigham, Mark Marvin DiPasquale, Bill Orem, Dave Krabbenhoft, George Aiken, and Margo Corum

I. Introduction

This document outlines the protocols for collection of stream-sediment porewater, subsampling for the various assays, sample preservation, and shipping requirements for the NAWQA Mercury Study. This protocol is written for collection of porewater using a slotted Teflon probe ("sipper") deployed at a sediment depth of 2 cm. The general procedures are readily adaptable to sampling other depths (up to about 10 cm), when desired, using the Teflon probe from the mercury lab. Analyses to be conducted on these samples include: mercury and methylmercury concentration; organic carbon; anions; and field analyses of sulfide and ORP.

II. Sampling Strategy

The schedule for collection of sediment and porewater is outlined in the Sediment Protocol document. Porewater should be collected in a relatively level area of stream sediment, directly adjacent (and in similar sediment) to the stream-bed sediment sampling zone. Choose one location per stream (sediment site with maximum methylation potential determined during initial sampling—either S1, S2, or S3), pending analysis of spatial data by Mark Marvin-DiPasquale.

III. Equipment and Supplies (number needed in parentheses; one unless otherwise noted)

<u>Supplied by Wisconsin District Mercury Laboratory</u>

- Teflon porewater probes (1 or 2 total)—Teflon cylinder with slots and fittings for ¼" Teflon tubing. Rinse between sites w/ 5% HCl and stream water.
- Acrylic plastic discs for porewater probes (2)
- Short Teflon sampling line [1/4 in. OD]
- Short C-flex pump head tubing
- Loaded filter cartridges (47 mm diameter quartz fiber filter; 5 per porewater sediment site)
- 500-mL Teflon sample bottles for porewater Hg/MeHg samples, precoded from WI Mercury Lab (1/site)

Supplied by Orem's laboratory

- Calibrated sulfide probe and meter

Supplied by Hg team

- ORP (redox) probe (Microelectrode)
- ORP standard (ThermoOrion 967961); alternatively follow procedures in NFM chapter 6.5.
- Sulfide antioxidizing buffer (SAOB)
- Minipiezometer (to measure head)
- Orion 250A+ pH/mV/Temperature meter and manual
- Orion pH probe
- Plastic syringe (5 mL, or 12 mL) with luer-lock ends (for ORP)
- C-flex tubing for filling syringe
- Magnetic stir plate
- Stir bars (1/2" long)
- Electrode holder

Supplied by Study Unit (or by WDML, if needed and requested in advance)

- Peristaltic pump fitted with pump head suitable for Masterflex # 15 and #24 tubing
- 12-V batteries (2)
- Plastic scintillation vials (20 mL) for sulfide, ORP, and anions (3/site + extras)
- Floating plastic tub [shallow tub, outfitted with Styrofoam (swimming noodle) floats] to hold pump, filters, bottles, etc.
- USGS Field forms
- Porewater sulfide data sheet (Attachment 1A)
- Plastic scintillation vials for calibrating meters.
- (Suggested deletion—instead use Orion ORP solution, or ZoBell's solution from Ocala, per National Field Manual)
- pH buffer series (4, 7 and 10)
- Small cooler for making pH and redox measurements
- Pipettor or syringe for delivering ~8 mL of SAOB (equivalent volume as sulfide sample)
- Prelabeled 20 mL plastic scintillation vial for porewater sulfate and chloride assay (2 per site, Liquinox cleaned → DI rinsed → dried)
- 40-mL brown DOC bottles (1/site)
- Meter stick (to measure head)
- Hand-operated vacuum pump (to pull water through minipiezometer)

IV. Sampling

General notes

- To minimize infiltration of stream water, carefully insert the probe vertically into the sediments. Sample in relatively horizontal sediments such that the probe is vertical and the disk is horizontal.
- Fast water will tend to slant probe toward downstream. Place small rocks on disc on upstream side (but not so many that the disc sinks into the sediment) or, preferably, have someone hold probe in place.
- Avoid disturbing the probe while it is deployed (disturbance can create channels that allow surface water to infiltrate).
- Pumping depletes pore waters in the desired depth increment, inducing infiltration of both deeper water and stream water to the zone around the probe. To minimize this effect, consider collecting a composite porewater from 3 separate deployments of the Teflon probe for each depth sampled. All deployments should be within a small (<1 m^2) area. (See "Suggested revision" below.)
- Remove filter cartridge from C-flex tubing before each deployment; slowly flush particle slug through pump line before reattaching filter cartridge**. This initial particle slug can clog filters instantly**.
- Calibrate ORP probe using calibration standards provided by the manufacturer, and procedures outlined in the National Field Manual and/or the manufacturer's probe manual.

