2010

DE BEERS CANADA INC.
VICTOR MINE

MERCURY PERFORMANCE MONITORING
2010 ANNUAL REPORT

AS PER CONDITIONS 7(5) and 7(6) OF
CERTIFICATE OF APPROVAL #3960-7Q4K2G

Submitted to:
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and

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List of Abbreviations

Abbreviation Meaning	
ATT	Attawapiskat
CEQG	Canadian Environmental Quality Guidelines
COM	Community
CONF	Confluence
CPUE	Catch Per Unit Effort
DS	Downstream
DSNAY	Downstream Nayshkootayaow
F-Value	Analysis of Variance from Sample Statistics
FF	Far Field
HgCON	Mercury Control Station / Northwest Control
MC	Monument Channel
MDL	Method Detection Limit
NAY or NAYSH	Nayshkootayaow
NAY-MOUTH	Mouth of Nayshkootayaow
NEF/F	Northeast Fen Final
NGC	North Granny Creek
ng/L	Nanograms per Litre
NF	Near Field
PPM	Parts Per Million
P-Value	Tabled Probability Threshold
SEF/F	Southeast Fen Final
SGC	South Granny Creek
ST	Station
SWF/F	Southwest Fen Final
T	Tributary
µg/G	Micrograms Per Gram
US	Upstream

1.0 INTRODUCTION

This report was prepared by AMEC Earth & Environmental Limited (AMEC) on behalf of De Beers Canada Inc. (De Beers), pursuant to the requirements of Conditions 7(5) and 7(6) of Certificate of Approval (C. of A.) #3960-7Q4K2G. The report is the third in a series of annual mercury monitoring reports that will be prepared for the Victor Mine. This third annual report summarizes all Victor Mine site mercury monitoring data collected for the year 2010, and also provides summaries of earlier data and trends where appropriate.

A broad-based, rigorous mercury monitoring program was established for the De Beers Victor Mine because of concerns raised during the provincial permitting process, regarding the possible influences of mine dewatering activities on muskeg system hydrodynamics and associated mercury chemodynamics. In particular, concerns have been expressed that should mine dewatering lead to extensive "drying out" of the local muskeg ecosystem, then there could be a potential for the release of increased quantities of mercury to area receiving waters above those that occur naturally. Mercury is present in area peatlands in the baseline condition as a result of the long-range aerial transport of emissions from natural and anthropogenic sources unrelated to activities of the Victor Mine.

AMEC and De Beers have previously provided evidence to support the position that mine dewatering activities were not likely to result in a condition that would substantively increase mercury release rates to area receiving waters, and that if evidence of such substantive release rates was to occur, then mitigation measures would be implemented to prevent or arrest the aggravating condition. The Victor Mine mercury monitoring program is designed to test De Beers' position that mine dewatering is not likely to substantively increase mercury release rates to area receiving waters.

Data collected up to the end of 2010 thus far continue to support the De Beers' position that mine dewatering is unlikely to result in substantive increases in mercury release to area surface waters, as described in detail in the sections that follow.

As an added note, laboratory services for the water sample program were conducted in part by Flett Research Ltd. in Winnipeg (to approximately the end of April 2009), and by Dr. Brian Branfireun's laboratory at the University of Western Ontario (approximately May 2009 until present). Fish flesh analyses were conducted at Dr. Branfireun's laboratory as of 2008. Both laboratories are recognized for their specialty of ultra-trace analyses for mercury.

Data reported as "less than values" (i.e., less than the detection limit values) by either laboratory are shown as being at the reported detection limit in all tables in this document. Lower end values are therefore conservative. Detection limits provided by Flett Research for water samples varied with the samples being analyzed with some detection limits being shown as a low as 0.00 ng/L, measured to two decimal places. Detection limits provided by Dr. Branfireun's laboratory were set at two levels: "limit of quantification" – 0.0169 ng/L, and "method detection limit" (MDL) – 0.0054 ng/L. Values less than the MDL were reported by Dr. Branfireun's laboratory as "non-detect" and are presented in the tables of this report as <0.01 ng/L or as stated. Values reported as "detect" by Dr. Branfireun's laboratory as presented in the tables as 0.01 ng/L or as stated.

For readers unfamiliar with these units of measurement:

ng/L represents nanograms per Litre of water, which can also be expressed as parts per trillion (ppt) or 1 part of material in 1,000,000,000,000 parts of water.

ug/G represents micrograms per gram of solids (e.g. fish flesh), which can also be expressed as parts per trillion (ppt) or 1 part of material in 1,000,000,000,000 parts of solids.

2.0 REQUIREMENTS

Condition 7(5) of Certificate of Approval (C. of A.) #3960-7Q4K2G states the following:

The Owner shall report the results from the previous calendar year for the mercury monitoring program described [in] Condition 6(8), to the District Manager and the Chief of the Attawapiskat First Nation by June 30 of each year.

The referenced Condition 6(8) states:

The Owner shall carryout a mercury monitoring program that includes, but [is] not necessarily limited to the following:

(a) A onetime assessment of peat solids to determine mercury content (completed in 2007);

(b) An analysis of peat, mineral soil, and bedrock pore water on an ongoing annual basis at the locations identified in Table 2 below;

(c) Monitoring of surface water systems on a monthly or quarterly basis depending on station at the locations identified in Table 3 below;

(d) Monitoring of the well field discharge on a monthly basis and quarterly basis and quarterly sampling of individual wells;

(e) Sampling of sportfish at 3 year intervals and small fish sampling on an annual basis at locations identified in Table 4 below.

Condition 7(6) states the following:

The Owner shall report the results from the previous calendar year for the mercury assessments described [in] Condition 6(9), to the District Manager and the Chief of the Attawapiskat First Nation by June 30 of each year.

The referenced Condition 6(9) states:

In conjunction with the mercury management and monitoring program required in Section 6(8), the Owner shall also carryout data analyses, enhanced sampling programs, modeling, risk assessments, and implement effective mitigation measures, as and when required, all in accordance with the March 31, 2008 Report prepared by AMEC and submitted to the District Manager, entitled Trigger Values for Mercury Concentrations and/or Body Burdens in Fish, Condition 6(10) of Certificate of Approval #8700-783LPK, De Beers Canada Inc., Victor Mine. This program may be amended from time to time when approved in writing by the District Manager. As well, water quality data collected as part of the groundwater well field recovery system shall be analyzed statistically to determine the variability and trending over time. Should significant variation occur over time within individual wells or group of wells then a potential concern will be deemed to exist, requiring further investigation.

3.0 REPORTING – CONDITION 6(8) DATA

3.1 Condition 6(8)(a) – One Time Assessment of Peat Solids

Requirements of this condition were fulfilled in Section 3.1 of the first annual mercury report (2008 Annual Report), and are not repeated here.

3.2 Condition 6(8) (b) – Annual Analysis of Peat, Mineral Soil and Bedrock Pore Water

Condition 6(8) of Amended C. of A. #4111-7DXKQW, dated October 3, 2008, and Condition 6(8) of the Amended version referred to as C. of A. #3960-7Q4K2G, dated March 13, 2009, both provide for the annual collection of peat pore water samples from muskeg monitoring program stations identified in Table 2 of the C. of A. The two C. of A.'s also provide for the annual collection of water samples from muskeg monitoring program mineral soil and bedrock monitoring wells / piezometers identified in Table 2 of the C. of A. Samples are to be analyzed for total and methyl mercury.

C. of A. #4111-7DXKQW was preceded by C. of A. #8700-783LPK, dated December 11, 2007. Condition 6(9) of C. of A. 8700-783LPK provided for the development and approval of a mercury monitoring plan. The mercury monitoring plan had been developed previously through consultation with the MOE and was submitted to the MOE on November 13, 2007. The November 13, 2007 monitoring plan provided for the annual collection of peat pore water samples from the same muskeg monitoring program stations identified in Table 2 of C. of A. #3960-7Q4K2G; as well as from mineral soil samples to be collected from three depths below surface from each of the MSV(1)-D, MSV(2)-D and MSV(3)-D stations.

As a precautionary measure to better document baseline conditions, filtered samples for total and methyl mercury analysis were collected from all of the monitoring stations identified in Table 2 of C. of A. #3960-7Q4K2G during 2007. However, due to confusion over the small changes to the sampling program introduced in October 2008 in C. of A. #4111-7DXKQW, from those defined in the earlier November 2007 AMEC submission, the mineral soil pore water samples for the muskeg monitoring program stations were not collected in 2008 prior to freeze-up. Hence, there were no mineral soil or bedrock pore water mercury samples for the late summer / fall of 2008.

Sample collection as per C. of A. #3960-7Q4K2G Table 2 requirements was resumed in August / September of 2009; with the omission of a few samples due to monitoring wells with too little water to sample – particularly in deep clay overburden wells; sample breakage in transit; sampling errors, etc.

Muskeg monitoring program pore water sample results for total and methyl mercury filtered samples are provided in Table 1 for 2007, 2008, 2009 and 2010. Station locations are shown in Figure 1. As a general observation, concentrations of total mercury in the 2010 peat horizon water samples increased; whereas concentrations of methyl mercury decreased compared to previous years (Tables 1 and 2). This trend was evident across the majority of the stations, irrespective of sample station location, including samples collected from reference site stations located well beyond the 2010 Victor Mine dewatering cone of depression in the upper bedrock aquifer shown in Figure 2 (i.e., Station Clusters S-1, S-7, S-9(1), S-9(2), S-13, S-15 and MS-V3). The general trend of increasing total mercury values and decreasing methyl mercury concentrations observed for 2010, compared with earlier years, therefore appears to be a regional phenomenon that is not linked to mine dewatering effects on muskeg mercury chemodynamics. The reason for the differences in 2010 compared with 2009 is likely attributed to the naturally dry conditions found both at site and regionally, compared to the excessively wet conditions in 2009. Locally under wet conditions there would tend to be an export of methyl mercury through the system driven by lateral flow, compared to dry conditions which can result in longer residence times, greater water table fluctuations and temperature increases resulting in the accumulation of methyl mercury within peatland systems (Personal Comm B. Branfireun).

3.3 Condition 6(8) (c) – Analysis of Surface Water Systems

Surface water systems considered in this section include the following:

- Passive fen treatment systems;
- Ribbed fen systems;
- Granny Creek; and,
- Nayshkootayaow and Attawapiskat Rivers.

Passive Fen Treatment Systems

The Southwest Fen (SWF) was used as a passive wetland treatment system for the removal of residual total suspended solids and nutrients from the Central Quarry waste water discharge during 2006. The Northeast Fen (NEF) provided a similar function for effluents derived from the following sources:

- Plant site excavation area (completed 2006);
- Crusher excavation area (completed 2006 and 2007);
- Attawapiskat River intake excavation and construction (completed 2007).
- Open Pit mine Phase 1 Mine Water Settling Pond (started 2007 and ongoing);
- Dry waste landfill runoff and leachate (started autumn of 2008 and ongoing); and,
- Fully treated sewage treatment plant effluent (started 2006 and ongoing).

The Southeast Fen (SEF) and the Northwest Control Fen (HgCon) were set up as control fens for the SWF and the NEF. The SEF previously received minor discharges from the shallow south quarry during parts of 2004 and 2005, but was not materially affected by these minor discharges, and is therefore regarded as being not impacted by site activities. The HgCON has never received effluent discharge from any source.

Sampling from the SWF was discontinued in June 2009 as the C. of A. for this fen treatment system (C. of A. 3374-6G7J2Y – dated December 13, 2005) was revoked on March 3, 2009. There are consequently no data for the SWF beyond May 2009.

Total mercury data (unfiltered and filtered) for the passive fen treatment and control system fens are presented in Tables 3 and 4. Methyl mercury data for these same systems are presented in Tables 5 and 6. All results are within applicable federal (and provincial) guidelines for the protection of aquatic life.

Total mercury concentrations were generally comparable between the effluent treatment fen station (NEF), and the two control fen stations (SEF and NWF) for 2010 (Tables 3 and 4). The average concentration (for all years, unfiltered and filtered) was lower in the NEF than for both control stations. The average total mercury concentration for the NEF in 2010 was lower than both SEF and HgCon control stations for filtered samples (Table 4). For unfiltered samples the average total mercury concentrations were comparable across the stations (Table 3). It has been noted that the higher total mercury concentrations measured in winter for the various stations are believed to be a function of: (1) the difficulty in retrieving free water samples from under thick ice conditions within the fens, and (2) the ion exclusion process associated with ice formation (Tables 3 and 4).

Maximum water depths associated with the ribbed fens are typically in the order of 1 to 1.3 m. As a result, broad areas of these fens freeze to bottom, or near bottom, and it is difficult to retrieve samples of free water from beneath the ice after mid-winter without disturbing bottom sediments. The filtered sample results shown in Table 4 are therefore a more reliable indicator of total mercury concentrations in the water column, compared with total mercury concentrations shown in Table 3.

Also, as the fen water freezes, the ice crystallization process tends to force ions out of the ice matrix, concentrating them in the small amount of free water below the ice. This process applies to all ions, including mercury ions. Freezing effects are evident in the historical data.

Results for methyl mercury in 2010, similar to 2009, show that while still meeting federal and provincial guidelines for the protection of aquatic life, concentrations of methyl mercury were notably higher in the NEF compared with either of the two control fens. Complications described above in relation to under ice sampling also apply to methyl mercury, so better data comparisons are drawn with open water period sampling results during July and October. During past years (2007 to 2009) the data for these two months show a decrease in methyl mercury concentrations for the NEF when compared to earlier winter months (Table 5 and 6). However during 2010 this phenomena was not experienced and methyl mercury concentrations in NEF were more stable ranging from 0.12 to 0.76 ng/L. The SEF and HgCon control sites ranged from 0.02 to 0.11 ng/L. Methyl mercury concentrations in previous years in the NEF and SEF and HgCon experienced much higher ranges, compared to 2010.

Methyl mercury concentrations in the NEF are believed to be elevated as a result of increased sulphate levels, as described in the 2008 Mercury Performance Monitoring report. Sulphate reducing bacteria utilize sulphate as a nutrient, and hence higher sulphate levels tend to promote increased rates of conversion from total mercury to methyl mercury (Ullrich et al. 2001; Jeremiason et al. 2006). Sulphate concentrations in the NEF during 2010 averaged 29.8 mg/L, which is within the optimal range of 20 to 50 mg/L for mercury methylation. Samples from control fen sites typically contain less than 0.01 mg/L of sulphate (Table 8, sites MS9, MS13, MS15). Sulphates are naturally present in deep groundwater in the region and sulphates are believed to have been discharged to the NEF from deep excavations during construction. Potential ongoing sources may also include the treated wastewater from the camp sewage plant, or water from the Phase 1 mine water settling pond that collects water from surface run-off and test trenches in the mine pit. The increased mercury methylation rate observed for the NEF is therefore a localized phenomenon, and is not related to muskeg drying effects.

Ribbed Fen Systems

The water quality of general site area drainage is monitored on a quarterly basis at three ribbed fen stations located on or near the Victor Mine site (Stations MS-V1-R, MS-V2-R, and MS-V3-R), as well as at several more remote sites (Figures 1 and 2). Ribbed fen sites were selected for surface water quarterly monitoring because ribbed fens, more than other muskeg types, tend to collect water from surrounding drainages and therefore provide the most representative data on overall site drainage.

Quarterly water sample collection from the suite of ribbed fen sites was initiated in mid-2007, and has been carried out since, except where prevented by frozen ground conditions (Table 7). However, due to confusion at the Mine site over the need to collect both peat pore water and surface water samples from ribbed fens, only peat pore water samples were collected in 2007 and 2008. C. of A. #3960-7Q4K2G provides for collecting peat pore water samples from all muskeg monitoring stations, including ribbed fens, on an annual basis; and collecting surface water samples from ribbed fen stations, only, on a quarterly basis. Sample collection protocols were remedied in 2009 in accordance with C. of A. requirements.

In addition, to assist with data interpretation De Beers collects samples from these same ribbed fen stations for the analysis of chloride, conductivity, nitrate, dissolved organic carbon, pH, sulphate, total phosphorus, calcium, iron, magnesium and sodium (Table 8). The only data of note are high values of chloride and sodium at station MS-8-R which rapidly drop off in 2009 and 2010. The elevated concentrations in 2007 and 2008 indicate active groundwater up-welling which likely ceased subsequently due to well field dewatering and reversing groundwater gradients.

Total and methyl mercury sample results for the ribbed fen stations are shown in Tables 7a and 7b for 2007 through 2010. The data show low concentrations of both total and methyl mercury, with total mercury values for summer and fall months being comparable with no increasing trends.

Granny Creek System

Upstream and downstream total and methyl mercury concentration data for the Granny Creek system are provided in Tables 9 through 12. Sampling locations are shown in Figure 3. Average total mercury concentrations for the four stations for 2010 varied from 1.70 to 1.86 ng/L for unfiltered samples, and from 1.14 to 1.38 ng/L for filtered samples (Tables 9 and 10). These values are well within the 26 ng/L CEQG value for the protection of aquatic life. Filtered sample results for total mercury, averaged over 2010, are similar for upstream and downstream samples from both creek branches (Table 10). The graphs attached to Tables 9 and 10 also show that while total mercury concentrations can vary substantively throughout the year, due to seasonal and hydrological effects, there are no evident long-term trends in the comparison of stations for either North or South Granny Creeks, for stations upstream or downstream of the developed areas of the mine site.

Methyl mercury concentrations for unfiltered and filtered samples, from upstream and downstream South and North Granny Creek stations, are shown in Tables 11 and 12. The values are again variable, depending on seasonal and hydrologic influences. All values for 2010 were consistently <0.19 ng/L for North and South Granny Creek systems (unfiltered and filtered), with the majority of the values being <0.10 ng/L. The July 2008 elevated values for methyl mercury for downstream North Granny Creek were considered to be anomalous in the 2008 Annual Report, and further data for 2009 and 2010 support this interpretation.

There are no evident long-term trends in the filtered methyl mercury data for either creek branch (South or North Granny Creek). For the period of 2008 to 2010 processed kimberlite containment facility discharge was pumped to the Attawapiskat River, as the discharge channel to North Granny Creek, was not commissioned until 2011.

Nayshkootayaow and Attawapiskat Rivers

Total and methyl mercury results for the Nayshkootayaow and Attawapiskat Rivers are shown in Tables 13 and 14. Sample locations are shown in Figure 3. Graphical data are presented in Figure 4. All values are generally low, consistent across the stations, and well within CEQG values. Filtered results for all stations on the Nayshkootayaow and Attawapiskat Rivers were generally comparable and well within the range of historical data for the respective stations.

3.4 Condition 6(8) (d) – Annual Analysis of Well Field Discharge

Starting in November 2007, in accordance with Condition 6(3) of C. of A. #8700-783LPK, dated December 11, 2007, and Condition 6(3) of Amended C. of A. #4111-7DXKQW, dated October 3, 2008, as well as Condition 6(3) of Amended C. of A. 3960-7Q4K2G, dated March 13, 2009, De Beers initiated monthly monitoring of total and methyl mercury concentrations in the well field discharge. Sampling was initiated proactively in advance of the December 2007 C. of A. issue date. All values for the period of November 2007 to December 2010 have remained low for both total and methyl mercury, as shown in Table 15. Total and methyl mercury concentrations in the well field discharge have thus far, on average, been below background concentrations measured in the Attawapiskat River as shown in Table 13 and 14, and there are no evident temporal trends in the data (Table 15).

Quarterly total and methyl mercury sampling results for operating individual wells are shown in Tables 16 and 17, respectively. During the period of November 2007 through April 2008, samples were collected monthly as a precautionary measure before switching to quarterly sampling as required by the C. of A. Only filtered samples were collected from wells during November 2007. The October 2008 total mercury values for VDW-11 are markedly elevated and were likely contaminated with sediments, or the results are anomalous (Table 16). The methyl mercury concentrations for the October 2008 and 2009 VDW-11 sample were quite low in keeping with other samples, which would also suggest sediment or other contamination for the total mercury sample. VDW 17 experienced a higher unfiltered methyl mercury concentration of 0.2 ng/L in January which was likely attributed to collection of sediment / peat during sample collection, based on comparison to the filtered sample at this station which showed a value of 0.002 ng/L.

3.5 Condition 6(8) (e) – Small Fish Mercury Body Burdens

Small-bodied fish species are to be collected annually from area receiving waters (North Granny Creek, South Granny Creek, Tributary 5A, Nayshkootayaow River (upstream of Tributary 3 and downstream of Granny Creek) and the Attawapiskat River (upstream of the mine site, approximately 500 m downstream of the well-field discharge and approximately 2 km downstream of the well-field discharge). Sampling locations in the Attawapiskat River upstream of the mine site, in the Nayshkootayaow River upstream of Tributary 3, as well as Tributary 5A are expected to serve as reference areas to near-field and far-field areas located downstream of the mine site and discharge locations.

The sample locations for small-bodied fish from 2007 to 2010 are shown in Figure 5. Small-bodied fish were collected from these locations using the techniques of electroshocking and minnow trapping where applicable. Small-bodied fish were captured at these locations in relatively low abundances despite reasonable effort with both sampling techniques. A single common sentinel species was not available at each sampling location. The presence of Pearl Dace (*Margariscus margarita*) was adequate to allow for comparisons between North Granny Creek, South Granny Creek and Tributary 5A. A second species, Trout-Perch (Percopsis omiscomaycus), was used to compare upstream and downstream Attawapiskat River locations as well as Nayshkootayaow River locations. Pearl Dace was captured at five of the eight locations sampled in 2010 and therefore provides some level of comparability across the study area. Total species-specific catch data for each location are summarized in Tables 18 and 19 for electroshocking and minnow trapping respectively. A total of 377 fish of the two sentinel species were captured and submitted for analysis of mercury body burden in 2010. The catch of each species was greater than 20 per site in all cases and therefore great enough to provide statistical comparison between sample areas for 2010. Lower sample sizes of Pearl Dace were obtained in previous sampling programs (2008 and 2009) and provided slightly lower potential for between year comparisons.

Mercury body burden primary comparisons between sample areas were made using the species as summarized in Table 20. Fish were captured under a Licence to Collect Fish for Scientific Purposes (No. 1058468). At time of capture fish were identified to species and measured for length (fork and total) and wet weight. Fish used for the mercury study were immediately frozen after processing.

In the laboratory, individual samples were thawed and sub-sampled for dorsal muscle on which total mercury analysis was completed. A small mass was retained for oven-drying, and a minimum of two wet samples (<0.5 g wet weight each) were used for analyses. Remaining sample, if any, was kept frozen for replicate analyses if required. Samples were analyzed and reported as wet weight as per standard methods. Analysis was by thermal decomposition and atomic absorption detection using a Milestone DMA-80 as per the requirements of USEPA Method 7473. Calibration and instrument performance were verified through the analysis of various fish tissue standard reference materials.

Granny Creek System

Pearl Dace mercury body burden levels were compared between North Granny Creek (NGC), South Granny Creek (SGC) and Tributary 5A (ST-5A) for samples collected during August of 2010. (Tables 18 to 20). Tributary 5A is the selected control system for comparisons with the Granny Creek system.

Mean total length (mm), wet weight (g) and total mercury concentration (μg/g = ppm) values are summarized for Pearl Dace in Table 21. Mean length and weight were statistically similar between NGC, SGC and ST-5A in 2010 (ANOVA, α = 0.05). Despite captures being similar with respect to size between these areas, Pearl Dace showed a greater mercury body burden concentration at NGC (0.259 µg/g) than at SGC (0.168 µg/g) or ST-5A (0.06 µg/g) in 2010. Differences in Pearl Dace mean body burden values were statistically significant (ANOVA, $p < 0.001$) (Figure 6; Table 22). Post-hoc comparison indicated that mean body burden values were significantly different between each of NGC, SGC and ST-5A. The body burden value for NGC was 4.3 times greater than that of ST-5A (Figure 6).

A between year comparison was made by ANOVA for each of NGC, SGC and ST-5A and the results are shown in Table 23. SGC and ST-5A showed no statistical difference between years for total mercury body burden levels. However, NGC Pearl Dace showed a change in mercury body burdens between years ($p < 0.001$) with no year between 2008 and 2010 being similar to another. Mean total mercury was reduced from 0.176 µg/g in 2008 to 0.066 µg/g in 2009, yet increased to 0.259 µg/g in 2010 (Table 21; Figure 6). NGC had the lowest mean body burden value of the three areas in 2009, yet the highest in 2008 and 2010.

The relationship between total mercury concentration and total length for Pearl Dace is shown in Figure 7 for each sample location from 2008 to 2010. The relationships were positive (i.e larger fish contained more mercury) for all locations and years, yet slopes were variable between areas and years.

Extrapolation of body burden levels for a standardized total length for Pearl Dace is summarized in Table 24. For Pearl Dace the standardized total length for comparison was 60 mm. The extrapolated values for Pearl Dace remained relatively consistent from 2008 to 2010 for SGC and ST-5A with a slight decrease in mercury concentration from 2009 to 2010 at these areas. However, NGC shows greater variability between years with 2010 showing the greatest extrapolated value to date (0.229 µg/g).

Summary and Discussion

Despite sampled Pearl Dace being similar in size in 2010, mean body burden mercury values for NGC were greater than for either ST-5A or SGC. This is in contrast to 2009 when SGC had the greatest mean mercury body burden value. However, a similar result to 2010 was evident in 2008. The relationship between total mercury concentration and total length showed variability between area and between years for Pearl Dace, however, variable intercept and positive slope values for relationships indicate annual changes in young-of-the year mercury body burdens and subsequent trajectories of methyl mercury (the form most easily taken up by fish) accumulation.

To further assess the basis for observed differentials in small-bodied fish mercury body burden concentrations between the two systems, AMEC also compared background methyl mercury water quality concentrations in Granny Creek and Tributary 5A. Data for the Granny Creek system were taken from downstream stations dating back to mid-2006 (Stations G2 and G6, Figure 3). These stations are within the potential influence of mine site discharges or well field dewatering effects as well as in the vicinity of the sampling areas for small-bodied fish. Results are shown in Table 25. The data for Granny Creek are variable, responding to seasonal and hydrologic influences, but show no long-term trends, indicating that methyl mercury concentrations have not likely been affected by activities at the Victor Mine. In comparing Granny Creek to Tributary 5A, the average methyl mercury concentration for the North Granny Creek 2008 was 8 times greater than for Tributary 5A and 2.6 times greater than for South Granny Creek for the same time period, suggesting that background methyl mercury concentrations are naturally elevated in North Granny Creek and South Granny Creek (in decreasing order) compared to Tributary 5A.

Data provided by Orihel et al. (2007) suggest a direct linear relationship between mercury concentrations in water and mercury body burden concentrations in small fish. The differences in background methyl mercury concentrations between Granny Creek and Tributary 5A systems would therefore appear to be sufficient in 2008 and 2010 to account for the observed results, but are less convincing for the 2009 values.

Annual increases, in Pearl Dace body burden levels, from the preceding year (i.e. South Granny Creek from 2008 to 2009 and North Granny Creek from 2009 to 2010) do not necessarily reflect the changes observed in mean methyl mercury water quality concentrations for each of these tributaries between years. Continued monitoring in subsequent years may provide further insight into observed body burden value differentials between the North and South Granny Creek and Tributary 5A.

Nayshkootayaow and Attawapiskat River Systems

Pearl Dace mercury body burden levels were compared between the Nayshkootayaow River upstream of Tributary 3 (NAY-US-T3) and the Nayshkootayaow River downstream of Tributary 6 (Granny Creek) (NAY-DS-T6) in 2010 (Figure 5). In total 30 Pearl Dace were captured at NAY-US-T3 and 29 at NAY-DS-T6 (Tables 18 and 21). NAY-US-T3 is considered the reference area sample location for this comparison as it is upstream of the mine site influence, while NAY-DS-T6 is downstream of the mine and the Granny Creek system.

For 2010 Trout-Perch mercury body burden levels were compared between NAY-US-ST3, NAY-DS-T6, the Attawapiskat River approximately 9 km upstream of the mine site (ATT-US-1), the Attawapiskat River 500 m downstream of the well-field discharge (ATT-NF), and the Attawapiskat River 2.5 km downstream of the well-field discharge (ATT-FF) (Figure 5). The total number of Trout-Perch captured was 611 and catch per sampling location is summarized in Table 18.

Pearl Dace

Mean total length (mm), wet weight (g) and total mercury concentration (µg/g) values are summarized for Pearl Dace in Table 21 and Figure 6. Mean length and weight were similar between locations NAY-US-T3 and NAY-DS-T6 (ANOVA, $\alpha = 0.05$). Total mercury body burden was similar between Nayshkootayaow River sampling locations with the NAY-US-T3 and NAY-DS-T6 having values of 0.058 and 0.087 µg/g respectively (ANOVA, $p < 0.001$; Table 22).

A comparison of mean mercury body burden values between years (2008 to 2010) at NAY-US-ST3 showed no significant difference. However, NAY-DS6 Pearl Dace were significantly different with respect to mercury values (ANOVA, $p < 0.001$) with 2008 and 2010 having more similar values (0.059 and 0.087 µg/g respectively) (Table 23; Figure 6). Mean mercury body burden values for Nayshkootayaow River sample areas have remained less than 0.10 µg/g from 2008 to 2010.

Trout Perch

Mean total length (mm), wet weight (g) and total mercury concentration (µg/g) values are summarized for Trout-Perch in Table 26 for 2008 to 2010. Mean length and weight were not similar between all sample locations in 2010 (ANOVA, $\alpha = 0.05$). However, size was similar between ATT-US and ATT-NF and also similar between ATT-NF and ATT-FF as the far-field area sample had the greatest mean total length (57.20 mm). Nayshkootayaow River sample areas were also not equal with respect to Trout-Perch mean size with NAY-DS6 having a greater mean total length (52.68 mm) compared to NAY-US-ST3 (42.40 mm) (Table 26).

In 2010 Trout-Perch mean mercury body burden levels were significantly different between Attawapiskat River sample areas. The near-field sampling area (ATT-NF) had a mean value (0.074 µg/g) significantly lower (ANOVA, $\alpha = 0.05$) than for ATT-US of the reference area (0.106 µg/g) and ATT-FF (0.097 µg/g) situated further downstream. Mercury body burden levels for Trout-Perch from the Nayshkootayaow River were significantly greater (ANOVA, $\alpha = 0.05$) at NAY-DS6 (0.108 µg/g) than at the reference area NAY-US-ST3 (0.074 µg/g) in 2010 (Tables 22 and 26; Figure 8).

A between year comparison was made by ANOVA for each of Attawapiskat and Nayshkootayaow River sample areas and the results are shown in Table 23. Each of the sample areas on the Attawapiskat River had a significant change in mercury body burden levels between years (ANOVA, $\alpha = 0.05$). Mean values for ATT-US were similar in 2008 and 2010 (0.096 and 0.106 µg/g respectively) while 2009 had a value of 0.058 µg/g, which was significantly lower than values for both 2008 and 2010. Mercury concentrations in Trout-Perch from ATT-NF were significantly reduced between 2009 (0.196 µg/g) and 2010. Similarly, mercury values from Trout-Perch sampled at ATT-FF were significantly reduced from 2008 (0.164 µg/g) to 2009 (0.096µg/g) with the value staying consistent in 2010 (0.097 µg/g) (Table 23 and 26; Figure 8).

No significant change in mercury body burden values was evident for Trout-Perch at NAY-US-ST3 between years, yet NAY-DS6 had a significant reduction in the mean mercury body burden concentration for this species from 0.176 µg/g in 2008 to 0.098 µg/g in 2009. This mercury level stayed relatively consistent for 2010 at 0.108 µg/g (Table 23 and 26; Figure 8).

The relationship between total mercury concentration and total length for Trout-Perch is shown in Figure 9 for each sample location from 2008 to 2010. Relationship slopes were variable between areas and years.

Extrapolation of body burden levels for a standardized total length for Trout-Perch is summarized in Table 24. For Trout-Perch the standardized total length for comparison was 50 mm. The extrapolated values showed annual variability for each of the sampling areas with the mercury value for ATT-US more than doubling between 2009 (0.052 µg/g) and 2010 (0.111 µg/g), while ATT-NF had an extrapolated mercury value reduced by a half (0.146 µg/g in 2009 to 0.074 µg/g in 2010).

Summary and Discussion

Mercury body burden levels in Pearl Dace were equal between both upstream and downstream Nayshkootayaow River locations in 2010 and have remained relatively consistent from year to year.

Trout-Perch body burden values were relatively similar across all sites that were sampled between the Attawapiskat River and the Nayshkootayaow River in 2010. In 2010 the mean mercury body burden concentration at the near-field area was lower than for both the reference and far-field areas, which is dissimilar to previous years of study which saw the near-field area producing Trout-Perch with significantly greater concentration of total mercury. Methyl mercury concentrations in water samples were virtually unchanged along the length of the Attawapiskat River (Table 14) and therefore variability in body burden levels of Trout-Perch are not fully understood.

Extrapolation of body burden levels for a standardized total length for Trout-Perch showed an increase at ATT-US in 2010 from 2009 yet a decrease at ATT-NF while the value remained similar for ATT-FF from 2008 to 2010.

3.6 Condition 6(8) (e) – Sport Fish Mercury Body Burdens

As per C of A #3960-7Q4K2G, large-bodied sport fish are to be sampled from the Attawapiskat River, Nayshkootayaow River and Monument Channel to investigate mercury body burden concentrations. The C of A requires that a minimum of 30 Northern Pike (Esox lucius) be captured from each of four sampling areas. These areas include a reference area located approximately 9 km upstream of the mine site on the Attawapiskat River (ATT-US); a near-field receiving water area (ATT-NF) located within 500 m downstream of the Victor Mine well-field discharge; the mainstem Nayshkootayaow River (NAYSH), and Monument Channel (MC). The locations of these sampling areas are shown in Figure 5. A fifth area was sampled as part of baseline data collections during 2007 and 2008 on the Attawapiskat River adjacent to the community of Attawapiskat. This location was not included in the sampling program in 2010. Incidentally captured species are also included in the study with the target of 10 of each of Walleye (*Sander vitreus*), Sucker (*Catastomus* spp.), and Lake Whitefish (*Coregonus clupeaformis*).

Large bodied fish were captured using gill nets, trap nets and angling. Gill nets were set in moderate to deep habitats in the Attawapiskat River, Nayshkootayaow River, and Monument Channel from August 21 to September 5, 2010. Set depths were variable due to low water levels. Standard net dimensions were 15.24 to 30.5 m lengths x 1.8 m height of multiple panel mesh sizes that ranged from 38.1 to 127 mm stretched mesh. Gill nets were set so as to provide multiple mesh sizes within a sample location to ensure that selectivity was similar between sample locations. This provided for a cross-section of age cohorts to be sampled across each species captured. Gill net CPUE is described in this report as the catch per 15 m standard gill net set. This is calculated as:

CPUE = total catch/set period (hours) x [length of gill net set (m)/15.24]

The division of the length of gill net set by 15.24 (the length in meters of one panel of standard gill net) allows for the effort to be standardized by length. Multiplying this ratio by the set period in hours provides a temporal effort coefficient.

Sampling of adult fish in the lower Nayshkootayaow River was conducted with spring-haul, 6-foot trap nets. Nets were constructed to Ontario Ministry of Natural Resources specifications for Nearshore Community Index Netting, of black polypropylene netting with a stretched mesh size of 6.4 cm, except on the top and bottom of the house and heart of the trap which had a mesh size of 4.4 cm. The leader length was 45.72 m (150 feet) and the wings were approximately 5 m, which directed fish through a tunnel with an aperture approximately 0.25 x 0.25 m and into the net box (crib) which was 1.8 x 3.5 x 1.8 m (width x length x height). Fish were removed from the crib of the net using a dip net through an access area which was closed by a zipper when the trap was submerged and passively fishing.

Two trap nets were fished in the Nayshkootayaow River from August 21 to September 6, 2010 at an average depth of 1.0 m. One trap net was fished with its leader angled up to 30 degrees from parallel in an upstream direction, either towards the true left or true right of the river so as to capture downstream moving fish. The second trap was fished with the mouth of the net facing downstream with the leader angled up to 20 degrees from parallel to direct fish moving upstream into the trap. This net was fished in this fashion to target a potential upstream moving Coregonid run. This capture method was also used for general community sampling. Net set durations ranged from 17 to 27 hours. Nets were deployed and collected using a 16-foot landing craft style aluminum boat with a 115 HP 4-stroke outboard engine with jet drive. Water levels and flows continued to be reduced in the Nayshkootayaow River over the course of sampling with trap nets and as a result the nets were repositioned in the same immediate area within the mouth of the Nayshkootayaow River to locate an area of sufficient depth for the nets to fish with a relative maximum efficiency. The CPUE for this gear was expressed as the number of fish captured per hour.

Angling was utilized in 2010 to capture adult fish in areas where other previously mentioned methods were not effective so as to increase overall fishing effort and therefore capture success. Angling took place in the Attawapiskat River, Nayshkootayaow River, and Monument

Channel. Anglers used spinning rod equipment with spoons or spinners. Each lure had a treble hook (three points). Fishing effort was determined as catch per rod per hour (rod hour). Typically, each location was sampled for the duration of 0.5 to 1.5 hours with two to three rods.

Species-specific catch per unit effort (CPUE) for each gear type is summarized in Tables 27, 28 and 29. A total of 274 large-bodied fish were captured and submitted for analysis in 2010. Similar techniques were used in 2007 with supplemental efforts provided in 2008 to provide a characterization of the baseline condition of mercury body burden concentrations in sport fish species within the Attawapiskat River, Nayshkootayaow River and Monument Channel.

All captured fish were identified to species and enumerated. Fish were measured for length, weight and sampled in a non-lethal manner when possible, for calcified age structures (scales, spines, and fin rays). Incidental mortalities were sampled for cleithra, otoliths and sexed. Calcified structure collection was consistent with the instruction of Collection Techniques for Fish Aging Structures, Northwest Region (MNR 2004). Calcified structures were analyzed for age by John Tost, North Shore Environmental Services. Large-bodied fish were non-lethally biopsied using a cylindrical punch apparatus to retrieve approximately 0.5 to 1.0 g of dorsal fish musculature. Samples were labelled appropriately and frozen until transport to the laboratory for analysis. In laboratory analysis was conducted as previously described in Section 3.5.

<u>Northern Pike</u>

A summary of Northern Pike metrics is presented in Table 30. Northern Pike were captured at all of the required areas in the desired quantity (30) except at ATT-US where 26 were sampled, yet this number allowed for a statistical comparison. ATT-DSNAY is included in Table 30 for completeness, yet analysis was not conducted for this area as the sample size was too low (3 individuals). Total length (size) was not equal between sample areas in 2010 as ATT-NF was significantly greater than the mean total length at both MC and NAYSH. Similarly mean total length was greater at ATT-US compared to MC. All other areas were statistically similar with respect to size.

Mean mercury body burden concentrations were compared by ANOVA between sample areas for 2010 (Table 22) and found to be significantly different. Northern Pike total mercury levels were greater at ATT-NF than at ATT-US. This difference is attributable to the larger size of Pike taken from the ATT-NF station as per table Table 30. Mean mercury levels were also greater at Attawapiskat River areas than for the Nayshkootayaow River (NAYSH) and Monument Channel (MC), however NAYSH and MC had similar levels of mercury in Northern Pike fish flesh in 2010.

Northern Pike mercury levels were reduced at ATT-US from 2007/08 baseline levels in 2010 (Figure10), however, average size and age of Northern Pike sampled in 2010 was lower as selectivity was broadened.

The relationship of total mercury concentration to total length of Northern Pike is shown for each sampling area for 2007/08 and 2010 in Figure 11. These relationships were shown to be exponential functions and statistically significant ($\alpha = 0.05$). The data for 2007/08 represents the baseline condition. The results for 2010 do not show any increase in mercury body burden levels at ATT-US, ATT-NF, NAYSH or MC. However, a number of the larger individuals continue to show mercury concentrations within the range of consumption advisory for women of child-bearing age and children under 15 years, as well as the general population specifically in the Attawapiskat River both upstream and downstream of the Victor Mine.

These relationships were used to extrapolate mercury body burden levels for a standardized Northern Pike total length of 650 mm (Table 24). The results of this analysis indicated that the total mercury level in Northern Pike flesh is similar between all sample areas and between years for a fish of this size. A Northern Pike of 650 mm consistently had mercury body burden concentrations (range = 0.229 to 0.389 ppm) above the starting advisory for women of child-bearing age and children under 15 years of age (0.26 ppm) and below the total restriction limit for this group (0.52 ppm).

Walleye

A summary of Walleye metrics is presented in Table 31. Walleye were captured at all of the required areas in the desired quantity (10) except at MC where only two and seven individuals were captured in 2008 and 2010 respectively. ATT-DSNAY is included in Table 31 for completeness, yet analysis was not conducted for this area as the sample size was too low (one individual). Total length (size) was not equal between sample areas in 2010 as Walleye length at ATT-US was significantly greater than at both ATT-NF and NAYSH.

