

3M Company St. Paul, Minnesota

# Fluorochemical (FC) Data Assessment Report

**3M Company** 

Cottage Grove, Minnesota Facility

April 2006



06P-0186-1

Exhibit 2095

State of Minnesota v. 3M Co., Court File No. 27-CV-10-28862

# FLUOROCHEMICAL (FC) DATA ASSESSMENT REPORT FOR THE 3M COTTAGE GROVE, MN FACILITY

April 2006

Prepared for

**3M Company** 

by

WESTON SOLUTIONS, INC. West Chester, Pennsylvania 19380

W.O. No. 02181.002.010.0001



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#### **ES. EXECUTIVE SUMMARY**

The 3M Company (3M) Cottage Grove, Minnesota facility has been in operation since 1947. The facility currently manufactures a range of products, some of which include adhesive products, specialty paper, industrial polymers, abrasives, and reflective road sign materials and also engages in research and development. 3M has worked cooperatively with the Minnesota Pollution Control Agency (MPCA) since the early 1980s in assessing and addressing the facility's past on-site waste disposal issues.

3M has expressed its intention to voluntarily assess the presence of fluorochemicals associated with the manufacturing operations at the Cottage Grove facility. The fluorochemicals (FCs) include the following compounds:

- Perfluorooctanoic acid (PFOA) An 8-carbon (C8) carboxylate.
- Perfluorooctane sulfonate (PFOS) An 8-carbon (C8) sulfonate.
- Perfluorohexane sulfonate (PFHS) A 6-carbon (C6) sulfonate.
- Perfluorobutane sulfonate (PFBS) A 4-carbon (C4) sulfonate.

In December 2004, 3M submitted to the MPCA the Facility-wide Fluorochemical (FC) Investigation Work Plan (FC Work Plan) to assess these FCs at its Cottage Grove, Minnesota plant. The MPCA approved the Work Plan with modifications in January 2005.

#### FC ASSESSMENT

Activities conducted under the FC Work Plan were initiated with a file review in January 2005. This review was conducted to collect information on the historic 3M Cottage Grove facility waste generation, waste disposal, or treatment both on-site and off-site. The field assessment commenced in March 2005 and was completed in August 2005. It consisted of the following:

• Groundwater and Additional Assessment – In March and May 2005, field data and groundwater samples were collected from 21 existing monitoring wells, six production wells, and two water supply wells at the 3M Cottage Grove facility. One monitoring well (MW-6) could not be sampled due to an



obstruction in the well borehole. A sample of water from the tap at Bldg. 116 (cafeteria) was collected after granular activated carbon (GAC) treatment unit.

Additionally, the four pumping wells at the former 3M Woodbury disposal site (Woodbury Site) and the combined discharge from these wells, which provide non-contact process water for the 3M Cottage Grove facility, were sampled once per month for three months in March, April, and May 2005. At the same time, the discharge from the 3M Cottage Grove non-contact process water retention pond also was sampled.

• <u>Soil Assessment</u> – In May 2005, the soil assessment included 16 soil borings installed to depths ranging from 25 to 70 feet below ground surface (ft bgs) and 112 composite soil samples collected at 5-ft intervals from the soil borings.

Fifty (50) surface soil samples were collected from two shallow depths at 25 locations in drainageways, areas where FCs were handled, and other general site locations.

- Sediment and Surface Water In August 2005, a sediment and surface water assessment was conducted at the 3M Cottage Grove facility and the Mississippi River. Twenty (20) sediment samples and nine surface water samples were collected from the east and west coves and the Mississippi River. Six sediment samples, colocated with six surface water samples, were collected from the 0-10 cm depth interval at locations upstream, adjacent, and downstream of the facility in the Mississippi River. Sediment samples were collected from three locations in the east and west coves and upstream of each cove. One surface water sample was collected from each cove. Also, one surface water sample was collected upstream of the east cove but the drainageway upstream of the west cove was dry.
- <u>Fish</u> In August 2005, fish sampling was performed at three reaches of the Mississippi River, one upstream, one adjacent to the plant, and one downstream. A total of 62 fish were collected including 11 smallmouth bass, 30 channel catfish and 21 bluegill sunfish. Whole body or filet tissue samples were prepared from the collected specimens for chemical analyses.
- <u>File Review and Interviews</u> A file review and interviews with retired and current employees were conducted to collect information on the historical waste generation, waste disposal, or treatment both on-site and off-site.

All of the samples collected under this FC assessment program were submitted to Exygen Research in State College, Pennsylvania, for analyses of PFOA, PFOS, PFHS, and PFBS.



A subset of the soil samples were also selected for grain size distribution and total organic carbon (TOC) analyses.

#### RESULTS OF THE FC ASSESSMENT AND DATA NEEDS

The findings from the file review relative to waste disposal locations utilized by the facility were submitted to the MPCA in June 2005. This review indicated that, other than on-site, there were three key off-site areas where wastes were disposed. These included: the former Oakdale disposal site (Oakdale Site), the Woodbury Site, and the Washington County Landfill. The Oakdale Site is being assessed by 3M under a related but separate work plan. The Woodbury Site has been assessed under the FC Work Plan covered by this Data Assessment Report. The MPCA is addressing the Washington County Landfill under its Closed Landfill Program.

It was found that the facility personnel interviews corroborated information from the file review and provided additional details. A new item discussed during the personnel interviews was the possible existence and location of a former on-site sludge disposal pit. No documentation of this pit was evident in the file review and it has not been assessed. This former on-site sludge disposal pit has been designated as D9 for future assessment purposes.

<u>Groundwater</u> -The highest FC concentrations were detected in groundwater samples from monitoring wells MW-12 downgradient of the D5 – Former Solids Burn Pit Area, MW-14 downgradient of the D8 – Former Waste Disposal Area, and MW-101 downgradient of the D1 – Former HF Tar Neutralization Pit. In these areas, PFOA concentrations ranged from 150 to 1,863 ppb and PFOS from 80 to 324 ppb.

The highest FC concentrations detected in groundwater samples collected from pumping wells were detected at pumping well PW-6 (155 ppb PFOA). PW-6 is downgradient of the D8 Area. Groundwater elevation data collected from the monitoring wells in March 2005 show that the influence of the pumping wells is most significant in the central plant area and is reduced with increasing distance from this area.

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With respect to groundwater at the 3M Cottage Grove facility, the following data needs (additional information that will be useful for assessment) have been identified:

- The file review and personnel interviews indicated that there may be a former sludge disposal pit, which had not been assessed previously. This is located between the wastewater treatment plant and the D2 Area and will be referred to as the D9 Area. Groundwater quality and movement in the area of the D9 sludge disposal pit has not been characterized.
- The potential movement of groundwater to surface water, particularly downgradient of the D8, D5, and D2 Areas, has not been characterized.

Of the four pumping wells at the Woodbury Site, pumping well R4 contained the highest FC concentrations (19.7-23.3 ppb PFHS, 5.72-11 ppb PFBS, 2.78-3.12 ppb PFOA, and 1.83-2.29 ppb PFOS). At pumping wells R1 and R3, detected concentrations of PFBS and PFHS ranged from 0.337 to 3.47 ppb and 1.03 to 2.61 ppb, respectively. PFOA and PFOS were detected in these wells at concentrations ranging from 0.153 to 2.33 ppb and 0.0562 to 0.144 ppb, respectively. No FCs were detected at pumping well R2. Additionally, FCs were detected in the pumping well combined discharge at comparable concentrations to the discharge from the Cottage Grove non-contact process water retention pond. Thus, the pumping wells at the Woodbury Site have been characterized and no further assessment of the Woodbury Site appears to be warranted at this time.