Sampling Method

- Attach disc to probe at desired sampling depth (generally 2 cm; probe is etched 2 cm above screened interval).
- Insert probe into sediment until disc contacts surface. Disc should lie flat on sediment surface, and probe must be vertical
- Attach Teflon tubing to C-flex tubing with nylon cable tie to prevent blowing off under pressure.
- Pump very slowly to flush slug of dirty water from line before attaching filter cartridge. (Pumping slowly minimizes the formation of a cone of depression and contamination from surface water.)
- When water is fairly clear, and while still pumping slowly, attach the filter cartridge and hold upright to purge air out of filter cartridge.
- Flush filter with **a few** mL of water.
- Pump 150 mL from each of three deployments of the Teflon probe, and composite the water into a clean 1 L PET bottle. After the third aliquot is pumped into the bottle (total volume=450 mL), fill a scintillation vial full for ORP sample.

ORP (aka redox potential)—Measure ORP immediately.

- Microelectrode ORP probe is stored in glass sheath, with DI-moistened sponge in the sheath. Probe is taped to glass sheath to form a seal.

- Remove probe from glass sheath and connect probe to meter. Make sure it is locked in place. Uncover hole on the ORP probe (remove small rubber plug).

- Check calibration using either freshly prepared saturated quinhydrone solutions in pH4 and pH7 buffers. Alternatively, use Orion ORP Standard (Orion 967961, absolute mV reading is 220 mV [+/- 5 mV]). Record mV readings of ORP standards. The meter is not calibrated, as is typically done with pH or dissolved oxygen. If readings are unacceptable, clean and maintain probe per manufacturer's instructions, or replace probe.

- Attach a small piece of tubing to the end of the syringe.

- Draw ~5 mL sample water into syringe, with tubing attached. Take sample immediately from anion vial, or directly from pump line.

- Insert probe into tubing.

- Slowly discharge sample water past the electrode, noting the mV readings on the meter.

- Record ORP reading in mV. Note: ORP mV readings are noisy; record a central value. Some samples are more stable than others. Pay attention to readings as you push the last bit of sample over the probe.

- In between samples, you do not rinse the tube or the electrode.

    - To clean up the electrode between samples, push slowly to clean the tube and electrode with the sample.

- Rinse and blot dry the electrode when sampling is completed. Replace rubber plug in the hole in the electrode, and store electrode in its glass sheath.

Immediately begin splitting the composite sample into sample containers:

1. Pour small amount of sample into PET bottle cap; syringe (or pipette) 8 mL into a scintillation vial that contains 8 mL of SAOB (sulfide anti-oxidizing buffer). [Margo wrote 3 mL sample into 3 mL SAOB—critical to use equal volumes of sample and SAOB.]

   Sulfide is unstable until sample is placed in SAOB.
   See Attachment 1B—sulfide analyses. Sulfide is analyzed by electrode either on site, or in hotel same night of sampling. Keep sample in cool, dark place until analysis.

At end of week, return sulfide probe and meter to Orem's lab.

2. Rinse 500 mL Teflon Hg bottle twice with ~5 mL aliquots of sample water, then fill bottle at least half full. Preserve with HCl preservative. Ship to Wisconsin District Mercury Lab.

3. 40 mL amber glass vial for DOC. Keep sample on wet ice until delivery to Aiken's lab.