Mean mercury body burden concentrations were compared by ANOVA between sample areas for 2010 (Table 22) and found to be similar for Walleye between ATT-NF and ATT-US. Mean mercury levels were also greater at Attawapiskat River areas than for the Nayshkootayaow River (NAYSH) and Monument Channel (MC), however NAYSH sample area had a significantly greater levels of mercury in Walleye fish flesh than at MC in 2010.

Walleye mercury levels were reduced from 2007/08 baseline levels in 2010 at ATT-US and MC, yet levels for fish captured in NAYSH showed an increase in mean mercury concentration (Table 31 Figure10).

The relationship of total mercury concentration to total length of Walleye is shown for each sampling area for 2007/08 and 2010 in Figure 13. These relationships were shown to be exponential functions and statistically significant for data collected in 2010 but not so for 2007/08 ($\alpha = 0.05$). The data for 2007/08 represents the baseline condition. The results for 2010 do not show any clear increase in mercury body burden levels at ATT-US, ATT-NF, NAYSH or MC. However, a number of the larger individuals continue to show mercury concentrations within the range of advisory for women of child-bearing age and children under 15 years, as well as the general population at all sample areas sampled in both years.

Where applicable (i.e. statistically significant regression) these relationships were used to extrapolate mercury body burden levels for a standardized Walleye total length of 450 mm (Table 24). The results of this analysis indicated that the total mercury level in Walleye flesh is similar between all sample areas and between years for a fish of this size. A Walleye of 450 mm consistently had mercury body burden concentrations (range = 0.453 to 0.497 ppm) above the starting advisory for women of child-bearing age and children under 15 years of age (0.26 ppm) and approaching or above the total restriction limit for this group (0.52 ppm). However, these values were below the starting advisory for the general population of 0.61 ppm.

Sucker

A summary of Sucker metrics is presented in Table 31. Both White Sucker (*C. commersoni*) and Longnose Sucker (*C. catastomus*) were captured during sampling and to increase sample size these species of the same genus were pooled. Sucker were captured at all areas in varying numbers. Total length (size) was not equal between sample areas in 2010.

Mean mercury body burden concentrations were compared by ANOVA between sample areas for 2010 (Table 22) and found to be similar for Sucker between ATT-NF and ATT-US. The MC sample area had a significantly greater levels of mercury in Sucker fish flesh than at NAYSH in 2010.

The relationship of total mercury concentration to total length of Sucker is shown for each sampling area for 2007/08 and 2010 in Figure 13. These relationships were shown to be exponential functions and statistically significant for 5 out of 8 regressions ($\alpha = 0.05$). The data for 2007/08 represents the baseline condition. The results for 2010 do not show any clear increase in mercury body burden levels at ATT-US, ATT-NF, NAYSH or MC.

Where applicable (i.e. statistically significant regression) these relationships were used to extrapolate mercury body burden levels for a standardized Sucker total length of 380 mm (Table 24). The results of this analysis indicated that the total mercury level in Sucker flesh is similar between all sample areas and between years for a fish of this size except for ATT-COM in 2007/08. A Sucker of 380 mm consistently had mercury body burden concentrations (range = 0.120 to 0.197 ppm) except for ATT-COM which had and extrapolated value of 0.356.

Lake Whitefish

A summary of Lake Whitefish metrics is presented in Table 33. Lake Whitefish mercury body burden concentrations ranged from 0.05 to 0.37 ppm across all sample areas and all years however, the majority (94%) of the individuals sampled had mercury concentrations below 0.26 ppm (the start of advisory for women of child-bearing age and children under 15 years of age). Lake Whitefish were not captured at all areas or in sufficient quantities to conduct comparisons regarding mercury body burdens, however, data is presented herein regarding this species for future reference.

Summary and Discussion

The target species, Northern Pike, was captured with considerable effort in the numbers required at all sampling locations in 2010. No clear increase in mean mercury body burdens was evident in 2010 from the baseline condition investigated in 2007/08. In fact exponential relationships of total mercury at total length provided an indication that a fish of standardized size had similar mercury levels between years as well as between sampling areas for the majority of large bodied species studied.

Larger Northern Pike and Walleye individuals continue to show mercury concentrations within the range of advisory for women of child-bearing age and children under 15 years, (start of advisory = 0.26 ppm to total restriction = 0.52 ppm) as well as the general population (start of advisory = 0.60) specifically in the Attawapiskat River both upstream and downstream of the Victor Mine. Only one Northern Pike individual had a mercury body burden concentration (1.82 ppm) that approached the total restriction level for the general population (1.84 ppm). This individual was captured in the near-field receiving water of the Victor Mine, yet was the largest individual in the analysis from any site at 1012 mm (1.01 m), 4490 g and 11 years of age.

Sucker species consistently had lower mercury burden concentrations than Northern Pike and Walleye which is likely indicative of their lower trophic level and benthivore feeding habits.

4.0 REPORTING – CONDITION 6(9) DATA

4.1 Annual Analysis of Peat Pore Water

As described in Section 3.2, and as a general observation, concentrations of total mercury in the 2010 peat horizon water samples were slightly increased, but were not markedly higher than the range of data for other years. Concentrations of methyl mercury tended to be lower than previous years, with the majority of data values achieving either a "non-detect" or "detect" value whereby limit detected by the analysis ranges ≥ 0.0054 or ≤ 0.0169 ng/L (Tables 1 and 2). This trend was evident across all stations, irrespective of sample station location.

Statistical analyses of total and methyl mercury peat pore water concentrations are presented in Table 34 for the: S-1 stations (Table 34a), the S-2 stations (Table 34b), the S-7 stations (Table 34c), the S-8 stations (Table 34d), the S-9(1) stations (Table 34e), the S-9(2) stations (Table 34f), and the S-V stations (Table 34g). As was the case for previous years, none of the 2010 results for total or methyl mercury were significantly different for location effect compared with the S-13 / S-15 background control stations using Two-Way Analysis of Variance at $\alpha = 0.05$.

General site inspections and flyovers, showed no evidence of any meaningful peatland "drying out", in the area of well field induced depressurization of the underlying upper bedrock aquifer for the 2010 season. This was despite an unusually low level of precipitation occurring in this area through the winter, spring and early summer of 2010. A few localized areas affected by shallow bedrock formations continue to show some dewatering effects, but these are very localized and in some cases intermittent from year to year.

4.2 Annual Analysis of Mineral Soil Pore Water

With minor exceptions shallow and deep clay pore water samples tended to show reduced total mercury values compared with 2007 and 2009 (no data 2008) results (Table 1). Observed methyl mercury values in 2009 clay pore water samples were all low, and generally comparable to results from previous years. Total mercury in shallow bedrock water samples showed no real trend.

4.3 Annual Analysis of Surface Waters

Statistical analyses of total and methyl mercury concentrations in surface water samples are presented in Table 35. Monthly analyses of North and South Granny Creek total mercury concentrations for upstream and downstream samples show no statistical differences (Table 35a).

Methyl mercury concentrations in upstream, mid-stream and downstream reaches of North and South Granny Creeks were also not statistically significant, due to high data variability and small sample sizes, but the data are suggestive of a possible downstream increase in methyl mercury concentrations for the October 2010 measurements (Table 35b). This downstream increase was also the evident in October of 2009 at this sample location, and similar results were reported in the 2009 Mercury Monitoring report.

Data for the Nayshkootayaow and Attawapiskat Rivers show no upstream or downstream trends, and none of the results are statistically significant for either total or methyl mercury (Tables 35c and 35d).

4.4 Trend Analysis of Well Field Water Discharge

Monthly well field discharge data are presented in Table 15. Concentrations of both total and methyl mercury are, on average, lower than for comparable Attawapiskat River background water concentrations (Tables 13 and 14), and there are no evident trends in the data (Table 15).

4.5 Annual Analysis of Fish Mercury Body Burdens

For discussions regarding comparisons of fish mercury body burdens between geographical locations in 2010 please refer to Section 3.5. Small-bodied fish species showed some variability between years. Extrapolation of body burden levels for a standardized total length for Pearl Dace remained relatively consistent from 2008 to 2010 in South Granny Creek and Tributary-5A with a slight decrease in mercury concentration from 2009 to 2010 at these areas. However, North Granny Creek had greater variability between years with 2010 showing a marked increase over 2009. Body burden levels for a standardized total length for Trout-Perch showed an increase at the Attawapiskat River reference area in 2010 compared to 2009 yet a decrease at the near-field receiving water area while values remained similar for the far-field area from 2008 to 2010.

No clear increase in mean mercury body burdens was evident in 2010 from the baseline condition investigated in 2007/08 for large-bodied sport fish species. In fact exponential relationships of total mercury at total length provided an indication that a fish of standardized size had similar mercury levels between years as well as between sampling areas for the majority of large bodied species studied.

5.0 CONCLUSIONS

Peat Pore Waters

- Total and methyl mercury concentrations in peat pore waters remained considerably lower than the respective CEQG values of 26 ng/L for total mercury and 4 ng/L for methyl mercury. For 2010, concentrations of total mercury were higher than 2009 but generally lower than data for 2007 and 2008; whereas concentrations of methyl mercury generally decreased in peat pore water in 2010 compared with data from 2007 through 2009. These trends were evident throughout the broader area including at stations located several kilometres beyond any possible influence of the Victor Mine.

- Statistical analysis of peat pore waters showed no significant differences, for total or methyl mercury, between peat complexes located near to and at mid-distances from the mine site, compared with more remote control stations.

Surface Waters

- Total mercury concentrations measured in proximal area fen systems (NEF, SEF and HgCon) showed no evident overall trends. Data collection from the SWF was discontinued partway through 2009 so no conclusions could be drawn regarding this fen.

- Methyl mercury concentrations in the NEF, which receives (or received) effluents from excavations into bedrock, showed elevated methyl mercury concentrations compared with the control fens (SEF and HgCon), but the range of values for 2010 was less pronounced than that shown in previous years, and methyl mercury concentrations remained consistently low. Elevated methyl mercury concentrations in the NEF are likely attributed to sulphate-rich effluent waters which stimulate the mercury methylation process, and are not a function of well field dewatering effects.

- Total and methyl mercury concentrations measured in area surface waters (Granny Creek, the Nayshkootayaow River and the Attawapiskat River) show mercury concentrations well below the applicable CEQG values of 26 ng/L and 4 ng/L, respectively, and there are no evident long-term trends in the data.

- Well field total and methyl mercury concentrations are well below CEQG values, and are also generally below Attawapiskat River background values upstream of the mine discharge, and there are no evident long-term trends in the data.

Fish Mercury Body Burdens

- Small-bodied species (Pearl Dace) samples collected from North Granny Creek show significant, elevated concentrations of mercury compared to South Granny Creek and the Tributary 5A reference sample location in 2010. The difference in body burden mercury concentrations between the Granny Creek system and Tributary 5A is believed to primarily be a function of naturally higher methyl mercury increases in Granny Creek downstream waters as described above. Fish body size differences do not appear to be a contributing factor for the 2009 or 2010 samples. Differences in body burden mercury concentrations between North Granny Creek and South Granny Creek may be indicative of background methyl mercury concentrations of the creek water and environment.
- Pearl Dace samples collected from the Nayshkootayaow River upstream of Tributary 3 and downstream of the Granny Creek confluence had similar mercury body burden levels.
- The Attawapiskat upstream reference area showed as doubling in mercury body burden concentration in small-bodied fish samples from 2009 to 2010.
- Trout-Perch samples collected from the Attawapiskat River near-field receiving water area had lower concentrations of mercury than the upstream reference area or far-field receiving water area in 2010. This was in contrast to the 2009 results which indicated an elevated level of mercury in the near-field area, further demonstrating the annual variability which at this time is not fully understood for this system.
- Large-bodied sport fish species generally showed similar mercury body burden levels for species specific standardized total lengths between areas and years. Differences in mean tissue total mercury concentrations within a year are likely attributable to differences in age representation within a sample.
- Larger Northern Pike and Walleye individuals continue to show mercury concentrations within the range of advisory for women of child-bearing age and children under 15 years, (start of advisory = 0.26 ppm to total restriction = 0.52 ppm) as well as the general population (start of advisory = 0.60) specifically in the Attawapiskat River both upstream and downstream of the Victor Mine.
- Sucker species consistently had lower mercury burden concentrations than Northern Pike and Walleye which is likely indicative of their lower trophic level and benthivore feeding habits. Generally Sucker had total mercury concentrations below 0.4 ppm. This is below levels of total restriction for women of child-bearing age and children under 15 years as well as the starting advisory for the general population.
- Lake Whitefish mercury body burden concentrations ranged from 0.05 to 0.37 ppm across all sample areas and all years however, the majority (94%) of the individuals sampled had mercury concentrations below 0.26 ppm (the start of advisory for women of child-bearing age and children under 15 years of age). However, sample sizes were not great enough for statistical comparison.

6.0 RECOMMENDATIONS

The mercury monitoring program is both extensive and robust, and it is recommended that the monitoring program continue to be carried out in its current form. Review comments from the MOE on the first annual mercury report have been taken into account in the preparation of this report.

7.0 REFERENCES

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TABLE 1
MUSKEG MONITORING PROGRAM - ANNUAL MERCURY RESULTS - 2007-2010
(late summer / fall sampling - Data in ng/L or parts per trillion)

Cluster Location	Substrate/Condition	Well Name	GPS Code	Sample Code	Total Mercury (Filtered)				Methyl Mercury (Filtered)			
					2007	2008	2009	2010	2007	2008	2009	2010
S-1	Bedrock (Bioherm)	MS-1-BR	ES1-BR	ES1BDR	1.30	ns	0.27	Detect	Detect	ns	0.06	Detect
	Clay - Deep	MS-1-CL(1)	ES1-BR	ES1CLD	1.47	ns	0.18	Detect	ns	ns	0.03	Detect
	Clay - Shallow	MS-1-CL(2)	ES1-BR	ES1CLS	0.27	ns	0.16	Detect	Detect	ns	0.03	0.04
	Peat - Domed Bog	MS-1-D	ES1D	ES1D	2.22	1.93	0.40	0.79	0.02	0.07	0.10	0.06
	Peat - Flat Bog	MS-1-F	ES1F	ES1F	2.73	3.04	0.83	1.47	Detect	0.18	0.19	0.14
	Peat - Horizontal Fen	MS-1-H	ES1H	ES1H	na	1.77	0.36	0.53	na	na	0.10	0.04
	Peat - Ribbed Fen	MS-1-R	ES1R	ES1R	1.81	2.27	0.49	1.24	0.02	0.07	0.06	0.06
S-2	Bedrock (Bioherm)	DAS-1	EDAS-1	EDAS-1	0.23	ns	0.24	0.45	Non-Detect	ns	0.05	0.02
		MS-2BR	ES2-BR	ES2BR	0.66	ns	ns	0.38	Non-Detect	ns	ns	0.14
	Clay - Deep	MS-2-CL(1)	ES2-BR	ES2CLD	ns	ns	0.36	Detect	ns	ns	0.13	0.03
	Clay - Shallow	MS-2-CL(2)	ES2-BR	ES2CLS	0.98	ns	0.17	Detect	Non-Detect	ns	0.04	0.02
	Peat - Domed Bog	MS-2-D	ES2D	ES2D	1.98	2.15	0.51	1.25	Non-Detect	0.02	0.04	0.05
	Peat - Flat Bog	MS-2-F	ES2F	ES2F	3.12	3.05	2.35	2.74	Non-Detect	0.10	0.07	0.11
	Peat - Ribbed Fen	MS-2-R	ES2R	ES2R	1.56	2.02	0.38	1.43	Non-Detect	0.04	0.09	0.08
S-7	BR Shallow		NS7-BR	NS7BRS	1.02	ns	0.53	0.34	0.09	ns	0.05	0.05
	BR Intermediate		NS7-BR	NS7BRI	1.93	ns	0.23	Detect	0.04	ns	0.02	0.05
	BR Deep		NS7-BR	NS7BRD	2.34	ns	0.12	0.39	0.03	ns	0.03	0.03
	Clay - Deep	MS-7-CL(1)	NS7-CL	NS7-CLD	0.59	ns	0.25	Detect	Non-Detect	ns	0.02	0.05
	Clay - Intermediate	-	NS7-CL	NS7-CLI	0.41	ns	0.13	Detect	0.02	ns	0.02	0.02
	Clay - Shallow	MS-7-CL(2)	NS7-CL	NS7-CLS	0.70	ns	0.10	Detect	Detect	ns	0.02	Detect
	Peat - Domed Bog	MS-7-D	NS-7D	NS-7D	0.72	1.04	0.29	0.62	Detect	Detect	0.04	0.02
	Peat - Flat Bog	MS-7-F	NS-7F	NS-7F	1.23	1.61	0.27	0.85	Detect	Non-Detect	0.05	Detect
	Peat - Horizontal Fen	MS-7-H	NS-7H	NS-7H	1.24	2.18	0.68	1.35	0.02	0.06	0.10	0.04
	Peat - Ribbed Fen	MS-7-R	NS-7R	NS-7R	0.62	0.52	0.12	0.44	Detect	Detect	0.03	0.02
S-8	Bedrock (Bioherm)	MS-8-BR(1)	NS8BR1	NS8B1S	7.46	ns	1.56	7.14	0.03	ns	0.03	0.13
	Bedrock (Bioherm)	MS-8-BR(2)	NS8BR1	NS8B1I	4.36	ns	ns	0.33	Non-Detect	ns	ns	0.05
			NS8BR1	NS8B1D	1.83	ns	ns	ns	Non-Detect	ns	ns	ns
	Clay - Deep	MS-8-CL(1)	NS8CL1	NS8C1D	0.31	ns	0.24	Detect	Detect	ns	0.02	Detect
	Clay - Middle	MS-8-CL(2)	NS8CL1	NS8C1I	ns	ns	0.26	ns	ns	ns	0.04	ns
	Clay - Shallow	MS-8-CL(3)	NS8CL1	NS8C1S	0.89	ns	0.28	0.50	0.03	ns	0.02	0.08
	Clay - Deep	MS-8-CL(4)	NS8CL2	NS8C2D	0.14	ns	0.16	Non-Detect	Detect	ns	0.02	Non-Detect
	Clay - Middle	MS-8-CL(5)	NS8CL2	NS8C2I	0.49	ns	ns	ns	Non-Detect	ns	ns	ns
	Clay - Shallow	MS-8-CL(6)	NS8CL2	NS8C2S	0.33	ns	0.59	Detect	0.08	ns	0.02	0.03
	Peat - Domed Bog	MS-8-D	NS8-1D	NS8-1D	1.13	1.49	0.38	1.66	Non-Detect	Detect	0.06	0.29
	Peat - Flat Bog	MS-8-F	NS8-1F	NS8-1F	1.91	2.85	1.46	2.76	Non-Detect	0.08	0.31	0.14
	Peat - Horizontal Fen	MS-8-H	NS8-1H	NS8-1H	0.56	0.55	0.18	Detect	Detect	Detect	0.07	0.02
	Peat - Ribbed Fen	MS-8-R	NS8-1R	NS8-1R	1.00	0.98	0.27	1.60	Non-Detect	Detect	0.09	Non-Detect
S-9(1)	Bedrock (Bioherm)	MS-9(1)-BR			ns	ns	ns	ns	ns	ns	ns	ns
	Clay - Deep	MS-9(1)-CL(1)	SS9CL1	SS9C1D	0.66	ns	Detect	0.52	Detect	ns	Detect	Non-Detect
	Clay - Shallow	MS-9(1)-CL(2)	SS9CL1	SS9C1S	1.03	ns	0.10	0.43	Detect	ns	0.07	0.02
	Peat - Domed Bog	MS-9(1)-D	SS9-1D	SS9-1D	0.77	0.77	0.27	0.58	Detect	Non-Detect	0.17	Detect
	Peat - Flat Bog	MS-9(1)-F	SS9-1F	SS9-1F	2.53	1.74	0.37	1.36	Detect	0.04	0.05	0.05
	Peat - Horizontal Fen	MS-9(1)-H	SS9-1H	SS9-1H	2.65	2.08	0.45	1.01	0.02	0.05	0.11	0.03
	Peat - Ribbed Fen	MS-9(1)-R	SS9-1R	SS9-1R	0.72	1.26	0.22	0.47	0.02	0.03	0.04	0.02
S-9(2)	Bedrock (Bioherm)	MS-9(2)-BR			ns	ns	ns	ns	ns	ns	ns	ns
	Clay - Deep	MS-9(2)-CL(1)	SS9CL2	SS9C2D	1.09	ns	0.30	0.38	0.01	ns	0.04	0.02
	Clay - Shallow	MS-9(2)-CL(2)	SS9CL2	SS9C2S	0.44	ns	0.13	Detect	Non-Detect	ns	0.02	Detect
	Peat - Domed Bog	MS-9(2)-D	SS9-2D	SS9-2D	1.72	1.89	0.42	1.04	Detect	0.02	0.02	Detect
	Peat - Flat Bog	MS-9(2)-F	SS9-2F	SS9-2F	1.10	1.27	0.57	1.21	Non-Detect	0.06	0.12	0.03
	Peat - Horizontal Fen	MS-9(2)-H	SS9-2H	SS9-2H	0.80	0.59	0.30	Detect	Non-Detect	Detect	0.08	0.02
	Peat - Ribbed Fen	MS-9(2)-R	SS9-2R	SS9-2R	1.29	0.90	0.33	0.72	Non-Detect	0.06	0.17	0.05
S-13	Bedrock (Bioherm)	MS-13-BR	WS13BR	WS13BS	2.57	ns	0.72	0.87	Non-Detect	ns	Detect	Non-Detect
			WS13BR	WS13BD	1.19	ns	ns	ns	Non-Detect	ns	ns	ns
	Clay - Deep	MS-13-CL(1)	WS13CL	WS13CD	0.42	ns	0.09	Detect	0.03	ns	0.02	0.02
			WS13CL	WS13CI	1.48	ns	0.18	ns	0.04	ns	0.04	ns
	Clay - Shallow	MS-13-CL(2)	WS13CL	WS13CS	0.50	ns	Detect	0.36	0.02	ns	ns	Detect
	Peat - Domed Bog	MS-13-D	WS13-D	WS13-D	2.81	2.68	1.26	1.45	0.03	0.12	0.24	0.11
	Peat - Flat Bog	MS-13-F	WS13-F	WS13-F	1.60	2.79	0.92	1.30	0.07	0.24	0.45	0.15
	Peat - Horizontal Fen	MS-13-H	WS13-H	WS13-H	ns	0.57	0.35	0.42	0.02	Detect	0.29	Detect
	Peat - Ribbed Fen	MS-13-R	WS13-R	WS13-R	0.40	0.95	0.25	Detect	0.13	Non-Detect	0.05	Detect
S-15	Bedrock (Bioherm)	MS-15-BR	WS15BR	WS15BS	2.00	ns	2.34	2.74	Detect	ns	0.37	0.03
			WS15BR	WS15BD	0.58	ns	ns	ns	Detect	ns	ns	ns
	Clay - Deep	MS-15-CL(1)	WS15CL	WS15CD	is	ns	ns	0.59	Detect	ns	ns	0.04
			WS15CL	WS15CI	1.70	ns	ns	ns	Non-Detect	ns	ns	ns
	Clay - Shallow	MS-15-CL(2)	WS15CL	WS15CS	0.69	ns	0.07	Detect	Detect	ns	Detect	Detect
	Peat - Domed Bog	MS-15-D	WS15-D	WS15-D	1.35	1.89	0.93	Detect	Detect	0.04	0.78	0.02
	Peat - Flat Bog	MS-15-F	WS15-F	WS15-F	2.66	2.55	0.30	0.35	Non-Detect	0.07	0.17	Non-Detect
	Peat - Horizontal Fen	MS-15-H	WS15-H	WS15-H	0.99	0.90	0.22	Detect	ns	Detect	0.10	Detect
	Peat - Ribbed Fen	MS-15-R	WS15-R	WS15-R	0.43	0.92	0.15	Detect	0.02	0.02	Non-Detect	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	-	NS-V-1D	1.98	0.60	0.18	0.53	ns	Detect	0.02	0.02
	Peat - Ribbed Fen	MS-V(1)-R	-	NS-V-1R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R
S-V2	Peat - Domed Bog	MS-V(2)-D	-	SS-V-2D	1.97	1.16	0.24	0.45	ns	Detect	0.02	0.05
	Peat - Ribbed Fen	MS-V(2)-R	-	SS-V(2)-R	0.59	0.60	0.13	0.85	ns	Non-Detect	0.03	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	-	SS-V-3D	0.72	0.61	0.49	0.60	ns	0.10	0.03	Detect
	Peat - Ribbed Fen	MS-V(3)-R	-	SS-V(3)-R	1.08	1.69	0.47	0.76	ns	0.02	0.04	0.02

Notes
na: not accessible
is: insufficient sample
ns: no sample

Non-Detect: <0.0054 ng/L
Detect: >0.0054 but ≤0.0169 ng/L

Near-field sites: S-2; S-8; S-V1; S-V2; S-V3
Mid-field sites: S-1; S-7; S-9(1); S-9(2)
Far-field sites: S-13; S-15

TABLE 2
MUSKEG MONITORING PROGRAM - ANNUAL MERCURY RESULTS - 2007-2010
(late summer / fall sampling - Data in ng/L or parts per trillion)

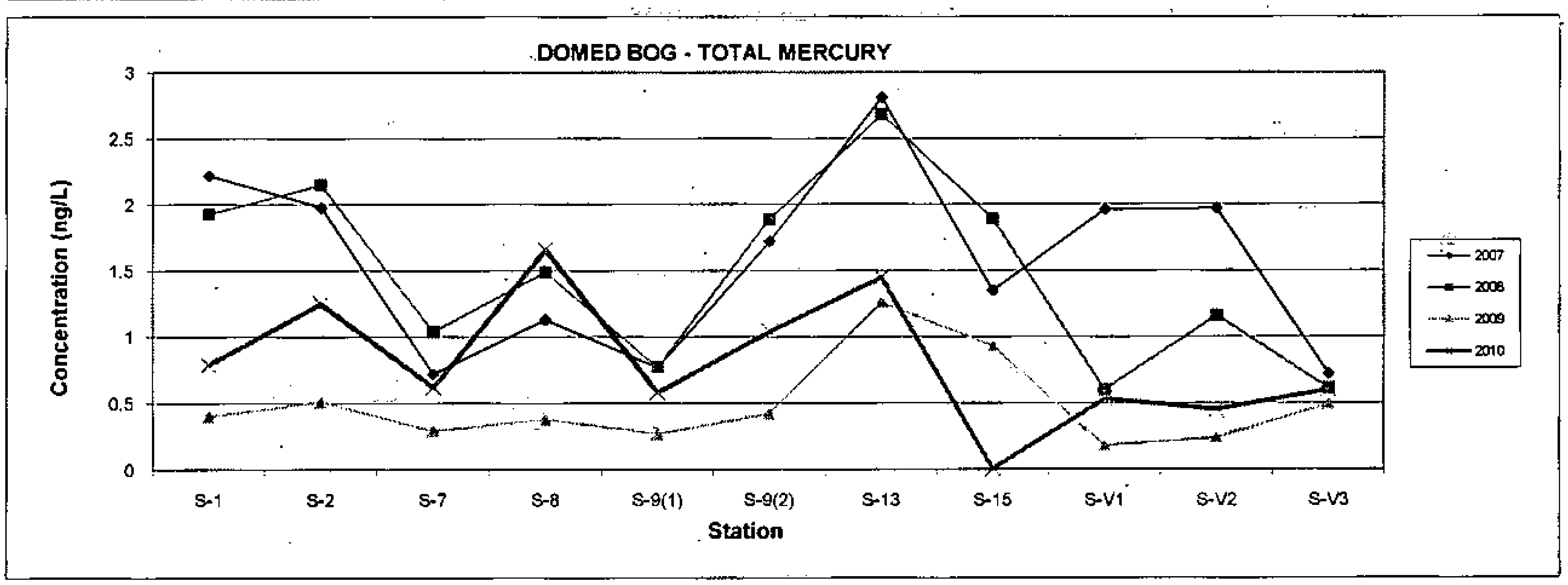
Cluster Location	Substrate/Condition	Total Mercury (Filtered)				Methyl Mercury (Filtered)			
		2007	2008	2009	2010	2007	2008	2009	2010
S-1	Peat - Domed Bog	2.22	1.93	0.40	0.79	0.02	0.07	0.10	0.06
	Peat - Flat Bog	2.73	3.04	0.83	1.47	Detect	0.18	0.19	0.14
	Peat - Horizontal Fen	na	1.77	0.36	0.53	na	na	0.10	0.04
	Peat - Ribbed Fen	1.81	2.27	0.49	1.24	0.02	0.07	0.06	0.06
S-2	Peat - Domed Bog	1.98	2.15	0.51	1.25	Non-Detect	0.02	0.04	0.05
	Peat - Flat Bog	3.12	3.05	2.35	2.74	Non-Detect	0.10	0.07	0.11
	Peat - Ribbed Fen	1.56	2.02	0.38	1.43	Non-Detect	0.04	0.09	0.08
S-7	Peat - Domed Bog	0.72	1.04	0.29	0.62	Detect	Detect	0.04	0.02
	Peat - Flat Bog	1.23	1.61	0.27	0.85	Detect	Non-Detect	0.05	Detect
	Peat - Horizontal Fen	1.24	2.18	0.68	1.35	0.02	0.06	0.10	0.04
	Peat - Ribbed Fen	0.62	0.52	0.12	0.44	Detect	Detect	0.03	0.02
S-8	Peat - Domed Bog	1.13	1.49	0.38	1.66	Non-Detect	Detect	0.06	0.29
	Peat - Flat Bog	1.91	2.85	1.46	2.76	Non-Detect	0.08	0.31	0.14
	Peat - Horizontal Fen	0.56	0.55	0.18	Detect	Detect	Detect	0.07	0.02
	Peat - Ribbed Fen	1.00	0.98	0.27	1.60	Non-Detect	Detect	0.09	Non-Detect
S-9(1)	Peat - Domed Bog	0.77	0.77	0.27	0.58	Detect	Non-Detect	0.17	Detect
	Peat - Flat Bog	2.53	1.74	0.37	1.36	Detect	0.04	0.05	0.05
	Peat - Horizontal Fen	2.65	2.06	0.45	1.01	0.02	0.05	0.11	0.03
	Peat - Ribbed Fen	0.72	1.26	0.22	0.47	0.02	0.03	0.04	0.02
S-9(2)	Peat - Domed Bog	1.72	1.89	0.42	1.04	Detect	0.02	0.02	Detect
	Peat - Flat Bog	1.10	1.27	0.57	1.21	Non-Detect	0.06	0.12	0.03
	Peat - Horizontal Fen	0.80	0.59	0.30	Detect	Non-Detect	Detect	0.08	0.02
	Peat - Ribbed Fen	1.29	0.90	0.33	0.72	Non-Detect	0.06	0.17	0.05
S-13	Peat - Domed Bog	2.81	2.68	1.26	1.45	0.03	0.12	0.24	0.11
	Peat - Flat Bog	1.60	2.79	0.92	1.30	0.07	0.24	0.45	0.15
	Peat - Horizontal Fen	ns	0.57	0.35	0.42	0.02	Detect	0.29	Detect
	Peat - Ribbed Fen	0.40	0.95	0.25	Detect	0.13	Non-Detect	0.05	Detect
S-15	Peat - Domed Bog	1.35	1.89	0.93	Detect	Detect	0.04	0.78	0.02
	Peat - Flat Bog	2.66	2.55	0.30	0.35	Non-Detect	0.07	0.17	Non-Detect
	Peat - Horizontal Fen	0.99	0.90	0.22	Detect	ns	Detect	0.10	Detect
	Peat - Ribbed Fen	0.43	0.92	0.15	Detect	0.02	0.02	Non-Detect	0.02
S-V1	Peat - Domed Bog	1.96	0.60	0.18	0.53	ns	Detect	0.02	0.02
	Peat - Ribbed Fen	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R	see MS-2-R
S-V2	Peat - Domed Bog	1.97	1.16	0.24	0.45	ns	Detect	0.02	0.05
	Peat - Ribbed Fen	0.59	0.60	0.13	0.85	ns	Non-Detect	0.03	0.04
S-V3	Peat - Domed Bog	0.72	0.61	0.49	0.60	ns	0.10	0.03	Detect
	Peat - Ribbed Fen	1.08	1.69	0.47	0.76	ns	0.02	0.04	0.02

Notes
na: not accessible
is: insufficient sample
ns: no sample

Non-Detect: <0.0054 ng/L
Detect: >0.0054 but <0.0169 ng/L

TABLE 2a
MUSKEG PORE WATER - DOMED BOG 2007-2010 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury				Methyl Mercury			
	2007	2008	2009	2010	2007	2008	2009	2010
S-1	2.22	1.93	0.40	0.79	0.02	0.07	0.10	0.06
S-2	1.98	2.15	0.51	1.25	<0.01	0.02	0.04	0.05
S-7	0.72	1.04	0.29	0.62	0.01	0.01	0.04	0.02
S-8	1.13	1.49	0.38	1.66	<0.01	0.01	0.06	0.29
S-9(1)	0.77	0.77	0.27	0.58	0.01	<0.01	0.17	0.01
S-9(2)	1.72	1.89	0.42	1.04	0.01	0.02	0.02	0.01
S-13	2.81	2.68	1.26	1.45	0.03	0.12	0.24	0.11
S-15	1.35	1.89	0.93	0.01	0.01	0.04	0.78	0.02
S-V1	1.96	0.6	0.18	0.53		0.01	0.02	0.02
S-V2	1.97	1.16	0.24	0.45		0.01	0.02	0.05
S-V3	0.72	0.61	0.49	0.60		0.10	0.03	0.01



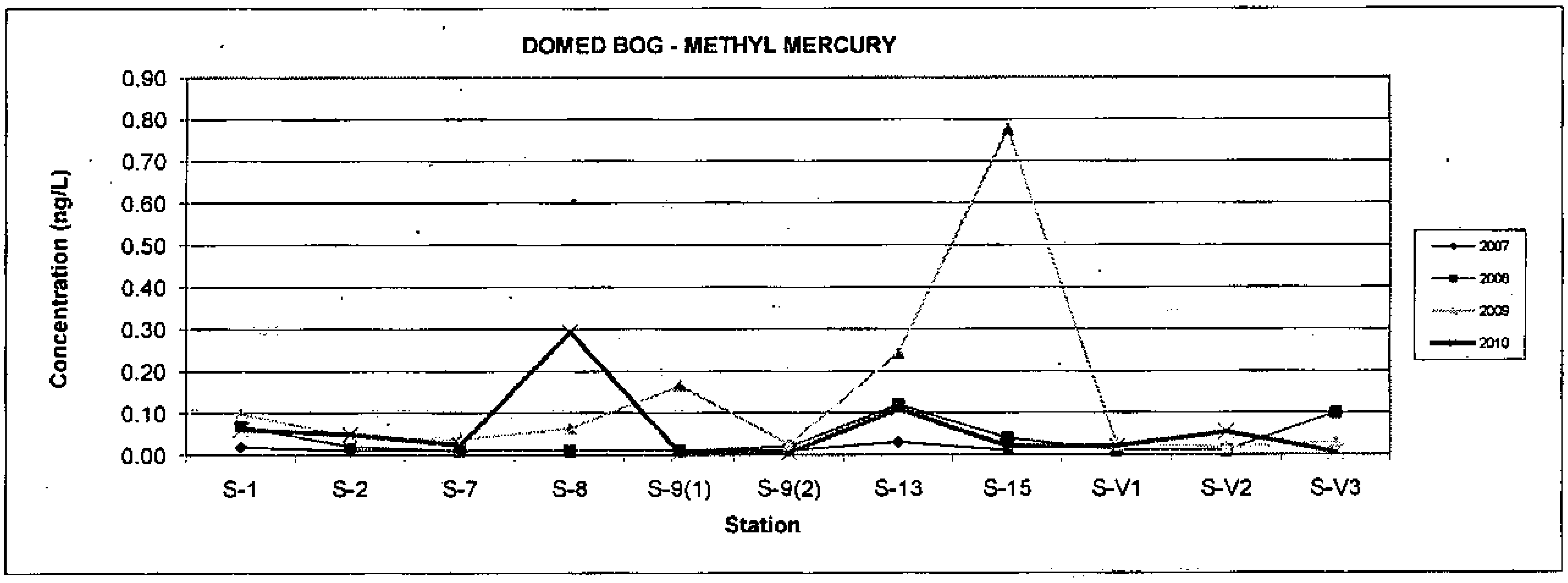
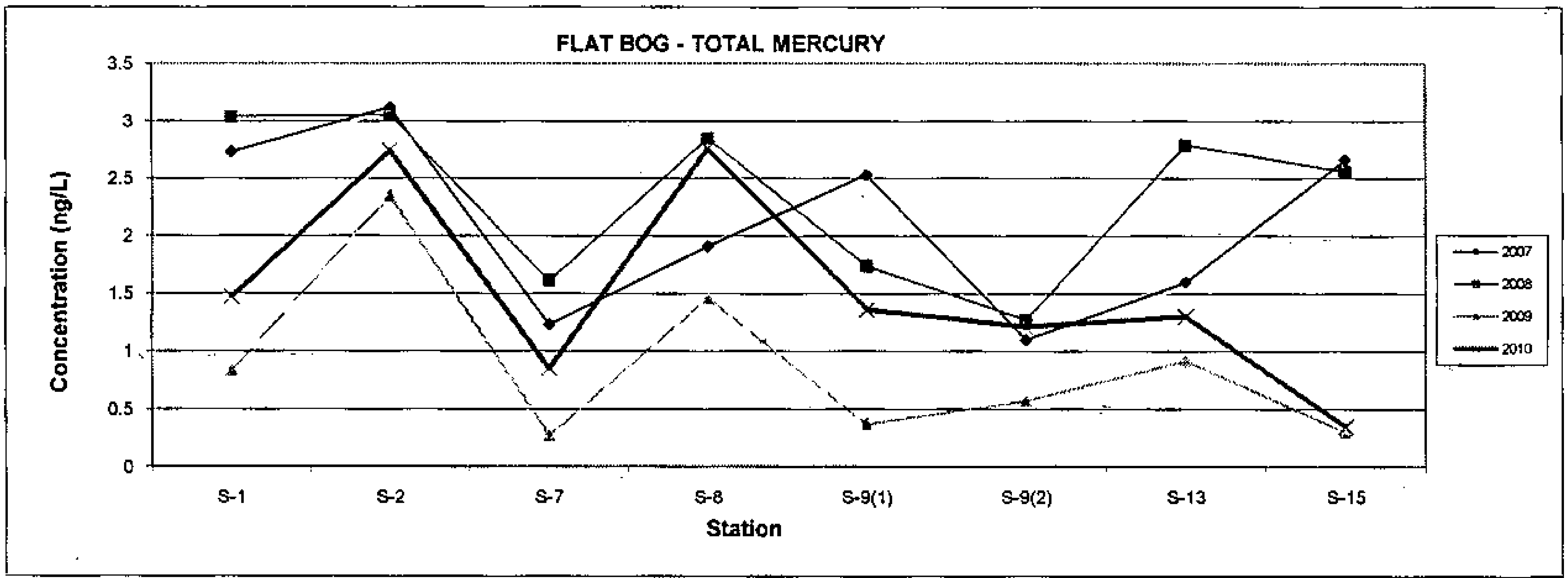


TABLE 2b
MUSKEG PORE WATER - FLAT BOG 2007-2010 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury				Methyl Mercury			
	2007	2008	2009	2010	2007	2008	2009	2010
S-1	2.73	3.04	0.83	1.47	0.01	0.18	0.19	0.14
S-2	3.12	3.05	2.35	2.74	<0.01	0.10	0.07	0.11
S-7	1.23	1.61	0.27	0.85	0.01	<0.01	0.05	0.01
S-8	1.91	2.85	1.46	2.76	<0.01	0.08	0.31	0.14
S-9(1)	2.53	1.74	0.37	1.36	0.01	0.04	0.05	0.05
S-9(2)	1.10	1.27	0.57	1.21	<0.01	0.06	0.12	0.03
S-13	1.60	2.79	0.92	1.30	0.07	0.24	0.45	0.15
S-15	2.66	2.56	0.30	0.35	<0.01	0.07	0.17	<0.01



