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February 2, 2007

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Re: Perfluorochemical Residential Exposure Data For Washington County, Minnesota

Ladies and Gentlemen:

In letters dated May 12, October 20, November 10, 2005, and January 13, 2006, we provided information regarding levels of various perfluorochemicals (PFCs), including PFOA and PFOS, detected in blood, soil, and water in the vicinity of 3M's perfluorochemical operations in Washington County, Minnesota. In recognition of the potential threat to human health and the environment revealed by the data, and in response to USEPA's prior public requests for perfluorochemical monitoring data, we are providing additional data to you for inclusion in USEPA's Administrative Record 226 and EPA-HQ-OPPT-2003-0012 to supplement the data we provided previously.

In particular, we are providing clarification with respect to the extent of our available data regarding detections of PFBA in the blood of residents exposed to PFBA in their drinking water. We thought this information might be of value in connection with the recent disclosure by the Minnesota Department of Health ("MDH") that PFBA has now been found in additional public water supply wells in Washington and Dakota Counties at levels exceeding the State's current guideline of 1.0 part per billion. (*See* Exhibit A) In our last letter on this topic dated January 13, 2006, we provided our own tap water sampling data confirming that PFBA had been found in tap water supplied by the City of Oakdale, Minnesota, at a level exceeding 1.0 part per billion, and that the level of PFBA in that water was actually more than double the amount of either PFOA and PFOS in the tap water. MDH's own recent sampling confirms that similar, if not higher, PFBA concentrations are present in additional public water supplies serving tens of thousands of additional residents of Washington and Dakota Counties. (*See id.*) Data independently collected and provided to us recently by an area resident reveal similarly elevated PFBA

concentrations in water from three wells identified to us as "Old Cottage Grove wells" (1.83 ppb, 1.85 ppb, and 1.25 ppb) and from tap water identified to us as being supplied by the City of South St. Paul (1.64 ppb).[1/] (*See* Exhibit B) These levels all also exceed the current 1.0 ppb well guideline for PFBS in drinking water.

Although a substantial number of the area blood samples referenced in our earlier letters were not analyzed for PFBA, some of the later samples included PFBA analysis and reveal detections as high as 2.92 ppb in the blood of an exposed individual. We have highlighted the available PFBA blood results in the following charts. We thought data confirming detections of PFBA in any exposed individuals would be of use to regulatory agencies evaluating this issue, particularly in light of MDH's current understanding that "PFBA does not appear to accumulate in animals or people." (Exhibit A)

Updated PFC results for serum samples collected and analyzed from Washington County, Minnesota, residents (this time, also noting PFBA blood results, if any) are summarized in the charts below. New serum data not included with our previous letters or included in 3M's August 4, 2006, letter forwarding some of our additional sampling information are highlighted below in bold type. The lab results for the new blood data are attached as Exhibit C. For privacy reasons, the names, addresses, and specific ages of those sampled are omitted from this submission. Please note that all results were provided by Axys Analytical Services LTD in Canada and were obtained, arranged for, and paid for without any involvement by 3M.

CHART A - OAKDALE CITY WATER CUSTOMERS

SEX	AGE	YEARS ON WATER	PFOA (ppb)/Dup.	PFOS (ppb)/Dup.	PFBA (ppb)/Dup.	TOTAL PFCs(ppb)*/ Dup.
M	<18	<10	155.0	180.0	1.16	371.35
M	41-50	N/A	121.0	109.0	N/T	267.12
F	51-60	>30	117.0	91.8	N/T	240.06

1/ We understand that the private citizen who reported these data to us arranged and paid for this testing and analysis through Axys Analytical Services, LTD in Canada.

SEX	AGE	YEARS ON WATER	PFOA (ppb)/Dup.	PFOS (ppb)/Dup.	PFBA (ppb)/Dup.	TOTAL PFCs(ppb)*/ Dup.
F	51-60	10-20	113.0	167.0	N/D	357.34
M	>70	>30	105.0	113.0	N/T	241.45
F	51-60	10-20	104.0	108.0	N/D	252.23
M	51-60	20-30	104.0/103.0	70.3/72.7	N/T	192.44/195.54
M	61-70	20-30	100.00	131.0	N/T	293.08
M	41-50	10-20	97.9	121.0	N/D	244.71
F	51-60	20-30	96.1	67.8	N/T	180.2
F	41-50	<10	95.1/89.1	85.9/79.8	N/T	200.71/186.15
M	51-60	10-20	92.7/92.5	88.0/111.0	2.92	211.78/240.23
M	51-60	20-30	86.8	125.0	N/T	248.01
F	61-70	>30	85.7	121.0	N/D	232.86
M	>70	N/A	82.3	118.0	N/T	221.79
F	61-70	20-30	80.5	163.0	N/T	212.40
M	**>70**	**>30**	**78.6**	**112.0**	**N/T**	**210.63**
F	41-50	N/A	77.5	78.4	N/T	178.51
F	31-40	10-20	75.9	103.0	N/D	196.84
F	51-60	20-30	74.9	61.1	N/T	152.72
M	31-40	10-20	74.6	91.0	N/T	182.36
F	18-30	N/A	70.9	112.0	N/D	200.91
F	**>70**	**>30**	**69.3**	**102.0**	**N/T**	**191.84**
F	41-50	N/A	69.0	77.2	N/T	163.79

SEX	AGE	YEARS ON WATER	PFOA (ppb)/Dup.	PFOS (ppb)/Dup.	PFBA (ppb)/Dup.	TOTAL PFCs(ppb)*/ Dup.
M	<18	<10	68.3	50.1	N/T	134.12
M	10-30	<10	67.4	83.3	N/D	167.12
M	41-50	10-20	63.3	76.7	N/T	158.88
F	41-50	<10	63.3	73.1	N/T	150.11
F	51-60	10-20	60.6	92.5	N/D	184.71
F	61-70	N/A	59.9	71.0	N/T	145.61
F	N/A	10-20	59.8	109.0	N/D	183.42
F	61-70	>30	58.7	73.4	N/T	149.48
M	61-70	<10	58.7	61.7	N/T	134.64
F	61-70	20-30	58.3	68.1	N/D	154.95
F	41-50	20-30	57.8	70.4	N/T	146.46
M	41-50	10-20	56.2	116.0	N/D	193.95
F	31-40	10-20	48.4	71.9	N/T	132.83
M	61-70	>30	46.1	85.3	N/D	131.40
M	<18	<10	45.4/46.4	68.2/71.7	N/D	130.85/132.92
M	51-60	10-20	44.6	60.4	N/T	115.40
M	41-50	<10	44.1	55.2	N/T	114.29
M	18-30	10-20	43.5	54.4	N/T	107.12
M	<18	10-20	42.4	51.1	N/T	107.84
M	61-70	>30	40.7	80.3	N/D	137.38
M	61-70	20-30	39.8	46.5	N/D	104.37

SEX	AGE	YEARS ON WATER	PFOA (ppb)/Dup.	PFOS (ppb)/Dup.	PFBA (ppb)/Dup.	TOTAL PFCs(ppb)*/ Dup.
F	41-50	10-20	39.3	46.3	N/D	94.34
F	18-30	20-30	38.8	47.6	N/T	96.33
M	51-60	>30	37.1	51.1	N/T	102.01
F	41-50	10-20	33.8	46.4	N/D	91.07
F	51-60	10-20	33.2	59.5	N/T	105.24
F	41-50	<10	32.7	41.5	N/T	89.66
M	41-50	10-20	32.1	57.6	N/T	103.35
F	<10	<10	30.7	56.8	N/T	99.11
F	<10	<10	27.5	62.0	N/T	98.63
F	51-60	10-20	26.2	104.0	1.06	149.68
F	51-60	<10	25.2	46.2	N/D	77.18
M	51-60	10-20	24.5	37.2	N/D	69.72
F	**41-50**	**10-20**	**23.8**	**40.3**	**N/D**	**74.18**
F	41-50	10-20	23.6	72.9	N/D	107.32
F	18-30	20-30	23.1	29.2	N/T	59.83
F	51-60	20-30	22.2	46.1	N/T	74.88
F	31-40	<10	21.1/19.6	12.8/8.81	N/T	29.64/36.80
M	41-50	10-20	20.3	32.5	N/D	60.23
F	51-60	10-20	19.7	52.6	N/D	76.87
F	<18	10-20	19.1	42.9	N/T	71.21
F	41-50	<10	18.6	21.0	N/D	43.83