4. Fill plastic vial for anions (chloride/sulfate). Keep samples cool and in dark. Ship to Orem's lab.

V. Head Measurement

To conceptually link porewater geochemistry with the overlying stream water, it is desirable to know if groundwater is discharging from the sediment zones being sampled. Positive groundwater head (elevation of water in minipiezometer > elevation of surface of stream) indicates groundwater discharge. Negative groundwater head (elevation of water in minipiezometer < elevation of stream surface) indicates recharge. At constant groundwater discharge rate, head increases with depth of sediment, and with the "resistance to flow" of the sediment (fine sediment resists flow more than coarse sediment). Groundwater head equals stream-water elevation at the sediment-water interface, and is likely immeasurable in the upper couple cm.

When sediment and porewater sampling is complete, attempt to measure head with the minipiezometer. Minipiezometer consists of steel casing (marked in 10 cm increments); rigid clear plastic tubing; and a drive point attached to the tubing.

Drive minipiezometer to the first 10 cm mark on the steel casing. Remove casing. Measure head (difference between water elevations) to nearest mm, and record in field notes. Pull a slight vacuum on minipiezometer to draw water farther up the tube; remove vacuum and let water re-equilibrate. Water should return to previously measured value. If it differs, there may have been head induced by deployment of the minipiezometer. Repeat procedure for 20 and 30 cm depths, if possible. Record values. Be careful when removing minipiezometer from sediments. If steel drive point breaks off of tubing, retrieve it and mount it on a spare length of tubing.

VI. Quality Control Samples

Replicates: Mercury lab has collected replicates for porewater THg and MHg at all sites; no further replicates are needed for mercury. During remainder of study, each study unit should collect a total of two sets of replicates for the remaining analytes.

Equipment blanks: Once, early in the study, each study unit should collect a blank sample for each analyte at one site. Pump blank water through Teflon probe, pump lines, and filter.

For DOC, use organic blank water and inorganic blank water.

For anions, ORP, and sulfide, use inorganic blank water.

For mercury, use Milli-Q from WDML (must request).

VII. Questions? Contact / Shipping Info:

a) Dave Krabbenhoft - phone: (608) 821-3843, e-mail: dpkrabbe@usgs.gov; Mark Olson - phone: (608) 821-3878, e-mail: mlolson@usgs.gov; John DeWild - phone: (608) 821-3846, e-mail: jfdewild@usgs.gov
USGS / 8505 Research Way / Middleton, WI 53562-3581

b) George Aiken - phone: (303) 541-3036, e-mail: graiken@usgs.gov
USGS / 3215 Marine Street, Suite E-127 / Boulder, CO 80303

c) Bill Orem - phone: 703-648-6273, e-mail: borem@usgs.gov
USGS / 12201 Sunrise Valley Drive / Mailstop 956 / Reston, VA 20192

Attachment 1A—Porewater Sulfide data sheet

Site Name:________________________________ Site Number:____________________

Project Name: ______________________________ Date: __________________________

Detection Limit of Electrode: -700 mV Electrode Used:__________________

Sample ID	Sulfide Reading (mV)

Attachment 1B—Sulfide measurement by Ion Selective Electrode
Protocol from Margo Corum

I. Preparation:
A. Night Before Sampling
Fill the Sulfide electrode with solution A. It is the only filling solution in the black case.

- Unscrew the black top on the filling solution A, remove the red stopper/plug, and replace the white top to fill the electrode. Remove the tape and teflon tape from the electrode, and fill with the filling solution A.

- Place the tape back over the hole on the electrode to store (overnight or when not in use), even if the electrode is soaking in SAOB/ascorbic mix.

Make sure the cap stays on the bottom of the electrode when not in use, shipping, or any other time unless, the electrode is in the SAOB/ascorbic mix

B. First thing in the morning

- Mix one container of pre-weighed ascorbic acid with one container of pre-measured SAOB.
    - Dump the ascorbic acid in the pre-measured SAOB, cap and shake.
    - Rinse the ascorbic acid container with SAOB.
        i. Pour some of the mix back into the container of ascorbic acid, cap and shake.
        ii. Pour back into the SAOB bottle.
    - Let the SAOB mix sit for 10 minutes, before using.
- Soak the sulfide electrode
    - Place ~3 mL SAOB in an extra scintillation vial
    - Place the electrode in the 3 mL SAOB mix.
    - Let the electrode soak in the mix until ready to use.
    - Keep the electrode soaking the entire time, day and night until you need to use.