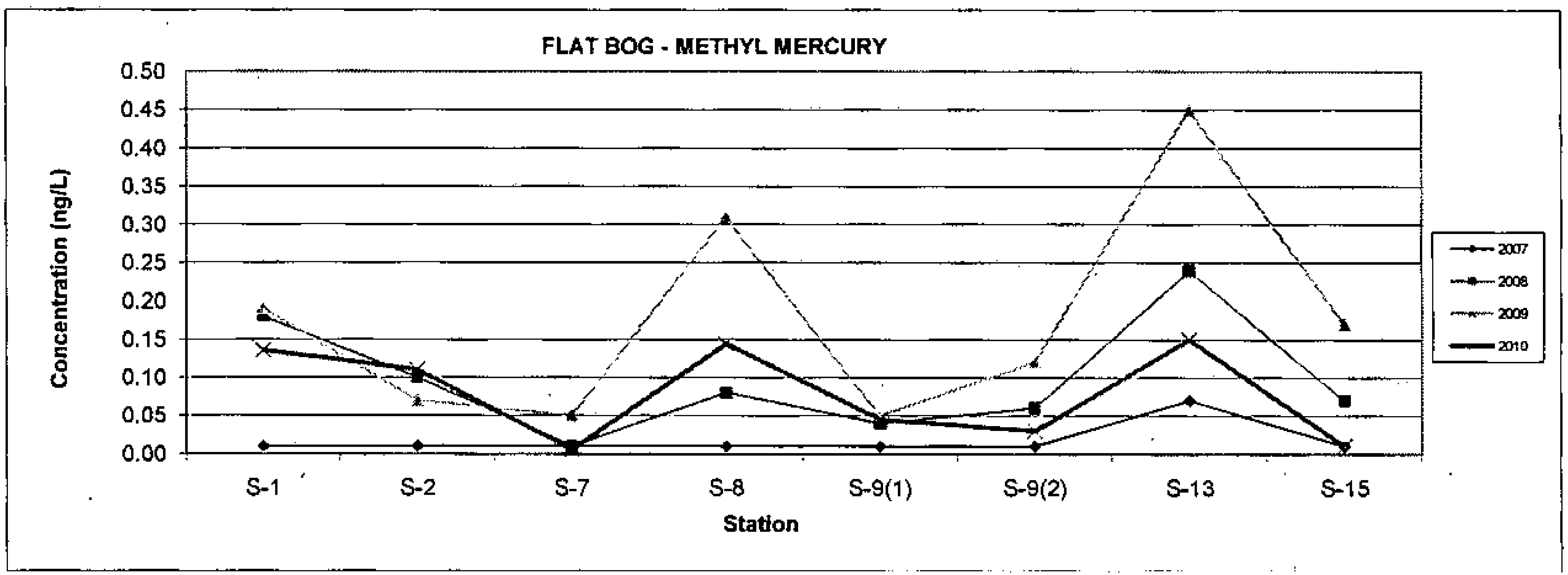
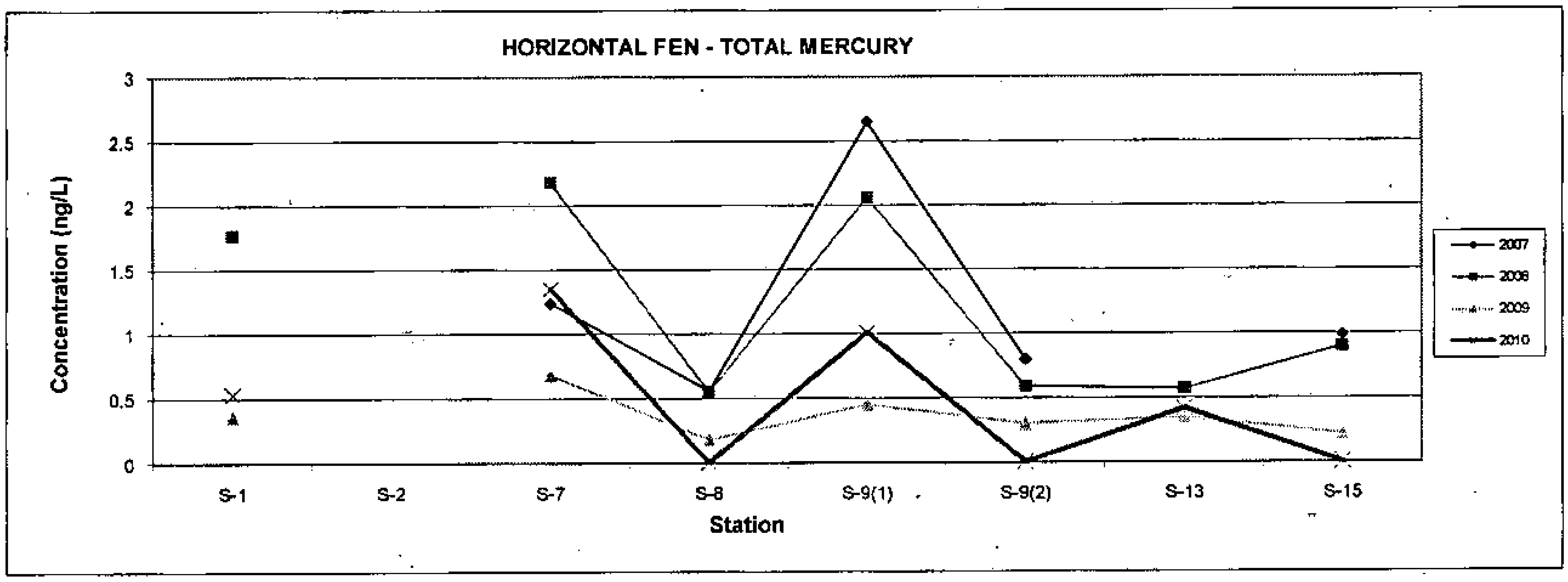


TABLE 2c
MUSKEG PORE WATER - HORIZONTAL FEN 2007-2010 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury				Methyl Mercury			
	2007	2008	2009	2010	2007	2008	2009	2010
S-1		1.77	0.36	0.53			0.10	0.04
S-2								
S-7	1.24	2.18	0.68	1.35	0.02	0.06	0.10	0.04
S-8	0.56	0.55	0.18	0.01	0.01	0.01	0.07	0.02
S-9(1)	2.65	2.06	0.45	1.01	0.02	0.05	0.11	0.03
S-9(2)	0.80	0.59	0.30	0.01	<0.01	0.01	0.08	0.02
S-13		0.57	0.35	0.42	0.02	0.01	0.29	0.01
S-15	0.99	0.90	0.22	0.01		0.01	0.10	0.01



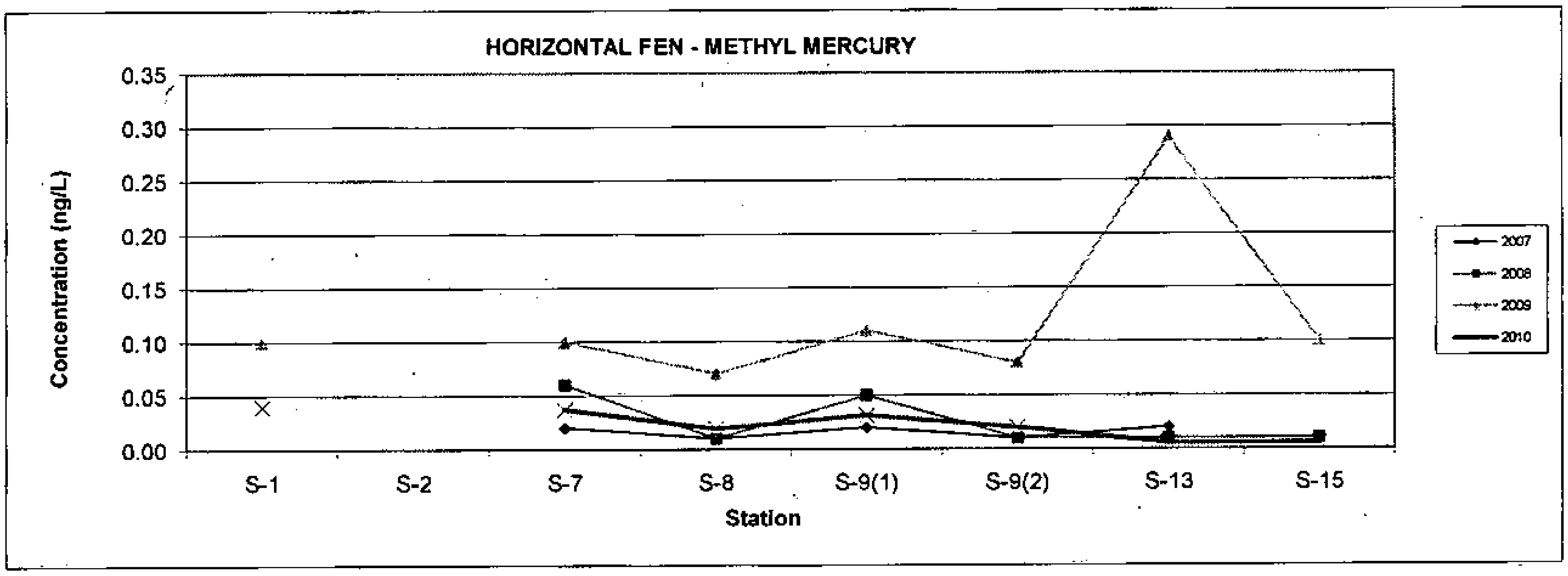
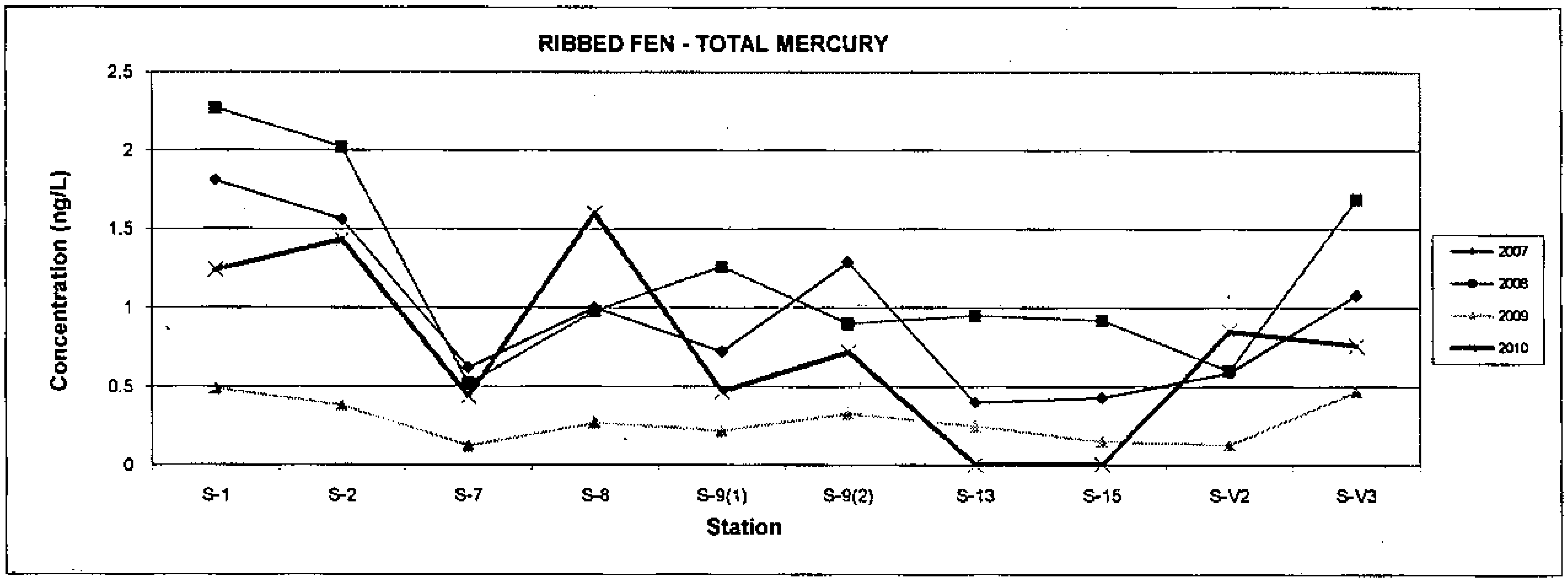


TABLE 2d
MUSKEG PORE WATER - RIBBED FEN 2007-2010 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury				Methyl Mercury			
	2007	2008	2009	2010	2007	2008	2009	2010
S-1	1.81	2.27	0.49	1.24	0.02	0.07	0.06	0.06
S-2	1.56	2.02	0.38	1.43	<0.01	0.04	0.09	0.08
S-7	0.62	0.52	0.12	0.44	0.01	0.01	0.03	0.02
S-8	1.00	0.98	0.27	1.60	<0.01	0.01	0.09	<0.01
S-9(1)	0.72	1.26	0.22	0.47	0.02	0.03	0.04	0.02
S-9(2)	1.29	0.90	0.33	0.72	<0.01	0.06	0.17	0.05
S-13	0.40	0.95	0.25	0.01	0.13	<0.01	0.05	0.01
S-15	0.43	0.92	0.15	0.01	0.02	0.02	<0.01	0.02
S-V2	0.59	0.60	0.13	0.85		<0.01	0.03	0.04
S-V3	1.08	1.69	0.47	0.76		0.02	0.04	0.02



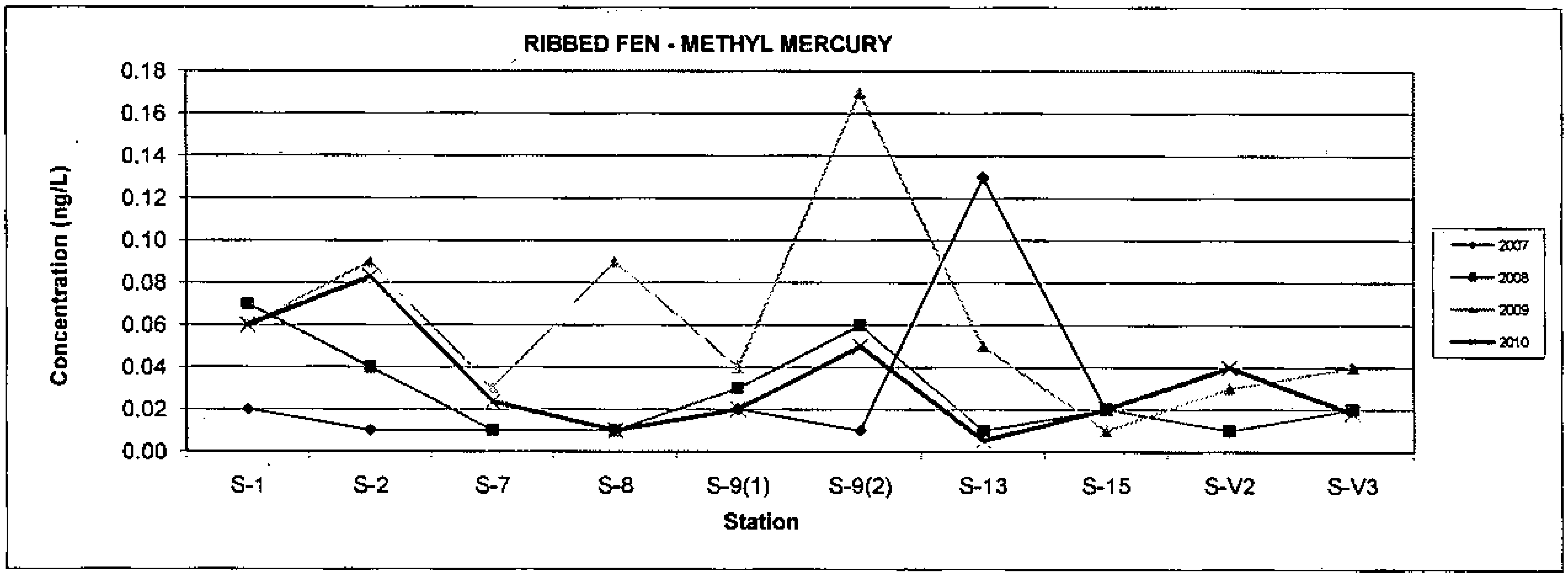
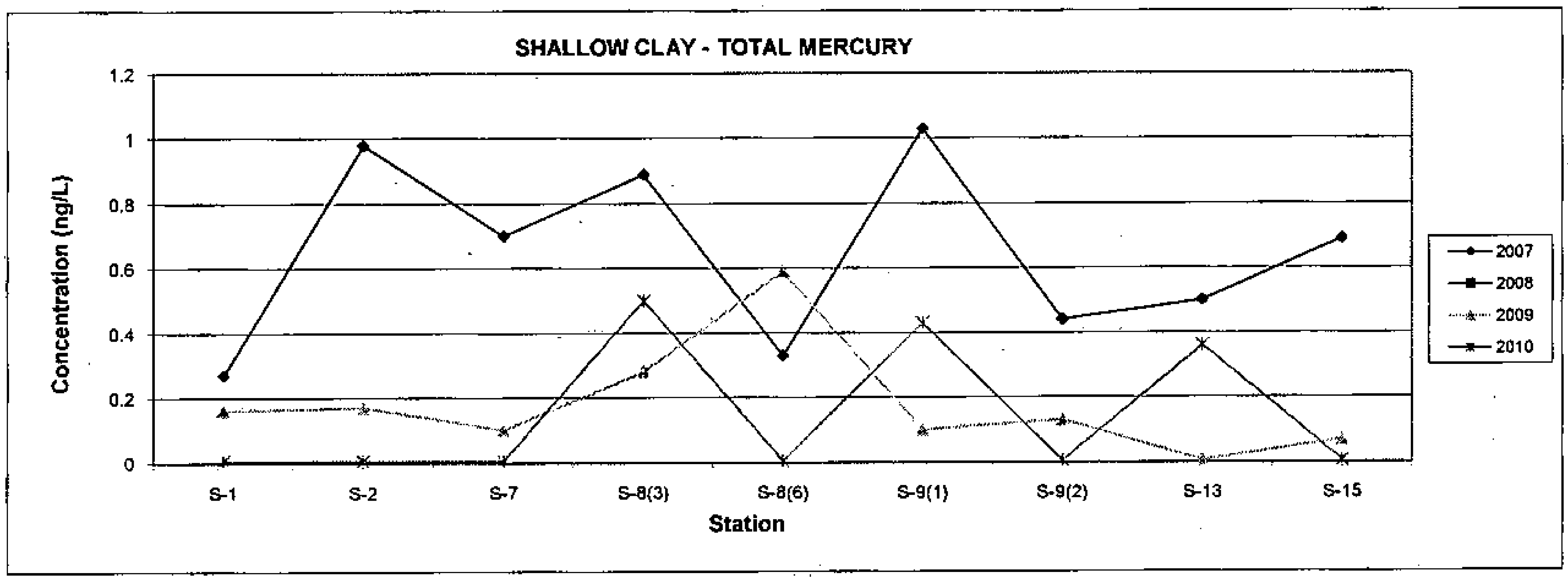


TABLE 2e
MINERAL HORIZON PORE WATER - SHALLOW CLAY 2007-2010 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury				Methyl Mercury			
	2007	2008	2009	2010	2007	2008	2009	2010
S-1	0.27		0.16	0.01	0.01		0.03	0.04
S-2	0.98		0.17	0.01	<0.01		0.04	0.02
S-7	0.70		0.10	0.01	0.01		0.02	0.01
S-8(3)	0.89		0.28	0.50	0.03		0.02	0.06
S-8(6)	0.33		0.59	0.01	0.08		0.02	0.03
S-9(1)	1.03		0.10	0.43	0.01		0.07	0.02
S-9(2)	0.44		0.13	0.01	<0.01		0.02	0.01
S-13	0.50		0.01	0.36	0.02			0.01
S-15	0.69		0.07	0.01	0.01		0.01	0.01



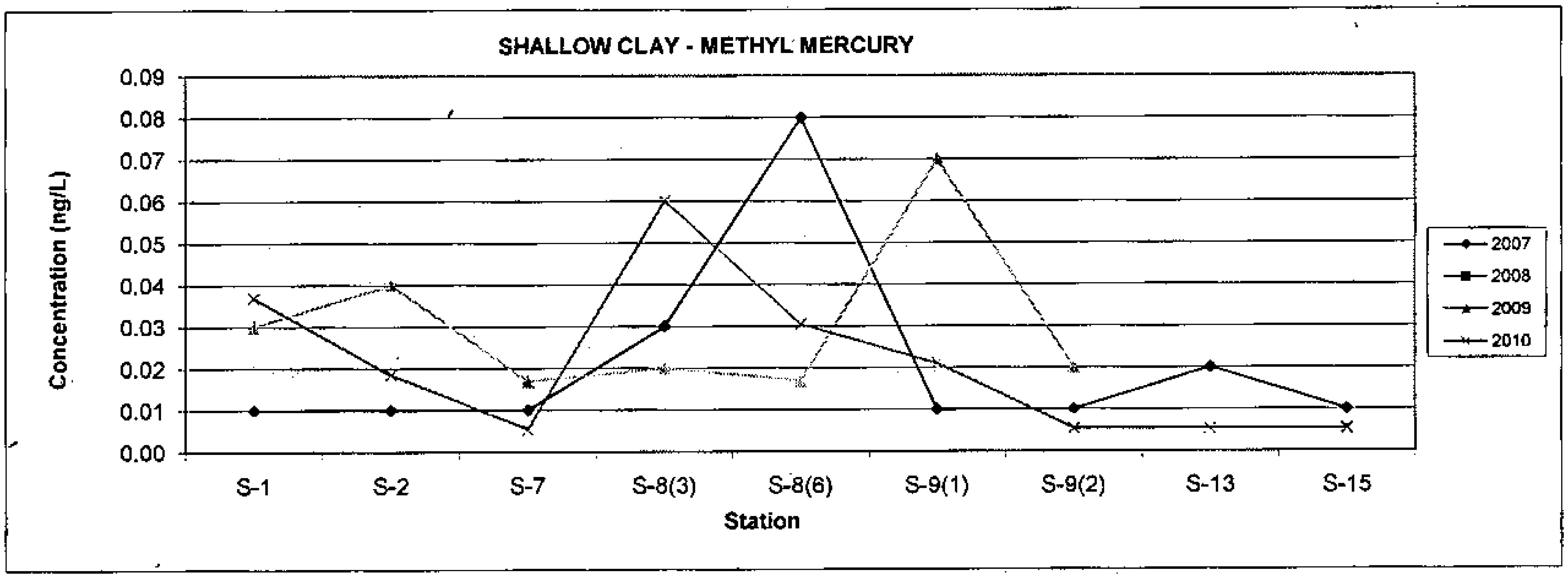
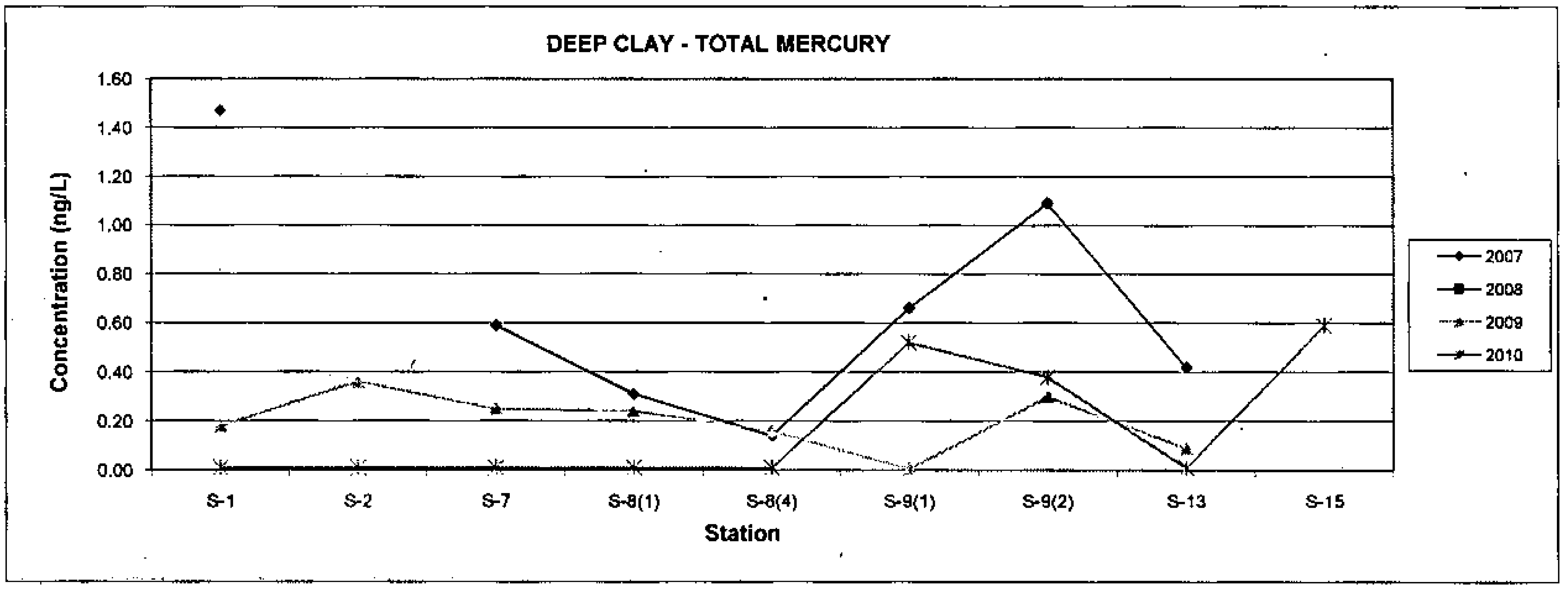


TABLE 2f
MINERAL HORIZON PORE WATER - DEEP CLAY 2007-2010 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury				Methyl Mercury			
	2007	2008	2009	2010	2007	2008	2009	2010
S-1	1.47		0.18	0.01			0.03	0.01
S-2			0.36	0.01			0.13	0.03
S-7	0.59		0.25	0.01	<0.01		0.02	0.05
S-8(1)	0.31		0.24	0.01	0.01		0.02	0.01
S-8(4)	0.14		0.16	0.01	0.01		0.02	0.01
S-9(1)	0.66		0.01	0.52	0.01		0.01	0.01
S-9(2)	1.09		0.30	0.38	0.01		0.04	0.02
S-13	0.42		0.09	0.01	0.03		0.02	0.02
S-15				0.59	0.01			0.04



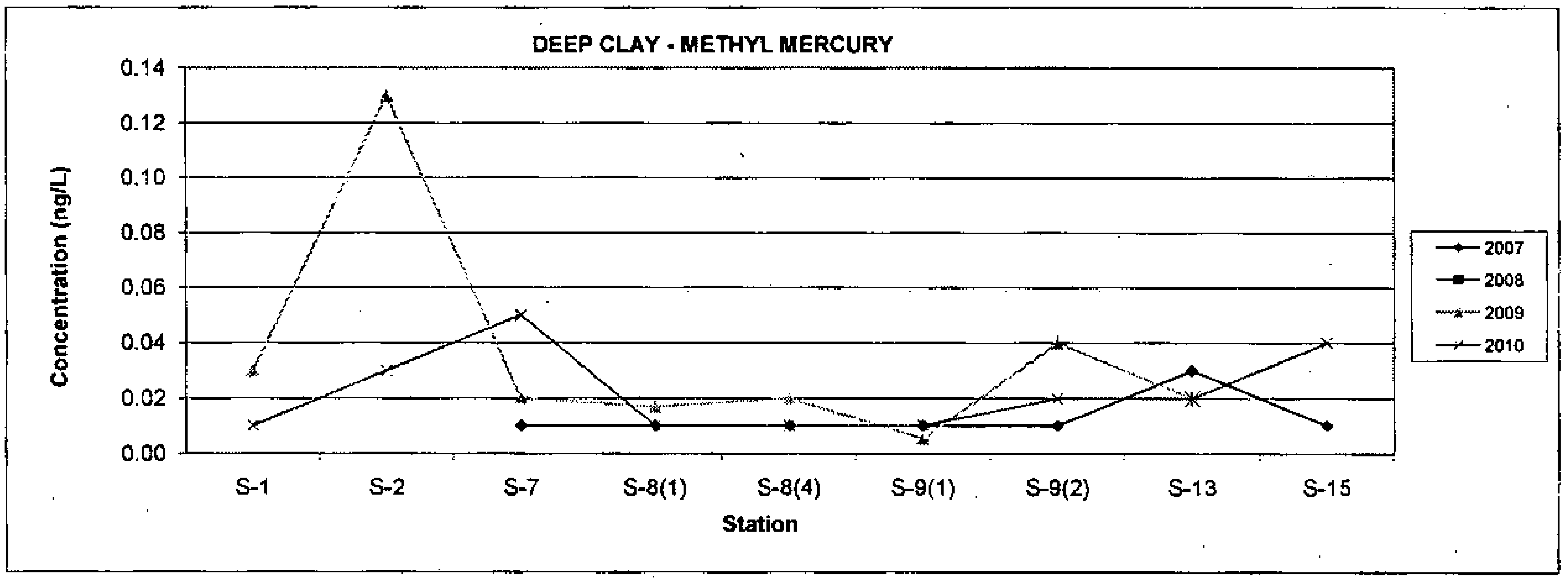
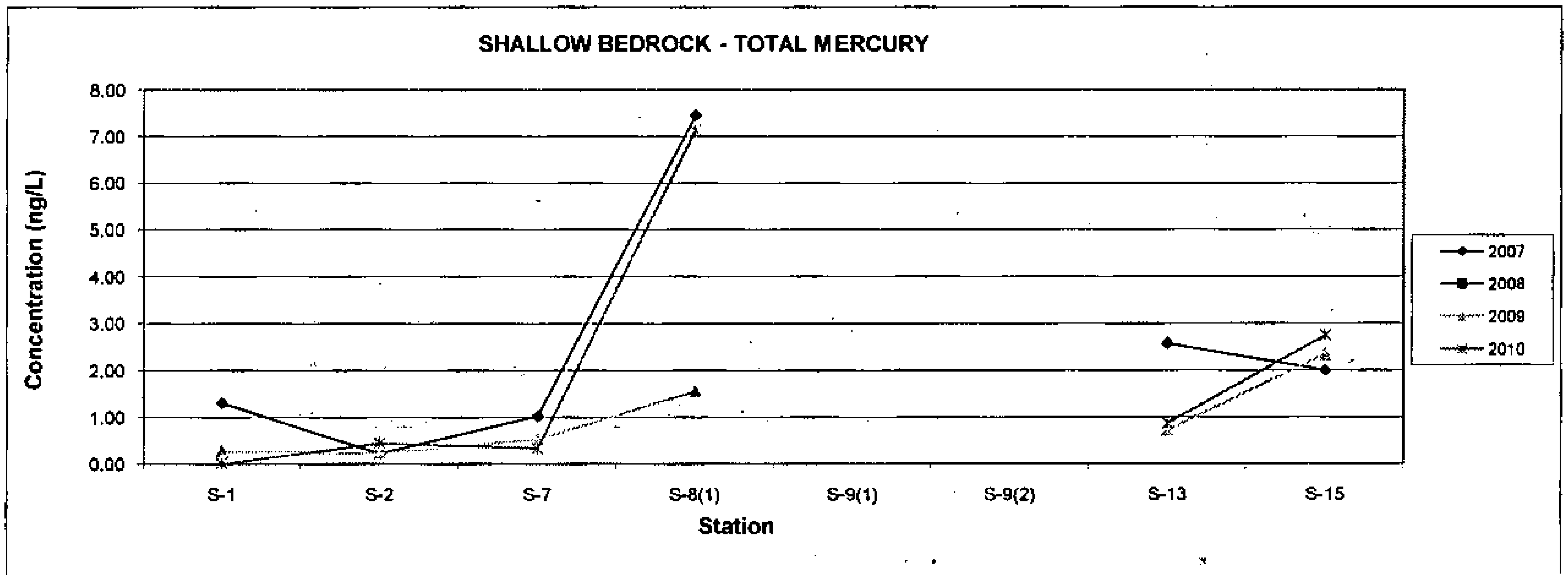


TABLE 2g
MINERAL HORIZON PORE WATER - SHALLOW BEDROCK 2007-2010 (Filtered)
(concentrations in ng/L)

Cluster Location	Total Mercury				Methyl Mercury			
	2007	2008	2009	2010	2007	2008	2009	2010
S-1	1.30		0.27	0.01	0.01		0.06	0.01
S-2	0.23		0.24	0.45	<0.01		0.05	0.02
S-7	1.02		0.53	0.34	0.09		0.05	0.05
S-8(1)	7.46		1.56	7.14	0.03		0.03	0.13
S-9(1)								
S-9(2)								
S-13	2.57		0.72	0.87	<0.01		0.02	0.01
S-15	2.00		2.34	2.74	0.01		0.37	0.03



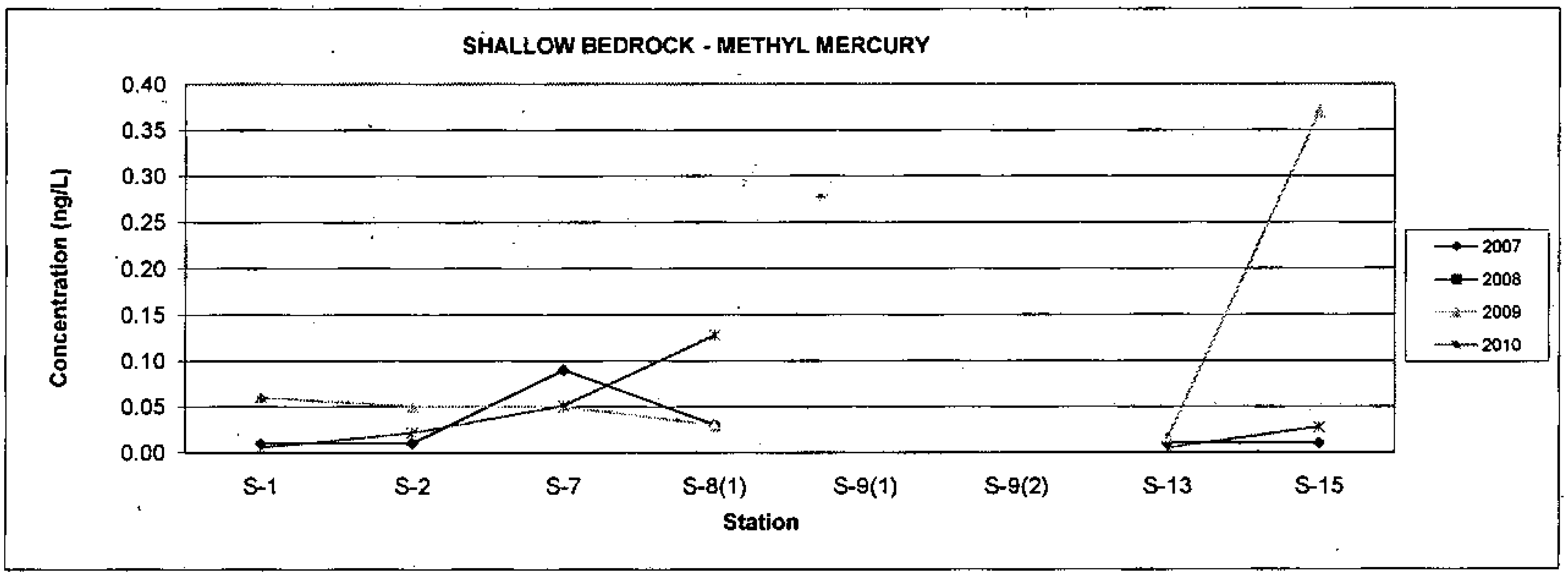
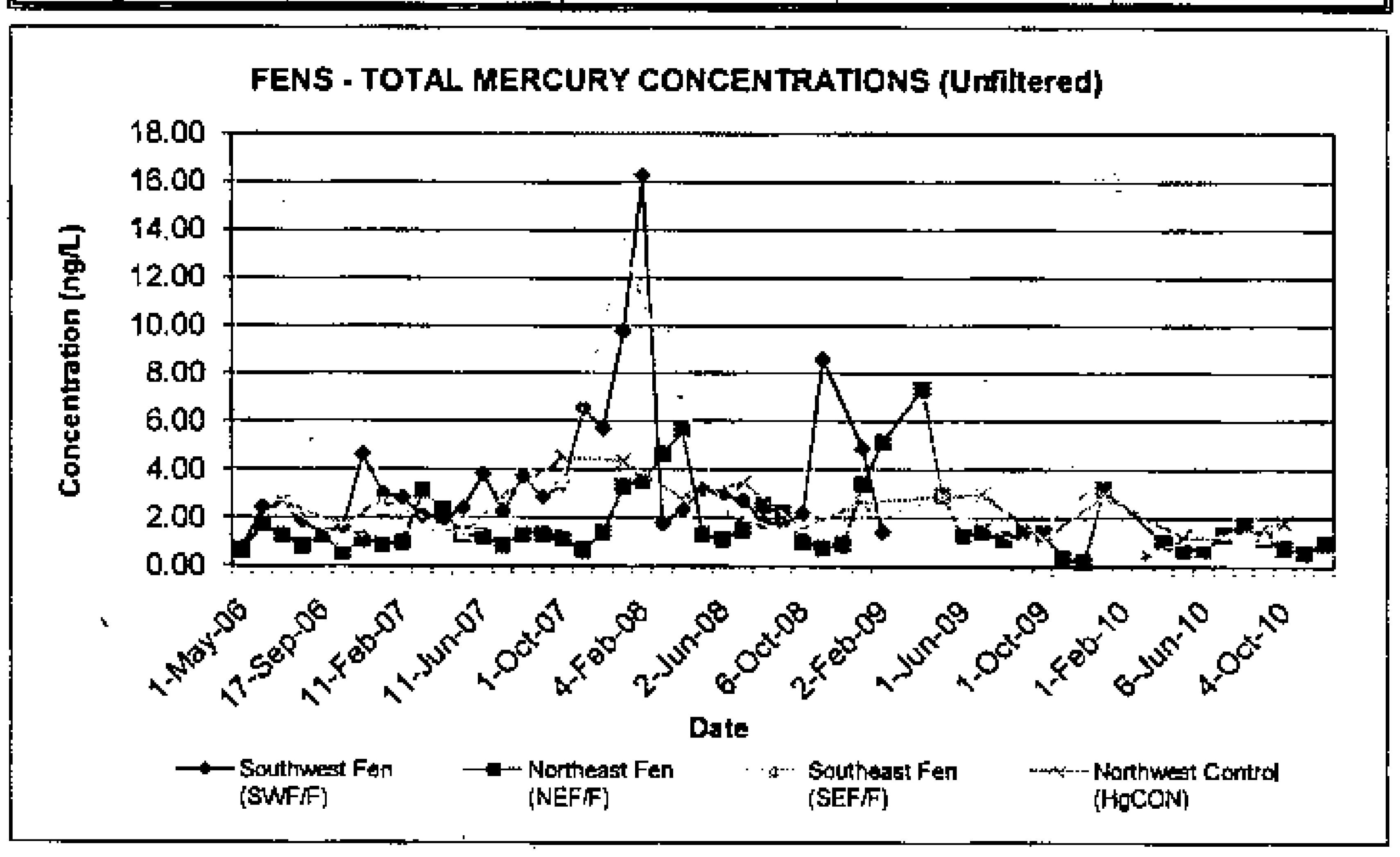


TABLE 3
TOTAL MERCURY - FENS (Unfiltered)
(concentrations in ng/L)