SEX	AGE	YEARS ON WATER	PFOA (ppb)/Dup.	PFOS (ppb)/Dup.	PFBA (ppb)/Dup.	TOTAL PFCs(ppb)*/ Dup.
F	<18	<10	17.1	20.1	N/T	43.08
M	<18	<10	16.1	24.3	N/D	51.95
M	31-40	<10	15.5	12.7	N/T	29.31
F	**41-50**	**<10**	**14.9**	**23.6**	**N/D**	**42.94**
F	31-40	10-20	14.6	37.4	N/D	59.61
M	41-50	<10	14.6	30.8	N/T	49.49
M	<18	<10	13.4	50.1	N/D	83.18
F	18-30	<10	13.3	12.3	N/T	27.14
M	41-50	<10	12.8	30.1	N/D	47.16
M	41-50	<10	11.2	27.7	N/D	57.94
F	18-30	<10	10.7	23.1	N/T	35.87
M	**41-50**	**10-20**	**10.5**	**35.2**	**N/D**	**52.66**
M	>70	20-30	10.2	24.2	N/T	35.31
F	31-40	<10	8.76	30.1	N/D	45.35
F	18-30	<10	7.35	10.5	N/T	19.39
F	61-70	>30	6.96	22.6	N/T	36.00
M	31-40	<10	6.16	16.1	N/D	26.90
F	18-30	10-20	6.09	17.7	N/D	26.79

SEX	AGE	YEARS ON WATER	PFOA (ppb)/Dup.	PFOS (ppb)/Dup.	PFBA (ppb)/Dup.	TOTAL PFCs(ppb)*/ Dup.
M	41-50	<10	5.52	8.27	N/D	15.82

N/T=not tested
N/A=data not available
N/D=not detected above laboratory detection limits
*Total of detected levels of PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnA, PFDoA, PFBS, PFHxS, PFOS, PFBA, and PFOSA in the blood sample

CHART B - LAKE ELMO/COTTAGE GROVE/ HASTINGS CITY WATER CUSTOMERS

SEX	AGE	YEARS ON WATER	PFOA (ppb)	PFOS (ppb)	PFBA (ppb)	TOTAL PFCs(ppb)***
F	51-60	<10	42.3	49.5	N/T	106.04
M	18-30	10-20	11.4	50.8	N/T	72.75
M	<18	<10	7.89	19.0	N/D	29.72
M	51-60	<10	7.21	38.9	N/T	57.56
F	N/A	N/A	6.9	19.6	N/T	33.04
M	31-40	10-20	6.78 (4.22*)	10.5 (7.95*)	N/D	24.07
M	31-40	>30	6.13	13.5	N/D	22.77
F	41-50	<10	4.97	12.9	N/D	21.57
M	>70	>30	4.34	14.0	N/D	21.99
F	51-60	10-20	4.10	17.3	N/T	26.12
M	51-60	10-20	3.89	21.2	N/T	29.84

SEX	AGE	YEARS ON WATER	PFOA (ppb)	PFOS (ppb)	PFBA (ppb)	TOTAL PFCs(ppb)***
M	31-40	<10	3.79	14.9	N/D	24.16
F	N/A	N/A	3.36	21.4	N/D	29.36
F**	51-60	>30	2.21	7.88	N/T	18.27
F	<18	<10	1.95	N/D	N/D	1.95

* = whole blood analysis
**= former 3M employee
N/T=not tested
N/A=data not available
N/D=not detected above laboratory detection limits
***Total of detected levels of PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnA, PFDoA, PFBS, PFHxS, PFOS, PFBA, and PFOSA in the blood sample

CHART C - WASHINGTON COUNTY PRIVATE WELL USERS

1. Lake Elmo Area Private Wells

SEX	AGE	YEARS ON WATER	PFOA (ppb)	PFOS (ppb)	PFBA (ppb)	TOTAL PFCs(ppb)*
M	**41-50**	**<10**	**133.0**	**155.0**	**N/D**	**322.93**
F	**<18**	**<10**	**110.0**	**111.0**	**N/T**	**247.19**
F	**41-50**	**10-20**	**72.9**	**87.6**	**N/T**	**175.25**
F	**<18**	**10-20**	**55.4**	**60.0**	**N/T**	**124.35**
M	41-50	20-30	45.7	19.7	**N/D**	72.11
F	41-50	<10	39.0	57.4	N/D	112.63
F	**61-70**	**20-30**	**30.9**	**88.6**	**N/T**	**128.93**

SEX	AGE	YEARS ON WATER	PFOA (ppb)	PFOS (ppb)	PFBA (ppb)	TOTAL PFCs(ppb)*
M	**61-70**	**20-30**	**24.2**	**38.0**	**N/T**	**69.91**
M	**51-60**	**10-20**	**27.0**	**28.5**	**N/T**	**62.32**
F	51-60	>30	24.0	17.1	N/D	50.96
M	**51-60**	**10-20**	**20.1**	**53.5**	**N/D**	**86.21**
M	N/A	N/A	16.4	22.1	N/D	44.43
F	41-50	10-20	15.7	9.27	N/D	27.68
F	>70	>30	14.3	8.90	N/D	26.27
M	61-70	>30	12.1	9.78	N/D	24.89
M	61-70	10-20	10.4	42.0	N/D	61.40
M	**41-50**	**10-20**	**9.66**	**26.6**	**N/T**	**42.51**
M	18-30	20-30	7.56	17.3	N/T	33.70
M	61-70	20-30	6.95	43.1	N/T	55.00
M	51-60	20-30	6.78	21.0	N/T	36.91
M	61-70	>30	6.10	43.7	N/T	54.19
F	61-70	10-20	6.06	36.9	N/D	49.09
F	**51-60**	**10-20**	**5.92**	**29.5**	**N/T**	**41.26**
M	51-60	N/A	5.35	20.4	N/T	29.02
F	41-50	N/A	3.14	11.2	N/T	16.29
F	61-70	>30	2.4	12.0	N/T	17.91

N/T=not tested
N/A=data not available
N/D=not detected above laboratory detection limits
*Total of detected levels of PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnA, PFDoA, PFBS, PFHxS, PFOS, PFBA, and PFOSA in the blood sample

2. Cottage Grove/Hastings Area Private Wells

SEX	AGE	YEARS ON WATER	PFOA (ppb)	PFOS (ppb)	PFBA (ppb)	TOTAL PFCs(ppb)***
M**	>70	20-30	19.7	108.0	N/T	151.41
F	31-40	<10	17.1	16.9	N/D	45.18
F	61-70	10-20	14.2	35.6	2.34	57.93
F	61-70	<10	10.3	28.7	N/D	45.53
F	51-60	20-30	9.12	42.8	N/D	57.61
M	61-70	<10	9.40	39.0	N/D	61.40
M	31-40	10-20	8.80	40.6	N/T	61.82
F	61-70	>30	7.38	32.5	N/T	66.46
M	>70	>30	6.42	32.5	N/T	45.32
M	<18	<10	5.75	14.9	N/D	27.01
F	41-50	20-30	4.97	16.3	N/D	25.08
F	41-50	<10	4.68	12.0	N/D	20.71
F	41-50	<10	4.31	23.5	N/D	32.92
F	51-60	10-20	4.12	12.4	N/T	18.60
M	61-70	10-20	3.88	38.6	N/D	49.39
F	<18	<10	3.87	15.8	N/T	28.51
F	N/A	N/A	3.54 (2.98*)	8.51 (8.3*)	N/D	15.76
F	41-50	>30	3.39	14.9	N/T	21.83
F	41-50	10-20	3.24	24.5	N/T	35.27
M	<18	<10	2.83	14.8	N/T	23.53

SEX	AGE	YEARS ON WATER	PFOA (ppb)	PFOS (ppb)	PFBA (ppb)	TOTAL PFCs(ppb)***
M	41-50	<10	2.01	22.4	N/D	29.52

*=whole blood analysis
**=former 3M employee
N/A=data not available
N/T=not tested
N/D=not detected above laboratory detection limits
***Total of detected levels of PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnA, PFDoA, PFBS, PFHxS, PFOS, PFBA, and PFOSA in the blood sample

Very truly yours,

Robert A. Bilott

RAB/mdm
Enclosures
cc: Alan Williams, Esq. (w/ encls.)
Gale D. Pearson, Esq. (w/o encls.)
Stephen J. Randall, Esq. (w/o encls.)
J. Mark Englehart, Esq. (w/o encls.)
R. Edison Hill, Esq. (w/o encls.)
Larry A. Winter, Esq. (w/o encls.)
Martha K. Wivell, Esq. (w/o encls.)