EACH DAY YOU COLLECT SULFIDE SAMPLES MIX FRESH SAOB MIX

II. Collecting and Storing the Samples

- Pipette out of the big collection bottle 3 mL into the appropriate sulfide scintillation vial, which should already have the SAOB mix in it and cap.
  - Store in dry dark cooler or dark area, until ready to measure.
- . Pour off sample from the big collection bottle into the 60 ml bottle for nutrients.
  - Fill the bottle to the shoulder or almost full. If you are taking out sample for redox see below.
  - Store nutrient sample in labeled bag, with date, site name, and number in a cooler with dry ice to be shipped back frozen.
- Pour off sample from the big collection bottle to the appropriate anion vial.
  - Store anion vials in labeled bag, with date, site name, and number in a cooler to be shipped back. These samples do not need to be frozen, just stored in a cooler.

III. Reading Sulfide

- Connect the sulfide electrode to meter.
  - Make sure BNC connector is locked in place.
- Place little stir bars in each sample you will be reading.
- Remove the sulfide electrode from the buffer.
- Rinse the electrode with DI water and dry with a kimwipe.
- Place the sample with stir bar on the stir plate
  - Turn stir plate on.
    - Just enough to gently stir the sample.
- Lower the electrode into the sample.
  - To prevent the meter from turning itself off, hit “yes” key every few minutes, especially if the sample is below detection limit.
  - If the sample is below detection limit. Keep electrode in sample for ~5-10 minutes.
    - For 5 minutes if it is really low, 10 minutes if it is borderline.

- Record the value in **mV** (millivolts).
  - If the sample is below detection limit, the reading will not stabilize.
  - If the sample is above detection limit, the value of sulfide will become stable faster.
- Between samples, rinse the electrode with DI water and blot dry with a kimwipe.

Attachment 2

Summary of the Interim SFWMD Modified Procedure for Pore Water Sample Collection

This is a summary of the interim SFWMD procedure for the collection of pore water using a modified *in situ* sipper design developed and field-tested by the District per Tier 1 Task 1. The final procedure is being prepared under a separate contract work order.

Modified Apparatus

The apparatus has been modified to include three new features. The first is the addition of a 0.75 m diameter x 0.025 m thick molded disk composed of "starboard" marine-grade plastic (chemical name of polymer) through which a 5-cm hole has been drilled. A 10-cm diameter Teflon brace with a 5-cm diameter hole aligned with a 5-cm hole in the center of the disk is mounted on the upper side of the disk with Teflon screws. The barrel of the original Teflon probe is inserted through the hole in the brace and the center of the disk. The probe is fixed at the desired depth by tightening three Teflon set screws threaded through the barrel of the brace at 120-degree angles.

The second new feature is a one-meter long, PVC handle added for ease of insertion of the probe into the subsurface soil/sediment layer, even in relatively deep water. The handle is affixed to the top of the disk with a series of four mounts with circular ___ to accommodate each of the four tubes that comprise the handle. The handle is stiffened with a series of cross bars affixed at 90-degree angles to the handle tubes.

The third new feature is a set of equally distributed weights hung from the handle cross-bars. The weights are intended to ensure that a uniform pressure is exerted on the sediment to seal off the water/sediment interface and prevent inadvertent collection of surface water during the collection of the pore water.

Advantages of the Modified Design

Many research analytical laboratories and almost all commercial analytical laboratories do not have a microvolume analytical capability, such that the use of the pore water micro-extractors popular with soil and sediment biogeochemists (REFs) is precluded. With our apparatus, following system purging with *in situ* pore water using roughly 0.03 L, this modified design allows the subsequent routine collection of 0.75 L of sample over an elongated ellipsoid of withdrawal centered beneath the probe tip at an average sediment depth of 2-6 cm in wetland sediments with bulk densities in the range of 50 to 300 Kg/m^3. The absence of surface water breakthrough has been verified by monitoring pore water redox potential continuously during collection (invariably redox potentials are in the range of -200 to – 300 mv relative to the standard hydrogen electrode and do not approach the redox potentials of the overlying surface water, which are in the range -30 to + 70 mv). The collection of large sample volumes has the additional advantage of averaging out the local microheterogeneities in soil pore water chemistry that could otherwise prove unrepresentative of the pore water at the scale of the system or subsystem of interest.