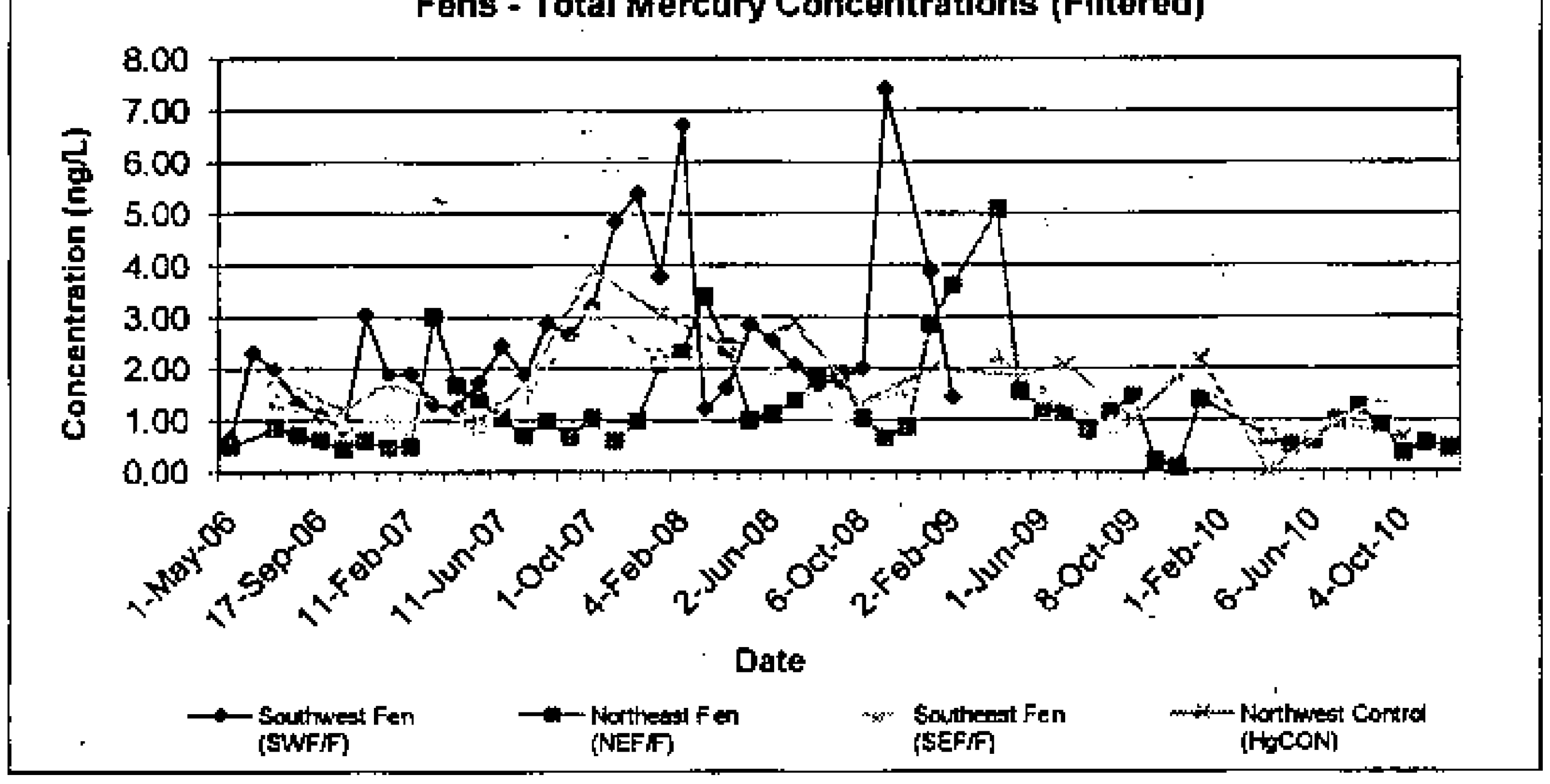
	Southwest Fen (SWF/F)	Northeast Fen (NEF/F)	Southeast Fen (SEF/F)	Northwest Control (HgCON)
1-May-06	0.77	0.62		
5-Jun-06	2.44	1.72		
3-Jul-06	2.49	1.26	2.51	2.64
21-Aug-06	1.86	0.83		
17-Sep-06	1.29	1.25		
3-Oct-06	1.59	0.53	1.09	1.70
4-Dec-06	4.65	1.08		
8-Jan-07	3.01	0.86	1.51	2.77
11-Feb-07	2.84	0.99		
13-Mar-07	F	3.14		
16-Apr-07	F	2.34		
7-May-07	2.07	1.31	1.43	1.25
11-Jun-07	1.96	1.21		
2-Jul-07	2.40	0.87	1.57	2.87
6-Aug-07	3.85	1.30		
12-Sep-07	2.28	1.32		
1-Oct-07	3.74	1.12	3.57	4.51
5-Nov-07	2.86	0.68		
3-Dec-07	3.42	1.41		
27-Jan-08	6.55	3.33	13.30	4.36
4-Feb-08	5.70	3.52		
10-Mar-08	9.79	4.64		
7-Apr-08	16.30	5.67	F	2.80
5-May-08	1.78	1.33		
2-Jun-08	2.37	1.11		
7-Jul-08	3.19	1.54	2.42	3.47
4-Aug-08	2.98	2.51		
1-Sep-08	2.76	2.22		
6-Oct-08	1.84	1.02	1.44	1.60
3-Nov-08	1.80	0.76		
1-Dec-08	2.19	0.92		
1-Jan-09	F	3.43	1.83	2.66
2-Feb-09	8.61	5.14		
Mar-09				
1-Apr-09	4.89	7.35		
1-May-09	1.44	2.92	2.60	2.91
1-Jun-09	Revoked	1.25		
1-Jul-09	Revoked	1.46	2.12	2.97
1-Aug-09	Revoked	1.11		
1-Sep-09	Revoked	1.42		
1-Oct-09	Revoked	1.41	0.94	1.15
1-Nov-09	Revoked	0.38		
1-Dec-09	Revoked	0.19		
1-Jan-10	Revoked	3.21	3.16	2.93
1-Feb-10	Revoked			
1-Mar-10	Revoked			
19-Apr-10	Revoked	1.03	0.55	
3-May-10	Revoked	0.70		1.20
6-Jun-10	Revoked	0.74		
1-Jul-10	Revoked	1.34	1.21	1.21
2-Aug-10	Revoked	1.76		
6-Sep-10	Revoked	1.15		
4-Oct-10	Revoked	0.78	1.29	1.86
1-Nov-10	Revoked	0.56		
6-Dec-10	Revoked	0.98		
*Average 2009	5.03	2.31	1.87	2.42
*Average 2010	-	1.59	1.55	1.80
Average All Years	3.62	1.74	2.50	2.49



Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump
Southweast Fen - Control site
Nortwest Control - Control site
*Annual average values are only for dates when control samples were collected
F Frozen

TABLE 4
TOTAL MERCURY - FENS (Filtered)
(concentrations in ng/L)

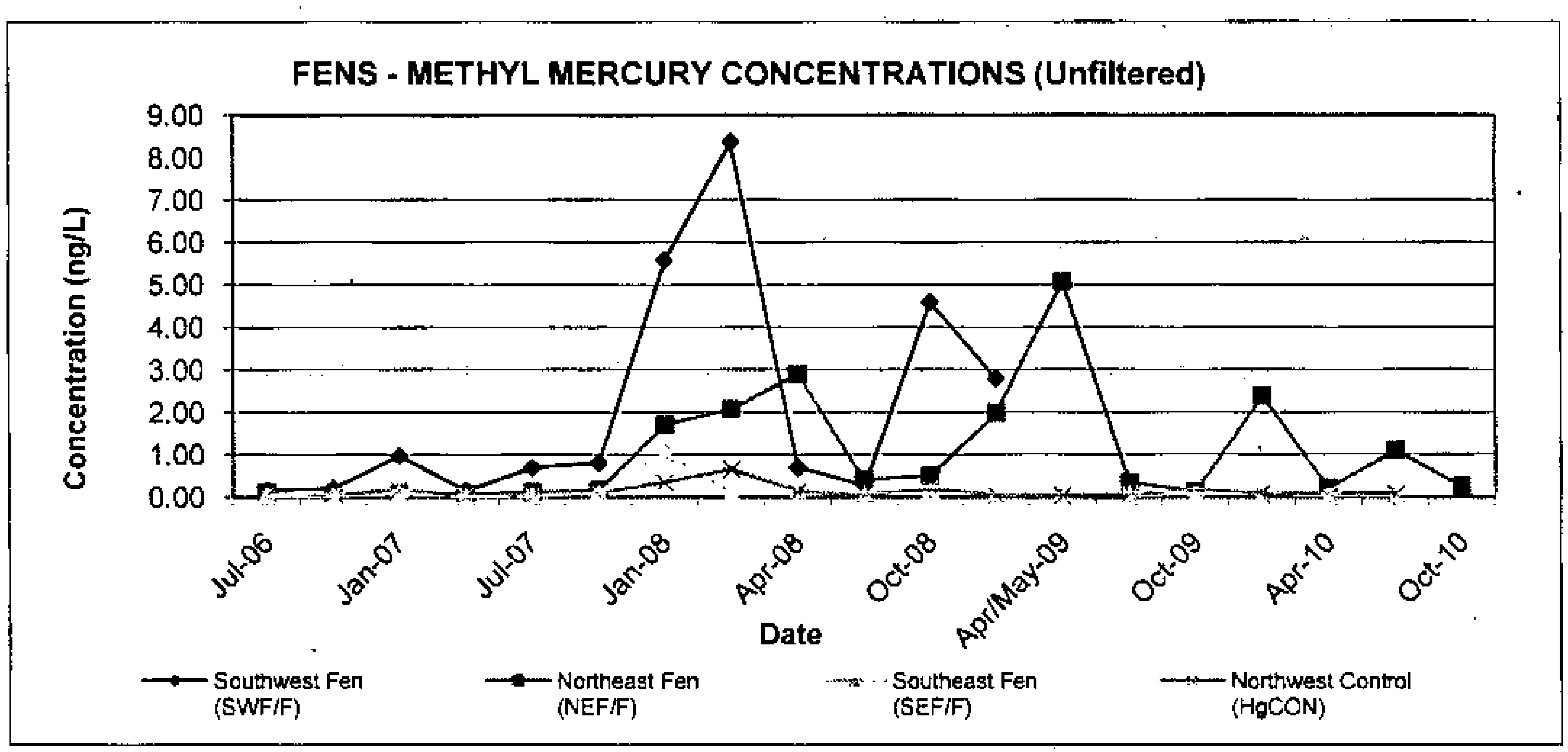
Date	Southwest Fen (SWF/F)	Northeast Fen (NEF/F)	Southeast Fen (SEF/F)	Northwest Control (HgCON)
1-May-06	0.64	0.48		
5-Jun-06	2.32			
3-Jul-06	1.96	0.86	1.38	1.82
21-Aug-06	1.34	0.72		
17-Sep-06	1.11	0.61		
3-Oct-06	0.85	0.44	0.94	1.19
4-Dec-06	3.05	0.59		
8-Jan-07	1.86	0.47	1.01	1.73
11-Feb-07	1.90	0.48		
13-Mar-07	F	3.03		
16-Apr-07	F	1.69		
7-May-07	1.31	1.41	0.89	1.03
11-Jun-07	1.24	1.05		
2-Jul-07	1.74	0.70	1.48	1.70
6-Aug-07	2.45	0.98		
12-Sep-07	1.87	0.69		
1-Oct-07	2.89	1.04	3.11	3.92
5-Nov-07	2.66	0.60		
3-Dec-07	3.22	1.00		
27-Jan-08	4.86	2.10	2.21	3.07
4-Feb-08	5.40	2.32		
10-Mar-08	3.79	3.41		
7-Apr-08	6.72	2.41	F	2.41
5-May-08	1.22	1.01		
2-Jun-08	1.63	1.11		
7-Jul-08	2.87	1.38	2.02	2.88
4-Aug-08	2.55	1.81		
1-Sep-08	2.07	1.90		
6-Oct-08	1.71	1.04	1.12	1.33
3-Nov-08	1.77	0.66		
1-Dec-08	2.02	0.86		
5-Jan-09	F	2.86	1.61	2.00
2-Feb-09	7.42	3.62		
Mar-09				
6-Apr-09	3.89	5.09		
4-May-09	1.44	1.55	2.25	1.85
1-Jun-09	Revoked	1.20		
7-Jul-09	Revoked	1.12	1.49	2.09
3-Aug-09	Revoked	0.79		
7-Sep-09	Revoked	1.15		
8-Oct-09	Revoked	1.46	0.92	1.02
2-Nov-09	Revoked	0.21		
7-Dec-09	Revoked	0.08		
4-Jan-10	Revoked	1.40	1.93	2.21
1-Feb-10	Revoked	-		
1-Mar-10	Revoked			
19-Apr-10	Revoked	0.65		0.01
3-May-10	Revoked	0.50	0.76	
6-Jun-10	Revoked	0.59		
5-Jul-10	Revoked	1.00	0.80	0.95
6-Aug-10	Revoked	1.25		
1-Sep-10	Revoked	0.89		
4-Oct-10	Revoked	0.37	1.35	0.64
6-Nov-10	Revoked	0.55		
2-Dec-10	Revoked	0.45		
*Average 2009	4.43	1.75	1.57	1.74
*Average 2010	-	0.86	1.21	0.95
Average All Years	2.56	1.25	1.49	1.77



Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump
Southweast Fen - Control site
Nortwest Control - Control site
*Annual average values are only for dates when control samples were collected
F Frozen

TABLE 5
METHYL MERCURY - FENS
(concentrations in ng/L)

Unfiltered Samples				
Date	**Southwest Fen (SWF/F)**	**Northeast Fen (NEF/F)**	**Southeast Fen (SEF/F)**	**Northwest Control (HgCON)**
Jul-06	0.16	0.10	0.03	0.06
Oct-06	0.20	0.02	0.02	0.05
Jan-07	0.97	0.07	0.07	0.16
May-07	0.14	0.07	0.01	0.04
Jul-07	0.68	0.10	0.02	0.05
Oct-07	0.81	0.15	0.08	0.09
Jan-08	5.58	1.72	1.07	0.34
Mar-08	F	2.07	F	F
Apr-08	8.37	2.90	0.07	0.65
Jul-08	0.69	0.40	0.11	0.12
Oct-08	0.27	0.50	0.05	0.04
Jan-09	4.59	1.99	0.12	0.19
Apr/May-09	2.79	5.08	0.05	0.04
Jul-09	Revoked	0.34	<0.01	0.03
Oct-09	Revoked	0.12	0.03	0.04
Jan-10	Revoked	2.38	0.06	0.18
Apr-10	Revoked	0.21	0.04	0.06
Jul-10	Revoked	1.10	0.03	0.08
Oct-10	Revoked	0.24	0.03	0.07
Average 2009	3.69	1.88	0.05	0.07
Average 2010	-	0.98	0.04	0.10
Average all Data	2.10	1.03	0.11	0.13

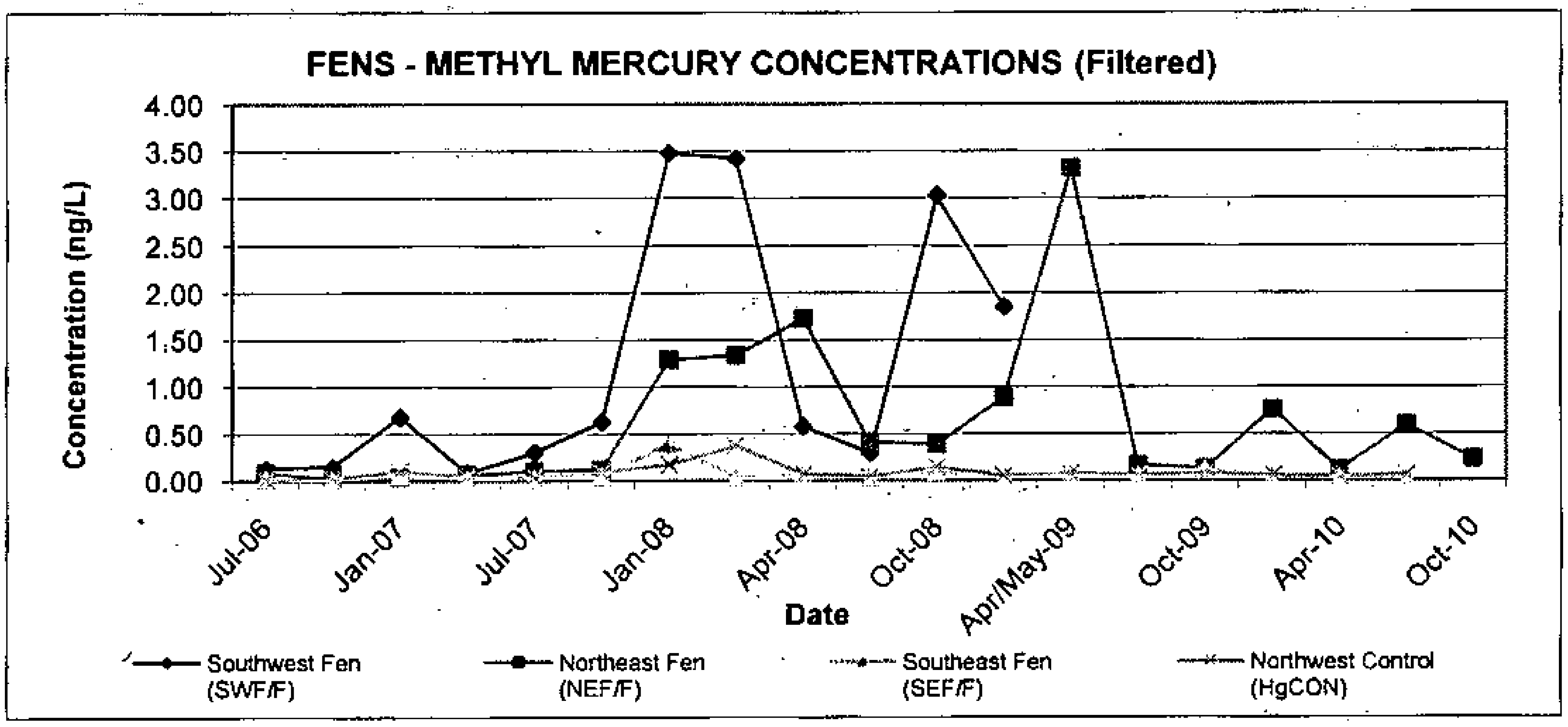


Southwest Fen - Received effluent from the Central Quarry
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump
Southwest Fen - Control site
Northwest Control - Control site
F Frozen

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

TABLE 6
METHYL MERCURY - FENS
(concentrations in ng/L)

Filtered Samples				
Date	**Southwest Fen (SWF/F)**	**Northeast Fen (NEF/F)**	**Southeast Fen (SEF/F)**	**Northwest Control (HgCON)**
Jul-06	0.13	0.08	0.02	0.01
Oct-06	0.15	0.02	0.01	0.02
Jan-07	0.68	0.04	0.06	0.10
May-07	0.08	0.06	0.02	0.04
Jul-07	0.30	0.10	0.02	0.04
Oct-07	0.63	0.12	0.04	0.09
Jan-08	3.48	1.29	0.39	0.17
Mar-08	F	1.34	F	F
Apr-08	3.42	1.73	0.03	0.37
Jul-08	0.58	0.41	0.08	0.07
Oct-08	0.29	0.39	0.02	0.04
Jan-09	3.03	0.89	0.09	0.14
Apr/May-09	1.85	3.32	0.05	0.05
Jul-09	Revoked	0.16	0.07	0.08
Oct-09	Revoked	0.13	0.05	0.06
Jan-10	Revoked	0.76	0.11	0.07
Apr-10	Revoked	0.12	0.03	0.05
Jul-10	Revoked	0.59	0.02	0.04
Oct-10	Revoked	0.23	0.03	0.06
Average 2009	2.44	1.12	0.07	0.08
Average 2010	-	0.43	0.05	0.06
Average All Data	1.22	0.62	0.06	0.08



Southwest Fen - Received effluent from the Central Quarry
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant and pit sump
Southwest Fen - Control site
Northwest Control - Control site
F Frozen

CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

TABLE 7a

TOTAL MERCURY - RIBBED FEN SURFACE WATERS (Sampled as Peat Pore Water 2007-2010)

(filtered; concentrations in ng/L)

Date	MS-1-R (ES1-R)	MS-2-R (ES2-R)	MS-7-R (NS7-R)	MS-8-R (NS8-1R)	MS-9(1)-R (SS9-1R)	MS-9(2)-R (SS9-2R)	MS-13-R (WS13-R)	MS-15-R (WS15-R)	MS-V(1)-R (ES2-R)	MS-V(2)-R (SSV2-R)	MS-V(3)-R (SSV3-R)
Aug / Sep-07	1.81	1.56	0.62	1.00	0.72	1.29	0.40	0.43	1.56	0.01	0.01
Nov-07	1.67	2.30	0.82	1.36	1.11	1.01	1.70	1.11	2.30	0.01	0.01
May-08	2.86	5.56	F	0.91	0.53	F	0.42	0.38	5.56	F	F
Aug-08	2.27	2.02	0.52	0.98	1.26	0.90	0.95	0.92	2.02	0.60	1.69
Oct-08	1.52	1.07	0.72	1.26	1.26	0.70	1.22	0.37	1.07	0.41	1.33
Jan-09	F	F	F	F	F	F	F	F	F	F	F
May-09	2.90	1.98	1.92	3.25	2.10	2.40	4.08	2.19	1.98	2.38	3.19
Aug-09	1.00	0.95	0.95	1.38	1.01	1.44	2.54	0.86	0.95	0.94	1.78
Oct-09	1.19	1.01	1.15	1.19	1.18	1.24	2.54	0.75	1.01	0.86	2.01
Jan-10	0.65	0.01	<0.01	2.45	1.17	0.01	1.21	0.01	0.01	0.01	F
May-10	1.86	1.75	0.74	1.32	1.32	1.40	0.93	2.68	1.05	0.83	2.06
Aug-10	1.24	1.43	0.44	1.60	0.47	0.72	0.01	0.01	1.43	0.85	0.76
Oct-10	1.11	1.24	0.81	1.79	1.25	1.05	3.03	0.68	1.24	1.03	1.67
2009 Average	1.70	1.31	1.34	1.94	1.43	1.69	3.05	1.27	1.31	1.39	2.32
2010 Average	1.22	1.11	0.50	1.79	1.05	0.79	1.29	0.84	0.93	0.68	1.50
Average All Years	1.67	1.74	0.79	1.54	1.12	1.10	1.59	0.87	1.68	0.72	1.45

TABLE 7b

METHYL MERCURY - RIBBED FEN SURFACE WATERS (Sampled as Peat Pore Water 2007-2010)

(filtered; concentrations in ng/L)

Date	MS-1-R (ES1-R)	MS-2-R (ES2-R)	MS-7-R (NS7-R)	MS-8-R (NS8-1R)	MS-9(1)-R (SS9-1R)	MS-9(2)-R (SS9-2R)	MS-13-R (WS13-R)	MS-15-R (WS15-R)	MS-V(1)-R (ES2-R)	MS-V(2)-R (SSV2-R)	MS-V(3)-R (SSV3-R)
Aug / Sep-07	0.02	<0.01	0.01	<0.01	0.02	<0.01	0.13	0.02	<0.01	0.01	0.01
Nov-07	0.02	<0.01	0.01	0.01	<0.01	0.02	<0.01	0.01	<0.01	0.01	0.01
May-08	0.11	0.07	F	<0.01	0.01	F	0.01	0.02	0.07	F	F
Aug-08	0.07	0.04	0.01	0.01	0.03	0.06	<0.01	0.02	0.04	<0.01	0.02
Oct-08	0.02	0.01	0.01	0.01	0.02	0.04	0.01	0.02	0.01	<0.01	0.01
Jan-09	F	F	F	F	F	F	F	F	F	F	F
May / June-09	0.07	0.05	0.02	0.08	0.02	0.01	0.08	0.01	0.05	0.04	0.04
Aug-09	0.03	0.05	0.03	0.09	0.02	0.04	0.04	0.11	0.05	0.04	0.01
Oct-09	0.05	0.03	0.05	0.06	0.04	0.04	0.09	0.02	0.03	0.05	0.14
Jan-10	0.07	0.01	<0.01	0.10	0.01	<0.01	0.05	0.02	0.01	<0.01	F
May-10	0.04	0.04	0.03	0.03	0.04	0.03	0.02	0.07	0.02	0.03	0.06
Aug-10	0.06	0.08	0.02	<0.01	0.02	0.05	0.01	0.02	0.08	0.04	0.02
Oct-10	0.03	0.04	0.01	0.08	0.03	0.02	0.12	0.01	0.04	0.01	0.07
2009 Average	0.05	0.04	0.03	0.08	0.03	0.03	0.07	0.05	0.04	0.04	0.06
2010 Average	0.05	0.04	0.02	0.05	0.02	0.03	0.05	0.03	0.04	0.02	0.05
Average All Years	0.05	0.04	0.02	0.04	0.02	0.03	0.05	0.03	0.04	0.02	0.04

Notes:

	MS-2-R and MS-v(1)-R are the same stations
F	Frozen - no sample
	Stations located at or inside the Upper Bedrock 2 m drawdown contour
	Stations located outside the Upper Bedrock 2 m drawdown contour

Amended C. of A. #3960-7Q4K2G dated March 13, 2009 provides for annual sampling of peat pore water and quarterly sampling of ribbed fen surface water (the previous C. of A. #4111-7DXKQW dated October 3, 2008 provided for the same sampling frequency

TABLE 8
MUSKEG SYSTEM RIBBED FEN GENERAL CHEMISTRY RESULTS - ALL YEARS

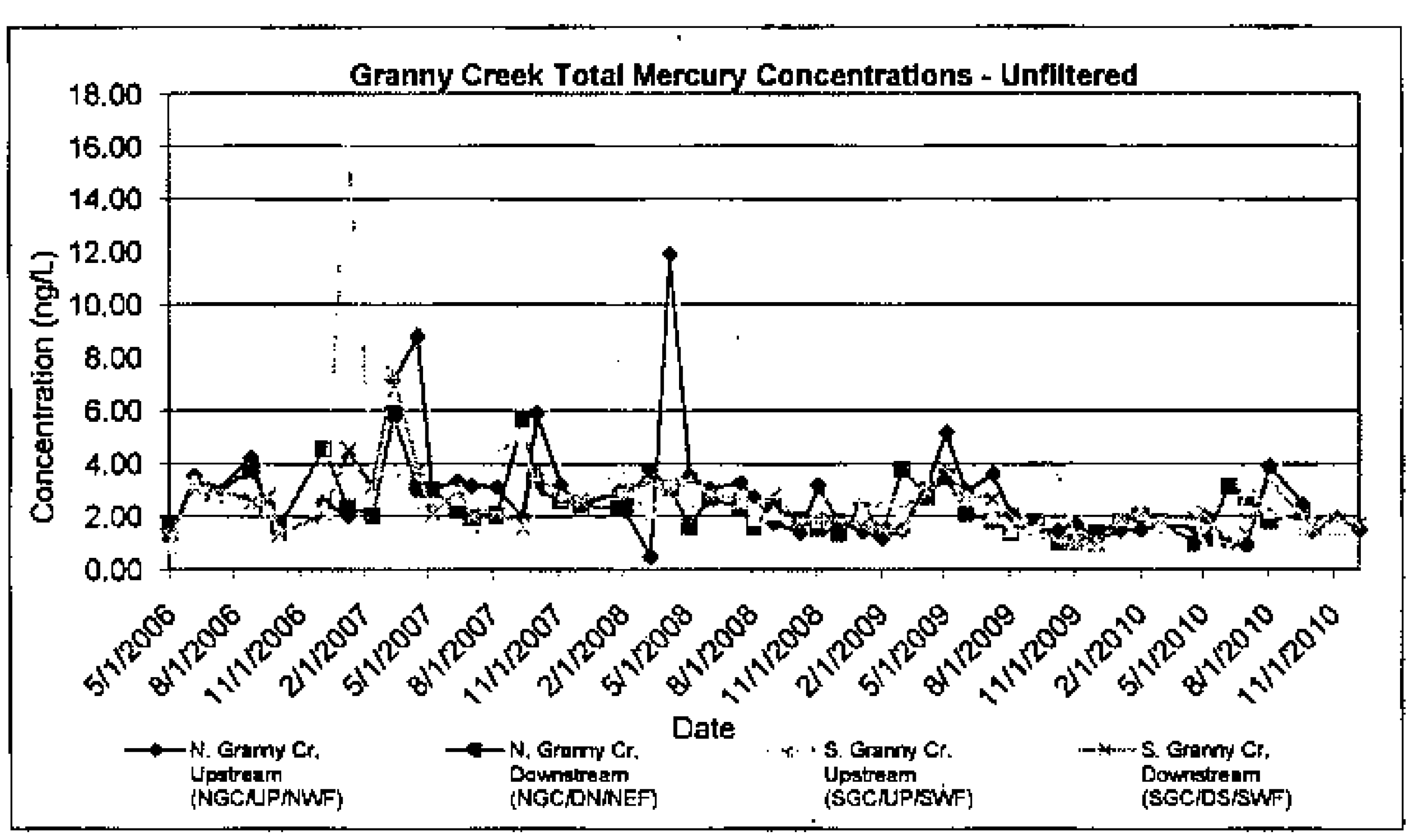
Station	Year	Number of Samples	Parameter										
			Cl (mg/L)	Cond (us/cm)	Nitrate (mg/L)	DOC (mg/L)	pH (units)	SO4 (mg/L)	TP (mg/L)	Ca-D (mg/L)	Fe-D (mg/L)	Mg-D (mg/L)	Na-D (mg/L)
MS-1V-R (ES2-R)	2007	2	0.6	44	<0.1	16.7	6.06	<0.1	0.10	7.2	0.660	0.7	<0.8
	2008	3	0.6	37	<0.1	23.3	5.68	<0.1	0.21	4.6	1.132	0.3	<0.5
	2009	3	0.4	19	<0.1	10.0	6.43	<0.1	<0.01	3.4	0.320	0.4	<0.4
	2010	4	0.6	27	<0.1	22.2	5.84	<1.0	0.01	3.7	0.860	0.3	0.4
MS-2V-R (SSV2-R)	2007	1	1.2	131	<0.1	29.0	6.18	0.2	1.81	24.4	1.910	1.6	0.8
	2008	2	0.9	91	<0.1	35.1	5.87	<0.1	0.06	11.6	0.557	0.5	0.7
	2009	3	0.4	19	<0.1	14.8	6.52	<0.1	<0.01	18.9	0.107	2.8	7.1
	2010	4	0.5	70	<0.1	18.7	6.93	<1.0	0.02	12.4	0.568	0.7	0.5
MS-3V-R (SSV3-R)	2007	1	1.8	141	<0.1	51.6	6.23	0.3	2.47	50.2	5.540	12.0	0.8
	2008	2	1.0	68	<0.1	59.2	5.75	<0.1	0.09	9.5	0.457	1.3	<0.5
	2009	3	0.3	18	<0.1	20.8	5.34	<0.1	<0.01	1.0	0.100	0.1	<0.5
	2010	3	0.3	20	<0.1	23.6	5.08	<1.0	0.01	1.8	0.161	0.2	0.2
MS-1R (ES1-R)	2007	2	0.6	98	<0.1	21.0	6.17	<0.1	0.20	11.3	0.340	0.8	1.5
	2008	3	0.8	47	<0.1	20.2	5.98	<0.1	0.13	5.5	0.340	0.4	1.2
	2009	3	0.5	26	<0.1	18.9	6.47	<0.1	<0.01	3.4	0.136	0.3	<0.6
	2010	4	0.4	34	<0.1	22.6	6.22	<1.0	0.01	5.6	0.499	0.4	0.8
MS-7R (NS-7-R)	2007	2	1.1	246	<0.1	28.7	6.33	<0.2	0.14	47.4	1.350	3.6	4.6
	2008	2	0.8	198	<0.1	14.9	6.40	<0.1	0.03	20.5	1.775	2.1	5.8
	2009	2	0.6	31	<0.1	13.6	7.14	<0.1	<0.01	2.6	0.165	0.3	0.9
	2010	4	0.6	76	<0.1	16.6	6.83	<1.0	0.01	11.2	1.966	1.1	1.5
MS-8R (NS-8-1R)	2007	2	85.8	591	<0.1	28.1	6.98	7.0	0.46	28.6	0.078	10.2	92.8
	2008	3	52.5	452	<0.1	33.2	7.13	<0.2	0.08	10.8	0.053	5.8	57.6
	2009	2	1.2	28	<0.1	16.4	6.81	<0.2	<0.01	1.9	0.119	0.5	2.3
	2010	4	4.2	82	<0.1	35.3	6.40	<1.0	0.02	8.4	0.993	1.4	7.2
MS-9(1)R (SS9-1R)	2007	2	0.5	199	<0.1	19.8	6.65	<0.3	0.22	38.5	0.245	1.0	1.4
	2008	3	0.4	77	<0.2	16.7	5.87	<0.1	0.02	9.8	0.241	0.7	<0.6
	2009	3	0.3	22	<0.1	14.6	6.56	<0.1	<0.02	2.5	0.670	0.2	<0.5
	2010	4	0.3	32	<0.1	19.4	6.14	<1.0	0.01	5.5	0.238	0.4	0.4
MS-9(2)R (SS9-2R)	2007	2	0.7	70	<0.1	17.8	6.28	<0.1	0.16	12.7	0.398	1.7	<1.1
	2008	2	0.4	79	<0.1	17.2	6.26	<0.1	0.05	10.4	0.847	1.1	1.4
	2009	3	0.5	30	<0.1	13.0	6.98	<0.1	<0.02	3.6	0.087	0.4	<0.5
	2010	4	0.7	58	<0.1	19.2	6.66	<1.0	0.03	10.1	0.881	1.1	0.7
MS-13R (WS-13R)	2007	2	1.2	248	<0.1	20.9	6.25	<0.1	0.07	47.9	1.360	3.7	4.9
	2008	3	0.8	203	<0.1	67.0	5.91	<0.1	0.06	33.1	1.357	2.5	0.7
	2009	3	0.4	21	<0.1	22.9	4.53	<0.1	<0.01	0.7	0.067	0.1	<0.5
	2010	3	0.9	31	<0.1	26.0	4.34	<1.0	0.00	0.9	0.090	0.1	0.3
MS-15R (WS15-R)	2007	2	0.8	172	<0.1	11.6	6.43	<0.1	0.04	36.8	0.769	2.6	1.3
	2008	3	0.7	191	<0.1	11.5	6.44	<0.1	0.04	24.0	0.666	1.9	1.0
	2009	3	0.4	50	<0.1	9.8	7.27	<0.1	<0.01	6.8	0.019	0.5	<0.5
	2010	4	0.7	86	<0.1	12.7	7.12	<1.0	0.00	15.7	0.344	1.3	0.6

MS-8R This station stands out as being influenced by natural groundwater upwellings, as evidenced by elevated Cl and Na

Beyond zone of dewatering influence

TABLE 9
TOTAL MERCURY - GRANNY CREEK
(unfiltered; concentrations in ng/L)

Date	N. Granny Cr. Upstream (NGC/UP/NWF)	N. Granny Cr. Downstream (NGC/DN/NEF)	S. Granny Cr. Upstream (SGC/UP/SWF)	S. Granny Cr. Downstream (SGC/DS/SWF)
1-May-06	1.18	1.66	0.86	1.26
5-Jun-06	3.55		3.37	3.16
3-Jul-06	2.92	2.80	2.72	3.08
24-Aug-06	4.21	3.77	2.57	2.6
17-Sep-06	2.37	2.26	2.28	2.74
3-Oct-06		1.61	1.34	1.30
4-Dec-06	2.53	4.58	2.23	2.08
8-Jan-07	2.02	2.35	16.20	4.52
11-Feb-07		2.02	3.57	3.16
13-Mar-07	7.17	F	F	7.43
16-Apr-07	8.82	5.87	3.72	3.76
7-May-07	3.01	3.02	2.46	2.08
11-Jun-07	3.34	2.99	2.49	3.04
2-Jul-07	3.16	2.23	2.73	2.03
6-Aug-07	3.10	1.94		2.17
12-Sep-07	1.96	2.04	4.41	1.61
1-Oct-07	5.91	5.67	5.16	3.79
5-Nov-07	3.19	3.00	2.74	2.49
3-Dec-07	2.42	2.60	2.67	2.61
26-Jan-08	2.95	2.42	2.97	2.94
4-Feb-08	2.19	2.29	3.76	2.91
10-Mar-08	0.46	2.66	3.06	3.35
7-Apr-08	11.90	F	2.19	2.91
5-May-08	3.54	3.73	3.37	3.42
2-Jun-08	3.06	3.08	2.55	2.81
16-Jul-08	3.28	1.61	3.60	2.68
4-Aug-08	2.71	2.69	2.63	2.38
1-Sep-08	1.76	2.32	1.94	2.78
8-Oct-08	1.37	1.57	2.14	1.83
3-Nov-08	3.20	2.39		1.81
1-Dec-08	1.82	1.83	1.84	1.88
5-Jan-09	1.41	1.54	4.42	1.64
2-Feb-09	1.18	1.34	2.22	1.52
2-Mar-09	1.48	2.26	2.56	1.45
6-Apr-09	3.19	1.41	2.19	2.98
4-May-09	5.18	3.81	3.31	3.82
1-Jun-09	2.95	2.72	2.65	2.76
8-Jul-09	3.62	3.48	2.70	2.69
3-Aug-09	2.07	2.08	2.06	2.05
7-Sep-09	1.45	1.82	1.47	1.39
8-Oct-09	1.47	1.38	1.40	1.05
2-Nov-09	1.70	1.79	3.65	0.98
1-Dec-09	1.11	1.02	1.08	0.96
4-Jan-10	1.46	1.03	0.94	1.89
1-Feb-10	1.49	1.36	1.89	2.03
1-Mar-10	1.64	1.78	2.14	1.84
19-Apr-10	1.56	2.05	1.68	1.90
3-May-10	1.99	1.80	1.90	2.13
6-Jun-10	0.93	0.97	0.83	0.78
1-Jul-10	0.92	1.04	0.70	1.28
2-Aug-10	3.90	3.15	3.06	3.37
19-Sep-10	2.44	2.71	2.21	2.00
2-Oct-10	1.46	1.81	1.59	1.55
6-Nov-10	1.94	2.10	1.82	1.86
7-Dec-10	1.50	1.62	1.59	1.67
Average 2009	2.23	2.06	2.48	1.94
Average 2010	1.77	1.79	1.70	1.86
Average All Data	2.78	2.37	2.72	2.40

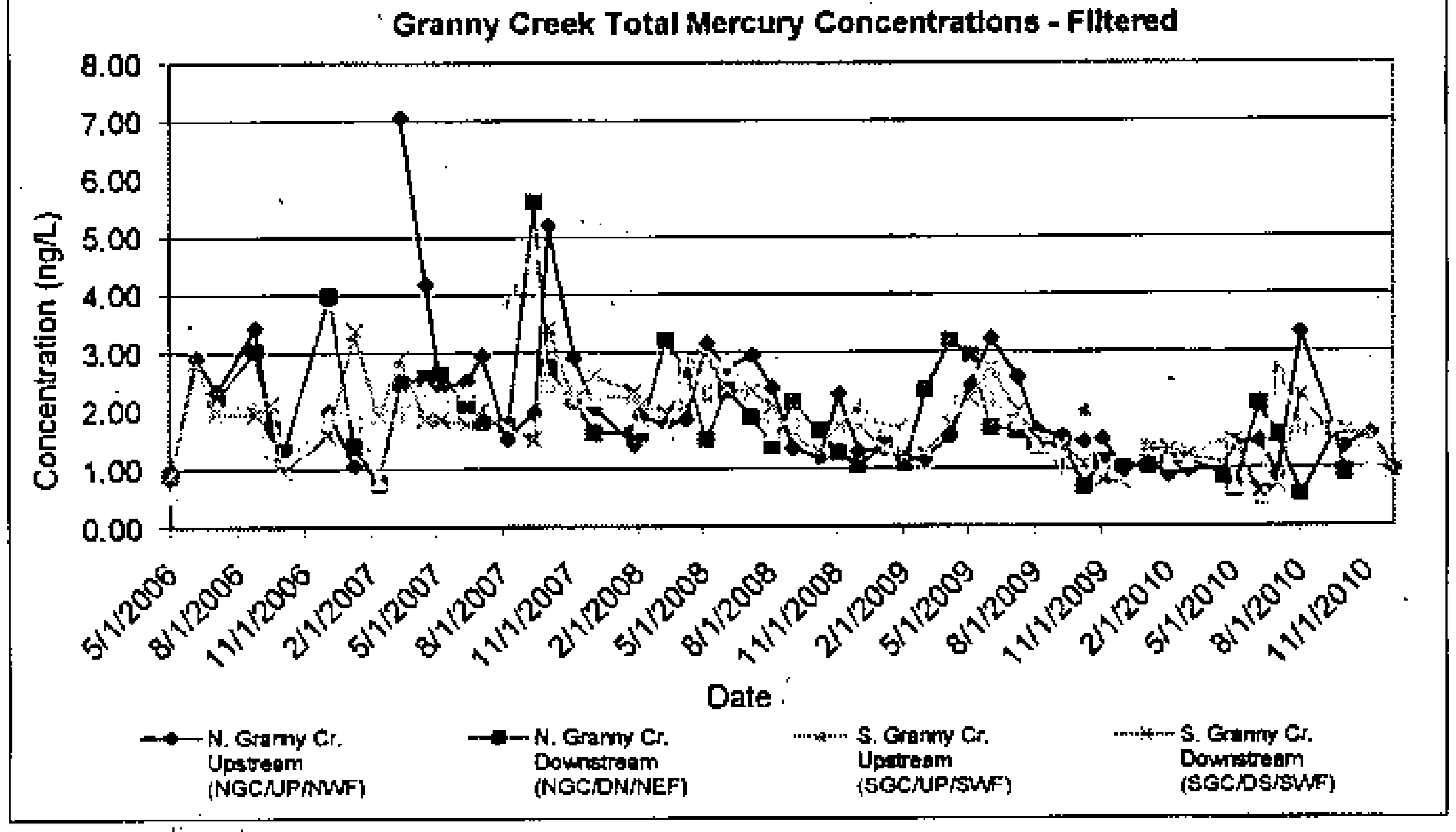


F Frozen
CCME Protection of Aquatic Life Guideline - 26 ng/L

TABLE 10
TOTAL MERCURY - GRANNY CREEK
(filtered; concentrations in ng/L)