EXHIBIT A

Minnesota Department of Health
Protecting, maintaining and improving the health of all Minnesotans

MINNESOTA MDH DEPARTMENT OF HEALTH

Minnesota Department of Health

News Release

January 19, 2007

Contact information

Low levels of PFBA found in six cities' wells in southeast metropolitan area

Levels pose no immediate health risk to residents; source of contamination under investigation

The Minnesota Department of Health has detected low levels of the chemical perfluorobutanoic acid (PFBA) in municipal wells in Woodbury, Cottage Grove, Newport, St. Paul Park, South St. Paul and Hastings. The contamination in all of these cities, except Woodbury, appears to be occurring in an area of groundwater that is separate from the one in Lake Elmo and Oakdale. The source of this new area of contamination is under investigation.

PFBA is one of a family of chemicals known as perfluorochemicals or PFCs. They were made and used by several companies around the world in household and industrial products such as stain repellents, lubricants, fire retardants and suppressants, pesticides, surfactants, and emulsifiers. PFBA was made by the 3M Company at its Cottage Grove facility.

Studies in laboratory animals have shown that PFCs may cause health problems if consumed in large enough quantities over long periods of time, or consumed at a sensitive time during development. Studies by 3M of workers exposed to PFCs during manufacturing show no apparent impact on their health.

"Finding this chemical at low levels does not pose an immediate health risk for residents," said John Linc Stine, director of the Environmental Health Division for MDH. "It does mean we need to proceed cautiously, investigate further and, if necessary, take steps to reduce people's exposure for the long term. Our toxicologists are currently evaluating the limited scientific information available on PFBA."

Staff from MDH and the Minnesota Pollution Control Agency will be conducting extensive testing, including private wells, to determine the extent of the

groundwater contamination. City wells will be monitored monthly for levels of PFCs.

The PFBA was found as part of MDH's ongoing investigation into groundwater contamination in southern Washington County. The investigation began several years ago when health officials learned 3M disposed of PFC wastes at three sites in Washington County: the former Washington County Sanitary Landfill, the former Abresch dump in Oakdale, the 3M Cottage Grove facility and another disposal site on the border of Woodbury and Cottage Grove.

In 2004, MDH staff began collecting samples from private wells in the City of Lake Elmo to look for two PFCs, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). Low levels of PFOA were found in a few private wells near the Washington County Landfill. In 2005 more testing detected PFOS and PFOA in a larger group of private wells in Lake Elmo and several city wells in Oakdale. Tests in several other nearby municipal water supplies, including Cottage Grove, Woodbury, and Hastings did not find PFOA or PFOS.

In spring 2006, the MDH Public Health Laboratory developed methods to detect five more types of PFCs. Analysis of the water samples revealed that one of these, PFBA, is widespread. PFBA seems to move very freely in the groundwater; more so than PFOS or PFOA. It does not break down or degrade. PFBA has now been found in two distinct areas of southern Washington County.

One area of groundwater contamination appears to originate from the former Washington County Landfill in Lake Elmo and the former Abresch Dump in Oakdale. This area extends into the City of Woodbury. In drinking water near the disposal sites, multiple PFCs, including PFOA and PFOS, are found. Only PFBA has been detected in the Woodbury municipal wells.

A second area of groundwater contamination is located further south and is primarily PFBA, with no detections of PFOA or PFOS. PFBA has been detected in all of the city wells in Cottage Grove, St. Paul Park and Newport and in some city wells in South St. Paul and Hastings. This area of contamination may originate from the disposal site on the border of Woodbury and Cottage Grove.

So far, PFCs have not been found in limited testing of groundwater done elsewhere in the metropolitan area.

"Learning about chemical contamination in groundwater is a step-by-step process," Stine said. "Though the discovery of PFCs in the southeast metro is relatively new, testing information from the last couple of years suggests that the levels of PFCs in the groundwater are stable and not increasing. The testing information also suggests that PFCs have been present for some time. Our testing for these chemicals has improved since we began."

MDH has been using the well advisory guideline for PFOA, 1 ppb, as a temporary guideline for PFBA. "It's important to note that these are guidelines and there is not a bright line of health risk for findings just above or below the number of 1," Stine said. "The levels of PFBA in each of the four cities is still very low. Some wells in Cottage Grove and St. Paul Park slightly exceed the MDH guidelines. The initial sampling results for South St. Paul and Hastings still need to be confirmed."

Scientific understanding of the relative toxicity of PFBA, along with the other PFCs is evolving. "Looking at new studies and some underway, we anticipate that PFBA should be less toxic to people than PFOA based on its chemical characteristics and on preliminary data from animal studies," Stine said. "In contrast to PFOA and PFOS, PFBA does not appear to accumulate in animals or people." Once the studies are completed and reviewed, MDH will develop specific advice for PFBA as well as revised values for PFOS and PFOA.

MDH will meet with officials from the affected cities next week to further discuss the test results and their implications. MDH will continue to provide technical support to cities for managing their drinking water systems.

While there is no immediate concern for drinking water, residents who have PFBA in their drinking water and wish to reduce their exposure can take some simple steps. They can use bottled water for part or all of their drinking or cooking needs. Also, filters containing granular activated carbon (GAC) remove PFCs, including PFBA. Many common water filters contain GAC.
Residents in the affected areas who want further information can contact the Minnnesota Department of Health Environmental Health Division at 651-201-4897 or visit MDH's Drinking Water Protection Web page at http://www.health.state.mn.us/divs/eh/water/index.html.

-MDH-

Map of PFC plumes in S. Washington Co. (PDF: 74KB/1 page)

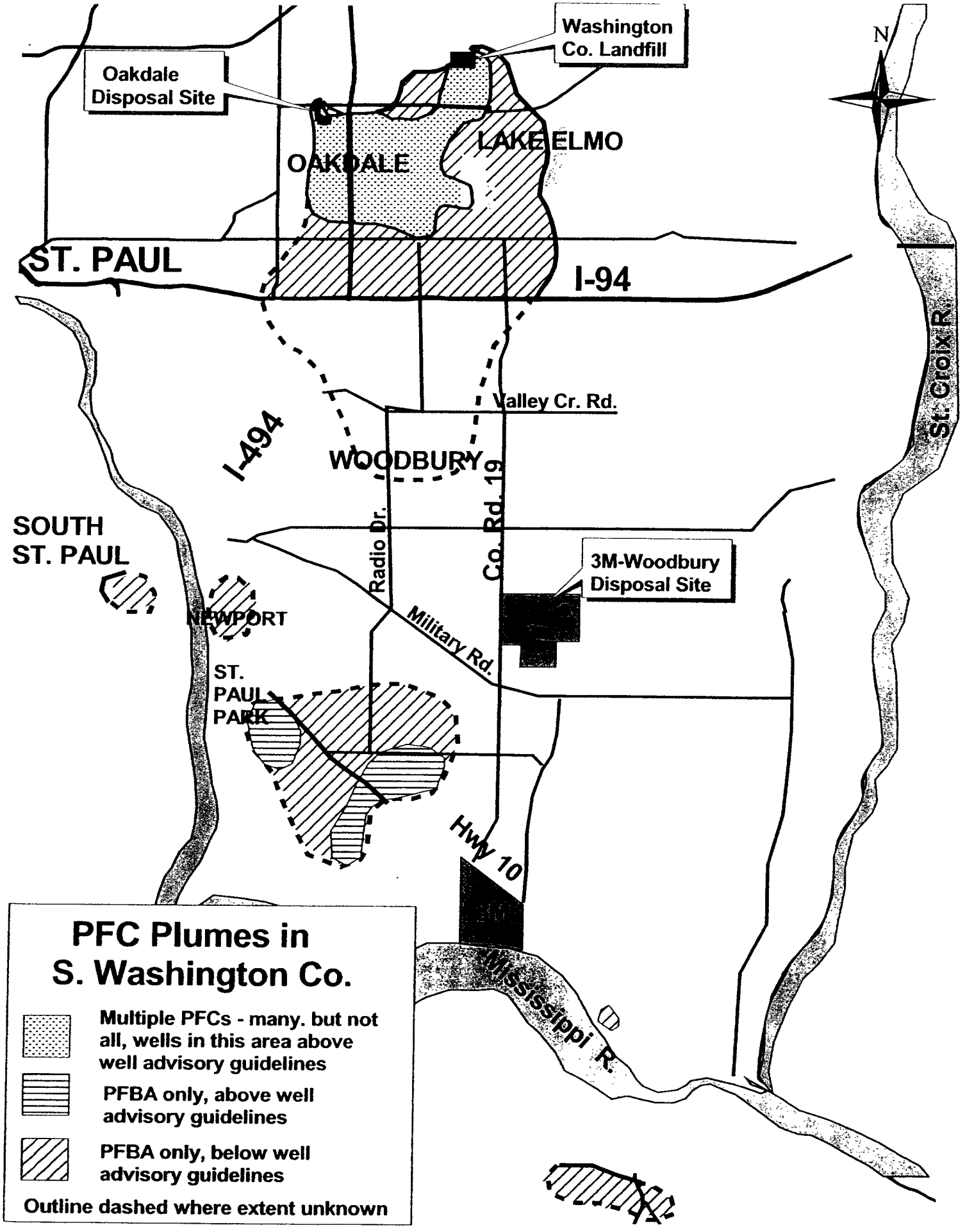
PFBA in the Groundwater of the South East Metro Area