<u>Soil</u> - The highest concentrations of FCs in soils were found in the D2 and D1 Areas. In the D2 – Former Sludge Disposal Area, the highest FC concentrations (up to 12,350 ppb PFOS<sup>1</sup>) were found in the sludge. Lower concentrations (ranging from 4.39 to 794 ppb PFOS) were detected in the underlying native soil, which occurs below approximately 20 to 25 ft bgs.

In the D1 – Former HF Tar Neutralization Pit Area, the highest FC concentrations (up to 4,520 ppb PFOA) were detected in the 5 to 30 ft bgs depth range in borings constructed just outside the suspected location of the pit structure and decreased below 30 ft bgs in the native soils (ranging from 53.9 to 375 ppb).

In the D5 – Former Solids Burn Pit Area, concentrations of PFOS (up to 2,310 ppb) and PFOA (up to 1,375 ppb) were detected in soil samples to a depth of approximately 15 ft

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<sup>&</sup>lt;sup>1</sup> For reference, the Minnesota Department of Health (MDH) has established Soil Reference Values for industrial sites of 200,000 ug/kg (ppb) PFOA and 40,000 ppb PFOS.



bgs in the one soil boring constructed in this area. Lower concentrations were detected at lower depths (34.5 and 46.8 ppb PFOS and 21.8 and 42.5 ppb PFOA).

In the D8 – Former Waste Disposal Area, concentrations of PFOA (up to 543 ppb) and PFOS (up to 983 ppb) were detected in subsurface soils to a depth of 15 ft bgs and at a surface soil sample location downgradient of this area.

At the Fire Training Area, PFOS was detected at concentrations up to 1,820 ppb primarily in shallow soils to a depth of 5 ft bgs, with significantly lower concentrations detected at lower depths.

At the Building 15 (location of the former electrochemical fluorination cells) Area, PFOS was detected at concentrations up to 833/904(duplicate) ppb in shallow soils (0-5 ft bgs) and 1,865 ppb at a depth of 20 to 25 ft bgs. At the Former Wastewater Pond, PFOS was detected at a concentration of 805 ppb at a depth of 15 to 20 ft bgs and there was no visual evidence of historic sludges at this boring.

Surface soil samples (0-6 and 6-24 in bgs) collected in the vicinity of buildings where FCs were managed (Buildings 7, 16, and 25) generally indicated higher concentrations of FCs than samples collected in the vicinity of buildings where FCs were not managed (Buildings 22, 102, and 112), the incinerator complex, and the D6 – Former Ash Disposal Area.

The following data needs have been identified for soils at the 3M Cottage Grove facility:

- D5 Former Solids Burn Pit Area. This area, which is approximately 2 acres in size, has not been defined with respect to the horizontal extent and concentrations of FCs. Historic records did not show specific limits or boundaries for this area. Only one boring was located in this area and soil samples from this boring exhibited concentrations of FCs primarily at 0 to 15 ft bgs.
- D8 Former Waste Disposal Area. Due to access issues, this area is not defined with respect to the horizontal extent of any remaining waste burial, which was not previously removed.
- D9 Former Sludge Disposal Pit. This newly identified area has not been assessed or characterized and will be referred to as the D9 Area.



<u>Sediment</u> – FCs were detected in sediment. Generally, upstream levels were less than downstream.

PFOA sediment concentrations in the east cove (11.7 to 28.7 ppb) are comparable to the west cove (4.11 to 38.7 ppb). PFOS sediment concentrations in the east cove (24.2 to 267 ppb) are higher than at the west cove (15.2 to 91.1 ppb). Higher PFOS concentrations were detected in the shallow sediments (0-10 cm) of the east cove than in the deeper sediments (10-20 cm).

In the Mississippi River, average sediment concentrations at sample location R1, R2, and R4 were NQ or ND. The average sediment concentrations (8.28 and 13.2 ppb, respectively) of PFOS and PFOA were detected at sample location R3, which is adjacent to the operating plant portion of the property.

<u>Surface Water</u> - The average concentrations of FCs in the east cove water sample were greater than the concentrations detected in the west cove water sample. In the Mississippi River, PFOA and PFOS concentrations were ND or NQ at the R1 through R4 sampling locations. The only quantifiable concentrations of PFOS and PFOA (0.098 and 0.132 ppb, respectively) in the water samples were detected at downstream location R5. With respect to sediment and surface water, the following data needs have been identified:

- Concentrations, if any, of FCs in groundwater entering the river (pore water) are not known.
- Distribution, if any, of FCs in surface waters and sediment extending across the river are not known.

<u>Fish</u> - The analytical results indicate that FCs have been detected in fish samples (whole body and filet) collected from three reaches of the Mississippi River in the immediate vicinity of the Cottage Grove facility. The FCs were detected in each of the three species sampled: Channel catfish, Bluegill sunfish, and Smallmouth bass.



The following conclusions have been identified for Mississippi River fish:

- The current data set represents one limited round of fish sampling conducted in the Mississippi River.
- Pending analytical work being performed on additional fish samples by the MPCA, further discussions may be warranted relative to additional data needs.

#### **RECOMMENDATIONS**

Substantial characterization has been completed at the 3M Cottage Grove facility as part of the work conducted in 2005. However, data needs were identified and should be addressed in order to define the most effective path forward. These additional field activities are presented in the following recommendations:

#### Groundwater

- Based on accessibility, install a total of three to five groundwater monitoring wells, if feasible (based on physical constraints and access considerations), downgradient of the D2 and D5 areas toward the river.
- Install two to three groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area) to determine groundwater quality and flow direction.
- Define the hydraulic capture and effect of pumping wells PW5 and PW6 by collecting water level and drawdown data from existing monitoring wells.

#### Soil

- D5 Former Solids Burn Pit Area. Install an additional three to five soil borings to 25 ft bgs to further characterize the extent of FCs in this area.
- D8 Former Waste Disposal Area. Review information on past survey and remediation activities conducted in this area. Based on a review of this information and accessibility constraints, determine if a geophysical survey would be necessary to further define the horizontal extent of any remaining waste burial at this location.
- D9- Former Sludge Disposal Pit. Install two to four soil borings to 25 ft bgs to characterize the extent of FCs, if any, in this area.

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#### Pore Water/Surface Water/Sediment

- Collect pore water samples using shallow hand-driven well points at approximately 25 locations in the Mississippi River along the facility shoreline to assess possible groundwater discharge through bottom sediments and into the river.
  - 20 equally spaced sampling locations along approximately 4,000 ft of shoreline between the D8 Area and the east cove. Conduct a groundwater flow net analysis to define the most effective locations for these samples.
  - Five locations in the reach between the west cove and monitoring well MW-14 to detect any groundwater discharge.
- Collect paired surface water/sediment samples at the following sampling locations:
  - Pore water sampling locations (25 samples).
  - East and west coves and associated drainageways (up to 6 samples).
- Collect surface water samples along a transect across the Mississippi River in Reach 3/5 area (estimate 10-15 sampling nodes).

#### Fish/Aquatic Biota

Review pending MPCA fish sampling results. Discuss with MPCA, Minnesota
Department of Health (MDH), and Minnesota Department of Natural Resources
(MDNR) plans for additional fish sampling in the river to determine the path
forward.

Table ES-1 provides a summary of the recommended Phase 2 FC assessment, which would be performed under the existing Health and Safety Plan (HASP) and FC Work Plan. The results of the Phase 2 FC assessment will be documented in the Phase 2 FC Data Assessment Report.