Disadvantages of the Modified Design

The primary disadvantage of the modified design is that the sample is collected at a constant bulk modulus rather than a constant sediment depth. However, in water bodies with flocculent and/or unconsolidated sediments, where the water/sediment interface is indistinct and/or ill-defined but the sediment composition and density are relatively uniform, this approach is likely to introduce less variability into the pore water sampling depth than when attempting to insert the probe to a constant depth relative to the perceived water/sediment interface.

Attachment 3

Hardcopy of Invoice Summary and Invoices for Reimburseable Match for Project under SP524 (C-11900-A03)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045 • TDD (561) 697-2574
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

June 30, 2004

Don Axelrad
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: SP524 (C-11900-A03) Seventh Quarterly Report

Dear Dr. Axelrad:

This letter constitutes the seventh and last quarterly report required by SP524 (C-11900-A03) for the period, January 1, 2004, through February 4, 2004. With the initiation of C-11900-A04, Darren Rumbold, Ph.D., will be the new Project Manager. He brings a wealth of experience to his new role, as I depart for other assignments. However, I will still be available to answer any questions that he or you may have regarding the project and will co-author the Final Report.

In summary, for the last set of unfiltered surface water samples collected for the STA-2 Mercury Special Studies Project on January 22, 2004, the concentration of methylmercury (MeHg) in the STA-2 Cell 1 outflow was running about five times the corresponding inflow concentration but only about twice the concentration of the Cell 2 outflow and two-and-one-half times the Cell 3 outflow at G-334. The Cell 1 outflow concentrations are now well within the range of what is typically encountered in the outflows of other STAs and structures. The average Cell 1 water and soil concentrations have decreased roughly one hundred- and ten-fold, respectively, since start-up. It is safe to conclude that the MeHg anomaly has dissipated and Cell 1 is fully operational in response to the initiation of flow-through operation as a mitigative measure.

At this juncture, I must acknowledge the superb contribution of Dave Struve, M.S., Laboratory Director, and Meifang Zhou, Ph.D., of the Water Quality Analysis Division in (1) adapting my design, constructing, and field-testing the modified *in situ* "sipper" pore water collection apparatus in coordination with Tetra Tech staff over an incredibly short period of time to meet project needs; (2) chemical analyses of the pore water samples for constituents of interest, including Fe(II) and S^{-2}, neither of which were routinely analyzed by the District's laboratory; and (3) the near real-time statistical analysis of the pre-study data for adaptive redesign of the validation study. Without them there would be no valid pore water data.

In addition, I would be remiss if I did not note the efforts of the Water Quality Monitoring Division staff involved in collecting the first complete sets of water, soil, vegetation, and fish samples and the subsequent training of the Tetra Tech sampling crew to complete what they had started. Kevin Nicholas and Nicole Niemeyer are stand-outs in this regard. Last but not least, without the dedication of Tetra Tech's Randy Keyser and Pat Zuloaga, the validity of the data generated from the routine and pore water monitoring in STA-2 might not have been assured.

Enclosed are (1) a brief synopsis of the key soil monitoring results regarding the sulfide inhibition hypothesis and (2) the invoices for equipment and supplies from project inception and for labor and chemical analyses for the period 5/1/2003 through 12/31/03. I have also forwarded via e-mail electronic copies of (1) the data generated in the pore water collection validation pre-study and study and a presentation on the modified pore water sipper collection method delivered by Tetra Tech staff at a recent professional conference. (Hardcopies not enclosed.)