For more information, contact:

Doug Schultz
MDH Communications
(651) 201-4993

| Return to top | MDH Home | News Releases |

Updated Thursday, 01-Feb-2007 12:34:59 CST


Washington Co. Landfill
Oakdale Disposal Site
N
OAKDALE
LAKE ELMO
ST. PAUL
I-94
St. Croix R.
Valley Cr. Rd.
I-494
WOODBURY
Radio Dr.
Co. Rd. 19
SOUTH ST. PAUL
3M-Woodbury Disposal Site
NEWPORT
Military Rd.
ST. PAUL PARK
Hwy 10
Mississippi R.
PFC Plumes in S. Washington Co.
Multiple PFCs - many. but not all, wells in this area above well advisory guidelines
PFBA only, above well advisory guidelines
PFBA only, below well advisory guidelines
Outline dashed where extent unknown

Minnesota Department of Health
Protecting, maintaining and improving the health of all Minnesotans

MDH

Hazardous Substances in Minnesota

PFBA in the Groundwater of the South East Metro Area

January 2007

Public Well PFBA Testing Results (PDF: 134KB/1page)

What is PFBA?

PFBA stands for perfluorobutanoic acid. It is one of a family of chemicals known as perfluorochemicals, or PFCs. PFCs are made by 3M in Cottage Grove and several other companies around the world for use in household and industrial products such as: stain repellents, lubricants, fire retardants and suppressants, pesticides, surfactants, and emulsifiers. PFBA was made by the 3M Company at its Cottage Grove facility, reportedly for use in film coatings. PFBA may also be a breakdown product of other PFCs.

How did we learn PFBA was in the groundwater?

Learning about chemical contamination in groundwater is a step by step process. Though the discovery of PFCs in groundwater in Washington County is relatively new, testing information from the last couple of years suggests that the levels of PFCs in the groundwater are stable and not increasing. The testing information also suggests that PFCs have been present for some time. Our testing for these chemicals has improved since we began.

3M disposed of PFC wastes at three sites in Washington County: the former Washington County Sanitary Landfill, the former Abresch dump in Oakdale and another disposal site on the border of Woodbury and Cottage Grove.

In 2004, MDH staff began collecting samples from private wells in the City of Lake Elmo to look for two PFCs, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). Low levels of PFOA were found in a few private wells near the former Washington County Landfill. More testing in 2005 revealed PFOS and PFOA in a larger group of private wells in Lake Elmo and several city wells in Oakdale. Tests in several other nearby municipal water supplies, including Cottage Grove, Woodbury, and Hastings did not find PFOA or PFOS.

In spring 2006, the MDH Public Health Laboratory developed methods to look for five more PFCs. Analysis of the water samples revealed that one of these, PFBA, is widespread. PFBA seems to move very freely in the groundwater; more so than PFOS or PFOA. It does not break down or degrade. PFBA is found in two distinct areas.

One area of groundwater contamination appears to originate from the former Washington County Landfill in Lake Elmo and the former Abresch Dump in Oakdale. This area extends into the City of Woodbury. In drinking water near the disposal sites, multiple PFCs, including PFOA and PFOS, are found. Only PFBA has been detected in the Woodbury municipal wells.

A second area of groundwater contamination is located further south and is primarily PFBA, with no detections of PFOA or PFOS. Confirming the test results of 2005, no PFOA or PFOS have been detected in these areas, but PFBA has been detected in all of the city wells in Cottage Grove, St. Paul Park and Newport, and some of the city wells in South St. Paul and Hastings. This area of contamination may originate from the disposal site on the border of Woodbury and Cottage Grove. Investigations are underway to determine if this site is the source of the contamination.

How does MDH decide if there are unsafe levels of PFCs in the drinking water?
A Health Based Value (HBV) is the amount of a chemical in drinking water considered by MDH to be safe for people to drink daily for up to a lifetime. In 2002 MDH developed HBVs for PFOA and PFOS because PFCs were disposed of in dumps and landfills in Minnesota and had been found in groundwater. HBVs are advisory values and are used by state health and environmental programs as one tool for deciding what actions should be taken.

Since 2002, new toxicological studies on PFCs have become available. MDH is in the process of re-evaluating the 2002 HBVs in light of this new information. As a cautious public health approach until the review is completed, MDH has been using the following well advisory guidelines:

PFOS: 0.6 ppb
PFOA: 1 ppb

Again, as a cautious public health approach, MDH is using the well advisory guideline for PFOA of 1 ppb to evaluate all the PFC carboxylic acids, including PFBA. Similarly, the well advisory guideline of 0.6 ppb for PFOS is being used to evaluate all PFC sulfonic acids. These guidelines are used to determine MDH drinking water advice.

When MDH looks at a chemical in water, it also considers if the chemical could evaporate out of the water when people wash clothes or shower and be breathed in, or if the chemical could be absorbed through people's skin. The chemistry of PFBA suggests that it does not easily evaporate from water. At this time, the exposure of most concern is through drinking water and not breathing it in or absorbing it through the skin.

The US EPA and 3M are currently doing more studies on PFBA. We anticipate that PFBA should be less toxic to people than PFOA based on its chemical characteristics and on preliminary data from animal studies. Unlike PFOA and PFOS, PFBA does not appear to accumulate in animals or people. Once the studies are completed and reviewed, MDH will revise our advice for PFBA, as well as PFOS and PFOA.

What is being done to monitor the situation?
MDH will continue to monitor the PFBA levels in public and private wells in the southeast metropolitan area and will report the results to citizens, local communities, local governments, county governments and the MPCA so that people's health will continue to be protected.

How can I reduce my exposure to PFBA?
Based on the available information, there is no immediate concern for drinking water. If PFBA has been detected in your drinking water and you wish to reduce your exposure, there are some simple steps you can take. You could use bottled water for part or all of your drinking or cooking needs. However, widespread testing of bottled water for PFCs has not been done.

Filters containing granular activated carbon (GAC) remove PFCs, including PFBA. Many common water filters contain GAC. Be sure that any GAC filter system is properly installed and maintained. Because GAC is not as effective at removing and retaining PFBA for as long as other PFCs, special care should be taken to change the carbon in the GAC at recommended intervals.

It is unlikely that other types of common water treatment systems, such as water softeners or reverse osmosis units, would remove PFBA. Boiling the water will not remove PFBA or other PFCs.

Beware of "fly by night" water treatment sellers. If you are interested in installing a water

treatment system of any sort, be sure to work with a reputable supplier.

Printable information sheet (PDF: 37KB/1page)

Who can I contact for further information?
Minnesota Department of Health (health issues)
James Kelly, Health Risk Assessor 651-201-4910
Ginny Yingling, Hydrogeologist, 651-201-4930
Helen Goeden, Research Scientist, 651-201-4904
Chad Kolstad, Engineer, 651-643-2103
Stew Thornley, Health Educator, 651-201-4655
Tannie Eshenaur, Health Educator, 651-201-4897

Minnesota Pollution Control Agency (site investigation)
Walker Smith, Public Information Officer, 651-297-7018