# Table ES-1 Summary (by Media) of the Phase 2 FC Assessment 3M Cottage Grove, MN Facility

Media	No. of Samples/Locations/Description of Activity
1. Groundwater	a. Install 3 to 5 groundwater monitoring wells downgradient of D2 and D5. Collect up to 5 groundwater samples.
(Up to 8 samples*)	(Up to 8 samples*) b. Install 2 to 3 groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area).  Collect up to 3 groundwater samples.
	c. Conduct hydraulic study of pumping wells PW-5 and PW-6 which will be coordinated with the upcoming scheduled shutdown of PW-6 for incinerator maintenance.
2. Soil (Up to 45 samples*)	<ul> <li>a. Up to 45 sub-surface soil samples collected from 5 to 9 soil borings as follows:</li> <li>- Up to 25 soil samples at D5 Area - Former Solids Burn Pit Area. One composite soil sample for each 5 ft interval</li> </ul>
	<ul> <li>(3 to 5 borings to 25 ft).</li> <li>Up to 20 soil samples at D9 Area - Former Sludge Disposal Pit. One composite soil sample for each 5 ft interval (2 to 4 borings to 25 ft).</li> </ul>
	b. Based on a review of past information and accessibility constraints, determine if a geophysical survey of the D8 - Former Waste Disposal Area would be necessary.
3. Pore Water	a. 25 pore water samples in the Mississippi River as follows:
(Approx. 25	- Conduct groundwater flow net analysis to locate pore water stations.
( sording	20 water samples octworn the 10 Area and the cast cove.  – 5 water samples in the reach between the west cove and MW-14.
4. Surface Water	a. At least 46 surface water samples collected as follows:
(At least 46	- 25 surface water samples at pore water sampling locations (paired with sediment) in the Mississippi River.
samples*)	- Up to 6 surface water samples at the east and west coves and associated drainageways (paired with sediment).
	b. Up to 15 surface water samples along a transect across the Mississippi River in Reach 3/5 area.
5. Sediment	a. At least 31 sediment samples collected as follows:
(At least 31	- 25 sediment samples at pore water sampling locations (paired with surface water) in the Mississippi River.
samples*)	<ul> <li>Up to 6 samples at the east and west coves and associated drainageways (paired with surface water).</li> </ul>

<sup>\*</sup> Actual number will be based upon conditions encountered in the field.



#### 1. INTRODUCTION

#### 1.1 BACKGROUND

The 3M Company (3M) Cottage Grove, Minnesota facility, formerly the 3M Chemolite facility, has been in operation since 1947. The facility currently manufactures a range of products some of which include adhesive products, specialty paper, industrial polymers, abrasives, and reflective road sign materials and also engages in research and development of a proprietary nature.

3M expressed its intention to voluntarily assess the presence of fluorochemicals associated with the manufacturing operations at the Cottage Grove facility. The fluorochemicals (FCs) include the following compounds:

- Perfluorooctanoic acid (PFOA) An 8-carbon (C8) carboxylate.
- Perfluorooctane sulfonate (PFOS) An 8-carbon (C8) sulfonate.
- Perfluorohexane sulfonate (PFHS) A 6-carbon (C6) sulfonate.
- Perfluorobutane sulfonate (PFBS) A 4-carbon (C4) sulfonate.

In December 2004, 3M prepared the Facility-wide Fluorochemical (FC) Investigation Work Plan (FC Work Plan) to assess these FCs at its Cottage Grove, Minnesota plant. The Work Plan presented a systematic approach to collect data in various environmental media related to FC manufacturing operations. In a letter to 3M dated January 31, 2005, the MPCA approved the Work Plan with modifications.

During 2005, 3M implemented the FC site-related investigative program of its Cottage Grove, Minnesota facility in accordance with the MPCA-approved FC Work Plan. This document is the Data Assessment Report for the facility-wide FC assessment.

It is important to note that groundwater sampling for FCs at four monitoring wells (MW-4, MW-7, MW-101, and PZ-14) and the tap at Bldg. 116 is conducted on a semiannual basis in accordance with 3M's Letter of Intent (LOI) to the United States Environmental



Protection Agency (U.S. EPA) dated March 13, 2003. This periodic sampling is reported to the U.S. EPA under the LOI program. The data collected under the LOI program from 2003 through 2005 are included in this report to supplement the data collected under the FC Work Plan.

Additionally, wastewater treatment plant (WWTP) effluent sampling for FCs was conducted on a monthly basis in 2003 and 2004 and quarterly in 2005 in accordance with a facility National Pollutant Discharge Elimination System (NPDES) permit and the LOI program. This sampling is reported to the MPCA and U.S. EPA under the NPDES and LOI programs. The data collected under the LOI and NPDES programs from 2003 through 2005 are included in this report to supplement the data collected under the FC Work Plan.

### 1.2 PURPOSE OF THE FLUOROCHEMICAL (FC) ASSESSMENT

The purpose of the FC assessment is to:

- Characterize the presence of these FCs at the site in various media and in the adjacent Mississippi River.
- Identify through a file review and interviews, historic off-site disposal locations of facility waste streams.
- Prepare this Data Assessment Report.



#### 2. ENVIRONMENTAL SETTING

#### 2.1 SITE LOCATION AND DESCRIPTION

The 3M Cottage Grove, Washington County, Minnesota facility is located approximately two miles southeast of the City of Cottage Grove (see Figure 2-1) and is approximately 1700 acres in size. The industrial, developed portion of the site is approximately 200 acres.

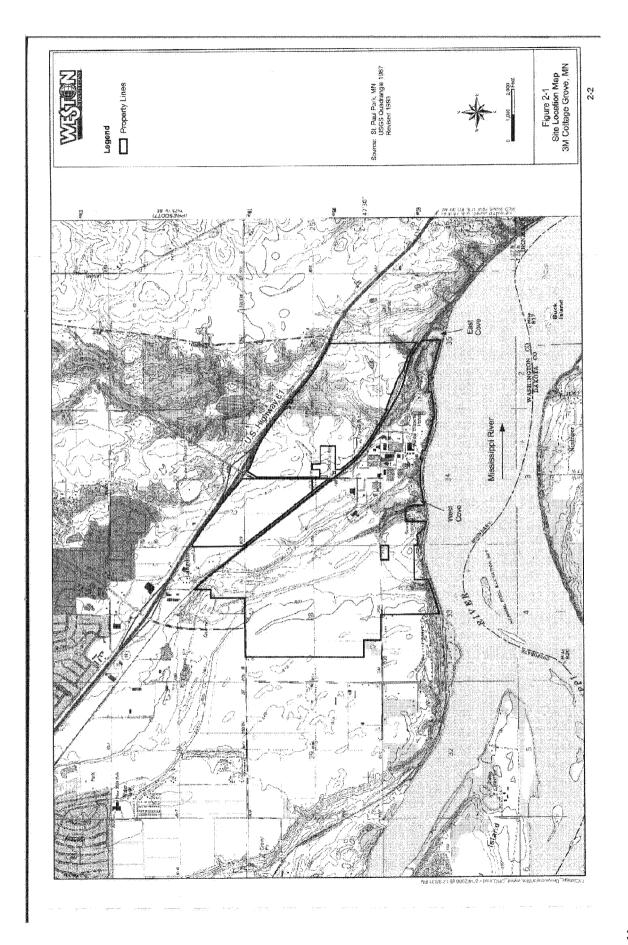
Bordering the site to the south is the Mississippi River; to the west is farmland and some residences; to the north is U.S. Highway 61 and farmland with some residences; and to the east are residential areas, a golf course, woodland, and farmland.