Date	N. Granny Cr. Upstream (NGC/UP/NWF)	N. Granny Cr. Downstream (NGC/DN/NEF)	S. Granny Cr. Upstream (SGC/UP/SWF)	S. Granny Cr. Downstream (SGC/DS/SWF)
1-May-06	0.87	0.90	0.55	0.90
5-Jun-06	2.91			2.83
3-Jul-06	2.33	2.22	2.07	1.94
24-Aug-06	3.43	3.03	2.07	1.94
17-Sep-06	1.64	1.70	1.34	2.11
3-Oct-06		1.30	1.11	0.97
4-Dec-06	1.98	3.98	1.92	1.58
8-Jan-07	1.06	1.40	2.01	3.37
11-Feb-07		0.75	0.79	1.90
13-Mar-07	7.05	F	F	2.92
16-Apr-07	4.19	2.50	1.96	1.84
7-May-07	2.40	2.56	2.40	1.83
11-Jun-07	2.51	2.64	2.26	1.79
2-Jul-07	2.96	2.10	2.32	2.01
6-Aug-07	1.52	1.81		1.70
12-Sep-07	1.96	1.75	3.87	1.49
1-Oct-07	5.19	5.60	4.76	3.42
5-Nov-07	2.91	2.74	2.45	2.16
3-Dec-07	2.05	2.18	2.35	2.61
26-Jan-08	1.42	1.63	2.21	2.33
4-Feb-08	1.91	1.60	2.24	2.08
10-Mar-08	1.76	1.63	1.76	1.98
7-Apr-08	1.84	F	1.63	2.06
5-May-08	3.16	3.21	2.90	2.97
2-Jun-08	2.74	2.72	2.29	2.36
7-Jul-08	2.95	1.49	2.84	2.32
4-Aug-08	2.39	2.34	2.23	2.06
1-Sep-08	1.35	1.88	1.62	1.60
8-Oct-08	1.19	1.40	1.88	1.27
3-Nov-08	2.28	2.15		1.73
1-Dec-08	1.30	1.65	1.77	1.71
5-Jan-09	1.33	1.27	2.05	1.34
2-Feb-09	1.15	1.05	1.68	1.19
2-Mar-09	1.15	1.40	1.75	1.22
6-Apr-09	1.56	1.09	1.34	1.78
4-May-09	2.43	2.34	1.98	2.19
1-Jun-09	3.24	3.19	2.75	2.71
8-Jul-09	2.57	2.93	2.20	1.96
3-Aug-09	1.66	1.69	1.80	1.59
8-Sep-09	1.54	1.63	1.39	1.39
8-Oct-09	1.45	1.38	1.01	1.08
2-Nov-09	1.51	1.45	2.01	0.80
1-Dec-09	0.97	0.68	0.95	0.75
4-Jan-10	1.07	1.11	1.29	1.31
1-Feb-10	0.88	1.05	1.37	1.32
1-Mar-10	0.96	1.02	1.11	1.23
19-Apr-10	0.97	1.10	1.14	1.07
3-May-10	1.43	1.11	1.54	1.45
6-Jun-10	1.47	0.87	0.68	0.60
1-Jul-10	0.89	0.65	0.50	0.70
2-Aug-10	3.33	2.10	2.72	2.25
19-Sep-10	1.66	1.57	1.69	1.48
2-Oct-10	1.38	0.54	1.71	1.61
6-Nov-10	1.59	1.63	1.61	1.54
7-Dec-10	0.98	0.92	1.08	0.95
Average 2009	1.71	1.68	1.74	1.50
Average 2010	1.38	1.14	1.37	1.29
Average All Data	2.05	1.82	1.86	1.77

Granny Creek Total Mercury Concentrations - Filtered

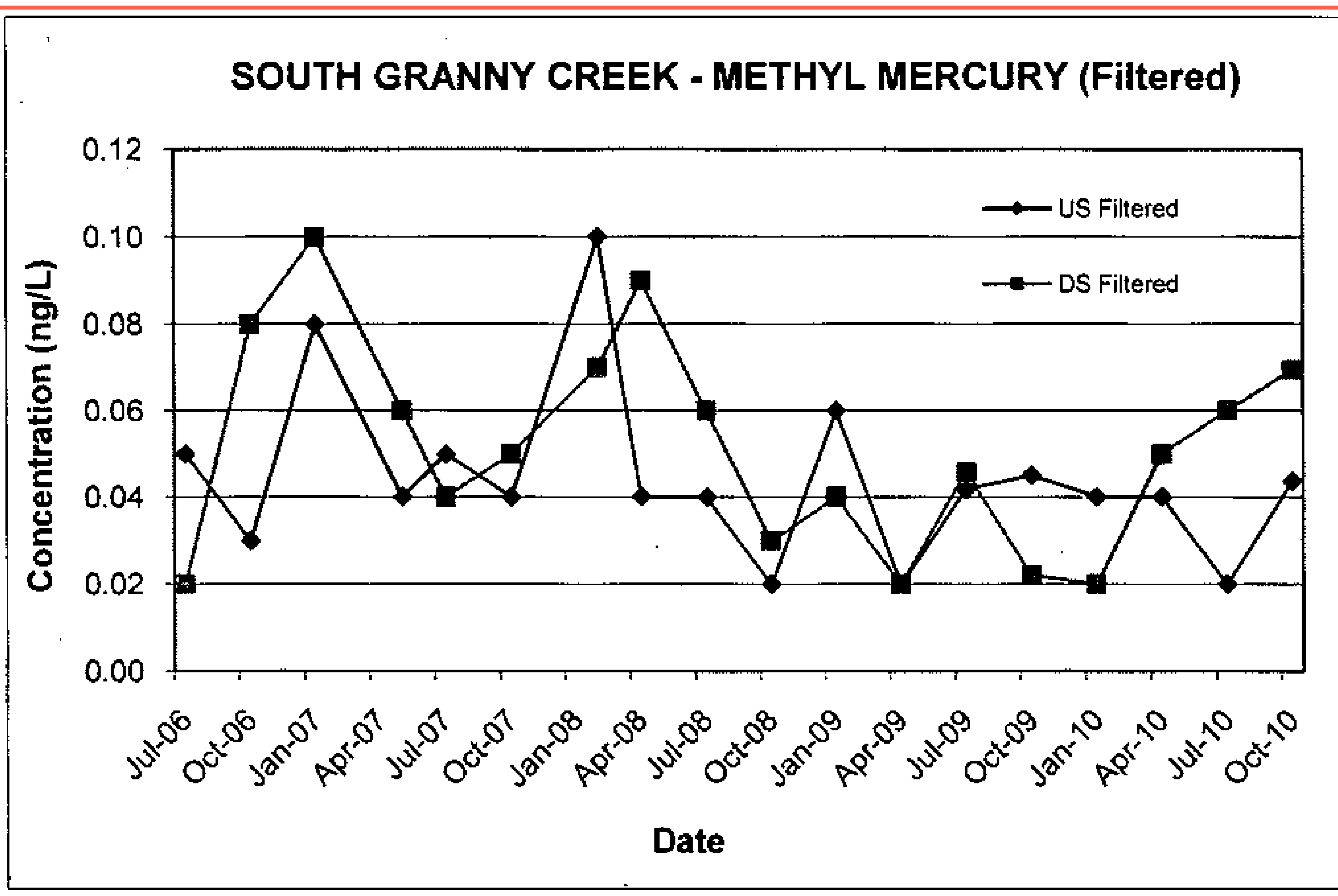


F Frozen

CCME Protection of Aquatic Life Guideline - 26 ng/L

TABLE 11
METHYL MERCURY - SOUTH GRANNY CREEK
(concentrations in ng/L)

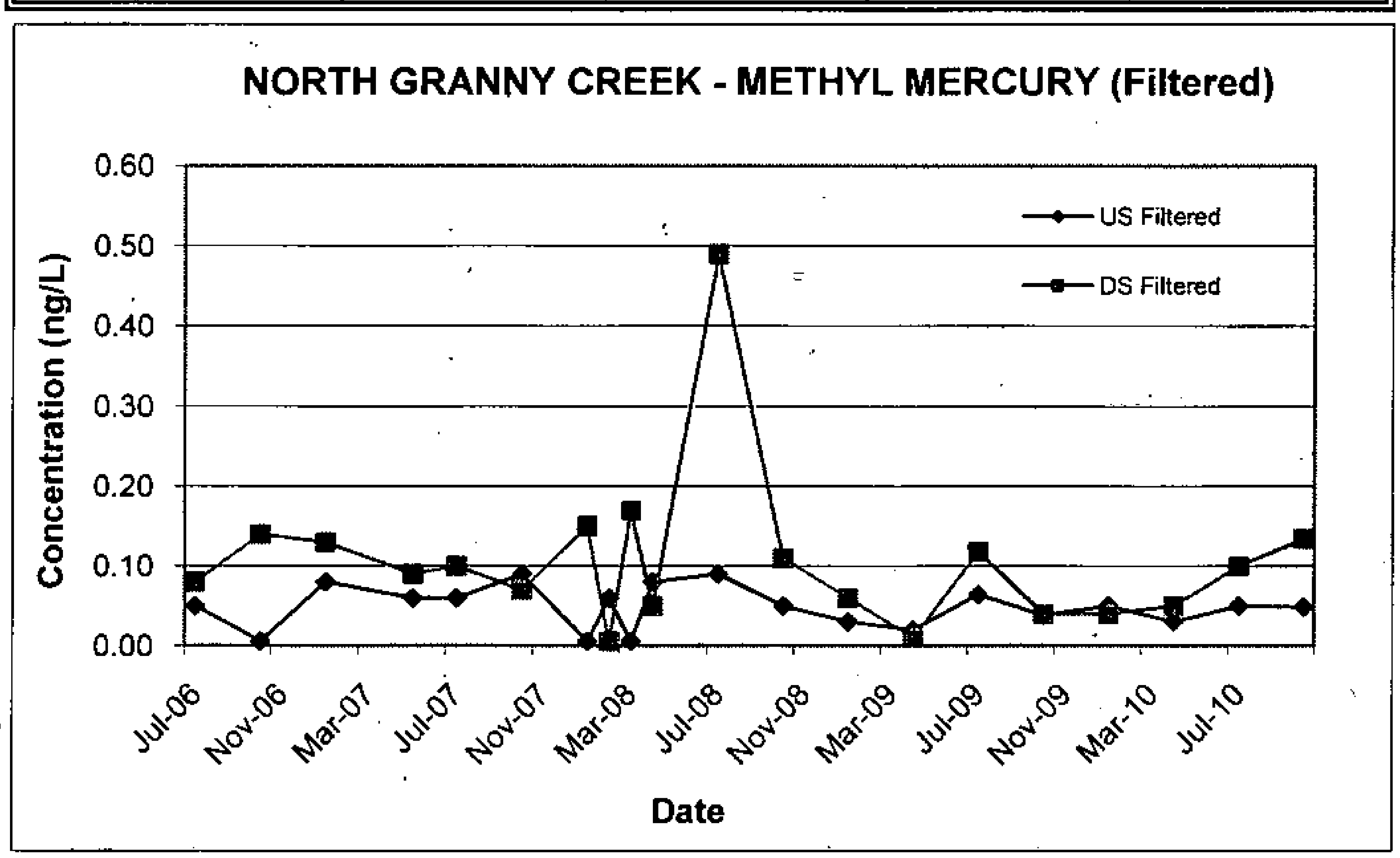
Date	Upstream SGC/UP/SWF		Downstream SGC/DS/SWF	
	US Unfiltered	US Filtered	DS Unfiltered	DS Filtered
Jul-06	0.06	0.05	0.04	0.02
Oct-06	0.03	0.03	0.11	0.08
Jan-07	0.10	0.08	0.13	0.10
May-07	0.04	0.04	0.06	0.06
Jul-07	0.05	0.05	0.05	0.04
Oct-07	0.05	0.04	0.07	0.05
Feb-08	0.17	0.10	0.11	0.07
Apr-08	0.06	0.04	0.15	0.09
Jul-08	0.06	0.04	0.07	0.06
Oct-08	0.02	0.02	0.04	0.03
Jan-09	0.01	0.06	0.06	0.04
Apr-09	0.08	0.02	0.06	0.02
Jul-09	0.01	0.04	0.05	0.05
Oct-09	0.02	0.05	0.01	0.02
Jan-10	0.06	0.04	0.07	0.02
Apr-10	0.05	0.04	0.08	0.05
Jul-10	0.06	0.02	0.08	0.06
Oct-10	0.04	0.04	0.07	0.07
2009 Average	0.03	0.04	0.04	0.03
2010 Average	0.05	0.04	0.08	0.05
Average All Years	0.05	0.04	0.07	0.05



CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

TABLE 12
METHYL MERCURY - NORTH GRANNY CREEK
(concentrations in ng/L)

Date	Upstream NGC/UP/NWF		Downstream NGC/DN/NEF	
	US Unfiltered	US Filtered	DS Unfiltered	DS Filtered
Jul-06	0.11	0.05	0.10	0.08
Oct-06	0.01	0.01	0.13	0.14
Jan-07	0.12	0.08	0.18	0.13
May-07	0.07	0.06	0.09	0.09
Jul-07	0.09	0.06	0.10	0.10
Oct-07	0.09	0.09	0.10	0.07
Jan-08	0.01	0.01	0.26	0.15
Feb-08	0.09	0.06	0.01	0.01
Mar-08	0.01	0.01	0.29	0.17
Apr-08	0.44	0.08	0.13	0.05
Jul-08	0.09	0.09	0.52	0.49
Oct-08	0.04	0.05	0.11	0.11
Jan-09	0.04	0.03	0.08	0.06
Apr-09	0.04	0.02	0.01	0.01
Jul-09	0.06	0.06	0.02	0.12
Oct-09	0.01	0.04	0.07	0.04
Jan-10	0.19	0.05	0.11	0.04
Apr-10	0.06	0.03	0.10	0.05
Jul-10	0.06	0.05	0.19	0.10
Oct-10	0.07	0.05	0.16	0.13
2009 Average	0.04	0.04	0.04	0.06
2010 Average	0.09	0.04	0.14	0.08
Average All Years	0.08	0.05	0.14	0.11



CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

TABLE 13a

TOTAL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS

(unfiltered; concentrations in ng/L)

Date	Naysh. R. Upstream (Naysh Riv up)	Naysh. R. Middle (Naysh Riv dn)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	1.48	1.47	5.33	0.81	8.75	2.19	10.50	2.20
May-08	4.31	4.58	3.30	3.15	3.41	3.64	3.64	3.61
Aug-08	1.98	2.14	2.28	2.13	1.91	2.32	2.09	1.82
Oct-08	2.30	2.31	2.53	1.86	1.93	1.25	1.72	1.79
Jan-09	1.39	1.19	2.00	1.07	1.39	2.09	2.35	1.34
Feb-09	-	-	-	-	-	2.17	1.84	-
Mar-09	-	-	-	-	-	1.36	1.28	-
Apr-09	-	1.00	1.47	0.69	1.36	1.26	1.93	1.22
May-09	5.26	-	-	-	-	4.17	3.19	-
Jun-09	-	-	-	-	-	2.81	2.57	-
Jul-09	2.80	2.58	2.47	2.83	3.58	3.23	3.48	3.50
Aug-09	-	-	-	-	-	1.69	1.79	-
Oct-09	0.80	0.70	1.33	1.07	1.58	1.25	1.39	1.35
Nov-09	-	-	-	-	-	1.07	1.13	-
Dec-09	-	-	-	-	-	0.81	0.96	-
Jan-10	-	-	-	-	-	1.20	1.52	-
Feb-10	1.39	1.11	1.50	1.03	1.76	1.43	1.93	1.52
Mar-10	-	-	-	-	-	1.67	1.80	-
Apr-10	-	-	-	1.60	-	2.13	2.31	-
May-10	2.54	2.21	2.17	-	2.58	2.68	2.82	2.77
Jun-10	-	-	-	-	-	0.70	0.94	-
Jul-10	1.28	1.10	1.12	1.10	1.40	1.08	0.87	0.90
Aug-10	-	-	-	-	-	2.50	1.89	-
Sep-10	-	-	-	-	-	1.23	1.12	-
Oct-10	1.27	1.35	1.28	1.30	1.31	1.71	1.24	1.26
Nov-10	-	-	-	-	-	1.52	1.28	-
Dec-10	-	-	-	-	-	2.17	1.35	-
Average 2009	**2.56**	**1.37**	**1.82**	**1.42**	**1.98**	**1.99**	**1.99**	**1.85**
Average 2010	**1.62**	**1.44**	**1.52**	**1.26**	**1.76**	**1.67**	**1.59**	**1.61**
Average All Years	**2.23**	**1.81**	**2.23**	**1.55**	**2.58**	**1.90**	**2.18**	**1.94**

Notes: CCME Protection of Aquatic Life Guideline - 26 ng/L

Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

Bracketted sampling notations are field identifications

TABLE 13b
TOTAL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS
(filtered; concentrations in ng/L)

Date	Naysh. R. Upstream (Naysh Riv up)	Naysh. R. Middle (Naysh Riv dn)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	1.15	1.12	2.31	0.69	2.36	2.12	1.73	1.97
May-08	2.71	2.71	2.35	2.57	2.62	2.58	2.80	2.64
Aug-08	1.66	1.71	1.89	1.68	1.57	1.53	1.53	1.49
Oct-08	1.79	1.79	1.90	1.72	1.60	1.24	1.39	1.39
Jan-09	0.96	0.99	1.99	0.80	1.14	1.58	1.49	1.17
Feb-09	-	-	-	-	-	-	-	-
Mar-09	-	-	-	-	-	-	-	-
Apr-09	-	0.78	0.76	0.67	1.08	1.11	1.36	1.06
May-09	2.40	-	-	-	-	2.11	2.07	-
Jun-09	-	-	-	-	-	1.93	1.84	-
Jul-09	1.49	1.43	1.50	1.75	2.36	1.82	2.03	2.34
Aug-09	-	-	-	-	-	1.20	1.22	-
Sep-09	-	-	-	-	-	1.32	1.53	-
Oct-09	0.80	0.68	0.86	0.80	1.05	1.05	1.02	0.94
Nov-09	-	-	-	-	-	0.76	0.69	-
Dec-09	-	-	-	-	-	0.67	0.68	-
Jan-10	-	-	-	-	-	1.41	1.49	-
Feb-10	0.85	0.65	1.06	0.50	1.21	1.47	1.64	1.49
Mar-10	-	-	-	-	-	1.30	1.30	-
Apr-10	-	-	-	1.05	-	1.45	1.58	-
May-10	1.28	1.59	1.28	-	1.69	1.77	1.29	1.84
Jun-10	-	-	-	-	-	0.60	0.69	-
Jul-10	0.74	0.74	0.73	0.70	0.77	0.72	1.55	0.63
Aug-10	-	-	-	-	-	1.62	1.59	-
Sep-10	-	-	-	-	-	0.86	0.71	-
Oct-10	1.07	1.08	1.10	1.09	1.17	1.24	1.27	1.30
Nov-10	-	-	-	-	-	1.04	1.39	-
Dec-10	-	-	-	-	-	0.98	0.94	-
Average 2009	**1.41**	**0.97**	**1.28**	**1.01**	**1.41**	**1.36**	**1.39**	**1.38**
Average 2010	**0.99**	**1.01**	**1.04**	**0.83**	**1.21**	**1.21**	**1.29**	**1.32**
Average All Years	**1.41**	**1.27**	**1.48**	**1.17**	**1.55**	**1.36**	**1.42**	**1.52**

Notes: CCME Protection of Aquatic Life Guideline - 26 ng/L
Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009
Bracketted sampling notations are field identifications

TABLE 14a
METHYL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS
(unfiltered; concentrations in ng/L)

Date	Naysh. R. Upstream (Naysh Riv Up)	Naysh. R. Middle (Naysh Riv DN)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	0.03	0.03	0.09	0.04	0.14	0.03	0.20	0.04
May-08	0.04	0.04	0.01	0.08	0.06	0.07	0.05	0.04
Aug-08	0.06	0.07	0.11	0.14	0.06	0.05	0.03	0.04
Oct-08	0.06	0.05	0.07	0.06	0.04	0.02	0.03	0.02
Jan-09	0.03	0.02	0.04	0.05	0.02	0.04	0.03	0.02
Feb-09	-	-	-	-	-	-	-	-
Apr-09	-	0.03	0.02	0.02	0.03	0.02	<0.01	0.03
May-09	0.03	-	-	-	-	0.02	0.02	-
Jun-09	-	-	-	-	-	0.10	0.07	-
Jul-09	0.05	0.05	0.03	0.03	0.04	0.04	0.10	0.02
Oct-09	0.06	0.05	0.05	0.10	0.09	0.06	0.05	0.10
Nov-09	-	-	-	-	-	0.04	0.05	-
Dec-09	-	-	-	-	-	0.08	0.10	-
Jan-10	-	-	-	-	-	0.09	0.08	-
Feb-10	0.20	0.04	0.03	0.02	0.04	0.05	0.07	0.03
Mar-10	-	-	-	-	-	0.06	0.03	-
Apr-10	-	-	-	0.07	-	0.06	0.06	-
May-10	0.05	<0.01	0.05	-	<0.01	0.02	0.05	0.01
Jun-10	-	-	-	-	-	0.08	0.05	-
Jul-10	0.02	0.10	0.11	0.14	0.15	0.04	0.12	0.09
Aug-10	-	-	-	-	-	0.08	0.07	-
Sep-10	-	-	-	-	-	0.04	0.04	-
Oct-10	0.04	0.05	0.05	0.14	0.03	0.03	0.04	0.03
Nov-10	-	-	-	-	-	0.07	0.04	-
Dec-10	-	-	-	-	-	<0.01	0.04	-
Average 2009	**0.04**	**0.04**	**0.03**	**0.05**	**0.04**	**0.05**	**0.05**	**0.04**
Average 2010	**0.08**	**0.05**	**0.06**	**0.09**	**0.06**	**0.05**	**0.06**	**0.04**
Average All Years	**0.06**	**0.04**	**0.06**	**0.07**	**0.06**	**0.05**	**0.06**	**0.04**

Notes: CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Sampling locations and frequency governed by Ammended C. of A. #3960-7Q4K2G, dated March 13, 2009
Bracketted sampling notations are field identifications

TABLE 14b
METHYL MERCURY - NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVERS
(filtered; concentrations in ng/L)

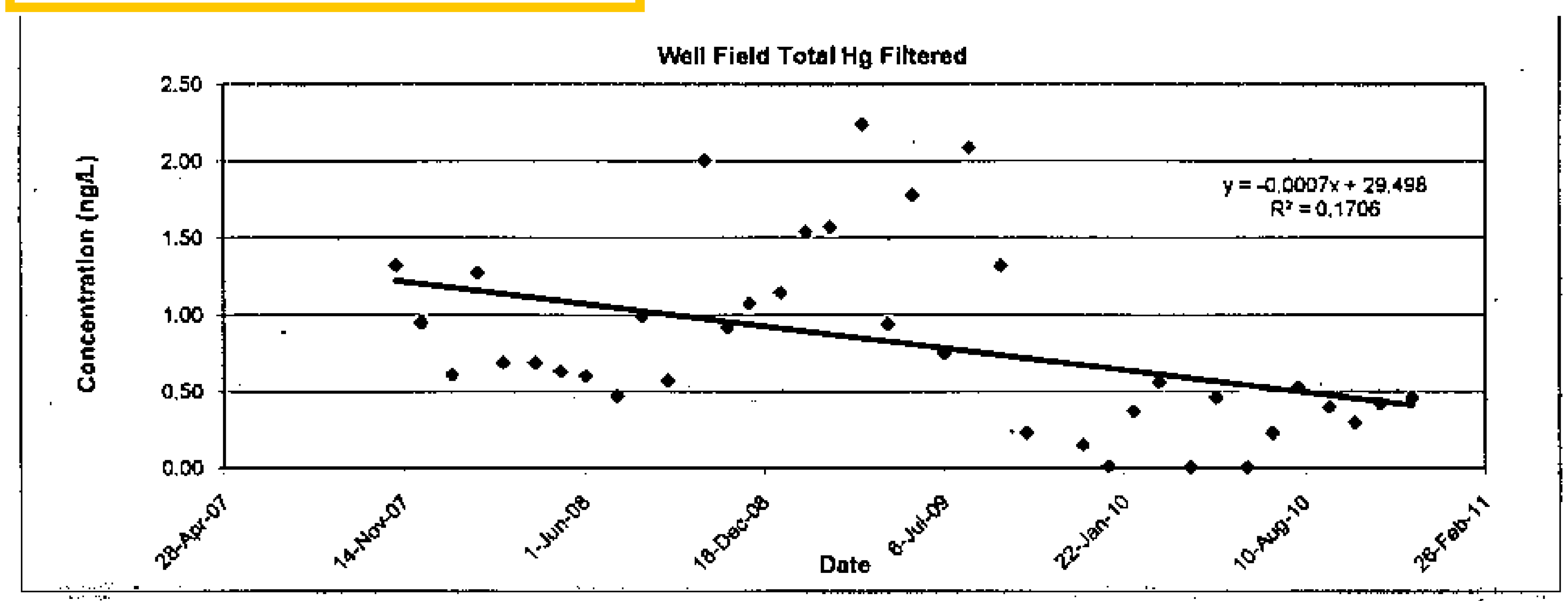
Date	Naysh. R. Upstream (Naysh Riv Up)	Naysh. R. Middle (Naysh Riv DN)	Naysh. R. Downstream (Naysh Riv up Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat R. A-1 (Att Riv up 2)	Attawapiskat R. A-2 (Att Riv up A2-1)	Attawapiskat R. A-3 (Att Riv dn A3-1)	Attawapiskat R. A-4 (Att Riv dn Naysh Riv)
Feb-08	0.03	0.02	0.03	0.03	0.04	0.05	0.03	0.04
May-08	0.01	0.03	0.02	0.06	0.01	0.03	0.02	0.03
Aug-08	0.05	0.05	0.06	0.10	0.04	0.02	0.03	0.03
Oct-08	0.03	0.02	0.03	0.04	0.03	0.02	0.02	0.02
Jan-09	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Feb-09	-	-	-	-	-	-	-	-
Apr-09	-	0.01	0.01	0.01	0.02	0.02	0.03	0.01
May-09	0.09	-	-	-	-	0.03	0.03	-
Jun-09	-	-	-	-	-	0.03	0.03	-
Jul-09	0.04	0.10	0.11	0.07	0.15	0.03	0.02	0.03
Aug-09	-	-	-	-	-	0.05	0.03	-
Oct-09	0.07	0.04	0.06	0.04	0.04	0.05	0.06	0.07
Nov-09	-	-	-	-	-	0.03	0.15	-
Dec-09	-	-	-	-	-	0.08	0.09	-
Jan-10	-	-	-	-	-	0.01	0.04	-
Feb-10	0.01	0.05	0.09	0.03	0.04	0.07	0.05	0.04
Mar-10	-	-	-	-	-	0.05	0.03	-
Apr-10	-	-	-	0.05	-	0.04	0.03	-
May-10	0.04	0.12	0.04	-	0.05	0.03	0.04	0.05
Jun-10	-	-	-	-	-	0.01	0.02	-
Jul-10	0.05	0.06	0.03	0.07	<0.01	0.03	0.04	0.04
Aug-10	-	-	-	-	-	0.04	0.05	-
Sep-10	-	-	-	-	-	0.03	0.02	-
Oct-10	0.05	0.04	0.05	0.10	0.04	0.03	0.04	0.03
Nov-10	-	-	-	-	-	0.02	<0.01	-
Dec-10	-	-	-	-	-	0.04	0.02	-
Average 2009	**0.06**	**0.05**	**0.05**	**0.03**	**0.06**	**0.04**	**0.05**	**0.03**
Average 2010	**0.04**	**0.07**	**0.05**	**0.06**	**0.03**	**0.03**	**0.03**	**0.04**
Average All Years	**0.04**	**0.05**	**0.05**	**0.05**	**0.04**	**0.03**	**0.04**	**0.03**

Notes: CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)
Sampling locations and frequency governed by Ammended C. of A. #3960-7Q4K2G; dated March 13, 2009
Bracketted sampling notations are field identifications

TABLE 15
MERCURY CONTENT IN WELL FIELD DISCHARGE
(concentrations in ng/L)

Date	Total Mercury		Methyl Mercury		Wells in Production
	Unfiltered	Filtered	Unfiltered	Filtered	
5-Nov-07	1.33	1.32	<0.01	<0.01	VDW-6, 11 and 22
3-Dec-07	1.33	0.95	0.01	0.01	VDW-6, 11 and 22
6-Jan-08	0.87	0.61	0.01	0.01	VDW-6, 11, 15, 17 and 22
3-Feb-08	1.55	1.27	<0.01	0.01	VDW-6, 11 and 22
2-Mar-08	0.70	0.69	<0.01	0.01	VDW-6, 11, 15, 17 and 22
7-Apr-08	0.84	0.69	0.02	0.02	VDW-7, 11, 15, 17 and 22
5-May-08	0.78	0.63	<0.01	<0.01	VDW-7, 11, 15, 17 and 22
2-Jun-08	0.72	0.60			VDW-7, 11, 15, 17 and 22
7-Jul-08	0.65	0.47	0.01	0.01	VDW-6, 11, 15, 17 and 22
3-Aug-08	2.63	0.99			VDW-6, 11, 15, 17 and 22
1-Sep-08	0.67	0.57			VDW-6, 11, 15, 17 and 22
13-Oct-08	2.20	2.01	<0.01	<0.01	VDW-3, 6, 7, 11, 15, 17 and 22
7-Nov-08	1.00	0.92	<0.01	<0.01	VDW-3, 6, 7, 11, 15, 17 and 22
1-Dec-08	1.34	1.07	0.01	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
5-Jan-09	1.43	1.14			VDW-3, 6, 7, 11, 15, 17 and 22
2-Feb-09	1.71	1.54			VDW-3, 6, 7, 11, 15, 17 and 22
1-Mar-09	1.73	1.57			VDW-3, 6, 7, 11, 15, 17 and 22
6-Apr-09	2.42	2.24	0.01	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
4-May-09	2.53	0.94		0.02	VDW-3, 6, 7, 11, 15, 17 and 22
1-Jun-09	0.72	1.78	0.04		VDW-3, 6, 7, 11, 15, 17 and 22
6-Jul-09	1.69	0.75	0.09	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
3-Aug-09	4.22	2.09	0.01		VDW-3, 6, 7, 11, 15, 17 and 22
7-Sep-09	0.77	1.32			VDW-3, 6, 7, 11, 15, 17 and 22
5-Oct-09	0.63	0.23	0.02	0.01	VDW-3, 6, 7, 11, 15, 17 and 22
1-Nov-09				0.02	VDW-3, 6, 7, 11, 15, 17 and 22
7-Dec-09	0.34	0.15	0.08	0.12	VDW-3, 6, 7, 11, 15, 17 and 22
4-Jan-10	1.09	<0.01	0.06	0.03	VDW-3, 6, 7, 11, 14, 15, 17 and 22
1-Feb-10	1.54	0.37			VDW-3, 6, 7, 11, 14, 15, 17 and 22
1-Mar-10	1.20	0.56			VDW-3, 6, 7, 11, 14, 15, 17 and 22
5-Apr-10	1.03	0.01	0.01	<0.01	VDW-3, 6, 7, 11, 14, 15, 17 and 22
3-May-10	1.03	0.46			VDW-3, 6, 7, 11, 14, 15, 17 and 22
7-Jun-10	0.62	0.01			VDW-3, 6, 7, 11, 14, 15, 17 and 22
5-Jul-10	0.92	0.23	0.01	0.01	VDW-3, 6, 7, 11, 14, 15, 17 and 22
2-Aug-10	1.10	0.53			VDW-3, 6, 7, 11, 14, 15, 17 and 22
6-Sep-10	1.25	0.40			VDW-3, 6, 7, 11, 14, 15, 17 and 22
4-Oct-10	1.61	0.30	<0.01	<0.01	VDW-3, 6, 7, 11, 14, 15, 17 and 22
1-Nov-10	1.15	0.42			VDW-3, 6, 7, 11, 14, 15, 17 and 22
6-Dec-10	0.94	0.46			VDW-3, 6, 7, 11, 14, 15, 17 and 22
Average 2009	**1.65**	**1.25**	**0.04**	**0.03**	
Average 2010	**1.12**	**0.31**	**0.02**	**0.02**	
Average All Years	**1.30**	**0.82**	**0.02**	**0.02**	

CEQG-PAL: Total Mercury - 26 ng/L; Methyl Mercury - 4 ng/L



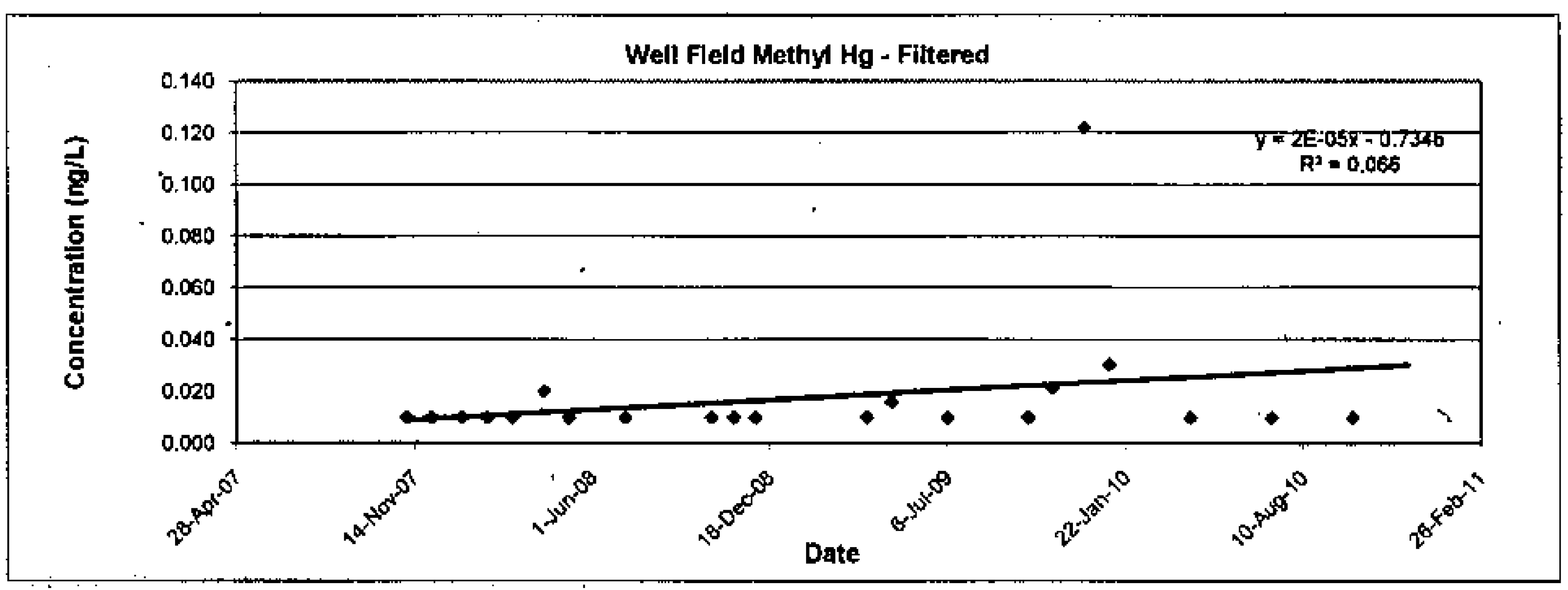


TABLE 16a
TOTAL MERCURY - INDIVIDUAL MINE DEWATERING WELLS
(unfiltered; concentrations in ng/L)

Date	VDW-3	VDW-6	VDW-7	VDW-11	VDW-15	VDW-17	VDW-22
Nov-07	-	-	-	-	-	-	-
Dec-07	-	0.07	-	1.31	-	-	3.08
Jan-08	-	0.06	-	1.64	0.29	0.09	3.66
Feb-08	-	0.12	-	1.41	-	-	3.13
Mar-08	-	0.33	-	2.93	0.22	0.28	3.26
Apr-08	-	-	-	1.89	0.64	0.31	4.27
Jul-08	-	0.14	-	2.18	0.20	0.19	2.28
Oct-08	0.03	0.05	0.42	38.60	0.07	0.06	6.52
Jan-09	0.04	0.02	0.25	3.33	0.07	0.10	6.56
Apr-09	0.03	0.05	-	3.34	0.03	0.10	5.59
Jul-09	0.74	0.52	1.11	3.50	0.69	0.85	4.37
Oct-09	0.14	0.63	0.16	1.55	0.41	0.09	1.61
Jan-10	<0.01	<0.01	<0.01	3.40	<0.01	<0.01	3.80
Apr-10	<0.01	<0.01	<0.01	2.59	<0.01	<0.01	3.32
Jul-10	0.12	0.09	0.28	3.00	0.03	0.24	3.36
Oct-10	<0.01	0.01	0.01	4.31	<0.01	<0.01	5.18
Average 2009	**0.24**	**0.31**	**0.51**	**2.93**	**0.30**	**0.29**	**4.53**
Average 2010	**0.04**	**0.03**	**0.08**	**3.32**	**0.01**	**0.07**	**3.91**
Average All Years	**0.13**	**0.15**	**0.28**	**2.60**	**0.21**	**0.18**	**4.00**

TABLE 16b
TOTAL MERCURY - INDIVIDUAL MINE DEWATERING WELLS
(filtered; concentrations in ng/L)

Date	VDW-3	VDW-6	VDW-7	VDW-11	VDW-15	VDW-17	VDW-22
Nov-07	-	0.08	-	1.07	-	-	2.36
Dec-07	-	0.08	-	0.96	-	-	2.27
Jan-08	-	0.05	-	1.01	0.08	0.12	1.87
Feb-08	-	0.10	-	1.17	-	-	2.74
Mar-08	-	0.25	-	0.14	0.09	0.17	2.92
Apr-08	-	-	-	1.21	0.18	0.35	3.71
Jul-08	-	0.18	-	1.56	0.15	0.18	1.82
Oct-08	0.05	0.06	0.41	17.40	0.09	0.06	6.09
Jan-09	0.02	0.01	0.19	2.30	0.05	0.09	4.63
Apr-09	0.04	0.06	-	3.34	0.03	0.08	5.28
Jul-09	0.61	0.62	0.60	1.12	0.58	0.45	0.95
Oct-09	0.09	0.34	0.10	0.49	0.36	0.08	0.38
Jan-10	0.01	0.01	<0.01	0.53	<0.01	<0.01	0.62
Apr-10	<0.01	<0.01	<0.01	0.82	<0.01	<0.01	0.57
Jul-10	0.10	0.06	0.11	0.42	0.03	0.12	0.45
Oct-10	0.39	0.36	0.42	0.75	0.01	0.01	0.01
Average 2009	**0.19**	**0.26**	**0.30**	**1.81**	**0.22**	**0.18**	**2.81**
Average 2010	**0.13**	**0.11**	**0.14**	**0.63**	**0.02**	**0.04**	**0.41**
Average All Years	**0.15**	**0.15**	**0.23**	**1.13**	**0.13**	**0.13**	**2.29**

Notes: CCME Protection of Aquatic Life Guideline - 26 ng/L
Average values for VDW-11 exclude the anomalous Oct 2008 values
Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

TABLE 17a

METHYL MERCURY - INDIVIDUAL MINE DEWATERING WELLS

(unfiltered; concentrations in ng/L)

Date	VDW-3	VDW-6	VDW-7	VDW-11	VDW-15	VDW-17	VDW-22
Nov-07	-	-	-	-	-	-	-
Dec-07	-	<0.01	-	0.01	-	-	0.01
Jan-08	-	0.01	-	0.01	0.01	0.01	0.01
Feb-08	-	<0.01	-	<0.01	-	-	<0.01
Mar-08	-	0.02	-	0.02	0.02	0.01	0.02
Apr-08	-	-	-	0.01	0.01	<0.01	<0.01
Jul-08	-	0.01	-	0.02	0.02	0.02	0.01
Oct-08	<0.01	0.01	0.01	0.01	<0.01	0.01	0.01
Jan-09	-	-	-	-	-	-	-
Apr-09	0.01	0.01	-	0.02	0.02	<0.01	<0.01
Jul-09	0.03	-	-	0.01	-	-	-
Oct-09	0.01	0.01	0.01	0.01	0.01	0.01	0.04
Jan-10	0.04	0.03	0.07	0.07	0.06	0.20	0.06
Apr-10	0.01	0.05	0.01	0.01	<0.01	0.02	0.01
Jul-10	0.02	0.01	<0.01	<0.01	0.03	<0.01	<0.01
Oct-10	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Average 2009	**0.02**	**0.01**	**0.01**	**0.01**	**0.02**	**0.01**	**0.02**
Average 2010	**0.02**	**0.03**	**0.03**	**0.02**	**0.03**	**0.06**	**0.02**
Average All Years	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.03**	**0.02**

TABLE 17b

METHYL MERCURY - INDIVIDUAL MINE DEWATERING WELLS

(filtered; concentrations in ng/L)

Date	VDW-3	VDW-6	VDW-7	VDW-11	VDW-15	VDW-17	VDW-22
Nov-07	-	0.01	-	0.01	-	-	<0.01
Dec-07	-	0.01	-	<0.01	-	-	0.01
Jan-08	-	0.01	-	0.01	0.01	0.01	0.01
Feb-09	-	0.01	-	0.01	-	-	0.01
Mar-09	-	<0.01	-	0.01	0.01	0.01	0.02
Apr-08	-	-	-	0.01	0.02	0.01	0.02
Jul-08	-	0.02	-	<0.01	0.01	0.01	0.02
Oct-08	0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01
Jan-09	-	-	-	-	-	-	-
Apr-09	0.01	0.02	-	0.02	0.02	0.01	0.02
Jul-09	0.05	0.18	-	0.06	0.03	0.14	0.03
Oct-09	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Jan-10	0.07	0.02	0.04	<0.01	0.01	0.02	0.01
Apr-10	0.01	0.01	<0.01	0.02	<0.01	0.01	<0.01
Jul-10	0.01	0.02	0.01	0.01	<0.01	0.01	<0.01
Oct-10	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01
Average 2009	**0.02**	**0.07**	**0.01**	**0.03**	**0.02**	**0.05**	**0.02**
Average 2010	**0.03**	**0.01**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**
Average All Years	**0.02**	**0.02**	**0.01**	**0.01**	**0.01**	**0.02**	**0.01**

Notes: CCME Protection of Aquatic Life Guideline - 4 ng/L (unfiltered)

Sampling locations and frequency governed by Amended C. of A. #3960-7Q4K2G, dated March 13, 2009

TABLE 18
SPECIES-SPECIFIC CATCH PER UNIT EFFORT FOR ELECTROFISHING BY LOCATION (2010)

Waterbody		Attawapiskat R.			Nayshkootayaow R.		North Granny Cr.	South Granny Cr.	Catch (n)
Sample Area		ATT-US	ATT-NF	ATT-FF	NAY-DS6	NAY-US-ST3	NGC*	SGC*	
Date (mm/dd/yy)		08/20/10	08/25/10	08/27/10	08/31/10	09/06/10	10/07/10	13/07/10	
Electroshocking seconds		2148.00	3141.00	1890.00	3179.00	2883.00	2340.00	2274.00	
Species-specific CPUE (fish/electroshocking second*100)	Burbot	0.00	0.17	0.00	0.08	0.00	0.00	0.00	7
	Brook Stickleback	0.00	0.00	0.00	0.17	0.00	12.62	5.47	130
	Northern Redbelly Dace	0.00	0.00	0.00	0.00	0.00	2.42	2.22	41
	Finescale Dace	0.00	0.00	0.00	0.00	0.00	35.61	2.59	202
	Blacknose Dace	0.00	0.00	0.00	0.09	0.00	0.00	0.00	1
	Blacknose Shiner	0.00	0.00	0.16	0.00	0.00	0.00	0.00	3
	Emerald Shiner	0.00	0.00	0.11	0.00	0.00	0.00	0.00	2
	YOY Brook Trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30
	Brook Trout Parr	0.00	0.00	0.00	0.00	0.00	0.00	0.20	1
	Mottled Sculpin	0.31	0.42	0.05	0.64	0.04	0.00	0.19	21
	Slimy Sculpin	0.00	0.00	0.00	0.23	0.00	0.00	0.00	13
	Pearl Dace	0.98	0.00	0.53	9.92	3.02	10.69	15.67	397
	Johnny Darter	0.00	0.00	0.00	0.32	0.00	0.23	8.09	45
	Iowa Darter	0.12	1.05	0.11	7.72	0.00	0.00	0.00	98
	Logperch	0.00	0.08	0.00	1.51	0.00	0.00	0.00	8
	Trout Perch	27.90	2.73	2.43	18.25	2.61	0.00	0.00	611
	White Sucker	5.58	0.44	0.00	6.31	0.00	0.00	2.08	146
	Lake Chub	2.02	0.00	0.00	0.00	0.00	0.00	0.00	19
	Longnose Dace	0.00	0.00	0.00	0.09	0.00	0.00	0.13	25
	Northern Pike	0.47	0.05	0.00	0.00	0.00	0.00	0.00	6
	Shorthead Redhorse Sucker	0.00	0.05	0.21	0.27	0.00	0.00	0.00	8
	Walleye	0.15	0.10	0.26	0.00	0.00	0.00	0.00	9
	Yellow Perch	0.00	0.00	0.05	0.00	0.00	0.00	0.00	1
CPUE Total		37.52	5.09	3.92	45.58	5.67	61.57	36.63	1661

Note
* - Comprised of multiple capture events

sample sizes very small?