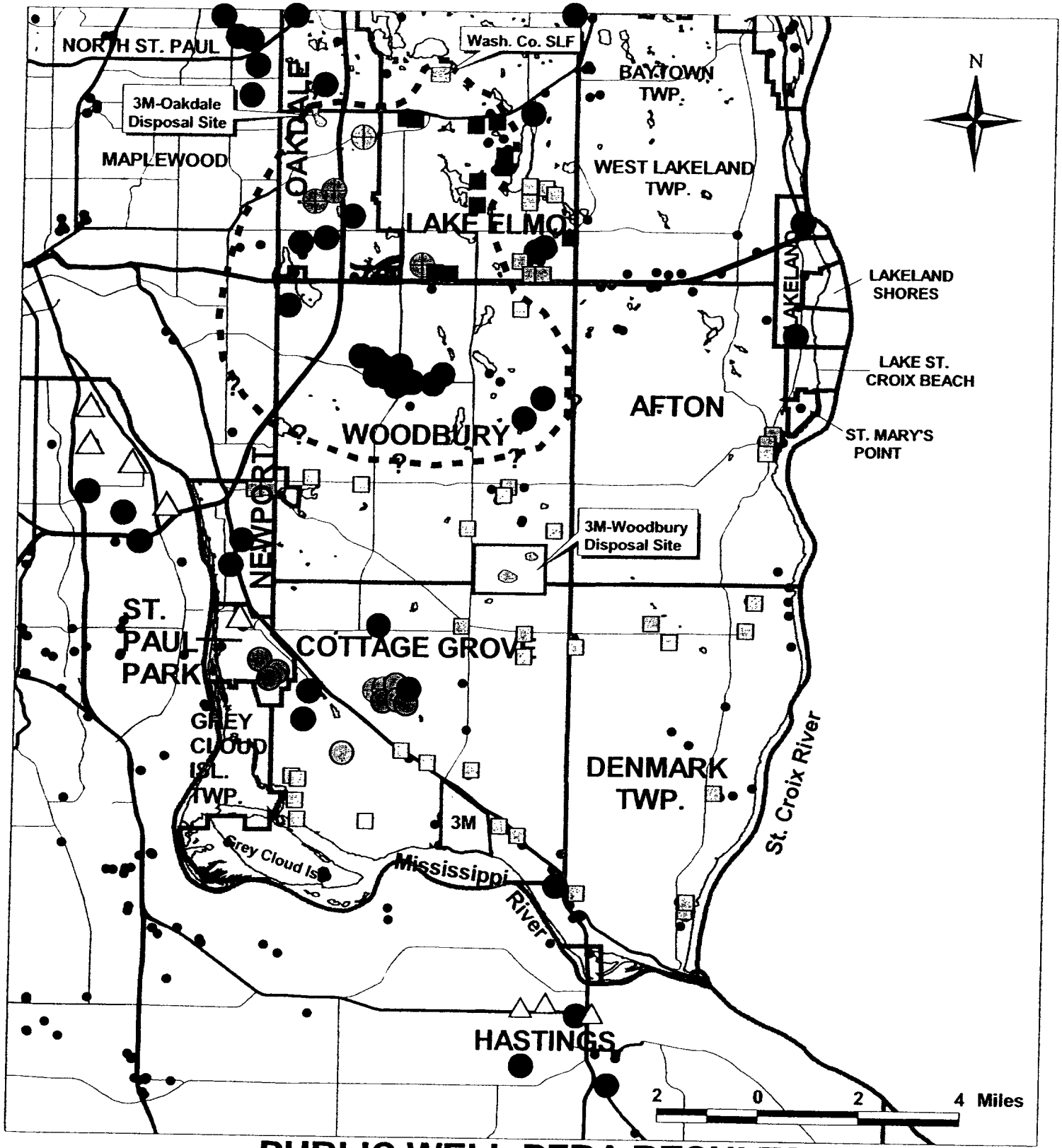
Dakota County
Jill Trescott, Water Resources Office, 952-891-7019

Washington County (general groundwater issues)
John Freitag, Public Health & Environment, 651-430-6707
Amanda Goebel, Public Health & Environment, 651-430-6477

This information sheet was prepared in cooperation with the Agency for Toxic Substances and Disease Registry.

For more information about this page, please contact us at hazhealth@health.state.mn.us call 651-201-4897, or toll-free 1-800-657-3908 and press "4" to leave a message.

Updated Wednesday, 24-Jan-2007 16:06:00 CST



PUBLIC WELL PFBA RESULTS

SYMBOLS

- ○ City well, tested for 7 PFCs, ND or only PFBA
- ⊕ City well, tested for 7 PFCs, PFBA and other PFCs
- ◑ City well, tested only for PFOA and PFOS
- △ City well, not used in winter
- □ Public, non-community well, ND or only PFBA

PFBA Concentrations

- PFBA not detected
- PFBA: 0.2 - 0.5 ug/L
- PFBA: 0.6 - 0.9 ug/L
- PFBA: 1.0 - 1.5 ug/L
- PFBA: 1.6 - 2.0 ug/L
- Results pending

Prepared: 1/19/07

EXHIBIT B

PERFLUORINATED ORGANICS ANALYSIS

AQUEOUS SAMPLES

AXYS METHOD: MLA-040

Contract: REDACTED
Data Package Identification: DPWG20231
Analysis WG20112

Prepared for:
REDACTED

Prepared by:
AXYS Analytical Services Ltd.
P.O. Box 2219, 2045 Mills Rd West
Sidney, British Columbia V8L 3S8
CANADA

Contact: Kalai Pillay
Project Manager

10 October 2006

CLIENT ID	REDACTED				Lab Blank	Spiked Matrix
AXYS ID	L9264-1	L9264-2	L9264-3	L9264-4 (A)	WG20112-101	WG20112-102
WORKGROUP	WG20112	WG20112	WG20112	WG20112	WG20112	WG20112
Sample Size	0.502 L	0.501 L	0.502 L	0.503 L	0.500 L	
UNITS	ng/L	ng/L	ng/L	ng/L	ng/L	% Recov
PFBA	1830	1850	1250	1840	< 1.15	89
PFPeA	71	53.9	54.7	62.9	< 1.09	86.6
PFHxA	15.2	15.9	14.6	17.9	< 0.952	83.8
PFHpA	1.86	2.42	5.52	5.24	< 1.11	89.5
PFOA	3.39	15.3	23.2	21.3	< 1.11	78.2
PFNA	< 0.933	< 0.934	< 0.932	< 0.930	< 0.936	79.8
PFDA	< 1.00	< 1.01	< 1.00	< 1.00	< 1.01	83.8
PFUnA	< 1.02	< 1.02	< 1.02	< 1.02	< 1.02	90.7
PFDoA	< 1.15	< 1.15	< 1.15	< 1.14	< 1.15	88.5
PFBS	< 2.81	< 2.82	< 2.81	< 2.80	< 2.82	80
PFHxS	< 2.57	< 2.57	< 2.57	4.63	< 2.58	83.8
PFOS	< 2.30	< 2.31	< 2.30	< 2.30	< 2.31	82.2
PFOSA	< 0.957	< 0.958	< 0.958	< 0.953	< 0.960	66.3

EXHIBIT C

AXYS METHOD MLA-031 Rev 01 | CLIENT ID:

PFOS_S1_D8

Form 1A/2

PERFLUORINATED SURFACTANT ANALYSIS REPORT

		Sample Collection:	08-Mar-2005 11:00
Lab Name: AXYS ANALYTICAL SERVICES			
Contract No.:	4191	Lab Sample ID:	L7652-27R2
Matrix:	SERUM	Sample Size:	1.00 mL
Sample Receipt date:	10-Mar-2005	Initial Calibration Date:	BRACKETING CAL
Extraction Date:	21-Apr-2005	Instrument ID:	LC-MS/MS
Analysis Date:	22-Apr-2005 Time: 1:37:18	LC Column ID:	C18, Zorbax XDB
Extract Volume (mL):	2	Sample Datafile:	PFS5G_058S047
Injection Volume (µL):	30.0	Blank Data Filename:	PFS5G_058S026
Dilution Factor:	N/A	Multiple Cal. data Filenames:	PFS5G_058S029 PFS5G_058S038 PFS5G_058S050
Concentration Units :	ng/mL		

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	U		0.312	
PFHxA	U		0.103	
PFHpA		0.839	0.0608	3.87
PFOA		78.6	0.0510	5.36
PFNA		1.07	0.0417	5.73
PFDA		0.468	0.0168	6.06
PFUnA		0.198	0.0079	6.40
PFDoA		0.044	0.0102	6.76
PFBS		0.117	0.0588	3.04
PFHxS		17.3	0.128	5.52
PFOS		112	0.204	6.22

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%) [2]	RETENTION TIME
13C-PFOA		12.0	8.80	73.3	5.36
13C-PFDA		12.0	9.43	78.6	6.08

(1) U = not detected
(2) R (%) = Percent recovery

15825PFD1_2.xls, S16 | Approved by: _____ QA/QC Chemist | 18-05-2005 dd-mm-yyyy

AXYS METHOD MLA-031 Rev 01 | CLIENT ID:

PFOS_S1_08

Form 1A/2

PERFLUORINATED SURFACTANT ANALYSIS REPORT

		Sample Collection:	08-Mar-2005 11:00
Lab Name: AXYS ANALYTICAL SERVICES			
Contract No.:	4191	Lab Sample ID:	L7652-25R2
Matrix:	SERUM	Sample Size:	1.00 mL
Sample Receipt date:	10-Mar-2005	Initial Calibration Date:	BRACKETING CAL
Extraction Date:	21-Apr-2005	Instrument ID:	LC-MS/MS
Analysis Date:	22-Apr-2005 Time: 1:24:26	LC Column ID:	C18, Zorbax XDB
Extract Volume (mL):	2	Sample Datafile:	PFS5G_058S046
Injection Volume (µL):	30.0	Blank Data Filename:	PFS5G_058S026
Dilution Factor:	N/A	Multiple Cal. data Filenames:	PFS5G_058S029 PFS5G_058S038 PFS5G_058S050
Concentration Units :	ng/mL		