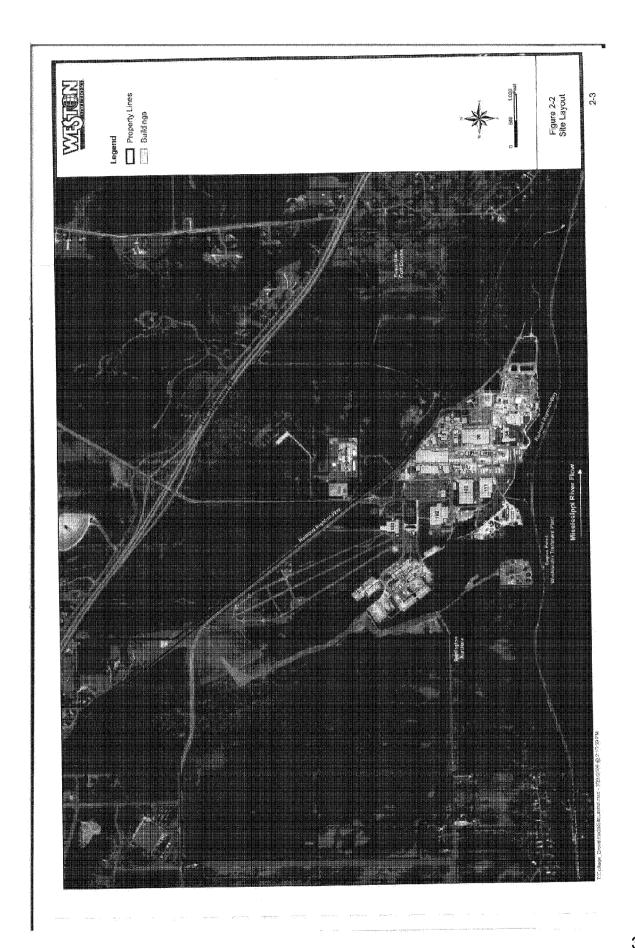
The plant operations and developed portion of the site are located on the southern part of the property adjacent to the river as shown in Figure 2-2. There are some groundwater monitoring and production wells on the northern portion of the property, but no industrial or production operations occur there. The Eagles Point Wastewater Treatment Plant (WWTP) is located along the Mississippi River west of the developed portion of the site. It is operated by the Metropolitan Council Environmental Services (MCES). Additionally, there is a parcel on the interior portion of the property that is owned by Cogentrix, which operates a cogeneration plant. This electrical power generation plant provides steam to the 3M Cottage Grove facility.

The property is bisected by a railroad right-of-way. There is another railroad right-of-way along the bank of the Mississippi River.

#### 2.2 LAND USE AND DEMOGRAPHICS

The 3M Cottage Grove facility is located in Washington County. As indicated in Section 2.1, the area immediately surrounding the facility is comprised predominantly of farmland and woodland, with some residences primarily to the west and east of the facility, and a wastewater treatment plant (Eagles Point) to the southwest.







In recent years, Washington County has experienced significant economic and population growth. The continued expansion of the Twin Cities metropolitan area has caused a spread of developed areas in the cities of Cottage Grove, Woodbury, and Oakdale. Cottage Grove is the nearest city to the 3M plant approximately 2 miles to the northwest. Woodbury and Oakdale are approximately 7 and 10 miles north of the City of Cottage Grove, respectively.

While much of Washington County has retained its rural atmosphere, the county comprises various areas consisting of farmland, woodlands, residential neighborhoods, and office and retail complexes along Interstate 94 near Woodbury and Oakdale (2004, www.co.washington.mn.us).

#### 2.3 TOPOGRAPHY AND DRAINAGE

The 3M Cottage Grove property is located on a flat to gently undulating bluff overlooking the main channel of the Mississippi River. Relief over most of the property is only on the order of tens of feet, ranging in elevation from a high of 822 feet above mean sea level (msl) on the northern portion to 780 feet msl on the southern portion at the edge of the bluff.

As shown in Figure 2-1, the southern portion of the site has been deeply incised by streams and drainage both east and west of the plant operations area, and along the Mississippi River, relief is quite steep with land surface elevations ranging from approximately 780 feet msl at the top of the bluff to approximately 700 feet msl at the riverbank. The western drainageway terminates at a cove (west cove), which flows to the Mississippi River. The eastern drainageway originates from a pond north of U.S. Highway 61, and follows a southerly direction until it approaches the plant operations area where it receives the NPDES-permitted discharges from the plant's wastewater treatment and cooling water system. The drainageway terminates at a cove (east cove), which drains to the Mississippi River.



#### 2.4 GEOLOGY

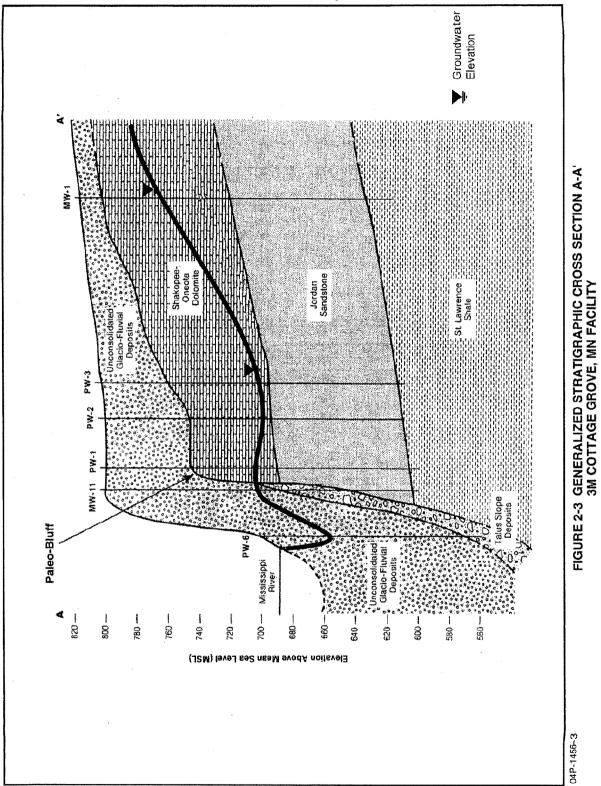
As shown on cross section A-A' (Figure 2-3), the 3M Cottage Grove facility is directly underlain by fill material and unconsolidated glacio-fluvial deposits of probable Quaternary age. The location of the cross section is shown in Figure 2-4. In the northern portion of the property, unconsolidated deposits range from a few feet to a few tens of feet in thickness, are dry, and are unimportant as potential sources of water supply. The unconsolidated deposits increase in thickness from north to south across the site and are over 100 feet thick near the Mississippi River where a buried bedrock valley exists.