TABLE 21
PEARL DACE DESCRIPTIVE STATISTICS

		2008				2009							2010				
	Area	NAY-DS6	NGC	SGC	ST-5A	ATT-US	ATT-FF	NAY-US-ST3	NAY-DS6	NGC	SGC	ST-5A	NAY-US-ST3	NAY-DS6	NGC	SGC	ST-5A
Sample Size (n)		4	7	5	30	6	14	23	17	18	19	32	30	29	40	40	40
Total Length (mm)	Mean	77.75	80.57	90.00	48.07	33.16	43.93	47.26	43.91	48.44	70.53	71.72	44.33	40.00	68.45	65.05	71.00
	SE	8.14	1.66	7.80	2.89	1.56	8.98	2.92	3.84	3.77	4.01	6.16	2.54	0.93	2.62	1.92	2.31
	Min	57.00	49.00	67.00	31.00	26.00	27.00	26.00	22.00	38.00	49.00	24.00	34.00	30.00	48.00	49.00	38.00
	Max	95.00	119.00	112.00	85.00	36.00	159.00	71.00	71.00	104.00	107.00	151.00	107.00	51.00	95.00	93.00	94.00
	Median	79.50	88.00	89.00	45.00	34.50	34.50	52.00	51.00	44.00	64.00	78.00	41.00	41.00	64.00	62.00	74.00
Round Weight (g)	Mean	4.43	5.35	6.80	1.13	0.33	3.49	1.04	0.97	1.45	3.66	5.97	1.02	0.54	3.58	2.67	3.91
	SE	1.25	1.66	1.82	0.20	0.04	3.00	0.15	0.19	0.57	0.62	1.17	0.35	0.04	0.39	0.23	0.34
	Min	1.57	1.13	2.36	0.20	0.18	0.17	0.15	0.07	0.51	1.10	0.11	0.29	0.24	0.98	1.13	0.54
	Max	7.23	13.58	12.24	4.53	0.42	43.79	2.65	2.80	10.79	10.35	27.83	10.77	0.97	8.36	6.16	8.17
	Median	4.46	5.18	5.70	0.75	0.34	3.10	1.11	1.12	0.77	2.70	4.64	0.58	0.57	2.62	2.29	3.91
Total Hg (µg/g)	Mean	0.059	0.176	0.151	0.059	0.033	0.072	0.042	0.042	0.066	0.166	0.076	0.058	0.087	0.259	0.168	0.060
	SE	0.010	0.014	0.013	0.004	0.002	0.008	0.002	0.004	0.005	0.027	0.010	0.002	0.007	0.021	0.013	0.005
	Min	0.030	0.108	0.115	0.022	0.029	0.042	0.028	0.025	0.038	0.040	0.011	0.038	0.058	0.101	0.071	0.018
	Max	0.074	0.226	0.194	0.108	0.042	0.163	0.064	0.089	0.116	0.522	0.227	0.081	0.235	0.689	0.431	0.163
	Median	0.066	0.183	0.146	0.058	0.032	0.068	0.042	0.038	0.062	0.199	0.072	0.058	0.074	0.234	0.141	0.052

TABLE 22
COMPARISON BY ANOVA OF TOTAL MERCURY (ARCSIN TRANSFORMED) BETWEEN LOCATION (2010)

Size Group	Species	Trophic Guild	ANOVA all Locations			Tukeys Post-hoc Comparisons (alpha = 0.05)		
			F-value	P-value	p< 0.05	ATT	NAYSH / MC	GC / ST- 5A
Small-bodied	Pearl Dace	Invertivore	67.43	< 0.001	Y	—	NAY-US-ST3 = NAY-DS6	NGC ≠ SGC ≠ ST-5A
	Trout-Perch	Invertivore	6.64	< 0.001	Y	ATT-US ≠ ATT-NF, ATT-US = ATT-FF, ATT-NF ≠ ATT-FF	NAY-US-ST3 ≠ NAY-DS6	—
Large-bodied	Northern Pike	Piscivore	16.78	< 0.001	Y	ATT-US = ATT-DSNAY, ATT-US ≠ ATT-NF, ATT-NF = ATT-DSNAY	NAYSH = MC	—
	Walleye	Piscivore	2.93	0.026	Y	ATT-US = ATT-NF = ATT-DSNAY	NAYSH ≠ MC	—
	White Sucker	Benthivore				ATT-US = ATT-NF	NAYSH ≠ MC	
	Lake Whitefish	Benthivore	8.5*	0.068	N	—	—	—

Note
* - indicates U-statistic of Kruskall-Wallis test for this species due to low sample sizes.

TABLE 23
COMPARISON BY ANOVA OF TOTAL MERCURY BETWEEN YEARS (2008 to 2010)

Species	Location	ANOVA all Years			Tukeys Post-hoc Comparisons (alpha = 0.05)
		F-value	P-value	p< 0.05	
Pearl Dace	NGC	32.32	< 0.001	Y	2008 ≠ 2009 ≠ 2010
	SGC	1.94	0.152	N	—
	ST-5A	1.12	0.329	N	—
Trout-Perch	ATT-US	7.52	0.002	Y	2008 = 2010, 2009 ≠ 2008, 2010
	ATT-NF	10.867	0.002	Y	2009 ≠ 2010
	ATT-FF	21.65	< 0.001	Y	2008 ≠ 2009, 2010 2009 = 2010
	NAY-US-ST3	0.074	0.789	N	—
	NAY-DS6	20.29	< 0.001	Y	2009 ≠ 2008, 2010 2008 = 2010

TABLE 24
SUMMARY OF STANDARDIZED LENGTHS AND EXTRAPOLATED MERCURY BODY BURDENS FROM REGRESSION RELATIONSHIPS

Size Group	Species	Sample Area	Standardized Total Length (mm)	Extrapolated Mercury Body Burden (µg/g = ppm)		
				2008	2009	2010
Small bodied	Pearl Dace	NGC	60	0.161	0.079	0.229
		SGC		0.103	0.170	0.146
		ST-5A		0.063	0.065	0.041
	Trout-Perch	ATT-US	50	0.091	0.052	0.111
		ATT-NF		—	0.146	0.074
		ATT-FF		0.112	0.098	0.098
		NAY-US-ST3		—	—	0.047
		NAY-DS6		0.098	0.081	0.109
				2007/2008		**2010**
Large bodied	Northern Pike	ATT-US	650	0.271		0.299
		ATT-NF		—		0.389
		ATT-COM		0.253		—
		NAYSH		0.271		0.239
		MC		0.236		0.229
	Walleye	ATT-US	450	0.568		0.453
		ATT-NF		—		0.514
		ATT-COM		NS		—
		NAYSH		0.597		0.494
		MC		—		0.453
	Sucker	ATT-US	380	—		0.120
		ATT-NF		0.130		0.158
		ATT-COM		0.356		—
		NAYSH		0.140		0.127
		MC		0.197		0.144

Notes
"—" = insufficient data for relationship generation
NS = Relationship not statistically significant

TABLE 25
Granny Creek and Tributary 5A Background Methyl Mercury Water Quality Concentrations (filtered, ng/L)

>> Text identifies this NGC DS station as being G2, vs G3 used elsewhere

Date	North Granny Creek DS	South Granny Creek DS	Tributary 5A
Jul-06	0.08	0.02	
Oct-06	0.14	0.08	
Jan-07	0.13	0.10	
May-07	0.09	0.06	
Jul-07	0.10	0.04	
Oct-07	0.07	0.05	
Jan-08	0.15		
Feb-08	0.01	0.07	0.02
Mar-08	0.17		
Apr-08	0.05	0.09	0.02
Jul-08	0.49	0.06	0.03
Oct-08	0.11	0.03	0.02
Jan-09	0.06	0.04	0.01
Apr-09	0.01	0.02	0.02
Jul-09	0.12	0.05	0.03
Oct-09	0.04	0.02	0.04
Jan-10	0.04	0.02	0.02
Apr-10	0.05	0.05	0.02
Jul-10	0.10	0.06	0.03
Oct-10	0.13	0.07	0.02
Average 2008	**0.16**	**0.06**	**0.02**
Average 2009	**0.06**	**0.03**	**0.03**
Average 2010	**0.08**	**0.05**	**0.02**
Average All Years	**0.11**	**0.05**	**0.02**

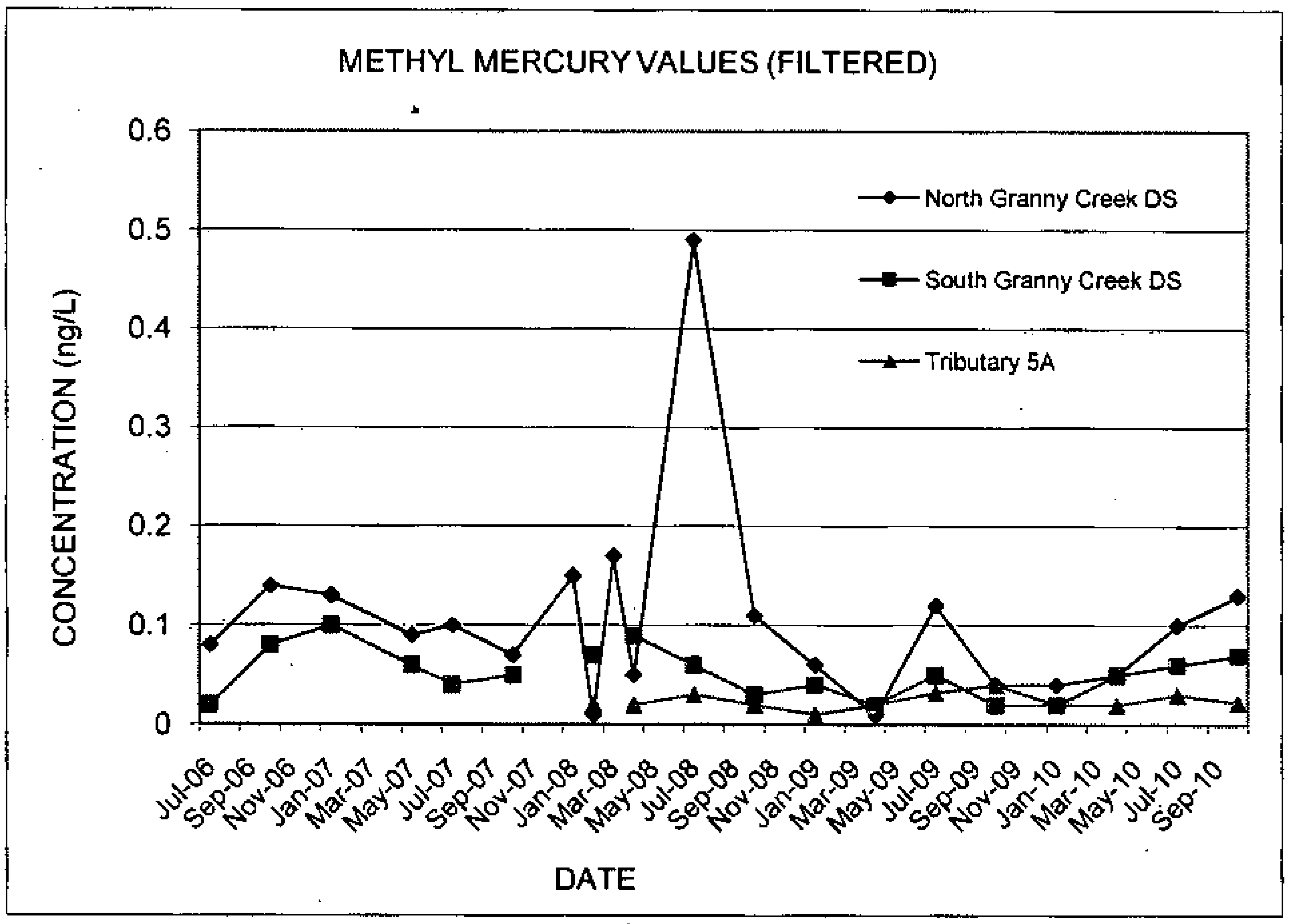


TABLE 26
TROUT-PERCH DESCRIPTIVE STATISTICS

		2008				2009					2010				
	Area	ATT-US	ATT-FF	NAY-DS6	SGC	ATT-US	ATT-NF	ATT-FF	NAY-US-ST3	NAY-DS6	ATT-US	ATT-NF	ATT-FF	NAY-US-ST3	NAY-DS6
Sample Size (n)		63	24	33	1	20	35	34	1	27	58	38	50	20	31
Total Length (mm)	Mean	54.64	78.71	69.15	77.00	59.65	38.68	50.32	67.00	59.93	47.97	49.32	57.20	42.40	52.68
	SE	3.33	2.51	2.47	—	4.97	2.21	4.01	—	4.80	1.20	0.95	2.23	1.04	2.79
	Min	27.00	64.00	44.00	77.00	30.00	23.00	29.00	67.00	24.00	30.00	40.00	35.00	34.00	38.00
	Max	115.00	101.00	104.00	77.00	97.00	70.00	104.00	67.00	92.00	81.00	61.00	87.00	50.00	87.00
	Median	36.00	72.50	72.00	77.00	64.00	34.00	36.00	67.00	69.00	46.00	48.50	55.00	44.00	45.00
Round Weight (g)	Mean	2.73	5.03	3.46	4.72	2.83	0.76	2.08	2.86	3.04	1.14	1.17	2.18	0.69	1.70
	SE	0.45	0.52	0.35	—	0.59	0.14	0.47	—	0.48	0.11	0.06	0.26	0.05	0.29
	Min	0.19	2.37	0.84	4.72	0.28	0.16	0.27	2.86	0.19	0.31	0.65	0.41	0.40	0.50
	Max	14.03	10.53	10.12	4.72	8.79	3.04	10.46	2.86	7.56	5.14	2.12	5.92	1.05	5.74
	Median	0.49	3.54	3.51	4.72	2.36	0.37	0.47	2.86	3.42	0.93	1.07	1.51	0.74	0.81
Total Hg (µg/g)	Mean	0.096	0.164	0.176	0.182	0.058	0.196	0.096	0.065	0.098	0.106	0.074	0.097	0.074	0.108
	SE	0.005	0.008	0.012	—	0.004	0.037	0.012	—	0.010	0.010	0.002	0.002	0.007	0.004
	Min	0.041	0.106	0.072	0.182	0.030	0.040	0.028	0.065	0.032	0.038	0.054	0.064	0.030	0.081
	Max	0.218	0.248	0.358	0.182	0.113	0.760	0.339	0.065	0.227	0.484	0.106	0.132	0.204	0.165
	Median	0.081	0.164	0.167	0.182	0.055	0.064	0.074	0.065	0.093	0.091	0.070	0.096	0.070	0.104

TABLE 27
SPECIES-SPECIFIC CATCH PER HOUR PER 15 m STANDARD GILL NET SET BY LOCATION (2010)

Waterbody		Attawapiskat R.			Nayshkootayaow R.		Monument Channel	Catch
Sample Area		ATT-US	ATT-NF	ATT-DSNAY	NAY-MOUTH	NAY-MS	MC	Total
Set Hours		414	963	354	283	1591	506	
Species-Specific Catch per hour of 15 m Standard Gillnet Set	Northern Pike	0.95	1.05	0.13	0.09	0.41	0.94	76
	Walleye	0.83	1.60	0.09	0.09	1.81	0.44	103
	White Sucker	0.15	0.28	0.00	0.05	1.53	2.13	87
	Shorthead Redhorse Sucker	0.09	0.00	0.04	0.00	0.04	0.06	5
	Lake Sturgeon	0.10	0.24	0.43	0.00	0.00	0.00	19
	Longnose Sucker	0.00	0.00	0.00	0.00	0.00	0.16	5
	Cisco	0.10	0.00	0.00	0.00	0.00	0.00	2
	Lake Whitefish	0.00	0.16	0.00	0.00	0.00	0.15	6
	Yellow Perch	0.00	0.00	0.00	0.00	0.00	0.06	1
	Brook Trout	0.00	0.00	0.00	0.00	0.04	0.00	1
	Site Total	2.23	3.32	0.68	0.22	3.87	3.93	305

TABLE 28
SPECIES-SPECIFIC CPUE FOR ANGLING ROD-HOUR BY LOCATION (2010)

Waterbody	Sample Area	Sample ID	Date (dd/mm/yy)	Effort (# rods)	Duration	Sampling Effort (rod-hours)	Species-Specific CPUE (fish / rod-hour)			
							Brook Trout	Walleye	Northern Pike	Site Total
Attawapiskat R.	ATT-NF	ATT-NF	28/08/10	2	0.75	1.50	0.00	0.00	0.00	0.00
Attawapiskat R.	ATT-NF	ATT-NF	29/08/10	2	0.75	1.50	0.00	0.00	0.00	0.00
Attawapiskat R.	ATT-NF	ATT-NF-AN1	30/08/10	2	0.75	1.50	0.00	0.67	0.00	0.67
Attawapiskat R.	ATT-NF	ATT-NF-AN2	31/08/10	2	1.50	3.00	0.00	0.33	1.67	2.00
Attawapiskat R.	ATT-NF	ATT-NF	01/09/10	3	0.50	1.50	0.00	0.00	0.00	0.00
Attawapiskat R.	ATT-NF	ATT-NF-AN3	02/09/10	3	1.00	3.00	0.00	0.00	1.00	1.00
Attawapiskat R.	ATT-NF	ATT-NF-AN4	03/09/10	3	1.00	3.00	0.00	0.00	0.67	0.67
Monument Channel	MC	MC-A1	01/09/10	2	1.80	3.60	0.00	0.56	0.56	1.11
Monument Channel	MC	MC-A2	02/09/10	2	2.50	5.00	0.00	0.00	1.20	1.20
Monument Channel	MC	MC-A3	03/09/10	2	2.00	4.00	0.00	0.00	0.00	0.00
Monument Channel	MC	MC-A4	04/09/10	2	1.20	2.40	0.00	0.00	5.00	5.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-AN1	31/08/10	2	1.00	2.00	0.00	0.00	0.50	0.50
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-AN2	01/09/10	3	1.00	3.00	0.00	0.00	0.67	0.67
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-AN3	02/09/10	3	1.00	3.00	0.00	0.00	0.33	0.33
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-AN4	03/09/10	3	0.75	2.25	0.00	0.00	0.44	0.44
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-AN5	07/09/10	3	1.50	4.50	0.00	0.00	0.44	0.44
Nayshkootayaow R.	NAY-US-ST3	NAY-T3A-1	04/06/10	3	0.50	1.50	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MS	NAY-GMA-1	07/06/10	3	1.00	3.00	0.67	0.33	1.00	2.00
Nayshkootayaow R.	NAY-MS	NAY-T7A-1	07/06/10	3	1.00	3.00	0.33	0.67	0.00	1.00
Nayshkootayaow R.	NAY-MS	NAY-MS	25/08/10	2	1.00	2.00	0.00	0.50	0.00	0.50
Nayshkootayaow R.	NAY-MS	NAY-MS	26/08/10	2	1.50	3.00	0.00	0.33	0.00	0.33
Nayshkootayaow R.	NAY-MS	NAY-MS	27/08/10	2	2.00	4.00	0.00	0.25	0.00	0.25
Nayshkootayaow R.	NAY-MS	NAY-MS-AN1	31/08/10	1	0.50	0.50	0.00	0.00	2.00	2.00
Nayshkootayaow R.	NAY-MS	NAY-MS-AN2	01/09/10	3	0.75	2.25	0.00	0.44	0.00	0.44
North Granny Creek	NGC	NGC-AN-1	10/07/10	2	0.50	1.00	0.00	0.00	0.00	0.00
North Granny Creek	NGC	NGC-AN-2	13/07/10	2	0.50	1.00	0.00	0.00	0.00	0.00
South Granny Creek	SGC	SGC-A-AN	09/07/10	3	1.00	3.00	0.33	0.00	0.00	0.33
South Granny Creek	SGC	SGC-B-AN	13/07/10	2	0.50	1.00	0.00	0.00	0.00	0.00
South Granny Creek	SGC	SGC-C-AN	13/07/10	2	0.50	1.00	0.00	0.00	0.00	0.00
Species Total							1.33	1.00	1.00	3.33
Catch (n)							4	11	41	56

TABLE 29
SPECIES-SPECIFIC CATCH PER HOUR IN 6-FOOT TRAP NETS
IN THE NAYSHKOOTAYAOW RIVER DURING AUGUST - SEPTEMBER 2010

Waterbody	Sample Area	Sample ID	Sampling Direction	Lift Date (dd/mm/yy)	Total Trap Hours	Number of Fish/ Hour/ 6-Foot Trap Net				
						White Sucker	Longnose Sucker	Lake Sturgeon	Northern Pike	Walleye
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU1	Upstream	21/08/10	26.8	0.00	0.00	0.00	0.07	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU2	Upstream	22/08/10	23.0	0.04	0.00	0.00	0.04	0.04
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU3	Upstream	23/08/10	24.0	0.04	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU4	Upstream	24/08/10	24.0	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU5	Upstream	25/08/10	23.0	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU6	Upstream	26/08/10	24.5	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU7	Upstream	27/08/10	24.0	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU8	Upstream	28/08/10	24.0	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU9	Upstream	29/08/10	24.0	0.00	0.00	0.00	0.04	0.08
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU10	Upstream	30/08/10	24.0	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU11	Upstream	31/08/10	23.5	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU12	Upstream	01/09/10	25.0	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU13	Upstream	02/09/10	20.3	0.00	0.00	0.00	0.10	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU14	Upstream	03/09/10	23.8	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU15	Upstream	04/09/10	23.3	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU16	Upstream	05/09/10	24.6	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TNU17	Upstream	06/09/10	21.5	0.00	0.00	0.00	0.00	0.00
				Sub-Total		0.09	0.00	0.00	0.26	0.13
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND1	Downstream	21/08/10	27.0	0.15	0.00	0.00	0.00	0.11
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND2	Downstream	22/08/10	25.0	0.00	0.00	0.00	0.00	0.08
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND3	Downstream	23/08/10	22.0	0.05	0.00	0.00	0.00	0.09
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND4	Downstream	24/08/10	24.5	0.00	0.00	0.04	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND5	Downstream	25/08/10	24.0	0.17	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND6	Downstream	26/08/10	24.5	0.00	0.00	0.00	0.00	0.04
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND7	Downstream	27/08/10	24.0	0.04	0.04	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND8	Downstream	28/08/10	24.9	0.04	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND9	Downstream	29/08/10	23.5	0.00	0.00	0.00	0.04	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND10	Downstream	30/08/10	23.0	0.00	0.00	0.00	0.04	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND11	Downstream	31/08/10	23.5	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND12	Downstream	01/09/10	25.0	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND13	Downstream	02/09/10	20.3	0.05	0.00	0.00	0.05	0.05
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND14	Downstream	03/09/10	23.8	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND15	Downstream	04/09/10	23.3	0.09	0.00	0.04	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND16	Downstream	05/09/10	24.6	0.00	0.00	0.00	0.00	0.00
Nayshkootayaow R.	NAY-MOUTH	NAY-MOUTH-TND17	Downstream	06/09/10	21.5	0.00	0.00	0.00	0.00	0.00
				Sub-Total		**0.58**	**0.04**	**0.08**	**0.14**	**0.37**
				Total		**0.66**	**0.04**	**0.08**	**0.39**	**0.50**
				Catch (n)		**16**	**1**	**2**	**9**	**12**

TABLE 30
NORTHERN PIKE DESCRIPTIVE STATISTICS

		2007-2008				2010				
	Area	ATT-US	ATT-COM	NAYSH	MC	ATT-US	ATT-NF	ATT-DSNAY	NAYSH	MC
Sample Size (n)		25	43	23	52	26	31	3	30	38
Total Length (mm)	Mean	882.79	605.23	491.60	530.19	586.39	698.94	467.33	501.30	434.61
	SE	13.80	20.17	38.12	15.68	35.28	32.73	52.52	25.08	26.49
	Min	727.60	270.00	246.00	265.00	162.00	326.00	365.00	323.00	96.00
	Max	995.10	850.00	772.00	800.00	945.00	1012.00	539.00	790.00	780.00
	Median	898.80	610.00	449.00	527.50	578.00	714.00	498.00	463.00	425.50
Round Weight (g)	Mean	5040.55	2400.00	1005.41	1771.94	1611.00	2220.00	716.67	989.33	685.47
	SE	240.82	191.93	225.52	171.24	257.65	295.76	277.39	155.94	118.78
	Min	2749.90	800.00	92.68	700.00	22.54	210.00	200.00	110.00	4.29
	Max	7370.88	4500.00	3210.00	6090.00	4950.00	6010.00	1150.00	3000.00	3060.00
	Median	0.57	2200.00	396.89	1600.00	1080.00	1350.00	800.00	630.00	425.00
Age (years)	Mean	8.22	3.46	3.58	3.10	5.71	6.74	3.33	3.03	3.00
	SE	0.21	0.22	0.69	0.25	0.45	0.54	1.20	0.40	0.29
	Min	6	0	0	0	1	1	1	1	1
	Max	10	6	10	7	11	12	5	9	7
	Median	8	4	3	3	6	7	4	2	3
Total Hg (µg/g)	Mean	0.593	0.249	0.215	0.205	0.330	0.577	0.236	0.186	0.156
	SE	0.045	0.014	0.020	0.016	0.063	0.072	0.073	0.019	0.016
	Min	0.262	0.093	0.116	0.083	0.047	0.103	0.119	0.047	0.045
	Max	1.060	0.568	0.537	0.527	1.196	1.818	0.371	0.546	0.414
	Median	0.569	0.223	0.185	0.176	0.214	0.459	0.219	0.147	0.125

TABLE 31
WALLEYE DESCRIPTIVE STATISTICS

		2007-2008				2010				
	Area	ATT-US	ATT-COM	NAYSH	MC	ATT-US	ATT-NF	ATT-DSNAY	NAYSH	MC
Sample Size (n)		12	10	26	2	19	30	1	25	7
Total Length (mm)	Mean	455.88	373.00	403.87	527.00	388.53	468.23	445.00	468.00	400.14
	SE	21.98	27.32	21.52	101.00	28.59	13.59	—	19.52	36.02
	Min	386.90	290.00	175.96	426.00	127.00	339.00	445.00	299.00	254.00
	Max	636.00	530.00	604.00	628.00	532.00	627.00	445.00	687.00	530.00
	Median	424.00	332.00	402.80	527.00	424.00	465.50	445.00	480.00	403.00
Round Weight (g)	Mean	770.00	—	596.64	5625.00	667.68	993.67	770.00	971.60	655.83
	SE	182.29	—	113.44	835.00	94.54	86.83	—	132.02	165.09
	Min	311.84	—	48.95	4790.00	13.64	370.00	770.00	260.00	140.00
	Max	2353.01	—	2579.81	6460.00	1350.00	2050.00	770.00	3000.00	1230.00
	Median	439.41	—	420.00	5625.00	690.00	895.00	770.00	890.00	685.00
Age (years)	Mean	6.00	4.60	6.40	16.00	8.65	10.30	8.00	10.48	5.71
	SE	0.49	0.56	0.46	9.00	0.98	0.51	—	1.04	0.92
	Min	4	2	3	7	2	4	8	4	2
	Max	8	9	10	25	14	15	8	24	8
	Median	6	4	6	16	9	11	8	10	7
Total Hg (µg/g)	Mean	0.555	0.389	0.431	0.632	0.412	0.566	0.282	0.615	0.334
	SE	0.082	0.024	0.050	0.027	0.058	0.039	—	0.071	0.043
	Min	0.000	0.219	0.000	0.605	0.057	0.207	0.282	0.152	0.174
	Max	1.060	0.520	0.868	0.659	0.866	1.162	0.282	1.773	0.495
	Median	0.536	0.398	0.451	0.632	0.419	0.517	0.282	0.582	0.357

TABLE 32
SUCKER DESCRIPTIVE STATISTICS

		2007-2008				2010				
	Area	ATT-US	ATT-COM	NAYSH	MC	ATT-US	ATT-NF	ATT-DSNAY	NAYSH	MC
Sample Size (n)		6	10	31	13	5	9	1	24	17
Total Length (mm)	Mean	361.33	315.00	338.78	422.69	391.20	366.78	177.00	336.33	374.00
	SE	19.11	6.15	13.64	10.49	28.80	18.09	—	10.07	11.95
	Min	296.00	280.00	209.00	385.00	332.00	276.00	177.00	262.00	248.00
	Max	408.00	345.00	570.00	495.00	480.00	485.00	177.00	437.00	448.00
	Median	374.00	315.00	334.00	405.00	379.00	404.00	177.00	329.00	370.00
Round Weight (g)	Mean	463.33	—	528.14	—	662.00	715.56	53.00	417.92	587.18
	SE	85.66	—	78.52	—	146.67	95.50	—	50.56	51.64
	Min	180.00	—	140.00	—	310.00	220.00	53.00	20.00	102.00
	Max	700.00	—	2100.00	—	1110.00	1200.00	53.00	1040.00	900.00
	Median	465.00	—	450.00	—	600.00	750.00	53.00	420.00	550.00
Age (years)	Mean	4.33	4.40	6.08	7.39	7.60	6.56	2.00	5.67	7.47
	SE	0.62	0.54	0.51	0.33	1.86	1.11	—	0.38	0.56
	Min	3	2	2	5	4	4	2	3	5
	Max	7	8	11	9	14	14	2	11	13
	Median	4	4	6	8	7	5	2	5	7
Total Hg (µg/g)	Mean	0.105	0.128	0.137	0.235	0.168	0.182	0.060	0.108	0.153
	SE	0.011	0.017	0.020	0.021	0.065	0.027	—	0.012	0.018
	Min	0.071	0.061	0.027	0.128	0.054	0.106	0.060	0.038	0.068
	Max	0.151	0.225	0.595	0.412	0.421	0.353	0.060	0.282	0.325
	Median	0.102	0.116	0.112	0.238	0.125	0.138	0.060	0.087	0.135

TABLE 33
LAKE WHITEFISH DESCRIPTIVE STATISTICS

		2007-2008				2010	
	Area	ATT-US	ATT-COM	NAYSH	MC	ATT-NF	MC
Sample Size (n)		3	12	7	20	3	3
Total Length (mm)	Mean	354.67	320.83	346.06	322.75	398.67	361.33
	SE	16.27	23.27	22.44	10.57	8.51	13.28
	Min	324.80	195.00	291.00	260.00	382.00	338.00
	Max	380.80	465.00	426.00	435.00	410.00	384.00
	Median	358.40	317.50	324.00	315.00	404.00	362.00
Round Weight (g)	Mean	406.34	—	366.27	—	673.33	384.00
	SE	52.62	—	99.19	—	46.67	73.28
	Min	340.19	—	180.00	—	600.00	300.00
	Max	510.29	—	900.00	—	760.00	530.00
	Median	368.54	—	226.80	—	660.00	322.00
Age (years)	Mean	6.33	4.17	5.50	3.55	7.33	5.33
	SE	0.33	0.77	0.72	0.29	0.67	0.33
	Min	6	1	4	2	6	5
	Max	7	10	8	6	8	6
	Median	6	4	5	3	8	5
Total Hg (µg/g)	Mean	0.202	0.152	0.118	0.114	0.178	0.136
	SE	0.053	0.029	0.022	0.009	0.024	0.030
	Min	0.122	0.063	0.050	0.066	0.137	0.097
	Max	0.302	0.370	0.225	0.244	0.219	0.194
	Median	0.183	0.098	0.103	0.102	0.179	0.116

TABLE 34a
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM AUGUST / SEPTEMBER 2010 RESULTS - CLUSTER S-1

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.79	0.06
	Peat - Flat Bog	MS-1-F	1.47	0.14
	Peat - Horizontal Fen	MS-1-H	0.53	0.04
	Peat - Ribbed Fen	MS-1-R	1.24	0.06
S-2	Peat - Domed Bog	MS-2-D	1.25	0.05
	Peat - Flat Bog	MS-2-F	2.74	0.11
	Peat - Ribbed Fen	MS-2-R	1.43	0.08
S-7	Peat - Domed Bog	MS-7-D	0.62	0.02
	Peat - Flat Bog	MS-7-F	0.85	0.01
	Peat - Horizontal Fen	MS-7-H	1.35	0.04
	Peat - Ribbed Fen	MS-7-R	0.44	0.02
S-8	Peat - Domed Bog	MS-8-D	1.66	0.29
	Peat - Flat Bog	MS-8-F	2.76	0.14
	Peat - Horizontal Fen	MS-8-H	0.01	0.02
	Peat - Ribbed Fen	MS-8-R	1.60	0.00
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.58	0.01
	Peat - Flat Bog	MS-9(1)-F	1.36	0.05
	Peat - Horizontal Fen	MS-9(1)-H	1.01	0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.47	0.02
S-9(2)	Peat - Domed Bog	MS-9(2)-D	1.04	0.01
	Peat - Flat Bog	MS-9(2)-F	1.21	0.03
	Peat - Horizontal Fen	MS-9(2)-H	0.01	0.02
	Peat - Ribbed Fen	MS-9(2)-R	0.72	0.05
S-13	Peat - Domed Bog	MS-13-D	1.45	0.11
	Peat - Flat Bog	MS-13-F	1.30	0.15
	Peat - Horizontal Fen	MS-13-H	0.42	0.01
	Peat - Ribbed Fen	MS-13-R	0.01	0.01
S-15	Peat - Domed Bog	MS-15-D	0.01	0.02
	Peat - Flat Bog	MS-15-F	0.35	0.00
	Peat - Horizontal Fen	MS-15-H	0.01	0.01
	Peat - Ribbed Fen	MS-15-R	0.01	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	0.53	0.02
	Peat - Ribbed Fen	MS-V(1)-R	1.43	0.08
S-V2	Peat - Domed Bog	MS-V(2)-D	0.45	0.05
	Peat - Ribbed Fen	MS-V(2)-R	0.85	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	0.60	0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.76	0.02

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-1	Sum r.
D. Bog	0.73	0.79	1.518
F. Bog	0.83	1.47	2.295
H. Fen	0.21	0.53	0.743
R. Fen	0.01	1.24	1.245
Sum c.	1.77	4.030	5.801

Total SS	1.653
Treat SS	0.638
Block SS	0.630
Error SS	0.384

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	1.653	-		
Treatment	1	0.638	0.638	**4.98**	10.1
Block	3	0.630	0.210	1.64	9.28
Error	3	0.384	0.128		

Treatment Effect (i.e., difference between Control and S-1) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-1	Sum r.
D. Bog	0.07	0.06	0.126
F. Bog	0.08	0.14	0.211
H. Fen	0.01	0.04	0.045
R. Fen	0.01	0.06	0.073
Sum c.	0.1581	0.297	0.455

Total SS	0.012
Treat SS	0.002
Block SS	0.008
Error SS	0.001

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.012	-		
Treatment	1	0.002	0.002	**6.14**	10.1
Block	3	0.008	0.003	6.78	9.28
Error	3	0.001	0.000		

Treatment Effect (i.e., difference between Control and S-1) **Not Significant**

TABLE 34b
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM AUGUST / SEPTEMBER 2010 RESULTS - CLUSTER S-2

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.79	0.06
	Peat - Flat Bog	MS-1-F	1.47	0.14
	Peat - Horizontal Fen	MS-1-H	0.53	0.04
	Peat - Ribbed Fen	MS-1-R	1.24	0.06
S-2	Peat - Domed Bog	MS-2-D	1.25	0.05
	Peat - Flat Bog	MS-2-F	2.74	0.11
	Peat - Ribbed Fen	MS-2-R	1.43	0.08
S-7	Peat - Domed Bog	MS-7-D	0.62	0.02
	Peat - Flat Bog	MS-7-F	0.85	0.01
	Peat - Horizontal Fen	MS-7-H	1.35	0.04
	Peat - Ribbed Fen	MS-7-R	0.44	0.02
S-8	Peat - Domed Bog	MS-8-D	1.66	0.29
	Peat - Flat Bog	MS-8-F	2.76	0.14
	Peat - Horizontal Fen	MS-8-H	0.01	0.02
	Peat - Ribbed Fen	MS-8-R	1.60	0.00
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.58	0.01
	Peat - Flat Bog	MS-9(1)-F	1.36	0.05
	Peat - Horizontal Fen	MS-9(1)-H	1.01	0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.47	0.02
S-9(2)	Peat - Domed Bog	MS-9(2)-D	1.04	0.01
	Peat - Flat Bog	MS-9(2)-F	1.21	0.03
	Peat - Horizontal Fen	MS-9(2)-H	0.01	0.02
	Peat - Ribbed Fen	MS-9(2)-R	0.72	0.05
S-13	Peat - Domed Bog	MS-13-D	1.45	0.11
	Peat - Flat Bog	MS-13-F	1.30	0.15
	Peat - Horizontal Fen	MS-13-H	0.42	0.01
	Peat - Ribbed Fen	MS-13-R	0.01	0.01
S-15	Peat - Domed Bog	MS-15-D	0.01	0.02
	Peat - Flat Bog	MS-15-F	0.35	0.00
	Peat - Horizontal Fen	MS-15-H	0.01	0.01
	Peat - Ribbed Fen	MS-15-R	0.01	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	0.53	0.02
	Peat - Ribbed Fen	MS-V(1)-R	1.43	0.08
S-V2	Peat - Domed Bog	MS-V(2)-D	0.45	0.05
	Peat - Ribbed Fen	MS-V(2)-R	0.85	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	0.60	0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.76	0.02