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	U		0.181	
PFHxA	U		0.114	
PFHpA		0.117	0.0734	3.97
PFOA		69.3	0.0541	5.34
PFNA		1.12	0.0129	5.73
PFDA		0.288	0.0157	6.06
PFUnA		0.115	0.0159	6.38
PFDoA	U		0.0377	
PFBS	U		0.0519	
PFHxS		18.9	0.0749	5.50
PFOS		102	0.171	6.22

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%) [2]	RETENTION TIME
13C-PFOA		12.0	9.99	83.2	5.34
13C-PFDA		12.0	11.7	97.9	6.06

(1) U = not detected
(2) R (%) = Percent recovery

1562SPFD1_2.xls, S15

Approved by: _____ QA/QC Chemist

10-05-2005
dd-mm-yyyy

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

AXYS METHOD MLA-042 Rev 08
AXYS ANALYTICAL SERVICES
P.O. Box 2219, 2045 MILLS RD. WEST, SIDNEY, B.C., CANADA
V8L 3S8 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4191	**Lab Sample I.D.:**	L9303-3
Matrix:	SERUM	**Sample Size:**	0.500 mL
Sample Receipt Date:	21-Sep-2006	**Initial Calibration Date:**	26-Sep-2006
Extraction Date:	26-Sep-2006	**Instrument ID:**	LC MS/MS
Analysis Date:	27-Sep-2006 Time: 00:48:24	**Column ID:**	C18
Extract Volume (uL):	2000	**Sample Data Filename:**	FC6G_399 S: 24
Injection Volume (uL):	15	**Blank Data Filename:**	FC6G_399 S: 21
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC6G_399 S: 14
Concentration Units:	ng/mL		

COMPOUND	LAB FLAG [1]	CONC. FOUND	DETECTION LIMIT	RETENTION TIME
PFBA	U		0.576	
PFPeA	U		0.544	
PFHxA	U		0.476	
PFHpA	U		0.556	
PFOA		23.8	0.556	4:45
PFNA		1.43	1.21	5:04
PFDA		0.905	0.504	5:24
PFUnA	U		0.512	
PFDoA	U		0.576	
PFBS	U		1.41	
PFHxS		7.74	1.29	4:57
PFOS		40.3	1.16	5:34
PFOSA	U		0.480	

(1) Where applicable, custom lab flags have been used on this report; U = not detected.

Approved by: _____Henry Huang_____ QA/QC Chemist

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 27-Sep-2006 13:19:27; Application: XMLTransformer-1.7.13; Report Filename: PFC_FC_LC_PFOA_L9303-3_Form1A_SJ593458.html; Workgroup: WG20188; Design ID: 261]

These pages are part of a larger report that may contain information necessary for full data evaluation.

AXYS METHOD MLA-042 Rev 08

CLIENT SAMPLE NO.

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

Sample Collection:
22-Aug-2006 17:55

AXYS ANALYTICAL SERVICES
P.O. Box 2219, 2045 MILLS RD. WEST, SIDNEY, B.C., CANADA
V8L 3S8 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4191	**Lab Sample I.D.:**	L9208-2 R
Matrix:	SERUM	**Sample Size:**	0.500 mL
Sample Receipt Date:	24-Aug-2006	**Initial Calibration Date:**	22-Sep-2006
Extraction Date:	20-Sep-2006	**Instrument ID:**	LC MS/MS
Analysis Date:	23-Sep-2006 Time: 01:21:08	**Column ID:**	C18
Extract Volume (uL):	2000	**Sample Data Filename:**	FC6G_394 S: 22
Injection Volume (uL):	15	**Blank Data Filename:**	FC6G_394 S: 21
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC6G_394 S: 14
Concentration Units:	ng/mL		

COMPOUND	LAB FLAG [1]	CONC. FOUND	DETECTION LIMIT	RETENTION TIME
PFBA	U		0.576	
PFPeA	U		0.544	
PFHxA	U		10.9	
PFHpA	U		0.556	
PFOA		14.9	0.556	4:45
PFNA	U		0.468	
PFDA	U		0.504	
PFUnA	U		0.512	
PFDoA	U		0.576	
PFBS	U		1.41	
PFHxS		4.44	1.29	4:57
PFOS		23.6	1.16	5:34
PFOSA	U		0.480	

(1) Where applicable, custom lab flags have been used on this report; U = not detected.

Approved by: _____Henry Huang_____ QA/QC Chemist

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 03-Oct-2006 10:15:16; Application: XMLTransformer-1.7.13; Report Filename: PFC_FC_LC_PFOA_L9208-2_Form1A_SJ594693.html; Workgroup: WG20159; Design ID: 472]

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Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

AXYS METHOD MLA-042 Rev 08
AXYS ANALYTICAL SERVICES
P.O. Box 2219, 2045 MILLS RD. WEST, SIDNEY, B.C., CANADA
V8L 3S8 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4191	**Lab Sample I.D.:**	L9303-2 (A)
Matrix:	SERUM	**Sample Size:**	0.500 mL
Sample Receipt Date:	21-Sep-2006	**Initial Calibration Date:**	26-Sep-2006
Extraction Date:	26-Sep-2006	**Instrument ID:**	LC MS/MS
Analysis Date:	27-Sep-2006 Time: 00:19:47	**Column ID:**	C18
Extract Volume (uL):	2000	**Sample Data Filename:**	FC6G_399 S: 22
Injection Volume (uL):	15	**Blank Data Filename:**	FC6G_399 S: 21
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC6G_399 S: 14
Concentration Units:	ng/mL		

COMPOUND	LAB FLAG [1]	CONC. FOUND	DETECTION LIMIT	RETENTION TIME
PFBA	U		0.576	
PFPeA	U		0.544	
PFHxA	U		10.5	
PFHpA	U		0.556	
PFOA		10.5	0.556	4:45
PFNA		0.963	0.468	5:07
PFDA	U		0.504	
PFUnA	U		0.512	
PFDoA	U		0.576	
PFBS	U		1.41	
PFHxS		6.00	1.29	4:54
PFOS		35.2	1.16	5:31
PFOSA	U		0.480	

(1) Where applicable, custom lab flags have been used on this report; U = not detected.

Approved by: _____Henry Huang_____ QA/QC Chemist

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AXYS METHOD MLA-042 Rev 08

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

AXYS ANALYTICAL SERVICES
P.O. Box 2219, 2045 MILLS RD. WEST, SIDNEY, B.C., CANADA
V8L 3S8 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4191	**Lab Sample I.D.:**	L8863-2
Matrix:	SERUM	**Sample Size:**	0.500 ml
Sample Receipt Date:	27-Apr-2006	**Initial Calibration Date:**	07-Jul-2006
Extraction Date:	06-Jul-2006	**Instrument ID:**	LC MS/MS
Analysis Date:	08-Jul-2006 Time: 09:08:11	**Column ID:**	C18
Extract Volume (uL):	2000	**Sample Data Filename:**	FC6G_277 S: 23
Injection Volume (uL):	15	**Blank Data Filename:**	FC6G_277 S: 21
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC6G_277 S: 14
Concentration Units:	ng/ml		

COMPOUND	LAB FLAG [1]	CONC. FOUND	DETECTION LIMIT	RETENTION TIME
PFBA	U		0.604	
PFPeA	U		0.472	
PFHxA	U		0.484	
PFHpA		1.08	0.532	4.17
PFOA		133	3.07	4:45
PFNA		1.15	0.680	5:08
PFDA	U		0.536	
PFUnA	U		0.476	
PFDoA	U		0.568	
PFBS	U		1.20	
PFHxS		32.7	1.01	4:56
PFOS		155	1.00	5:33
PFOSA	U		0.460	

(1) Where applicable, custom lab flags have been used on this report; U = not detected.