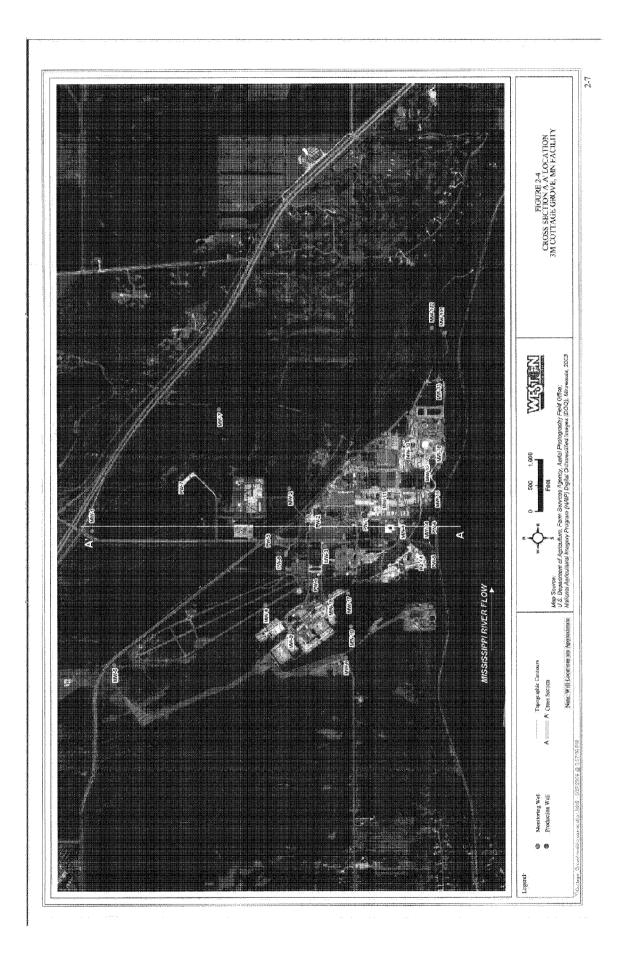
The boring for monitoring well MW-11 encountered talus slope materials at approximately 135 feet below ground surface (bgs) (drill cuttings were identified as Oneota Dolomite) and drilled into the Jordan Sandstone at a depth of 168 feet bgs. Thus, south of the paleo-bluff, unconsolidated glacio-fluvial materials exceed 135 feet in thickness, and at least locally, become important sources of groundwater supply.

An erosional unconformity lies between the base of the unconsolidated deposits and the bedrock beneath the facility. The youngest bedrock in subcrop at the facility is the Shakopee and Oneota Dolomites of the Prairie du Chien Group (early Ordovician age). Inspection of well completion logs for monitoring and production wells at the facility indicates that these formations underlie much of the northern portion of the property, through the central plant area south to a paleo-bluff (the boundary of the buried bedrock valley) as shown in Figure 2-3. The bedrock surface closely mimics the present-day topography and the cliff line of the bedrock paleo-bluff appears to be located parallel to the Mississippi River.

Underlying the Shakopee and Oneota Formations is the Jordan Sandstone. Several production wells at the site tap this formation for water supply. The St. Lawrence Formation (a confining layer – shale unit) is present at the base of the Jordan Sandstone, approximately 200 feet below the central portion of the site.









#### 2.5 WATER USAGE AND HYDROGEOLOGY

All site production and monitoring wells are completed in the upper water-bearing stratigraphic units at the site. The upper water-bearing units consist of the Shakopee-Oneota Dolomites, Jordan Sandstone, and unconsolidated deposits. Due to the presence of the paleo-bluff, the Jordan Sandstone and Shakopee-Oneota Dolomites are hydraulically connected to the unconsolidated deposits near the Mississippi River. Literature indicates that the underlying St. Laurence Shale is not considered an aquifer but rather a confining unit because it has low vertical permeability to groundwater (Lindholm, et al., 1974).

There are six production wells (PW-1 through PW-6) that supply water for industrial and sanitary purposes at the facility. The six production wells were installed during the period 1947 to 1970. Wells PW-1 through PW-4 are drilled into the Jordan Sandstone. Wells PW-5 and PW-6 are completed entirely in the unconsolidated deposits near the Mississippi River.

The groundwater from four of the production wells (PW-2 through PW-5) is blended on a continuous basis in a water supply distribution system for various site needs, including production and sanitation. Bottled water or water treated by granular activated carbon (GAC) is supplied for drinking. The remaining two production wells are utilized independently on a periodic basis for site-wide fire protection (PW-1) and non-contact cooling for the site incinerator (PW-6). All groundwater used for production processes is treated after use at the on-site wastewater treatment facility, prior to an NPDES-permitted discharge to the eastern drainageway (east cove) leading to the Mississippi River. The on-site groundwater obtained for non-contact cooling is supplemented by groundwater from the 3M Woodbury Site located north of the plant which is conveyed to the facility by underground piping. Once utilized for cooling, the non-contact cooling water is discharged to an on-site cooling water pond prior to permitted discharge to the eastern drainageway where it is combined with the wastewater treatment discharge.

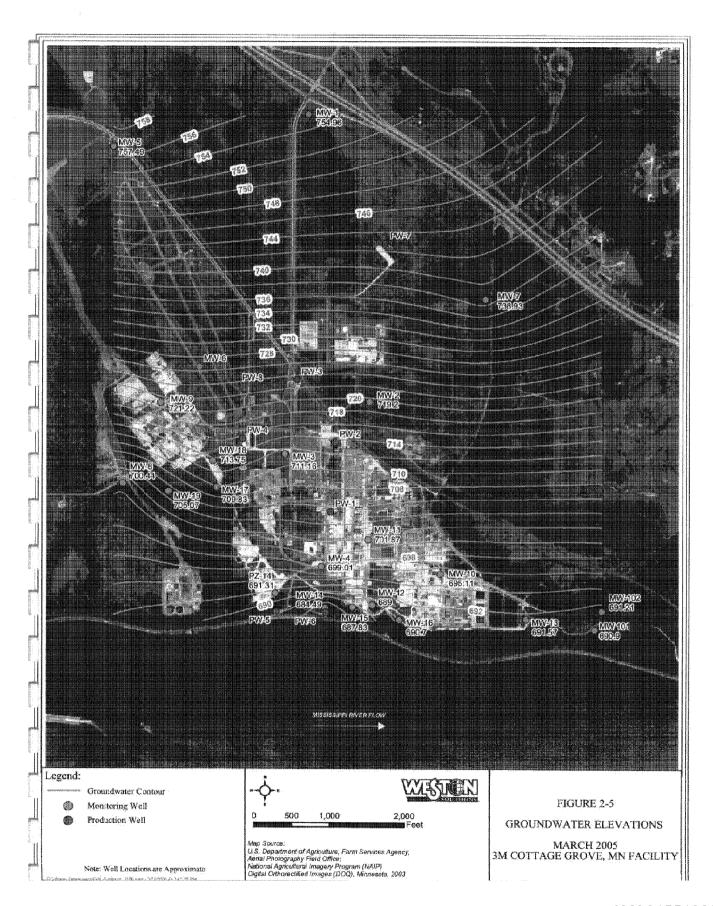


Two additional wells (PW-7 and PW-8) are used for water supply on an as needed basis. PW-7 is located at the Trap Range and PW-8 is located adjacent to a guard house at the plant entrance.

There are also eight groundwater monitoring wells (MW-1 through MW-8) that were installed during a 3M study between 1974 and 1975 in order to maintain an ongoing record of groundwater levels. Monitor well PZ-14 was subsequently added for this activity. A ninth monitor well (MW-9) was installed on the west side of the plant to monitor groundwater conditions at the former coal storage pile area located north of the incinerator facility. An old production well was discovered in 1981 on the east side of the plant near the wastewater treatment facility and was redesignated as monitor well MW-10. During the 1980s, monitoring wells MW-11 through MW-16 were installed to monitor several past waste disposal areas and an ammonium sulfate release near the In the late 1990s monitoring wells MW-17, MW-18, and MW-19 were WWTP. installed to monitor groundwater conditions at the closed ash/sludge landfill south of the incinerator. Monitoring wells MW-101 and MW-102 were installed in 2002 at a former disposal area (D1 Area) to assess the area southeast of the production area. Figure 2-4 shows the locations of the monitoring and production wells which are known to exist at the facility.

Groundwater elevation data indicate a natural southerly groundwater gradient toward the Mississippi River from the 3M property. Figure 2-5 depicts the configuration of the water table surface at the plant in March 2005. Groundwater levels have been measured and contoured several times and the water table surface configurations have remained relatively consistent.