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-2	Sum r.
D. Bog	0.73	1.25	1.978
F. Bog	0.83	2.74	3.565
R. Fen	0.01	1.43	1.435
Sum c.	1.5581	5.420	6.978

Total SS	4.210
Treat SS	2.486
Block SS	1.225
Error SS	0.499

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	5	4.210	-		
Treatment	1	2.486	2.486	**9.96**	18.5
Block	2	1.225	0.612	2.45	19.0
Error	2	0.499	0.250		

Treatment Effect (i.e., difference between Control and S-2) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-2	Sum r.
D. Bog	0.07	0.05	0.114
F. Bog	0.08	0.11	0.185
R. Fen	0.01	0.08	0.096
Sum c.	0.1527	0.242	0.395

Total SS	0.005
Treat SS	0.001
Block SS	0.002
Error SS	0.002

ANOVA Table

Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	5	0.005	-		
Treatment	1	0.001	0.001	**1.43**	18.5
Block	2	0.002	0.001	1.19	19.0
Error	2	0.002	0.001		

Treatment Effect (i.e., difference between Control and S-2) **Not Significant**

TABLE 34c
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM AUGUST / SEPTEMBER 2010 RESULTS - CLUSTER S-7

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.79	0.06
	Peat - Flat Bog	MS-1-F	1.47	0.14
	Peat - Horizontal Fen	MS-1-H	0.53	0.04
	Peat - Ribbed Fen	MS-1-R	1.24	0.06
S-2	Peat - Domed Bog	MS-2-D	1.25	0.05
	Peat - Flat Bog	MS-2-F	2.74	0.11
	Peat - Ribbed Fen	MS-2-R	1.43	0.08
S-7	Peat - Domed Bog	MS-7-D	0.62	0.02
	Peat - Flat Bog	MS-7-F	0.85	0.01
	Peat - Horizontal Fen	MS-7-H	1.35	0.04
	Peat - Ribbed Fen	MS-7-R	0.44	0.02
S-8	Peat - Domed Bog	MS-8-D	1.66	0.29
	Peat - Flat Bog	MS-8-F	2.76	0.14
	Peat - Horizontal Fen	MS-8-H	0.01	0.02
	Peat - Ribbed Fen	MS-8-R	1.60	0.00
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.58	0.01
	Peat - Flat Bog	MS-9(1)-F	1.36	0.05
	Peat - Horizontal Fen	MS-9(1)-H	1.01	0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.47	0.02
S-9(2)	Peat - Domed Bog	MS-9(2)-D	1.04	0.01
	Peat - Flat Bog	MS-9(2)-F	1.21	0.03
	Peat - Horizontal Fen.	MS-9(2)-H	0.01	0.02
	Peat - Ribbed Fen	MS-9(2)-R	0.72	0.05
S-13	Peat - Domed Bog	MS-13-D	1.45	0.11
	Peat - Flat Bog	MS-13-F	1.30	0.15
	Peat - Horizontal Fen	MS-13-H	0.42	0.01
	Peat - Ribbed Fen	MS-13-R	0.01	0.01
S-15	Peat - Domed Bog	MS-15-D	0.01	0.02
	Peat - Flat Bog	MS-15-F	0.35	0.00
	Peat - Horizontal Fen	MS-15-H	0.01	0.01
	Peat - Ribbed Fen	MS-15-R	0.01	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	0.53	0.02
	Peat - Ribbed Fen	MS-V(1)-R	1.43	0.08
S-V2	Peat - Domed Bog	MS-V(2)-D	0.45	0.05
	Peat - Ribbed Fen	MS-V(2)-R	0.85	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	0.60	0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.76	0.02

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-7	Sum r.
D. Bog	0.73	0.62	1.348
F. Bog	0.83	0.85	1.675
H. Fen	0.21	1.35	1.563
R. Fen	0.01	0.44	0.445
Sum c.	1.7708	3.260	5.031

Total SS	1.215
Treat SS	0.277
Block SS	0.468
Error SS	0.470

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	1.215	-		
Treatment	1	0.277	0.277	**1.77**	10.1
Block	3	0.468	0.156	0.99	9.28
Error	3	0.470	0.157		

Treatment Effect (i.e., difference between Control and S-7) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-7	Sum r.
D. Bog	0.07	0.02	0.088
F. Bog	0.08	0.01	0.080
H. Fen	0.01	0.04	0.042
R. Fen	0.01	0.02	0.036
Sum c.	0.1581	0.089	0.247

Total SS	0.005
Treat SS	0.001
Block SS	0.001
Error SS	0.003

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.005	-		
Treatment	1	0.001	0.001	**0.55**	10.1
Block	3	0.001	0.000	0.32	9.28
Error	3	0.003	0.001		

Treatment Effect (i.e., difference between Control and S-7) **Not Significant**

TABLE 34d
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM AUGUST / SEPTEMBER 2010 RESULTS - CLUSTER S-8

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.79	0.06
	Peat - Flat Bog	MS-1-F	1.47	0.14
	Peat - Horizontal Fen	MS-1-H	0.53	0.04
	Peat - Ribbed Fen	MS-1-R	1.24	0.06
S-2	Peat - Domed Bog	MS-2-D	1.25	0.05
	Peat - Flat Bog	MS-2-F	2.74	0.11
	Peat - Ribbed Fen	MS-2-R	1.43	0.08
S-7	Peat - Domed Bog	MS-7-D	0.62	0.02
	Peat - Flat Bog	MS-7-F	0.85	0.01
	Peat - Horizontal Fen	MS-7-H	1.35	0.04
	Peat - Ribbed Fen	MS-7-R	0.44	0.02
S-8	Peat - Domed Bog	MS-8-D	1.66	0.29
	Peat - Flat Bog	MS-8-F	2.76	0.14
	Peat - Horizontal Fen	MS-8-H	0.01	0.02
	Peat - Ribbed Fen	MS-8-R	1.60	0.00
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.58	0.01
	Peat - Flat Bog	MS-9(1)-F	1.36	0.05
	Peat - Horizontal Fen	MS-9(1)-H	1.01	0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.47	0.02
S-9(2)	Peat - Domed Bog	MS-9(2)-D	1.04	0.01
	Peat - Flat Bog	MS-9(2)-F	1.21	0.03
	Peat - Horizontal Fen	MS-9(2)-H	0.01	0.02
	Peat - Ribbed Fen	MS-9(2)-R	0.72	0.05
S-13	Peat - Domed Bog	MS-13-D	1.45	0.11
	Peat - Flat Bog	MS-13-F	1.30	0.15
	Peat - Horizontal Fen	MS-13-H	0.42	0.01
	Peat - Ribbed Fen	MS-13-R	0.01	0.01
S-15	Peat - Domed Bog	MS-15-D	0.01	0.02
	Peat - Flat Bog	MS-15-F	0.35	0.00
	Peat - Horizontal Fen	MS-15-H	0.01	0.01
	Peat - Ribbed Fen	MS-15-R	0.01	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	0.53	0.02
	Peat - Ribbed Fen	MS-V(1)-R	1.43	0.08
S-V2	Peat - Domed Bog	MS-V(2)-D	0.45	0.05
	Peat - Ribbed Fen	MS-V(2)-R	0.85	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	0.60	0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.76	0.02

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-8	Sum r.
D. Bog	0.73	1.66	2.388
F. Bog	0.83	2.76	3.585
H. Fen	0.21	0.01	0.218
R. Fen	0.01	1.60	1.605
Sum c.	1.7708	6.025	7.796

Total SS	6.591
Treat SS	2.263
Block SS	2.992
Error SS	1.337

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	6.591	-		
Treatment	1	2.263	2.263	**5.08**	10.1
Block	3	2.992	0.997	2.24	9.28
Error	3	1.337	0.446		

Treatment Effect (i.e., difference between Control and S-8) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-8	Sum r.
D. Bog	0.07	0.29	0.358
F. Bog	0.08	0.14	0.219
H. Fen	0.01	0.02	0.025
R. Fen	0.01	0.00	0.013
Sum c.	0.1581	0.457	0.615

Total SS	0.070
Treat SS	0.011
Block SS	0.041
Error SS	0.017

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.070	-		
Treatment	1	0.011	0.011	**1.92**	10.1
Block	3	0.041	0.014	2.36	9.28
Error	3	0.017	0.006		

Treatment Effect (i.e., difference between Control and S-8) **Not Significant**

TABLE 34e
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM AUGUST / SEPTEMBER 2010 RESULTS - CLUSTER S-9(1)

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.79	0.06
	Peat - Flat Bog	MS-1-F	1.47	0.14
	Peat - Horizontal Fen	MS-1-H	0.53	0.04
	Peat - Ribbed Fen	MS-1-R	1.24	0.06
S-2	Peat - Domed Bog	MS-2-D	1.25	0.05
	Peat - Flat Bog	MS-2-F	2.74	0.11
	Peat - Ribbed Fen	MS-2-R	1.43	0.08
S-7	Peat - Domed Bog	MS-7-D	0.62	0.02
	Peat - Flat Bog	MS-7-F	0.85	0.01
	Peat - Horizontal Fen	MS-7-H	1.35	0.04
	Peat - Ribbed Fen	MS-7-R	0.44	0.02
S-8	Peat - Domed Bog	MS-8-D	1.66	0.29
	Peat - Flat Bog	MS-8-F	2.76	0.14
	Peat - Horizontal Fen	MS-8-H	0.01	0.02
	Peat - Ribbed Fen	MS-8-R	1.60	0.00
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.58	0.01
	Peat - Flat Bog	MS-9(1)-F	1.36	0.05
	Peat - Horizontal Fen	MS-9(1)-H	1.01	0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.47	0.02
S-9(2)	Peat - Domed Bog	MS-9(2)-D	1.04	0.01
	Peat - Flat Bog	MS-9(2)-F	1.21	0.03
	Peat - Horizontal Fen	MS-9(2)-H	0.01	0.02
	Peat - Ribbed Fen	MS-9(2)-R	0.72	0.05
S-13	Peat - Domed Bog	MS-13-D	1.45	0.11
	Peat - Flat Bog	MS-13-F	1.30	0.15
	Peat - Horizontal Fen	MS-13-H	0.42	0.01
	Peat - Ribbed Fen	MS-13-R	0.01	0.01
S-15	Peat - Domed Bog	MS-15-D	0.01	0.02
	Peat - Flat Bog	MS-15-F	0.35	0.00
	Peat - Horizontal Fen	MS-15-H	0.01	0.01
	Peat - Ribbed Fen	MS-15-R	0.01	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	0.53	0.02
	Peat - Ribbed Fen	MS-V(1)-R	1.43	0.08
S-V2	Peat - Domed Bog	MS-V(2)-D	0.45	0.05
	Peat - Ribbed Fen	MS-V(2)-R	0.85	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	0.60	0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.76	0.02

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-9(1)	Sum r.
D. Bog	0.73	0.58	1.308
F. Bog	0.83	1.36	2.185
H. Fen	0.21	1.01	1.223
R. Fen	0.01	0.47	0.475
Sum c.	1.7708	3.420	5.191

Total SS	1.314
Treat SS	0.340
Block SS	0.735
Error SS	0.240

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	1.314	-		
Treatment	1	0.340	0.340	**4.25**	10.1
Block	3	0.735	0.245	3.06	9.28
Error	3	0.240	0.080		

Treatment Effect (i.e., difference between Control and S-9[1]) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-9(1)	Sum r.
D. Bog	0.07	0.01	0.070
F. Bog	0.08	0.05	0.120
H. Fen	0.01	0.03	0.037
R. Fen	0.01	0.02	0.033
Sum c.	0.1581	0.102	0.260

Total SS	0.005
Treat SS	0.000
Block SS	0.002
Error SS	0.002

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.005	-		
Treatment	1	0.000	0.000	**0.54**	10.1
Block	3	0.002	0.001	1.13	9.28
Error	3	0.002	0.001		

Treatment Effect (i.e., difference between Control and S-9[1]) **Not Significant**

TABLE 34f
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM AUGUST / SEPTEMBER 2010 RESULTS - CLUSTER S-9(2)

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.79	0.06
	Peat - Flat Bog	MS-1-F	1.47	0.14
	Peat - Horizontal Fen	MS-1-H	0.53	0.04
	Peat - Ribbed Fen	MS-1-R	1.24	0.06
S-2	Peat - Domed Bog	MS-2-D	1.25	0.05
	Peat - Flat Bog	MS-2-F	2.74	0.11
	Peat - Ribbed Fen	MS-2-R	1.43	0.08
S-7	Peat - Domed Bog	MS-7-D	0.62	0.02
	Peat - Flat Bog	MS-7-F	0.85	0.05
	Peat - Horizontal Fen	MS-7-H	1.35	0.04
	Peat - Ribbed Fen	MS-7-R	0.44	0.02
S-8	Peat - Domed Bog	MS-8-D	1.66	0.29
	Peat - Flat Bog	MS-8-F	2.76	0.14
	Peat - Horizontal Fen	MS-8-H	0.01	0.02
	Peat - Ribbed Fen	MS-8-R	1.60	0.00
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.58	0.01
	Peat - Flat Bog	MS-9(1)-F	1.36	0.05
	Peat - Horizontal Fen	MS-9(1)-H	1.01	0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.47	0.02
S-9(2)	Peat - Domed Bog	MS-9(2)-D	1.04	0.01
	Peat - Flat Bog	MS-9(2)-F	1.21	0.03
	Peat - Horizontal Fen	MS-9(2)-H	0.01	0.02
	Peat - Ribbed Fen	MS-9(2)-R	0.72	0.05
S-13	Peat - Domed Bog	MS-13-D	1.45	0.11
	Peat - Flat Bog	MS-13-F	1.30	0.15
	Peat - Horizontal Fen	MS-13-H	0.42	0.01
	Peat - Ribbed Fen	MS-13-R	0.01	0.01
S-15	Peat - Domed Bog	MS-15-D	0.01	0.02
	Peat - Flat Bog	MS-15-F	0.35	0.00
	Peat - Horizontal Fen	MS-15-H	0.01	0.01
	Peat - Ribbed Fen	MS-15-R	0.01	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	0.53	0.02
	Peat - Ribbed Fen	MS-V(1)-R	1.43	0.08
S-V2	Peat - Domed Bog	MS-V(2)-D	0.45	0.05
	Peat - Ribbed Fen	MS-V(2)-R	0.85	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	0.60	0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.76	0.02

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-9(2)	Sum r.
D. Bog	0.73	1.04	1.768
F. Bog	0.83	1.21	2.035
H. Fen	0.21	0.01	0.218
R. Fen	0.01	0.72	0.725
Sum c.	1.7708	2.975	4.746

Total SS	1.504
Treat SS	0.181
Block SS	1.104
Error SS	0.218

ANOVA Table					
Source V.	d.f.	SS.	MS	F_{cal}	F_{tab} 0.05
Total	7	1.504	-		
Treatment	1	0.181	0.181	**2.49**	10.1
Block	3	1.104	0.368	5.06	9.28
Error	3	0.218	0.073		

Treatment Effect (i.e., difference between Control and S-9[2]) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-9(2)	Sum r.
D. Bog	0.07	0.01	0.070
F. Bog	0.08	0.03	0.105
H. Fen	0.01	0.02	0.025
R. Fen	0.01	0.05	0.063
Sum c.	0.1581	0.105	0.264

Total SS	0.005
Treat SS	0.000
Block SS	0.002
Error SS	0.003

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.005	-		
Treatment	1	0.000	0.000	**0.32**	10.1
Block	3	0.002	0.001	0.49	9.28
Error	3	0.003	0.001		

Treatment Effect (i.e., difference between Control and S-9[2]) **Not Significant**

TABLE 34g
MUSKEG MONITORING PROGRAM - STATISTICAL ANALYSIS OF CLUSTER PEAT HORIZON MERCURY PORE WATERS
ANNUAL SAMPLING PROGRAM AUGUST / SEPTEMBER 2010 RESULTS - CLUSTER S-V SERIES

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
S-1	Peat - Domed Bog	MS-1-D	0.79	0.06
	Peat - Flat Bog	MS-1-F	1.47	0.14
	Peat - Horizontal Fen	MS-1-H	0.53	0.04
	Peat - Ribbed Fen	MS-1-R	1.24	0.06
S-2	Peat - Domed Bog	MS-2-D	1.25	0.05
	Peat - Flat Bog	MS-2-F	2.74	0.11
	Peat - Ribbed Fen	MS-2-R	1.43	0.08
S-7	Peat - Domed Bog	MS-7-D	0.62	0.02
	Peat - Flat Bog	MS-7-F	0.85	0.01
	Peat - Horizontal Fen	MS-7-H	1.35	0.04
	Peat - Ribbed Fen	MS-7-R	0.44	0.02
S-8	Peat - Domed Bog	MS-8-D	1.66	0.29
	Peat - Flat Bog	MS-8-F	2.76	0.14
	Peat - Horizontal Fen	MS-8-H	0.01	0.02
	Peat - Ribbed Fen	MS-8-R	1.60	0.00
S-9(1)	Peat - Domed Bog	MS-9(1)-D	0.58	0.01
	Peat - Flat Bog	MS-9(1)-F	1.36	0.05
	Peat - Horizontal Fen	MS-9(1)-H	1.01	0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.47	0.02
S-9(2)	Peat - Domed Bog	MS-9(2)-D	1.04	0.01
	Peat - Flat Bog	MS-9(2)-F	1.21	0.03
	Peat - Horizontal Fen	MS-9(2)-H	0.01	0.02
	Peat - Ribbed Fen	MS-9(2)-R	0.72	0.05
S-13	Peat - Domed Bog	MS-13-D	1.45	0.11
	Peat - Flat Bog	MS-13-F	1.30	0.15
	Peat - Horizontal Fen	MS-13-H	0.42	0.01
	Peat - Ribbed Fen	MS-13-R	0.01	0.01
S-15	Peat - Domed Bog	MS-15-D	0.01	0.02
	Peat - Flat Bog	MS-15-F	0.35	0.00
	Peat - Horizontal Fen	MS-15-H	0.01	0.01
	Peat - Ribbed Fen	MS-15-R	0.01	0.02
S-V1	Peat - Domed Bog	MS-V(1)-D	0.53	0.02
	Peat - Ribbed Fen	MS-V(1)-R	1.43	0.08
S-V2	Peat - Domed Bog	MS-V(2)-D	0.45	0.05
	Peat - Ribbed Fen	MS-V(2)-R	0.85	0.04
S-V3	Peat - Domed Bog	MS-V(3)-D	0.60	0.01
	Peat - Ribbed Fen	MS-V(3)-R	0.76	0.02

Clusters used for statistical analysis

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-V1	S-V2	S-V3	Sum r.
D. Bog	0.73	0.53	0.45	0.60	2.31
R. Fen	0.01	1.43	0.85	0.76	3.05
Sum c.	0.73	1.96	1.30	1.36	5.35

Total SS	1.136
Treat SS	0.377
Block SS	0.068
Error SS	0.691

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	1.136	-		
Treatment	3	0.377	0.126	**0.55**	**9.28**
Block	1	0.068	0.068	0.30	10.1
Error	3	0.691	0.230		

Treatment Effect (i.e., difference between Control and S-V Series) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-V1	S-V2	S-V3	Sum r.
D. Bog	0.07	0.02	0.05	0.01	0.14
R. Fen	0.01	0.08	0.04	0.02	0.15
Sum c.	0.08	0.10	0.09	0.02	0.30

Total SS	0.005
Treat SS	0.002
Block SS	0.000
Error SS	0.003

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	7	0.005	-		
Treatment	3	0.002	0.001	**0.54**	**9.28**
Block	1	0.000	0.000	0.00	10.1
Error	3	0.003	0.001		

Treatment Effect (i.e., difference between Control and S-V Series) **Not Significant**

TABLE 35a
GRANNY CREEK - STATISTICAL ANALYSIS - TOTAL MERCURY - 2010
(filtered samples, concentrations in ng/L)

NORTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	US NWF (G1)	DS NEF (G3)	Sum r.
Jan	1.07	1.11	2.18
Feb	0.88	1.05	1.93
Mar	0.96	1.02	1.98
Apr	0.97	1.10	2.07
May	1.43	1.11	2.54
Jun	1.47	0.87	2.34
Jul	0.89	0.65	1.54
Aug	3.33	2.10	5.43
Sep	1.66	1.57	3.23
Oct	1.38	0.54	1.92
Nov	1.59	1.63	3.22
Dec	0.98	0.92	1.90
Sum c.	16.61	13.67	30.28

Total SS	7.480
Treat SS	0.360
Block SS	6.079
Error SS	1.041

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	23	7.480	-		
Treatment	1	0.360	0.360	**3.80**	**4.84**
Block	11	6.079	0.553	5.84	2.98
Error	11	1.041	0.095		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US NWF - Upstream Northwest Fen; DS NEF - Downstream Northeast Fen
r. - rows; c. - columns

SOUTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	US SWF (G5)	DS SWF (G6)	Sum r.
Jan	1.29	1.31	2.60
Feb	1.37	1.32	2.69
Mar	1.11	1.23	2.34
Apr	1.14	1.07	2.21
May	1.54	1.45	2.99
Jun	0.68	0.60	1.28
Jul	0.50	0.70	1.20
Aug	2.72	2.25	4.97
Sep	1.69	1.48	3.17
Oct	1.71	1.61	3.32
Nov	1.61	1.54	3.15
Dec	1.08	0.95	2.03
Sum c.	16.44	15.51	31.95

Total SS	5.748
Treat SS	0.036
Block SS	5.562
Error SS	0.151

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	23	5.748	-		
Treatment	1	0.036	0.036	**2.63**	**4.84**
Block	11	5.562	0.506	36.90	2.98
Error	11	0.151	0.014		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US SWF - Upstream Southwest Fen; DS SWF - Downstream Southwest Fen
r. - rows; c. - columns

TABLE 35b
GRANNY CREEK - STATISTICAL ANALYSIS - METHYL MERCURY - 2010
(filtered samples, concentrations in ng/L)

NORTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	US NWF (G1)	DS NEF (G3)	US CONF (G4)	Sum r.
Jan	0.05	0.04	0.08	0.17
Apr/May	0.03	0.05	0.06	0.14
Jul	0.06	0.10	0.08	0.23
Oct	0.05	0.13	0.13	0.32
Sum c.	0.19	0.32	0.35	0.86

The April value for US Conf is estimated

Total SS	0.012
Treat SS	0.003
Block SS	0.006
Error SS	0.003

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.012	-		
Treatment	2	0.003	0.002	**3.24**	**5.14**
Block	3	0.006	0.002	3.68	4.76
Error	6	0.003	0.001		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US NWF - Upstream Northwest Fen; DS NEF - Downstream Northeast Fen; US CONF - Upstream Confluence
r. - rows; c. - columns

SOUTH GRANNY CREEK DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	US SWF (G5)	DS SWF (G6)	US CONF (G7)	Sum r.
Jan / Feb	0.04	0.19	0.07	0.30
Apr/May	0.04	0.05	0.08	0.17
Jul	0.02	0.06	0.08	0.16
Oct	0.04	0.07	0.13	0.24
Sum c.	0.15	0.36	0.36	0.87

Total SS	0.022
Treat SS	0.008
Block SS	0.004
Error SS	0.010

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.022	-		
Treatment	2	0.008	0.004	**2.26**	**5.14**
Block	3	0.004	0.001	0.83	4.76
Error	6	0.010	0.002		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US SWF - Upstream Southwest Fen; DS SWF - Downstream Southwest Fen; US CONF - Upstream Confluence
r. - rows; c. - columns

TABLE 35c
NAYSHKOOTAYAOW RIVER - STATISTICAL ANALYSIS - MERCURY - 2010
(filtered samples, concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Nash R. US (N1)	Nash R. M (N2)	Nash R. DS (N3)	Sum r.
Jan/Feb	0.85	0.65	1.06	2.56
Apr/May	1.28	1.59	1.28	4.15
Jul	0.74	0.74	0.73	2.21
Oct	1.07	1.08	1.10	3.25
Sum c.	3.94	4.06	4.17	12.17

Total SS	0.880
Treat SS	0.007
Block SS	0.732
Error SS	0.142

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.880	-		
Treatment	2	0.007	0.003	**0.14**	**5.14**
Block	3	0.732	0.244	10.30	4.76
Error	6	0.142	0.024		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US - Upstream; M - Middle; DS - Downstream
r. - rows; c. - columns

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Nash R. US (N1)	Nash R. M (N2)	Nash R. DS (N3)	Sum r.
Jan/Feb	0.01	0.05	0.09	0.15
Apr/May	0.04	0.12	0.04	0.20
Jul	0.05	0.06	0.03	0.13
Oct	0.05	0.04	0.05	0.14
Sum c.	0.14	0.27	0.22	0.62

Total SS	0.009
Treat SS	0.002
Block SS	0.001
Error SS	0.006

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	11	0.009	-		
Treatment	2	0.002	0.001	**0.94**	**5.14**
Block	3	0.001	0.000	0.29	4.76
Error	6	0.006	0.001		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US - Upstream; M - Middle; DS - Downstream
r. - rows; c. - columns

TABLE 35d
ATTAWAPISKAT RIVER - STATISTICAL ANALYSIS - MERCURY - 2010
(filtered samples, concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Jan/Feb	1.21	1.41	1.49	1.49	5.60
Apr/May	1.69	1.45	1.58	1.84	6.56
Jun/Jul	0.77	0.72	1.55	0.60	3.64
Oct	1.17	1.24	1.27	1.30	4.98
Sum c.	4.84	4.82	5.89	5.23	20.78

Total SS	1.828
Treat SS	0.188
Block SS	1.123
Error SS	0.518

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	15	1.828	-		
Treatment	3	0.188	0.063	**1.09**	**3.86**
Block	3	1.123	0.374	6.51	3.86
Error	9	0.518	0.058		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US - Upstream; DN - Downstream
r. - rows; c. - columns

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Jan	0.04	0.01	0.04	0.04	0.12
Apr	0.05	0.04	0.03	0.05	0.16
Jul	0.00	0.03	0.04	0.04	0.12
Oct	0.04	0.03	0.04	0.03	0.14
Sum c.	0.12	0.11	0.15	0.16	0.54

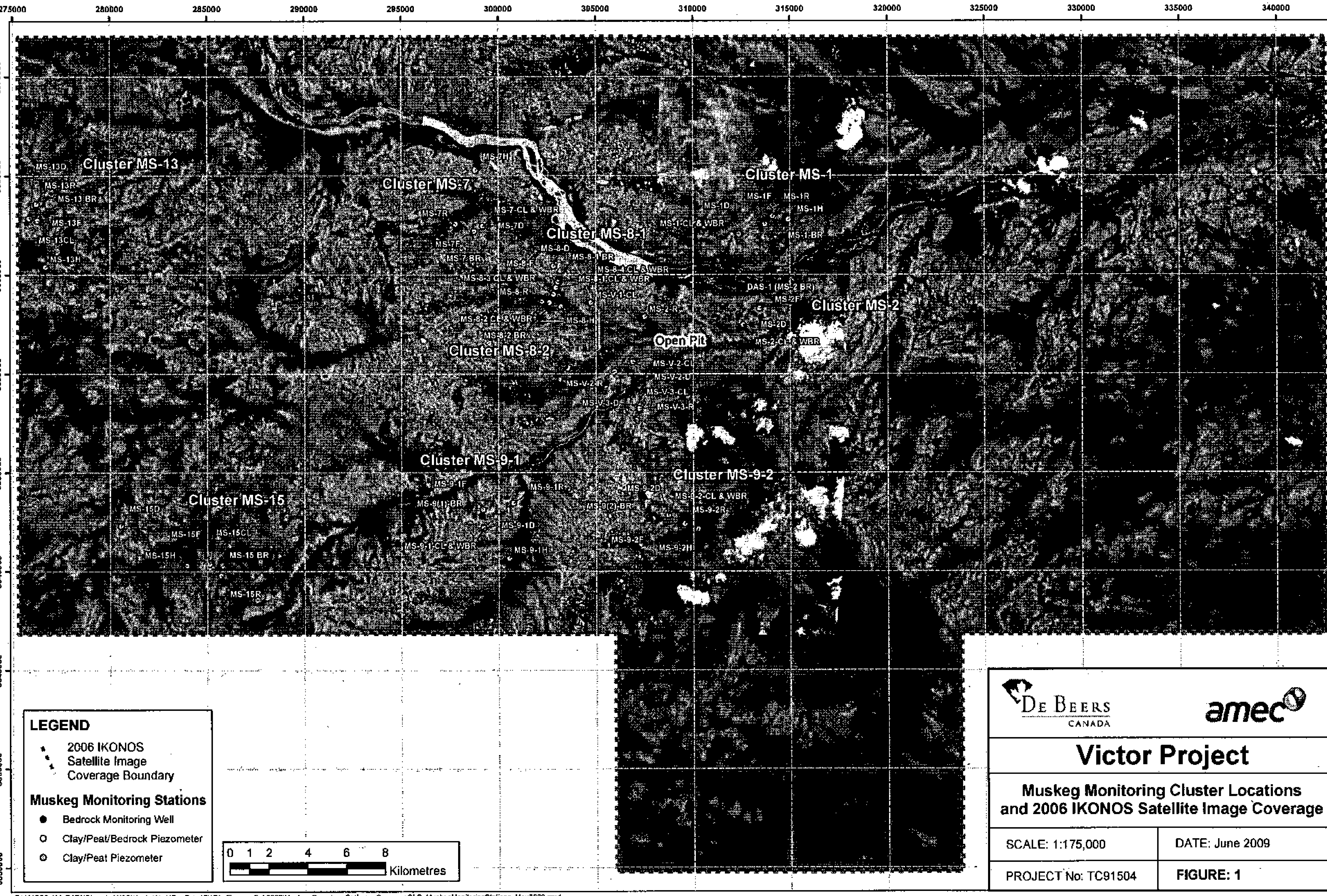
Total SS	0.003
Treat SS	0.000
Block SS	0.000
Error SS	0.002

ANOVA Table					
Source V.	d.f.	SS	MS	F_{cal}	F_{tab} 0.05
Total	15	0.003	-		
Treatment	3	0.000	0.000	**0.67**	**3.86**
Block	3	0.000	0.000	0.52	3.86
Error	9	0.002	0.000		

Treatment Effect (i.e., difference between US and DS) **Not Significant**

Notes: US - Upstream;DN - Downstream
r. - rows; c. - columns

FIGURES



DE BEERS CANADA

amec

Victor Project

Muskeg Monitoring Cluster Locations and 2006 IKONOS Satellite Image Coverage

SCALE: 1:175,000	DATE: June 2009
PROJECT No: TC91504	FIGURE: 1

E:\AMEC3-ALL DATA\Simon's MISC\Ken's Work\For Dave\FUPA_Figures_Feb2009\Muskeg Overview_SatImageCoverageOLD_MuskegMonitoringStations_May2009.mxd

000174

E:\AMEC3-ALL DATA\Simon's MISC\Ken's Work\For Dave\FUPA_Figures_2010\Fig2_UpperBR_Drawdown_and_RibbedFenStations.mxd

LEGEND

Monitoring Locations

- Pumping Wells
- Bedrock Monitoring Well
- Clay/Peat Piezometer
- Clay/Peat/Bedrock Piezometer
- Ribbed Fen Station (Clay/Peat Piezometer)

10 Drawdown in Upper Bedrock (m)

0 0.5 1 2 3 4 5
Kilometres

NOTE:
- IKONOS Satellite imagery scene date is August 27, 2008

Datum: NAD83
Projection: UTM Zone 17N

N W E S

DE BEERS CANADA

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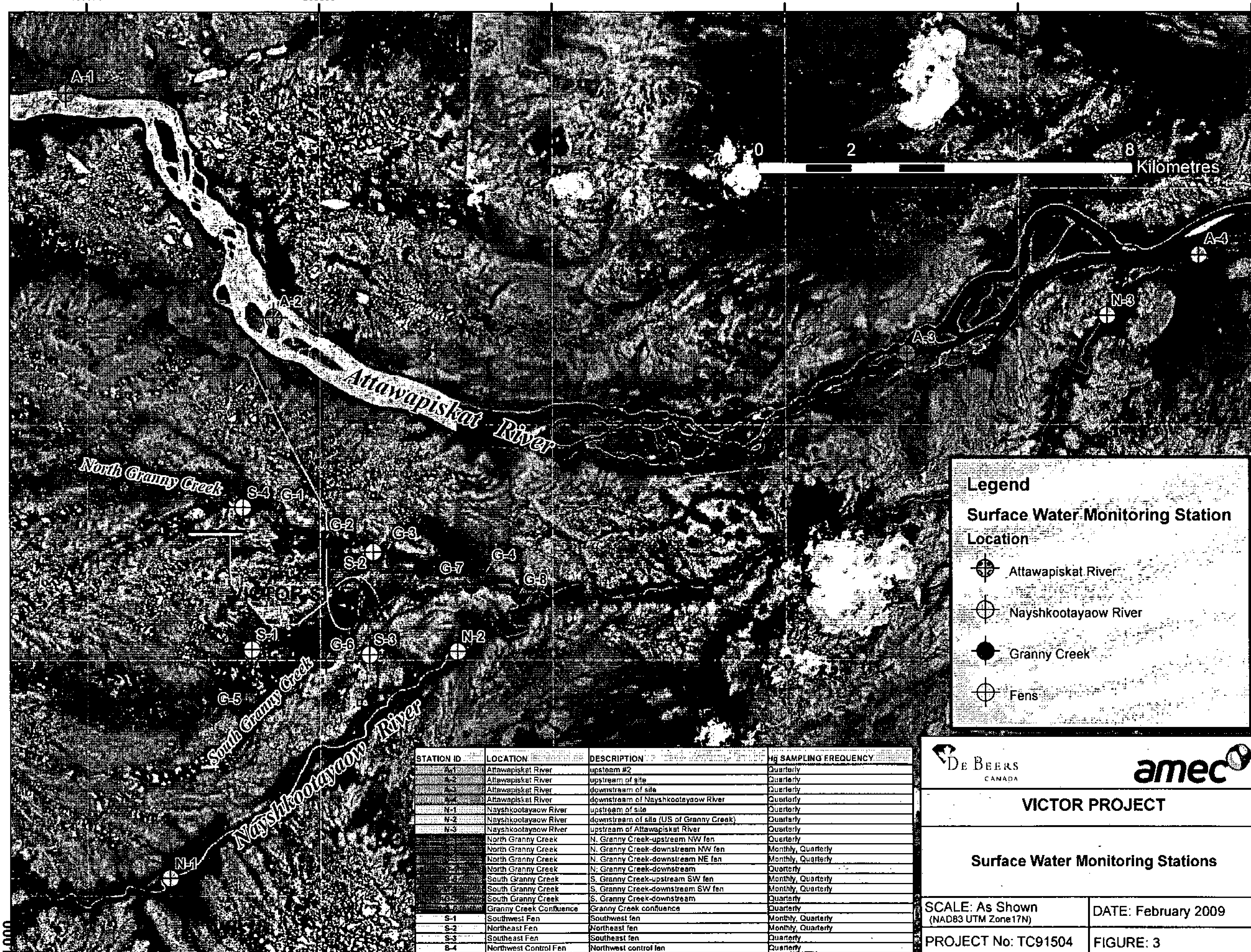
VICTOR MINE

Interpreted Drawdown Contours (m) in Upper Bedrock Aquifer (July 15, 2009 data)

SCALE: 1:90,000	DATE: June 2010
PROJECT No: TC91504	FIGURE: 2



STATION ID	LOCATION	DESCRIPTION	Hg SAMPLING FREQUENCY
A-1	Attawapiskat River	upsteam #2	Quarterly
A-2	Attawapiskat River	upstream of site	Quarterly
A-3	Attawapiskat River	downstream of site	Quarterly
A-4	Attawapiskat River	downstream of Nayshkootayaow River	Quarterly
N-1	Nayshkootayaow River	upstream of site	Quarterly
N-2	Nayshkootayaow River	downstream of site (US of Granny Creek)	Quarterly
N-3	Nayshkootayaow River	upstream of Attawapiskat River	Quarterly
[illegible]	North Granny Creek	N. Granny Creek-upstream NW fen	Quarterly
[illegible]	North Granny Creek	N. Granny Creek-downstream NW fen	Monthly, Quarterly
[illegible]	North Granny Creek	N. Granny Creek-downstream NE fen	Monthly, Quarterly
[illegible]	North Granny Creek	N; Granny Creek-downstream	Quarterly
[illegible]	South Granny Creek	S. Granny Creek-upstream SW fen	Monthly, Quarterly
[illegible]	South Granny Creek	S. Granny Creek-downstream SW fen	Monthly, Quarterly
[illegible]	South Granny Creek	S. Granny Creek-downstream	Quarterly
[illegible]	Granny Creek Confluence	Granny Creek confluence	Quarterly
S-1	Southwest Fen	Southwest fen	Monthly, Quarterly
S-2	Northeast Fen	Northeast fen	Monthly, Quarterly
S-3	Southeast Fen	Southeast fen	Quarterly
S-4	Northwest Control Fen	Northwest control fen	Quarterly

DE BEERS CANADA

amec

VICTOR PROJECT

Surface Water Monitoring Stations

SCALE: As Shown (NAD83 UTM Zone17N)	DATE: February 2009
PROJECT No: TC91504	FIGURE: 3

E:\AMEC3-ALL DATA\Simon's MISC\Ken's Work\For Dave\Mercury Monitoring Maps\surface_Water_Monitoring_Stations(8.5x11).mxd

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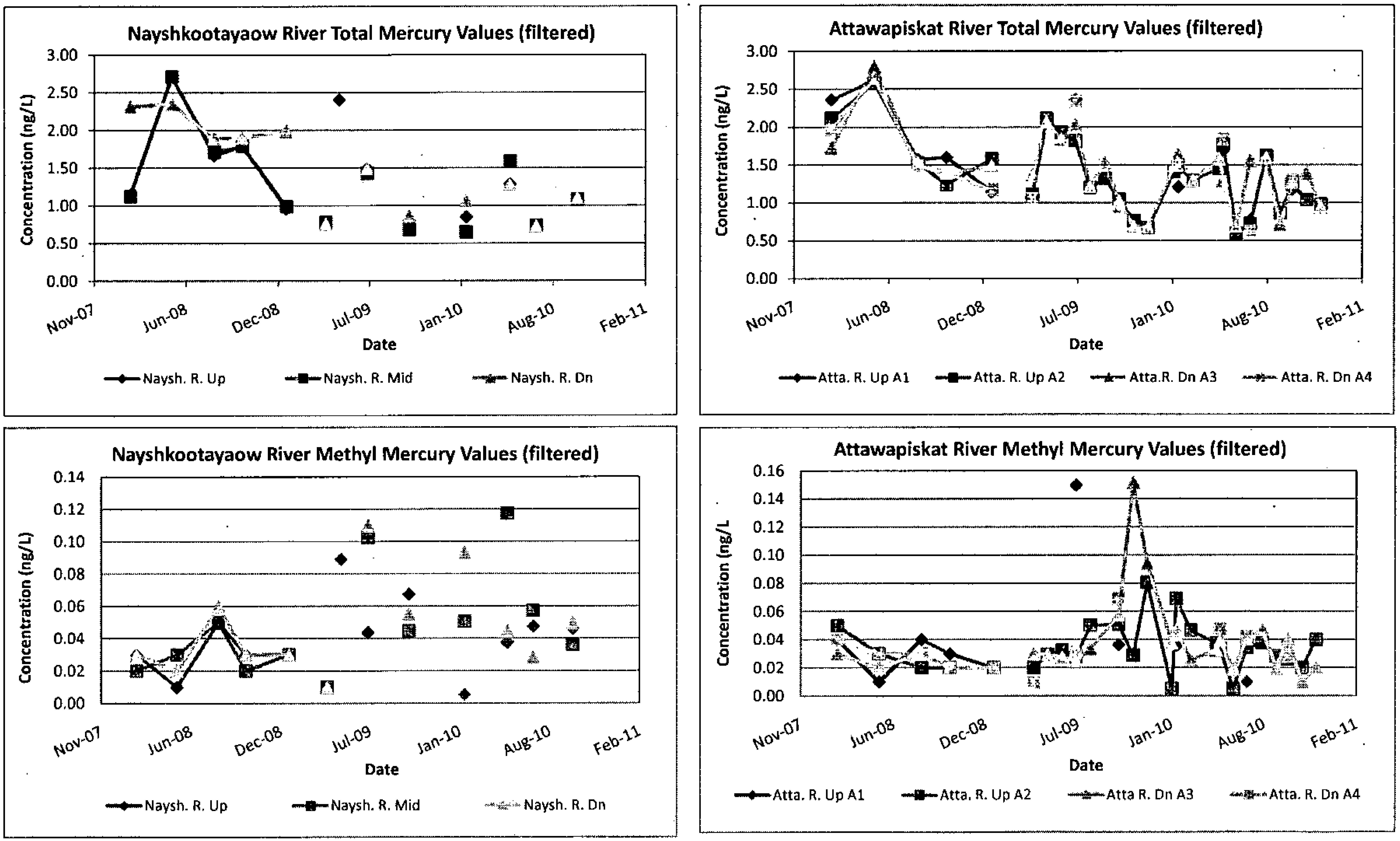
FIGURE 4
NAYSHKOOTAYAOW AND ATTAWAPISKAT RIVER TOTAL AND METHYL MERCURY TRENDS (filtered values)