Approved by: _____ QA/QC Chemist

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 12-Jul-2006 16:32:12; Application: XMLTransformer-1.7.4; Report Filename: PFC_FC_LC_PFOA_L8863-2_Form1A_SJ571307.html; Workgroup: WG19474; Design ID: 332]

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AXYS METHOD MLA-042 Rev 03 CLIENT ID:

PFOS_S1_D12

Form 1A/2

PERFLUORINATED ORGANICS ANALYSIS REPORT

		Sample Collection:	31-Aug-2005 10:32
Lab Name: AXYS ANALYTICAL SERVICES			
Contract No.:	4191	Lab Sample ID:	L7932-53 i
Matrix:	SERUM	Sample Size:	1 00 mL
Sample Receipt date:	01-Sep-2005	Initial Calibration Date:	22-Sep-2005
Extraction Date:	21-Sep-2005	Instrument ID:	LC-MS/MS
Analysis Date:	23-Sep-2005 Time: 1:09:49	LC Column ID:	C18
Extract Volume (mL):	2	Sample Datafile:	FC5G_181S056
Injection Volume (µL):	10 0	Blank Data Filename:	FC5G_181S070
Dilution Factor:	3	Cal. Ver. Data Filename:	FC5G_181S048
		CAL VER ID:	PFC-LIN-055CS-F
Concentration Units :	ng/mL		

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	UD		0 639	
PFHxA	UD		0 620	
PFHpA	D	1 95	0 628	4 18
PFOA	D	110	0 618	4 65
PFNA	D	2 92	0 670	5 05
PFDA	D	1 32	0 648	5 36
PFUnA	UD		0 641	
PFDoA	UD		0 638	
PFBS	UD		0 635	
PFHxS	D	20 0	0 638	4 80
PFOS	D	111	0 645	5 46
PFOSA	UD		0 625	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C2-PFOA	D	12 0	12 1	101	4 65
13C4-PFOS (80)	D	12 0	12 0	99 6	5 46
13C4-PFOS (99)	D	12 0	12 7	106	5 46
13C2-PFDA	D	12 0	10 8	90 0	5 36

(1) U = not detected; D = dilution data

(2) R (%) = Percent recovery

16982PFD1_1 >Js. S6 Approved by: _____ QA/QC Chemist 28-09-2005 dd-mm-yyyy

AXYS METHOD MLA-042 Rev 03
PFOS_S1_D12

CLIENT ID:
>

Form 1A/2
PERFLUORINATED ORGANICS ANALYSIS REPORT

			Sample Collection:	31-Aug-2005 10:03	
Lab Name: AXYS ANALYTICAL SERVICES					
Contract No.:	4191		Lab Sample ID:	L7932-52 I	
Matrix:	SERUM		Sample Size:	1 00	mL
Sample Receipt date:	01-Sep-2005		Initial Calibration Date:	22-Sep-2005	
Extraction Date:	21-Sep-2005		Instrument ID:	LC-MS/MS	
Analysis Date:	23-Sep-2005	Time: 0:55:34	LC Column ID:	C18	
Extract Volume (mL):	2		Sample Datafile:	FC5G_181S055	
Injection Volume (µL):	10 0		Blank Data Filename:	FC5G_181S070	
Dilution Factor:	3		Cal. Ver. Data Filename:	FC5G_181S048	
			CAL VER ID:	PFC-LIN-055CS-F	
Concentration Units :	ng/mL				

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	UD		0 639	
PFHxA	UD		0 620	
PFHpA	UD		0 628	
PFOA	D	72 9	0 618	4 65
PFNA	D	1 51	0 670	4 99
PFDA	D	0 739	0 648	5 36
PFUnA	UD		0 641	
PFDoA	UD		0 638	
PFBS	UD		0 635	
PFHxS	D	12 5	0 638	4 80
PFOS	D	87 6	0 645	5 46
PFOSA	UD		0 625	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C2-PFOA	D	12 0	12 2	102	4 65
13C4-PFOS (80)	D	12 0	12 9	108	5 46
13C4-PFOS (99)	D	12 0	13 2	110	5 46
13C2-PFDA	D	12 0	10 3	85 6	5 36

(1) U = not detected; D = dilution data
(2) R (%) = Percent recovery

16982PFD1_1 xls. S5

Approved by: _____ QA/QC Chemist

28-09-2005
dd-mm-yyyy

AXYS METHOD MLA-042 Rev 03 | CLIENT ID:

PFOS_S1_D12

Form 1A/2

PERFLUORINATED ORGANICS ANALYSIS REPORT

			Sample Collection:	31-Aug-2005 10:30	
Lab Name: AXYS ANALYTICAL SERVICES					
Contract No.:	4191		Lab Sample ID:	L7932-54 i	
Matrix:	SERUM		Sample Size:	1 00	mL
Sample Receipt date:	01-Sep-2005		Initial Calibration Date:	22-Sep-2005	
Extraction Date:	21-Sep-2005		Instrument ID:	LC-MS/MS	
Analysis Date:	23-Sep-2005	Time: 1:24:02	LC Column ID:	C18	
Extract Volume (mL):	2		Sample Datafile:	FC5G_181S057	
Injection Volume (µL):	10 0		Blank Data Filename:	FC5G_181S070	
Dilution Factor:	3		Cal. Ver. Data Filename:	FC5G_181S048	
			CAL VER ID:	PFC-LIN-055CS-F	
Concentration Units :	ng/mL				

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	UD		0 639	
PFHxA	UD		0 620	
PFHpA	UD		0 628	
PFOA	D	55 4	0 618	4 65
PFNA	D	2 36	0 670	5 05
PFDA	UD		0 648	
PFUnA	UD		0 641	
PFDoA	UD		0 638	
PFBS	UD		0 635	
PFHxS	D	6 59	0 638	4 80
PFOS	D	60 0	0 645	5 46
PFOSA	UD		0 625	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C2-PFOA	D	12 0	11 8	98 2	4 65
13C4-PFOS (80)	D	12 0	15 0	125	5 51
13C4-PFOS (99)	D	12 0	13 4	112	5 46
13C2-PFDA	D	12 0	10 1	84 4	5 36

(1) U = not detected; D = dilution data
(2) R (%) = Percent recovery

16982PFD1_1.xls S7

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28-09-2005
dd-mm-yyyy

AXYS METHOD MLA-042 Rev 02 | CLIENT ID:
PFOS_S1_D12

Form 1A/2
PERFLUORINATED ORGANICS ANALYSIS REPORT

			Sample Collection:	28-Jun-2005 10:27
Lab Name: AXYS ANALYTICAL SERVICES				
Contract No.:	4191		Lab Sample ID:	L7932-1
Matrix:	SERUM		Sample Size:	1 00 mL
Sample Receipt Date:	29-Jun-2005		Initial Calibration Date:	05-Aug-2005
Extraction Date:	04-Aug-2005		Instrument ID:	LC-MS/MS
Analysis Date:	05-Aug-2005	Time: 21:17:29	LC Column ID:	C18. Zorbax XDB
Extract Volume (mL):	2		Sample data Filename:	FC5G_131S040
Injection Volume (µL):	30 0		Blank data Filename:	FC5G_131S024
Dilution Factor:	N/A		Cal. Ver. data Filename:	FC5G_131S037
			CAL VER ID:	PFC-LIN-039CS-F
Concentration Units :	ng/mL			

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	U		0 638	
PFHxA	U		0 620	
PFHpA	U		0 251	
PFOA		30 9	0 247	4 70
PFNA		2 60	0 268	5 07
PFDA		0 510	0 259	5 38
PFUnA		0 290	0 256	5 67
PFDoA	U		0 255	
PFBS	U		0 254	
PFHxS		6 03	0 255	4 90
PFOS		88 6	0 258	5 50
PFOSA	U		0 250	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C-PFOA		12 0	7 69	64 1	4 70
13C-PFDA		12 0	10 3	85 8	5 34

(1) U = not detected
(2) R (%) = Percent recovery

16535PFD2_1.xls. S2 | Approved by: _____ QA/QC Chemist | 24-08-2005 dd-mm-yyyy

(3) Concentrations are blank-corrected

AXYS METHOD MLA-042 Rev 02 | CLIENT ID:
PFOS_S1_D12

Form 1A/2

PERFLUORINATED ORGANICS ANALYSIS REPORT

			Sample Collection:	28-Jun-2005 10:30
Lab Name: AXYS ANALYTICAL SERVICES				
Contract No.:	4191		Lab Sample ID:	L7932-2
Matrix:	SERUM		Sample Size:	1 00 mL
Sample Receipt Date:	29-Jun-2005		Initial Calibration Date:	05-Aug-2005
Extraction Date:	04-Aug-2005		Instrument ID:	LC-MS/MS
Analysis Date:	05-Aug-2005	Time: 21:42:08	LC Column ID:	C18. Zorbax XDB
Extract Volume (mL):	2		Sample Datafile:	FC5G_131S042
Injection Volume (µL):	30 0		Blank Data Filename:	FC5G_131S024
Dilution Factor:	N/A		Cal. Ver. Data Filename:	FC5G_131S037
			CAL VER ID:	PFC-LIN-039CS-F
Concentration Units :	ng/mL			