Pumping of the production wells, which commenced in 1947, has depressed the groundwater table below the active portion of the plant property with hydraulic gradients directed towards the production wells.



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# 3. SUMMARY OF FIELD ACTIVITIES

The FC assessment field activities were conducted in accordance with the FC Work Plan and Health and Safety Plan (HASP) (Appendix B to the FC Work Plan). Field procedures were consistent with MPCA site characterization and sampling guidance. Any deviations from the FC Work Plan are identified in the following sections of this Data Assessment Report.

#### 3.1 DESCRIPTION OF THE GROUNDWATER ASSESSMENT

#### 3.1.1 Background

The FC Work Plan specified that groundwater sampling would be conducted at all 22 active monitoring wells, six production and two water supply wells at the 3M Cottage Grove facility, as well as the tap at the Bldg 116 cafeteria. Additionally, sampling of four 3M Woodbury disposal site (Woodbury Site) pumping wells, the combined discharge from these wells, and the discharge from the non-contact process water retention pond at the 3M Cottage Grove facility would be conducted on a monthly basis for three months. The Woodbury Site is owned by 3M and is approximately five miles north of the 3M Cottage Grove facility. Water is pumped from the four production wells at the Woodbury Site through an underground pipeline to the 3M Cottage Grove plant for use as non-contact process water. Once through the plant, the water is discharged to a retention pond.

#### 3.1.2 On-site Groundwater Sampling

Groundwater sampling was conducted at the 3M Cottage Grove facility from March 11 through March 17, 2005 and on May 16, 2005. Figure 3-1 shows the groundwater monitoring well and production well locations at the facility and Table 3-1 presents a groundwater sampling summary. Water levels were recorded onto well evacuation/sampling forms for each of the monitoring wells. A copy of the well evacuation/sampling forms is provided in Appendix A. After measuring water levels, the wells were purged and sampled in accordance with the MPCA-approved FC Work Plan.

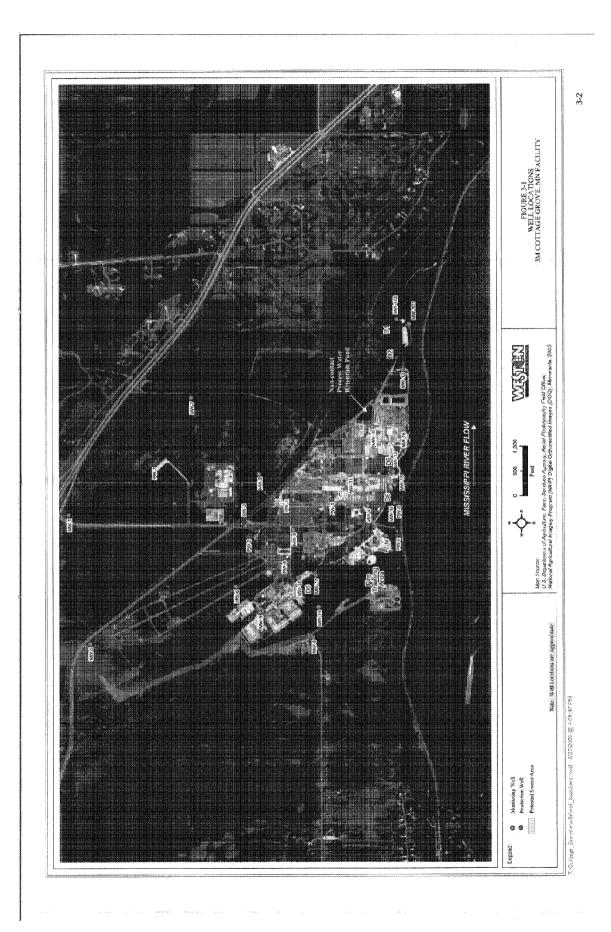




Table 3-1 Groundwater Sampling Summary - On-site Wells 3M Cottage Grove, MN Facility

Sampling Location	Well Depth (ft bgs)	Measured Well Depth (ft toc)	Depth to Water (ft toc)	Well Diameter (in)	Volume Purged (gal)	Pump Rate <sup>a</sup> (gpm)	Date Sampled
MW-1 <sup>b</sup>	200	92.64	67.71	6	585	<u>.</u>	03/16/05
MW-2 <sup>b</sup>	192	92.00	85.91	6	8 - Dry		03/15/05
MW-3	210	196.75	99.40	6	440	-	03/16/05
MW-4 <sup>b</sup>	200	133.20	108.25	6	425	-	03/16/05
MW-5	210	208.70	51.57	6	695	-	03/16/05
MW-6 <sup>b</sup>	219	103.20	Dry	6	NS	-	03/16/05
MW-7	146	140.24	55.07	6	375	-	03/16/05
MW-8 <sup>c</sup>	173	172.45	65.45	6	490	_	05/16/05
MW-9	104	107.95	47.17	4	120	•	03/15/05
MW-10	237	241.50	93.73	8 -	1,182	-	03/16/05
MW-11	200	186.60	102.90	4	165	-	03/12/05
MW-12	141	141.03	93.63	4	35 - Dry	-	03/15/05
MW-13	134	134.00	92:03	4	97	•	03/12/05
MW-14	64	59.00	26.85	4	24 - Dry	-	03/16/05
MW-15	186	186.54	96.08	4	192	-	03/12/05
MW-16	140	141.10	93.78	4	103	-	03/12/05
MW-17	112	114.36	75.28	4	78	-	03/15/05
MW-18	92	93.20	69.07	4	50	-	03/15/05
MW-19 <sup>c</sup>	120	120.00	52.33	4	10 - Dry	-	05/16/05
MW-101	100	101.90	94.87	2	3.5	-	03/12/05
MW-102	96	94.67	91.97	2	1.5	-	03/12/05
PZ-14	100	187.71	64.26	2	72.5	-	03/15/05
PW-1	205	NA	76°	14	8,100	729	03/14/05
PW-2	202	NA	81°	20	6,000	749	03/14/05
PW-3	224	NA	96°	24	11,320	924	03/14/05
PW-4	275	NA	112 <sup>e</sup>	24	12,255	817	03/14/05
PW-5	150	NA	30°	36	21,000	1481	03/14/05
PW-6	143	NA	31°	20	57 <sup>f</sup>	576	03/14/05
PW-7	200	NA	75°	4	250	10 .	05/16/05
PW-8	208	NA	108 <sup>e</sup>	4	219	2	03/14/05
Bldg 116 Tap	•	-	-	-	30	-	03/14/05

<sup>&</sup>lt;sup>a</sup>Pumping rates were provided by the facility based on 2004 measurements.

<sup>\*</sup>Measured depths are significantly shallower than previously recorded total depths suggesting borehole collapse. At MW-6, a sample could not be collected.

\*Wells contained dedicated pumps that were inoperative. Pumps were removed and samples were collected May 16, 2005.

 $<sup>^{\</sup>mbox{\scriptsize d}}\mbox{\ensuremath{\mbox{Well}}}$  was dry due to obstruction in borehole. No sample collected.

Water depths are from historic records.

Well pump runs continuously. As a result, only a small volume of water was purged through sampling port.

NA - Not available.

<sup>-</sup> Not applicable.

ft bgs - Feet below ground surface.

ft toc - Feet below top of casing.

in-inches.

gal – gallons.

gpm – gallons per minute.



During the measurement of water levels, it was noted that some of the deep bedrock wells exhibited shallower total depths than originally recorded. It is believed that the difference in depth is due to borehole collapse within the Jordan Sandstone. Groundwater purging volumes at these locations were calculated based on the original well depths. In some instances, the wells were dry (MW-6), or exhibited low volumes of water accessible for purging, resulting in the well purging dry before the calculated volume was obtained. This was noted on the well evacuation/sampling form and samples were collected where possible.