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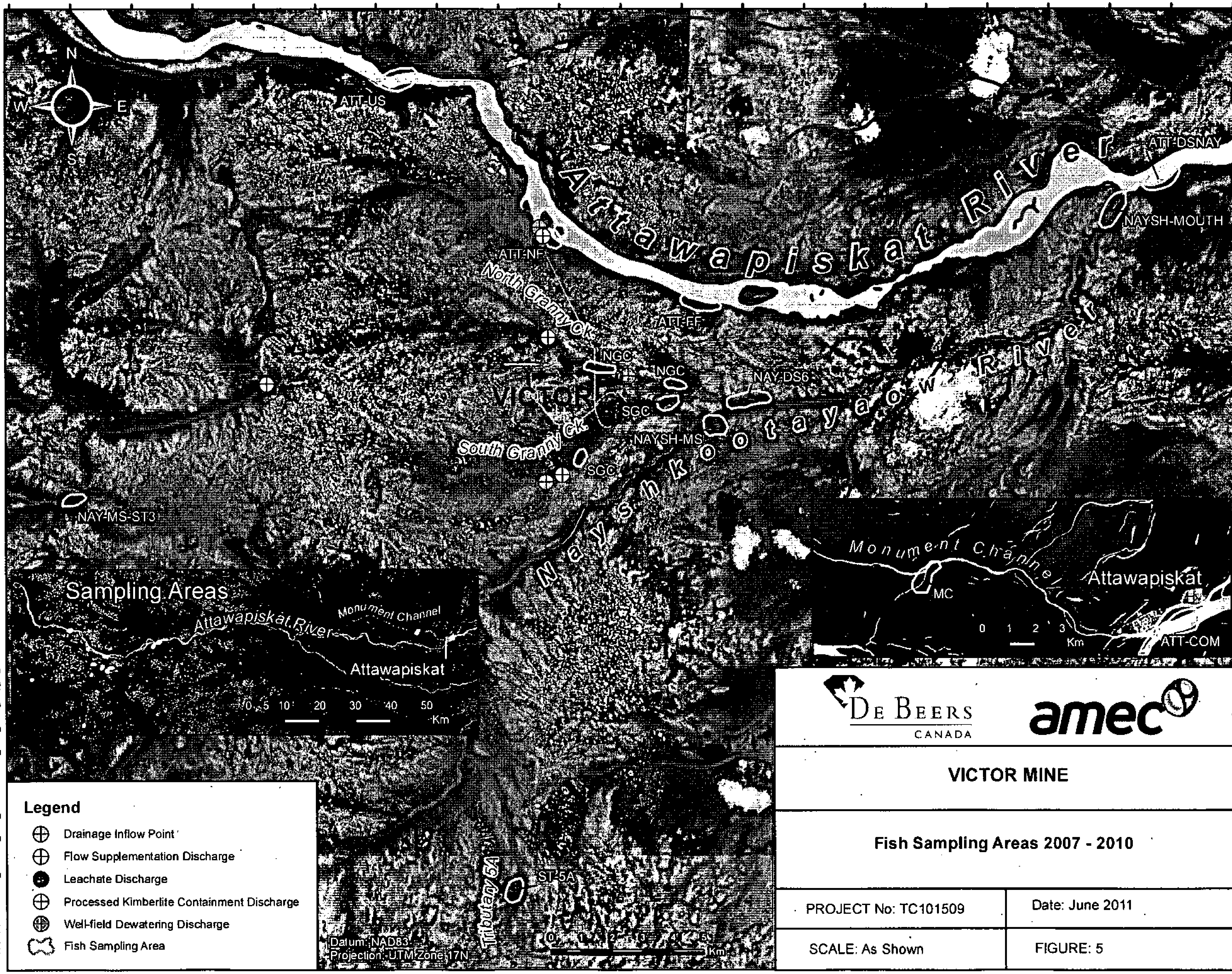

DE BEERS CANADA

amec

VICTOR MINE

Fish Sampling Areas 2007 - 2010

PROJECT No: TC101509	Date: June 2011
SCALE: As Shown	FIGURE: 5

Path: P:\GIS\BACKUP_Portable_Hard_Drives\VICTOR_Hard_Drive_May_11_2011\AMEC3-ALL DATA\Jason D_Misc\MXD_Maps\March2011\Fig3-5_Angling_2010_Markup2.mxd

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FIGURE 6: SITE SPECIFIC PEARL DACE MEAN MERCURY BODY BURDEN (± 1 SE)

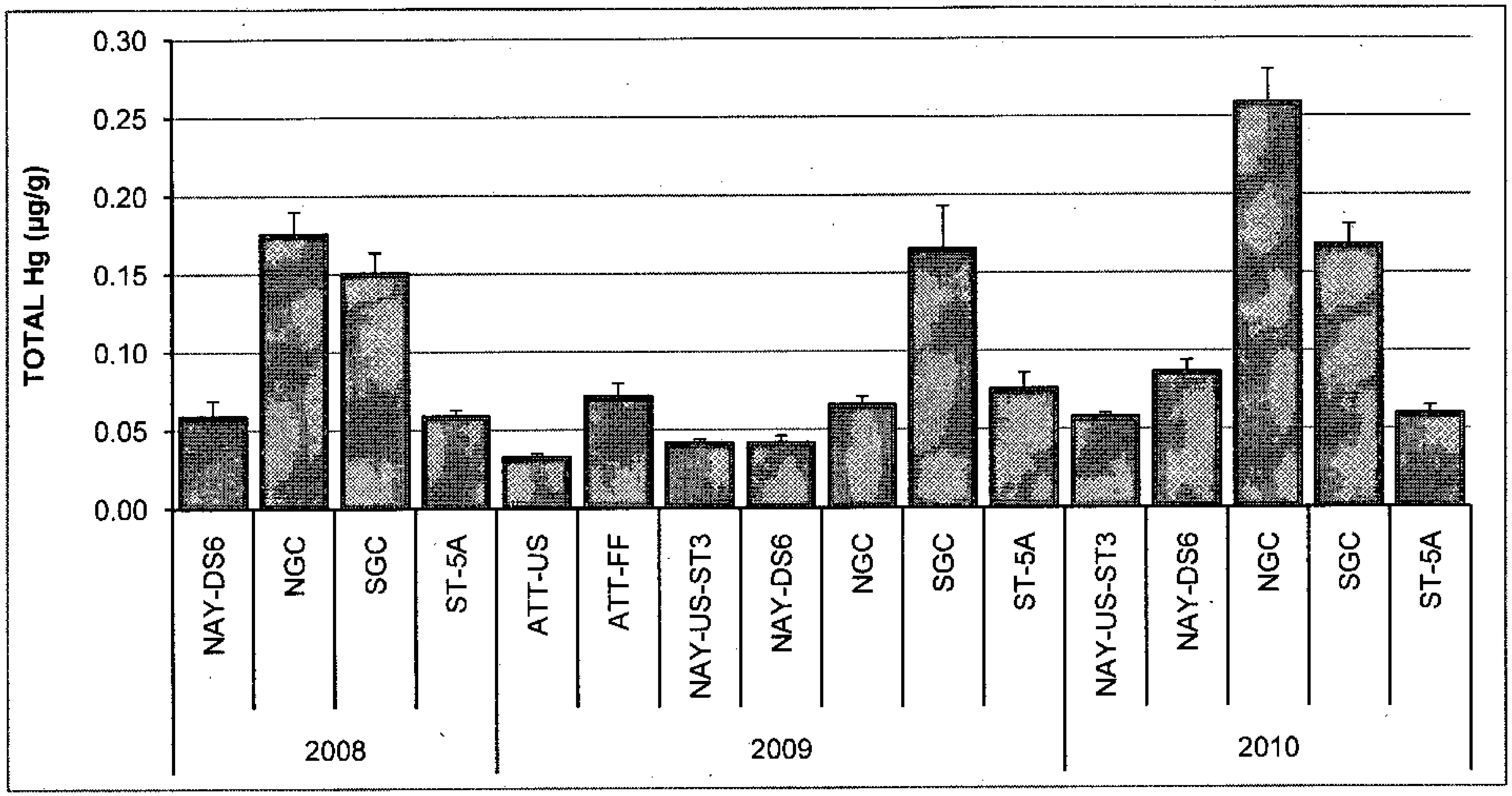

FIGURE 7: SITE SPECIFIC PEARL DACE MERCURY BODY BURDENS AS A FUNCTION OF TOTAL LENGTH

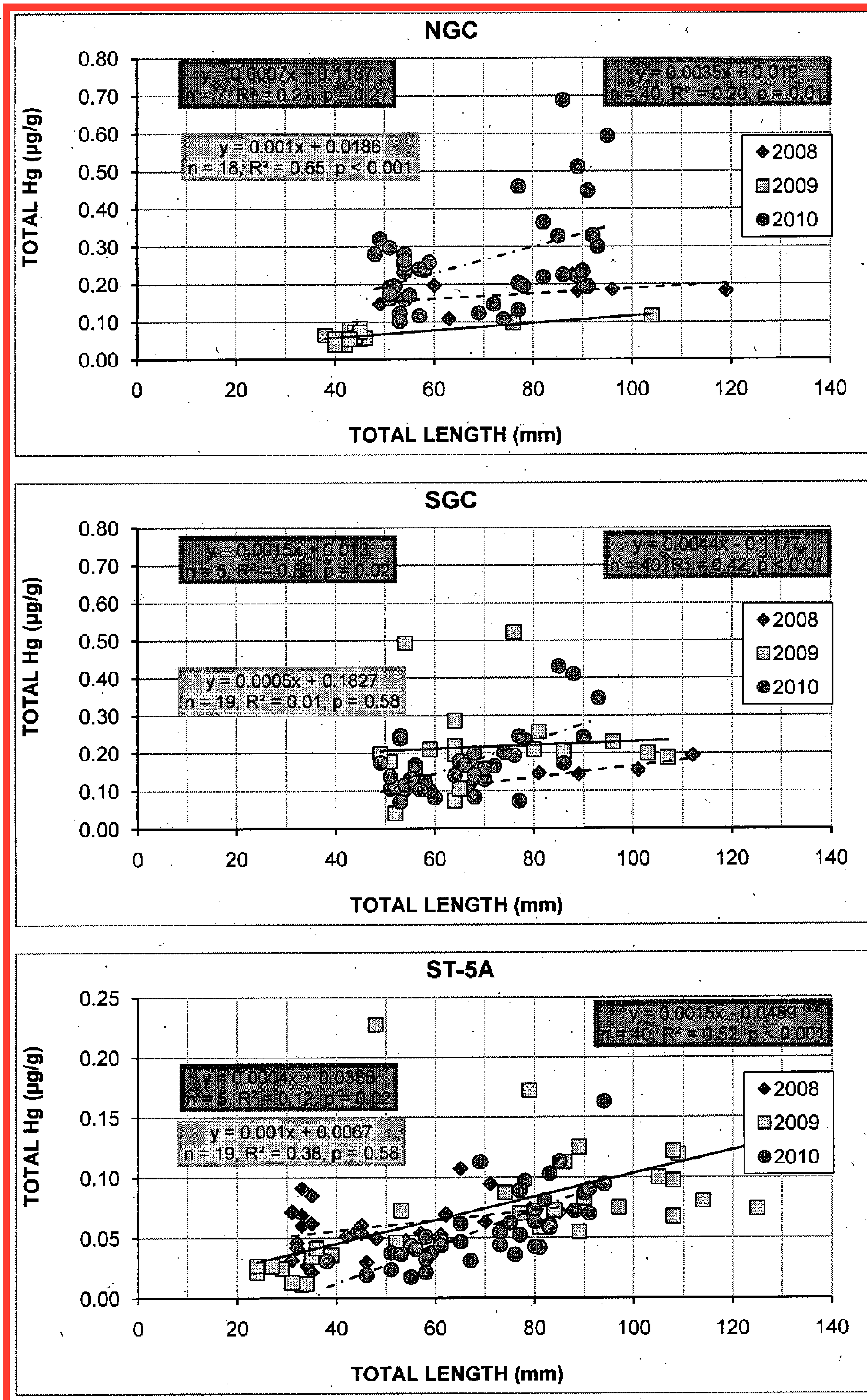

FIGURE 8: SITE SPECIFIC TROUT-PERCH MEAN MERCURY BODY BURDEN (± 1 SE)

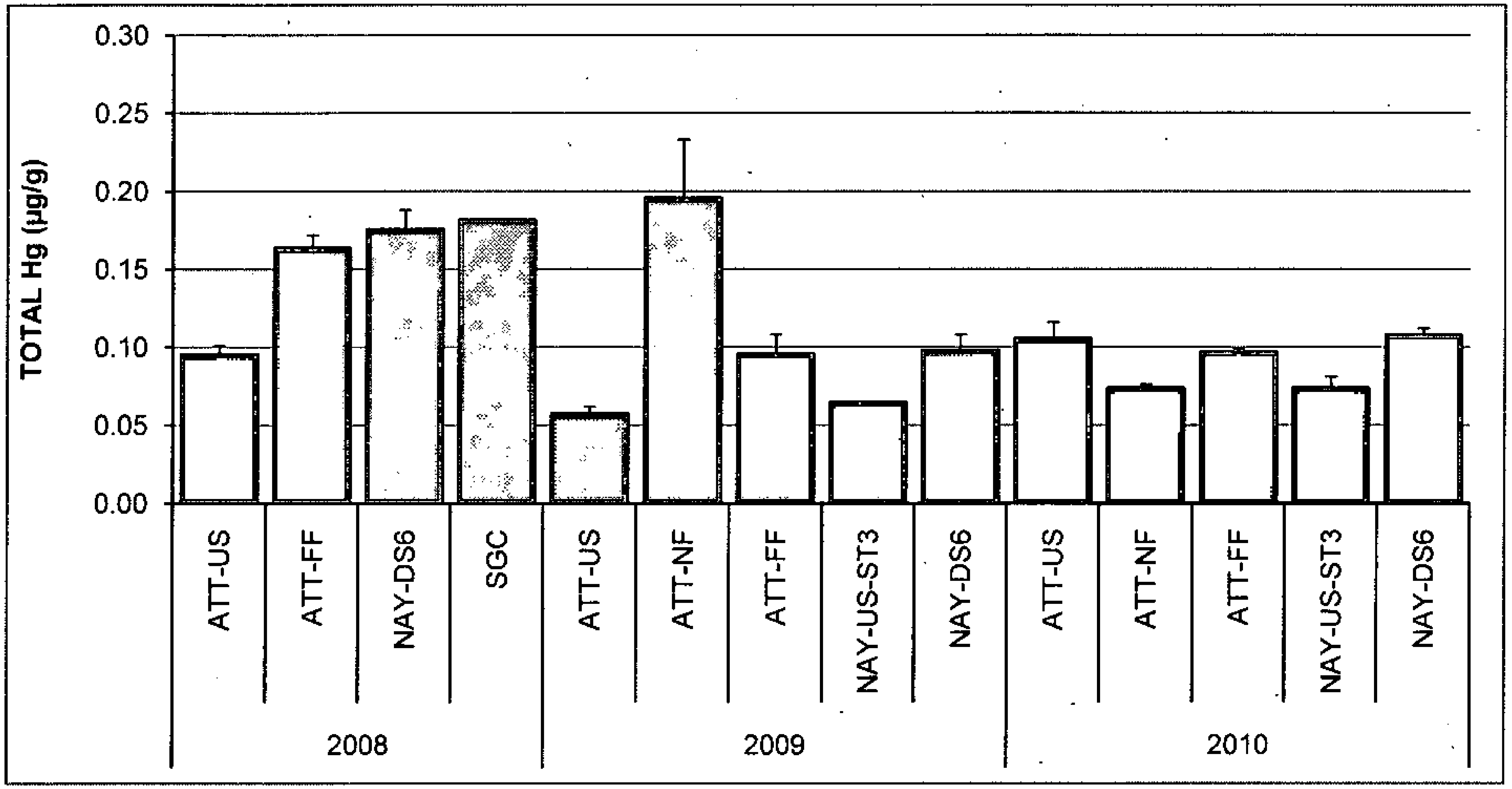

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FIGURE 9: SITE SPECIFIC TROUT-PERCH MERCURY BODY BURDENS AS A FUNCTION OF TOTAL LENGTH

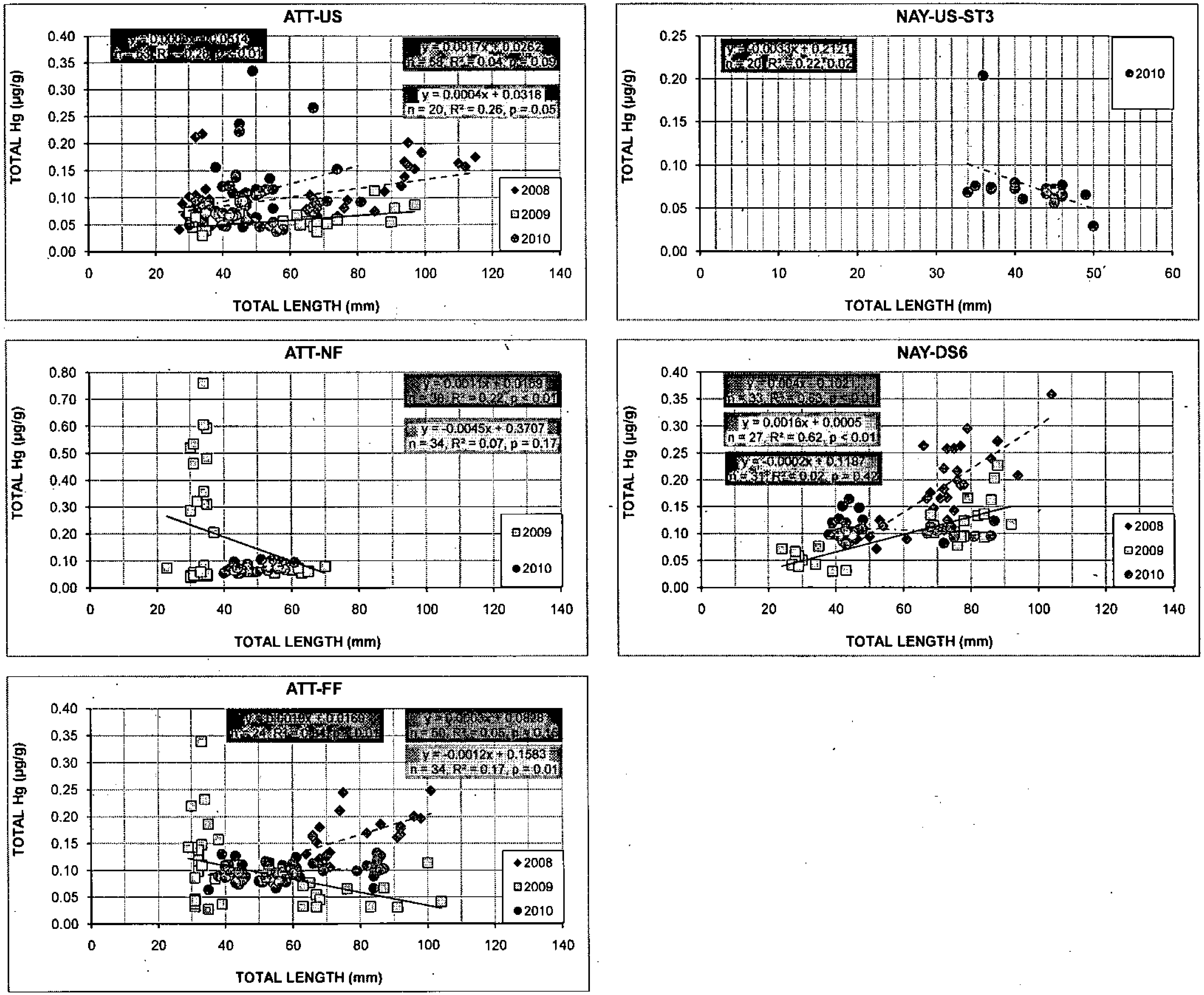

FIGURE 10: SITE SPECIFIC NORTHERN PIKE MEAN MERCURY BODY BURDEN (± 1 SE)

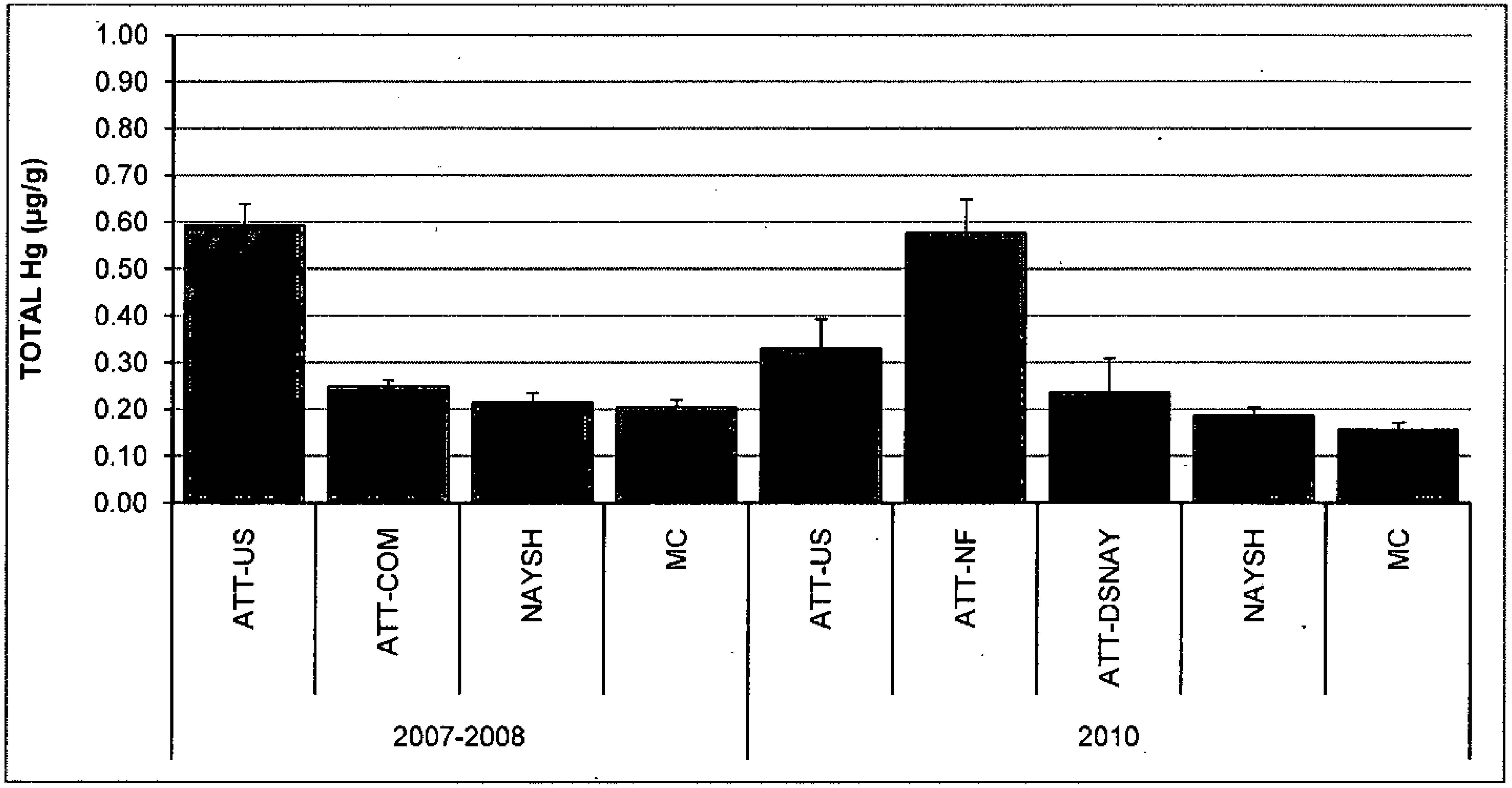

FIGURE 11: SITE SPECIFIC NORTHERN PIKE MERCURY BODY BURDENS AS A FUNCTION OF TOTAL LENGTH

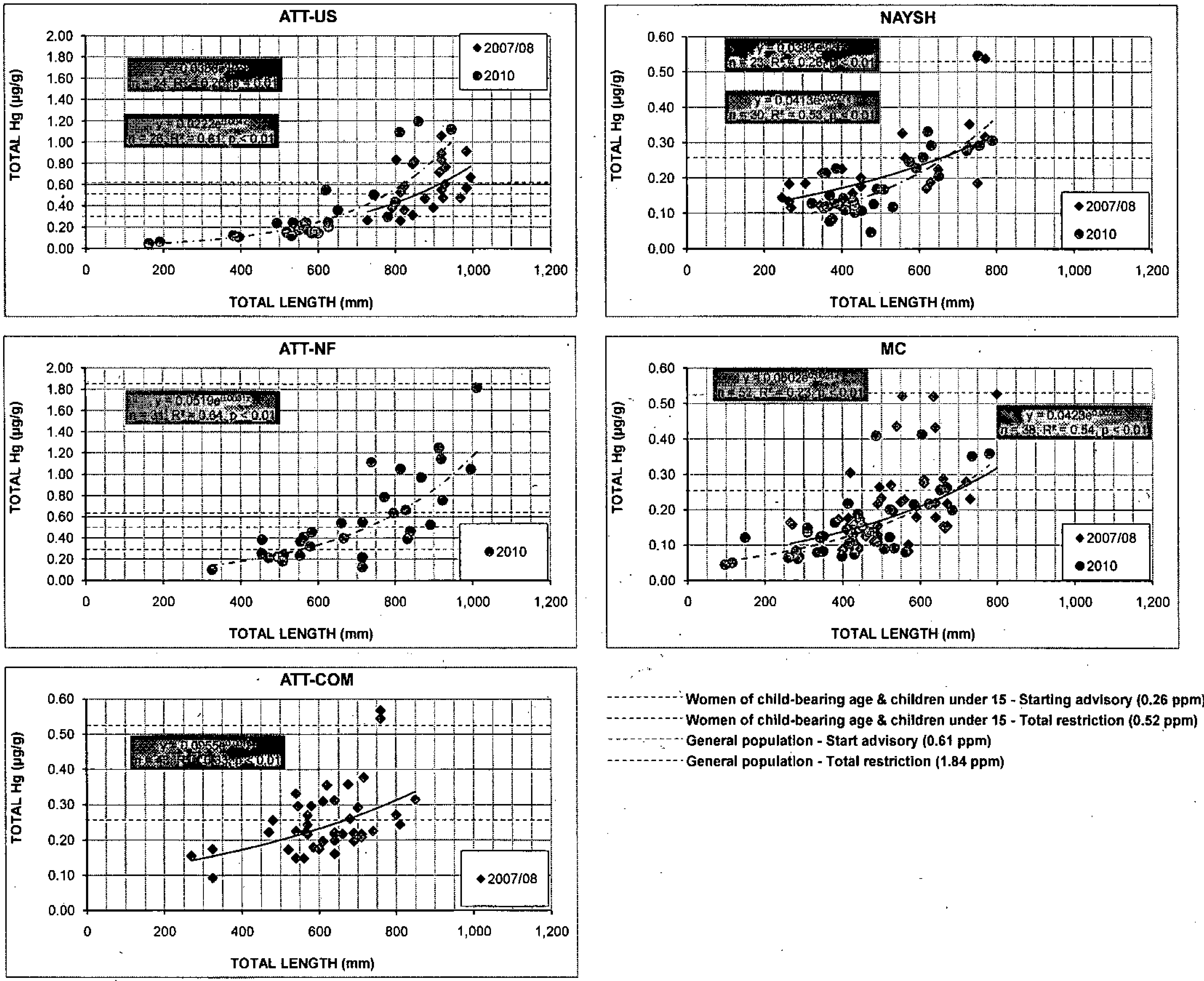

FIGURE 12: SITE SPECIFIC WALLEYE MEAN MERCURY BODY BURDEN (± 1 SE)

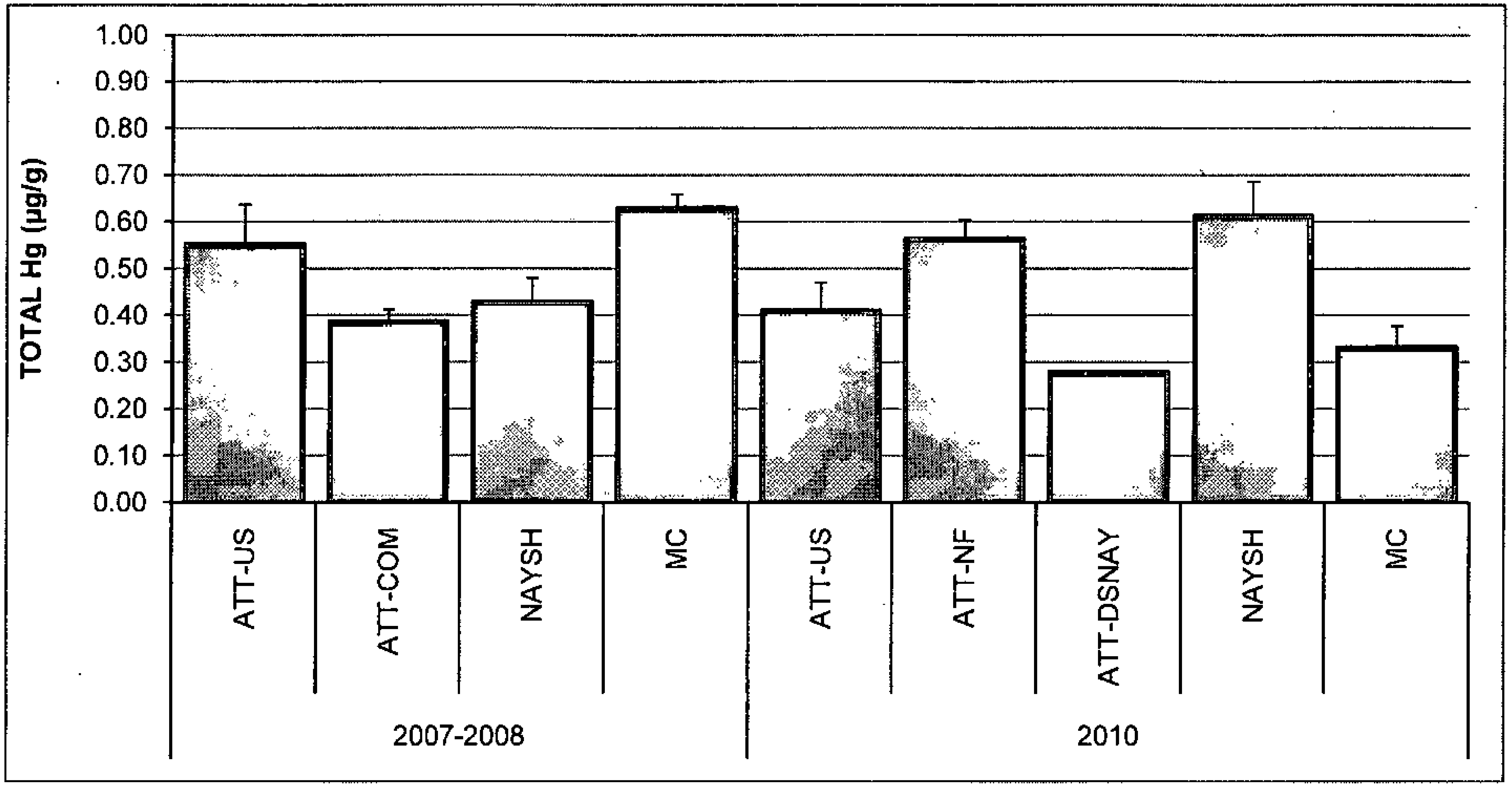

FIGURE 13: SITE SPECIFIC WALLEYE MERCURY BODY BURDENS AS A FUNCTION OF TOTAL LENGTH

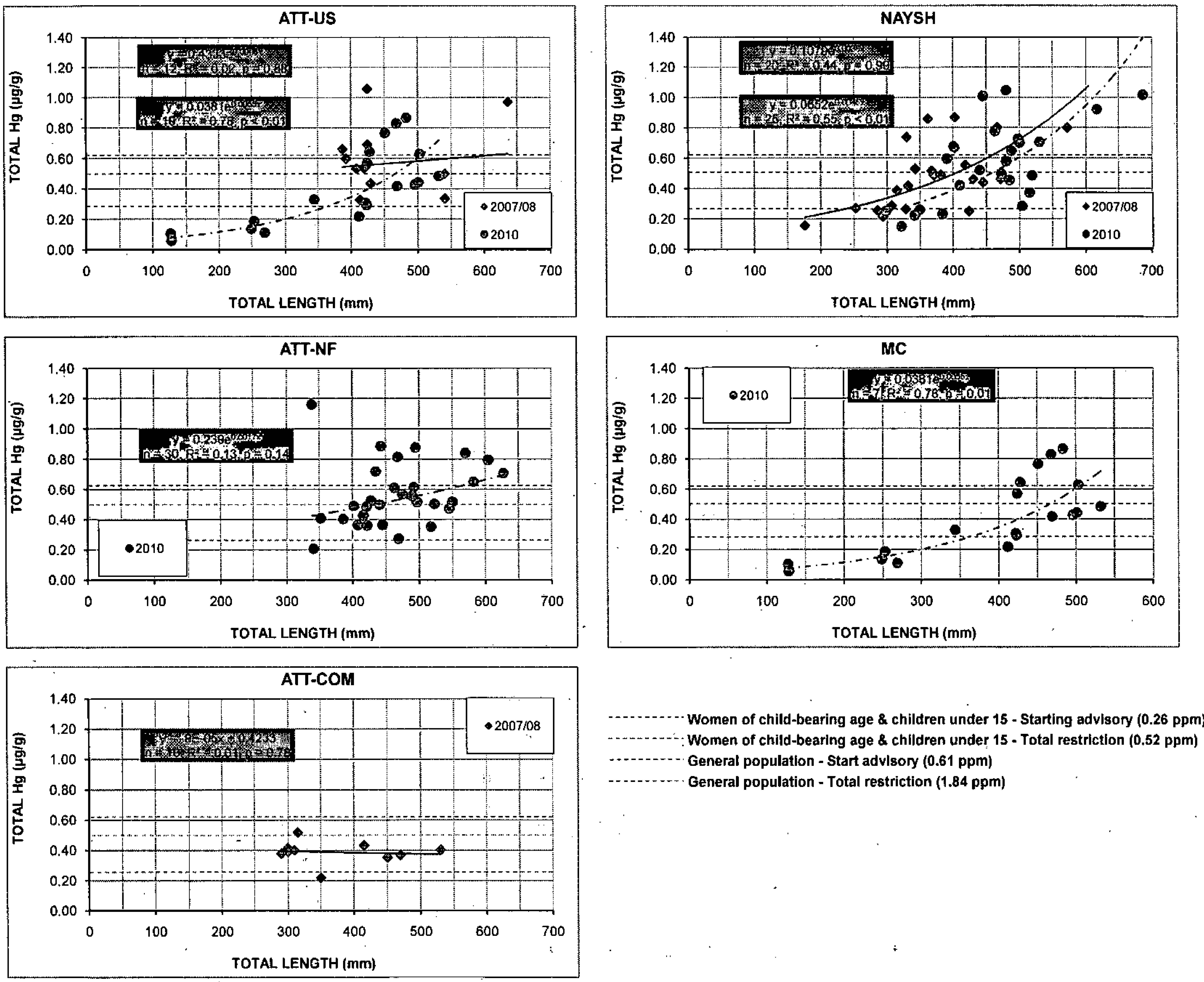

FIGURE 14: SITE SPECIFIC SUCKER MEAN MERCURY BODY BURDEN (± 1 SE)

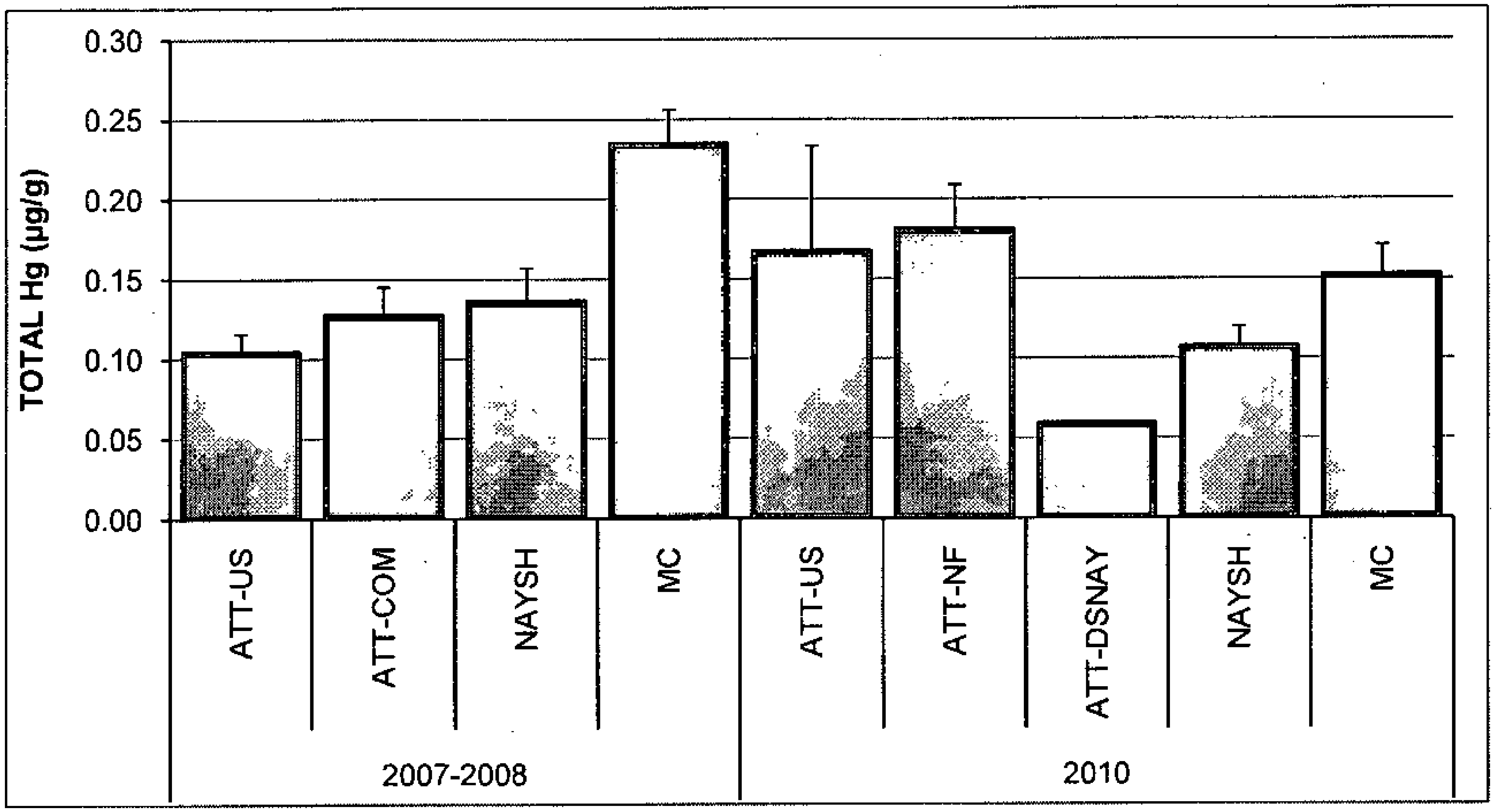

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FIGURE 15: SITE SPECIFIC SUCKER SPECIES MERCURY BODY BURDENS AS A FUNCTION OF TOTAL LENGTH