This last set of invoices fulfills the District's matching requirement under the Section 319 Grant. Additional costs have been incurred since then in completing the monitoring for the STA-2 Mercury Special Studies in the period January 1, 2004, through February 4, 2004, and the pre-study and side-by-side validation study for the *in situ* modified sipper method of pore water collection, which were initiated after February 4, 2003, under C-11900-A04. However, no more invoices will be submitted under C-11900-A03 or amendment C-11900-A04, which extends the project through September 15, 2004. The Final Report will be submitted on or before September 15, 2004.

It has been a privilege and pleasure to work with you and the entire team on this seminal project. Thank you for your and FDEP's continuing support. Feel free to call me at (561) 682-6749 if you have any follow-up questions or concerns.

Sincerely,

Larry E. Fink, M.S.
Project Manager
C-11900-A03

LEF/lef
Enclosures (2)

c: Tom Atkeson, FDEP (Synopsis only)
Richard Harvey/Dan Scheidt USEPA 4 (Synopsis only)
Frank Nearhoof/Temperince Morgan, FDEP (Synopsis only)

STA-2 Mercury Special Studies
Seventh Quarterly Report
January 1, 2004 to February 4, 2004.

June 30, 2004

Cell 1 of Stormwater Treatment Area (STA-2) experienced methylmercury (MeHg) anomalies of progressively increasing magnitude in the fall of 2000 and 2001 and the summer of 2002. The August 2001 decision by the Florida Department of Environmental Protection (FDEP) to authorize flow-through operation of Cell 1 without it first meeting its mercury start-up criteria was based on the predicted beneficial effect of (1) keeping Cell 1 continuously inundated and flowing to deplete the pool of whatever was fostering excess MeHg production in the surficial soils; and (2) exposing Cell 1 soils to excess sulfate in the inflow water sufficient to allow the build-up of soil and/or pore water sulfide to levels capable of inhibiting MeHg production. Since August of 2002, Cell 1 did not dry out, and there is strong evidence of the build-up of soil and pore water sulfide to levels that inhibited MeHg production at Cell 1 Site C1C between the winter of 2002 and the winter of 2004 when the study ended.

At Site C1C after the intentional dryout of Cell 1 was essentially complete in February 2002, the USGS reported a baseline MeHg concentration in surficial soil (0-5 cm) of 3.6 ug/Kg dry wt vs an average of 0.38 ug/Kg dry wt (0-4 cm) in the last three months of the study, a nearly nine-fold decrease. During that same period, the average soil AVS concentration increased about five-fold and pore water sulfide increased about seven-fold. When three of the 26 individual soil concentration data points are censored as outliers, the correlation between soil MeHg and soil AVS changes dramatically, from r = 0.47 to r = -0.78. For Cell 1 at the interior sites C1AA, BB, and CC, omitting only the pre-wet baseline soils data, the strongest correlations between the surficial soil MeHg concentration and other soil constituents was an inverse relationship with soil moisture (r = -0.57) and soil sulfur (r -0.61) for the natural logarithmic transformation (LNT) of the data. The inverse correlation with LNT AVS was somewhat weaker (r = -0.44) for Sites C1AA, BB, and CC than the replicate site C1C, however.

The expected inverse relationship between pore water sulfide and pore water MeHg was not observed in the pore water data, either when all cells were combined or when Cell 1 was evaluated individually. To the contrary, the relationship ranged from moderately positive to weakly negative, depending on the lag time. This suggests a more complex relationship than is accessible to linear correlation analysis. When the data were first parsed into high and low sulfide concentration categories, the positive and inverse correlations strengthen substantially (M. Zhou, SFWMD, personal communication). This would not be inconsistent with the parabolic relationship between the concentrations of pore water sulfide and pore water MeHg hypothesized by ANSERC's Cynthia Gilmour based on mechanistic grounds.

The Final Report will present an in-depth discussion of the patterns of correlation observed and their possible mechanistic explanations. However, only controlled experiments can test these emerging hypotheses rigorously. Follow-up research by the U.S. Geological Survey and the Smithsonian Institution in the District's STAs should further our understanding of the underlying cause of the statistically and ecologically significant observed reductions in MeHg concentrations in STA-2 Cell 1 soil, water, and fish over the course of the study. Whatever the cause, the desired effect has been achieved.