During the March 2005 groundwater sampling event, four wells could not be sampled, including MW-6, MW-8, MW-19, and PW-7. Monitoring well MW-6 was dry and a sample could not be collected. A total depth was measured at 103.2 feet below top-of-casing (TOC) while the previously recorded total well depth for MW-6 was 219 feet below TOC.

Two monitoring wells, MW-8 and MW-19, contained dedicated pumps that were not operational at the time of sampling. Sampling at these locations was postponed until the pumps could be removed in early May 2005 and groundwater samples were collected on May 16, 2005.

Production well PW-7 was not sampled in March due to frozen pipes. Sampling at this well was postponed until May to allow the pipes to thaw and PW-7 was sampled on May 16, 2005.

All groundwater samples were submitted to Exygen Research in State College, Pennsylvania for FC analyses, which include PFOA, PFOS, PFBS, and PFHS.

#### 3.1.2.1 Monitoring Wells

In accordance with the FC Work Plan, monitoring wells were purged a minimum of three well volumes or until they purged dry before sampling was conducted. Temperature, specific conductivity, and pH were measured during the purging process so that representative groundwater samples could be collected after these parameters stabilized. This data was recorded on the well evacuation/sampling forms. Following purging, the

3-4



wells were allowed to stabilize to minimize the suspended particulate in the sample media. Groundwater samples were collected using disposable polyethylene bailers and poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 degrees Celsius (°C). The sample information was entered onto a Chain-of-Custody (COC) that accompanied the samples to the laboratory.

## 3.1.2.2 Production and Water Supply Wells

Due to the necessity in maintaining the operation of the production wells, actual water levels could not be recorded. As a result, data was obtained from the facility regarding average flow rates for each of the production wells. Information was also gathered on the well construction and the frequency of use. Based on this information, purge volumes were calculated.

Since production well PW-6 was operating continuously at the time of sampling, it was not necessary to purge this well. However, a groundwater sample was collected after allowing sufficient purging to clear the sample line. The remaining production and water supply wells were being operated intermittently at the time of sampling. These wells were turned on manually and kept in operation until the calculated three well volumes were purged. Some of the wells (PW-1, PW-2, PW-3, PW-5, and PW-8) were constructed with flow meters allowing direct measurement of the flow. Other wells (PW-4 and PW-7) did not have flow meters. For these, well volumes were measured based on the average flow data provided by the facility and length of time purged. A summary of the flow rate data and purged volumes is presented in Table 3-1.

Groundwater samples from each of the production and water supply wells were collected directly from sampling ports within the pump houses. The valves were turned on, water was allowed to flow sufficiently to clear the lines, and then the water was poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.



## 3.1.2.3 **Building 116 Tap**

The water at this location is treated with a granular activated carbon (GAC) filter prior to use at the tap. This is the only building on the Cottage Grove facility that utilizes treated well water for potable water purposes. All other buildings are supplied with bottled water.

One water sample was collected from a water tap at the Building 116 cafeteria. The sample was collected downstream of the carbon filter from a faucet at the cafeteria kitchen sink where previous samples had been collected. Prior to sampling, the faucet was turned on and allowed to purge for 15 minutes. The estimated purge rate was two gallons per minute (gpm). Following purging, the sample was collected directly into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

## 3.1.3 Woodbury Site Sampling

Groundwater samples were collected from each of the four Woodbury Site production wells, the combined discharge from the wells, and the discharge from the non-contact process water retention pond on March 14, April 5, and May 12, 2005. Figure 3-2 shows the production well locations at the Woodbury Site. A sampling summary is presented in Table 3-2.

Due to the necessity in maintaining the operation of the four Woodbury Site production wells, actual water levels could not be recorded. Since the production wells operate continuously, it was not necessary to purge three well volumes.



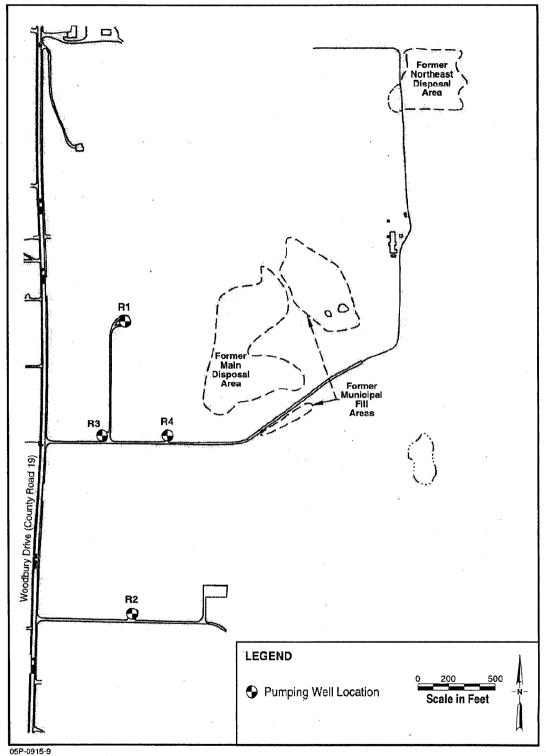


FIGURE 3-2 PRODUCTION WELL LOCATIONS WOODBURY SITE



Table 3-2 Sampling Summary - Woodbury Site Production Wells and Non-Contact **Process Water** 

Sampling Location	Volume Purged (gal)	Pump Rate <sup>a</sup> (gpm)	Dates Sampled
Woodbury Site R1	5 <sup>b</sup>	884	03/14/05, 04/5/05, & 05/12/05
Woodbury Site R2	56	141	03/14/05, 04/5/05, & 05/12/05
Woodbury Site R3	5 <sup>b</sup>	487	03/14/05, 04/5/05, & 05/12/05
Woodbury Site R4	5 <sup>ь</sup>	1,537	03/14/05, 04/5/05, & 05/12/05
Woodbury Site Combined Discharge at Bldg 56	2	-	03/14/05, 04/5/05, & 05/12/05
Discharge from Retention Pond	0	-	03/14/05, 04/5/05, & 05/12/05

<sup>&</sup>lt;sup>a</sup>Pumping rates were provided by the facility based on 2004 measurements.
<sup>b</sup>Well pump runs continuously. As a result, only a small volume of water was purged through sampling port.
- Not applicable.



Groundwater samples from each of the production wells were collected directly from sampling ports within the pump houses. The valves were turned on, water was allowed to flow sufficiently to clear and purge the lines, and then the water was poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

The combined discharge from the Woodbury Site production wells was sampled directly from the non-contact process water supply line that enters the 3M Cottage Grove facility at Building 56. A sampling port on the supply line was opened and allowed to purge sufficiently to clear the line. The sample was collected directly from the port into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

The non-contact process water was sampled after it had been through the plant. The water is discharged into an open retention pond. The sample was collected from an established monitoring point located at the discharge for the pond. The sample was collected by lowering a disposable polyethylene bailer into the discharge flow to collect the water sample. The water was poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

All water samples were submitted to Exygen Research in State College, Pennsylvania for FC analyses.

#### 3.2 DESCRIPTION OF THE SOIL ASSESSMENT

# 3.2.1 Background

Based upon a review of the historical activities conducted at the plant, the focus of the soil sampling program was the known and potential FC management areas (production,



fire training, etc.). Additionally, soil samples were collected in other areas of the plant to gain an overall understanding of the FC distribution in soils on a plant-wide basis.