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	U		0 638	
PFHxA	U		0 620	
PFHpA	U		0 251	
PFOA		24 2	0 247	4 70
PFNA		1 48	0 268	5 07
PFDA	U		0 259	
PFUnA	U		0 256	
PFDoA	U		0 255	
PFBS	U		0 254	
PFHxS		6 23	0 255	4 90
PFOS		38 0	0 258	5 50
PFOSA	U		0 250	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C-PFOA		12.0	8 09	67 4	4 70
13C-PFDA		12 0	11 2	93 0	5 34

(1) U = not detected
(2) R (%) = Percent recovery

16535PFD2_1 xls S4 | Approved by: _____ QA/QC Chemist | 24-08-2005 dd-mm-yyyy

AXYS METHOD MLA-042 Rev 03 CLIENT ID:
PFOS_S1_D12

Form 1A/2
PERFLUORINATED ORGANICS ANALYSIS REPORT

			Sample Collection:	31-Aug-2005 09:56	
Lab Name: AXYS ANALYTICAL SERVICES					
Contract No.:	4191		Lab Sample ID:	L7932-51 I (A)	
Matrix:	SERUM		Sample Size:	1 00	mL
Sample Receipt date:	01-Sep-2005		Initial Calibration Date:	22-Sep-2005	
Extraction Date:	21-Sep-2005		Instrument ID:	LC-MS/MS	
Analysis Date:	23-Sep-2005	Time: 0:27:07	LC Column ID:	C18	
Extract Volume (mL):	2		Sample Datafile:	FC5G_181S053	
Injection Volume (µL):	10 0		Blank Data Filename:	FC5G_181S070	
Dilution Factor:	3		Cal. Ver. Data Filename:	FC5G_181S048	
Concentration Units :	ng/mL		CAL VER ID:	PFC-LIN-055CS-F	

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	UD		0 639	
PFHxA	UD		0 620	
PFHpA	UD		0 628	
PFOA	D	27 0	0 618	4 65
PFNA	D	1 55	0 670	4 99
PFDA	UD		0 648	
PFUnA	UD		0 641	
PFDoA	UD		0 638	
PFBS	UD		0 635	
PFHxS	D	5 27	0 638	4 80
PFOS	D	28 5	0 645	5 46
PFOSA	UD		0 625	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C2-PFOA	D	12 0	11 4	94 9	4 65
13C4-PFOS (80)	D	12 0	14 6	122	5 46
13C4-PFOS (99)	D	12 0	13 5	113	5 46
13C2-PFDA	D	12 0	10 1	83 8	5 36

(1) U = not detected; D = dilution data
(2) R (%) = Percent recovery

16982PFD1_1 xls S3 Approved by: _____ OA/QC Chemist 28-09-2005 dd-mm-yyyy

AXYS METHOD MLA-042 Rev 08

CLIENT SAMPLE NO.

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

Sample Collection:
26-Apr-2006 09:15

AXYS ANALYTICAL SERVICES
P.O. Box 2219, 2045 MILLS RD. WEST, SIDNEY, B.C., CANADA
V8L 3S8 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4191	**Lab Sample I.D.:**	L8863-3
Matrix:	SERUM	**Sample Size:**	0.500 ml
Sample Receipt Date:	27-Apr-2006	**Initial Calibration Date:**	07-Jul-2006
Extraction Date:	06-Jul-2006	**Instrument ID:**	LC MS/MS
Analysis Date:	08-Jul-2006 Time: 09:22:30	**Column ID:**	C18
Extract Volume (uL):	2000	**Sample Data Filename:**	FC6G_277 S: 24
Injection Volume (uL):	15	**Blank Data Filename:**	FC6G_277 S: 21
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC6G_277 S: 14
Concentration Units:	ng/ml		

COMPOUND	LAB FLAG [1]	CONC. FOUND	DETECTION LIMIT	RETENTION TIME
PFBA	U		0.604	
PFPeA	U		0.472	
PFHxA	U		0.484	
PFHpA	U		0.532	
PFOA		20.1	0.484	4:48
PFNA		3.46	0.680	5:08
PFDA		0.768	0.536	5:27
PFUnA		0.642	0.476	5:47
PFDoA	U		0.568	
PFBS	U		1.20	
PFHxS		7.74	1.01	4:59
PFOS		53.5	1.00	5:37
PFOSA	U		0.460	

(1) Where applicable, custom lab flags have been used on this report; U = not detected.

Approved by: _____ QA/QC Chemist

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 12-Jul-2006 16:32:12; Application: XML Transformer-1.7.4; Report Filename: PFC_FC_LC_PFOA_L8863-3_Form1A_SJ571308.html; Workgroup: WG19474; Design ID: 332]

These pages are part of a larger report that may contain information necessary for full data evaluation

AXYS METHOD MLA-042 Rev 02 | CLIENT ID:
PFOS_S1_012

Form 1A/2
PERFLUORINATED ORGANICS ANALYSIS REPORT

			Sample Collection:	18-Aug-2005 18:15
Lab Name: AXYS ANALYTICAL SERVICES				
Contract No.:	4191		Lab Sample ID:	L7932-39 Y4
Matrix:	SERUM		Sample Size:	1 00 mL
Sample Receipt date:	23-Aug-2005		Initial Calibration Date:	12-Sep-2005
Extraction Date:	29-Aug-2005		Instrument ID:	LC-MS/MS
Analysis Date:	13-Sep-2005	Time: 0:18:25	LC Column ID:	C18
Extract Volume (mL):	2		Sample Datafile:	FC5G_167S056
Injection Volume (µL):	30 0		Blank Data Filename:	FC5G_167S031
Dilution Factor:	N/A		Cal. Ver. Data Filename:	FC5G_167S044
			CAL VER ID:	PFC-LIN-044CS-F
Concentration Units :	ng/mL			

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	U		0 256	
PFHxA	U		0 248	
PFHpA	U		0 251	
PFOA		9 66	0 247	4 70
PFNA		1 35	0 268	5 05
PFDA		0 375	0 259	5 36
PFUnA	U		0 257	
PFDoA	U		0 255	
PFBS	U		2 54	
PFHxS		4 52	2 55	4 87
PFOS		26 6	0 258	5 51
PFOSA	U		0 250	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C2-PFOA		12 0	9 15	76 2	4 70
13C4-PFOS(80)		12 0	13 8	115	5 56
13C4-PFOS(99)		12 0	12 8	107	5 56
13C2-PFDA		12 0	12 8	106	5 36

(1) U = not detected
(2) R (%) = Percent recovery

1675SPF_02_1.xls S12 | Approved by: _____ QA/QC Chemist | 19-09-2005 dd-mm-yyyy

AXYS METHOD MLA-042 Rev 02
PFOS_S1_D12

CLIENT ID:

Form 1A/2
PERFLUORINATED ORGANICS ANALYSIS REPORT

			Sample Collection:	15-Aug-2005 13:54
Lab Name: AXYS ANALYTICAL SERVICES				
Contract No.:	4191		Lab Sample ID:	L7932-28 Y2
Matrix:	SERUM		Sample Size:	1 00 mL
Sample Receipt date:	17-Aug-2005		Initial Calibration Date:	12-Sep-2005
Extraction Date:	29-Aug-2005		Instrument ID:	LC-MS/MS
Analysis Date:	12-Sep-2005	Time: 22:10:04	LC Column ID:	C18
Extract Volume (mL):	2		Sample Datafile:	FC5G_167S047
Injection Volume (µL):	30 0		Blank Data Filename:	FC5G_167S031
Dilution Factor:	N/A		Cal. Ver. Data Filename:	FC5G_167S044
			CAL VER ID:	PFC-LIN-044CS-F
Concentration Units :	ng/mL			

COMPOUND	LAB FLAG [1]	CONC FOUND	DETECTION LIMIT	RETENTION TIME
PFPeA	U		0 256	
PFHxA	U		0 248	
PFHpA	U		0 251	
PFOA		5 92	0 247	4 70
PFNA		1 32	0 268	5 05
PFDA		0 486	0 259	5 41
PFUnA		0 272	0 257	5 75
PFDoA	U		0 255	
PFBS	U		2 54	
PFHxS		3 76	2 55	4 87
PFOS		29 5	0 258	5 56
PFOSA	U		0 250	

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng)	CONC. FOUND (ng)	R (%)[2]	RETENTION TIME
13C2-PFOA		12 0	10 5	87 2	4 70
13C4-PFOS(80)		12 0	11 3	94 4	5 56
13C4-PFOS(99)		12 0	10 4	86 4	5 56
13C2-PFDA		12 0	13 6	113	5 41

(1) U = not detected
(2) R (%) = Percent recovery

16755PF_D2_1 xls S3

Approved by: _____ QA/QC Chemist

19-09-2005
dd-mm-yyyy