In accordance with the FC Work Plan and MPCA-requested Work Plan modifications, the following areas at the 3M Cottage Grove, Minnesota facility were assessed through the collection of subsurface soil samples from soil borings and/or surface soil samples:

- D1 Former HF Tar Neutralization Pit
- D2 Former Sludge Disposal Area
- D5 Former Solids Burn Pit Area
- D8 Former Waste Disposal Area
- Fire Training Area
- Building 15 Area
- Former Wastewater Pond Area
- D6 Former Ash Disposal Area
- Incinerator Complex
- General Plant Area
- Background Areas (vicinity of monitor wells MW-5 and MW-7)

All soil samples were analyzed for FCs and a subset of these samples was analyzed for sieve (grain size) and total organic carbon (TOC).

# 3.2.2 Description of Soil Boring Sampling

From May 15 to May 26, 2005, a total of 16 soil borings were installed at the 3M facility using hollow-stem auger drilling techniques. A total of 116 composite soil samples were collected from 5-ft intervals using split-spoon samplers continuously to boring termination for descriptive logging and analytical testing. The soil was logged by an experienced geologist noting color, texture, moisture content, and any odors or discoloration. The soil samples were also screened using an organic vapor meter (OVM). OVM readings were recorded on the soil boring logs.

After descriptive logging, soil samples were collected from each five-foot interval, placed in a stainless steel bowl, and blended until homogenized. The composited soil was placed into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The



sample information was entered onto a COC that accompanied the samples to the laboratory. In accordance with the FC Work Plan, duplicate media samples and rinsate blank samples were collected as specified in the sampling protocol.

Soil samples were submitted to Exygen Research in State College, Pennsylvania for FC analyses. Twelve samples were also selected for grain size distribution and TOC analyses. The samples for grain size distribution were submitted to Tuscaloosa Testing Laboratory in Decatur, Alabama. The TOC samples were submitted to Severn Trent Laboratories, Inc. (STL) in University Park, Illinois.

Figure 3-3 shows the soil boring locations. Table 3-3 presents a summary of soil borings and a listing of soil samples collected for laboratory testing. A copy of the boring logs is provided in Appendix B.

#### 3.2.2.1 D1 Area - Former HF Tar Neutralization Pit

Background - From approximately 1960 to 1963, hydrofluoric acid (HF) tars were collected at the site and disposed off-site at the 3M Woodbury Site. When disposal of the waste tars was discontinued at the Woodbury Site, they were disposed on-site in the designated D1 Area – Former HF Neutralization Pit. As shown in Figure 3-3, the D1 Area is located in the southeastern corner of the 3M property. It has been filled and covered. Information collected during previous assessments indicates that the D1 Area was constructed as a concrete basin or pit and the basin or pit was used to neutralize HF tars with lime. The historic information indicates that tars were taken to the pit in drums and then the drum contents were dumped into the pit. Lime was placed into the pit first, followed by the waste tar, then followed by more lime. A clamshell was used to mix the lime with the waste materials. It is believed that the D1 Area was operated from the mid 1960s to the early 1970s when it was closed and covered with local soils.

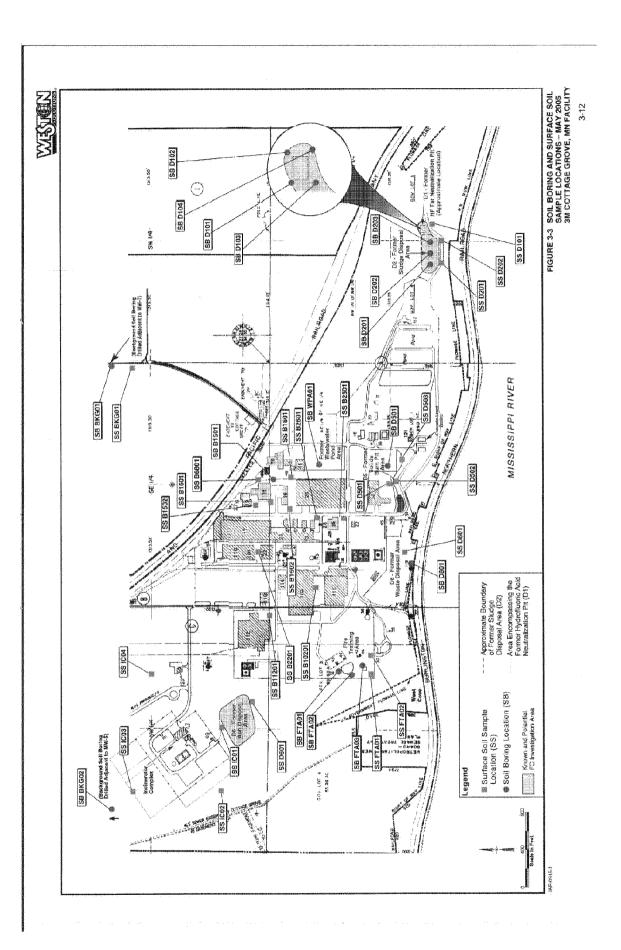




Table 3-3 Summary of Soil Borings and Soil Samples 3M Cottage Grove, MN Facility

Soil Boring Location	Area of Assessment	Total Depth of Boring (ft bgs)	Sample ID	Sample Depth (ft bgs)
D101	Former HF Tar Neutralization Pit	25	CGMN SBC D101 0 0000 CGMN SBC D101 0 0050 CGMN SBC D101 0 0100 CGMN SBC D101 DB 0100 CGMN SBC D101 0 0150 CGMN SBC D101 0 0200*	0-5 5-10 10-15 10-15 (duplicate) 15-20 20-25
D102	Former HF Tar Neutralization Pit	25	CGMN SBC D102 0 0000 CGMN SBC D102 0 0050 CGMN SBC D102 0 0100 CGMN SBC D102 0 0150 CGMN SBC D102 0 0200	0-5 5-10 10-15 15-20 20-25
D103	Former HF Tar Neutralization Pit	70	CGMN SBC D103 0 0000 CGMN SBC D103 0 0050 CGMN SBC D103 0 0100 CGMN SBC D103 0 0150 CGMN SBC D103 DB 0150 CGMN SBC D103 0 0200 CGMN SBC D103 0 0250 CGMN SBC D103 0 0300 CGMN SBC D103 0 0350* CGMN SBC D103 0 0400 CGMN SBC D103 0 0450 CGMN SBC D103 0 0550* CGMN SBC D103 0 0550 CGMN SBC D103 0 0650 CGMN SBC D103 0 0650	0-5 5-10 10-15 15-20 15-20 (duplicate) 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60-65 65-70



Soil		Total Depth of		
Boring	Area of	Boring		Sample Depth
Location	Assessment	(ft bgs)	Sample ID	(ft bgs)
			CGMN SBC D104 0 0000	0-5
		·	CGMN SBC D104 0 0050	5-10
			CGMN SBC D104 DB 0050	5-10 (duplicate)
			CGMN SBC D104 0 0100*	10-15
			CGMN SBC D104 0 0150	15-20
			CGMN SBC D104 0 0200	20-25
	Former HF Tar		CGMN SBC D104 0 0250	25-30
D104	Neutralization	70	CGMN SBC D104 0 0300	30-35
D104	Pit	70	CGMN SBC D104 0 0350	35-40
	FIL		CGMN SBC D104 0 0400	40-45
			CGMN SBC D104 0 0450*	45-50
			CGMN SBC D104 DB 0450	45-50 (duplicate)
			CGMN SBC D104 0 0500	50-55
			CGMN SBC D104 0 0550	55-60
			CGMN SBC D104 0 0600	60-65
			CGMN SBC D104 0 0650	65-70
			CGMN SBC D201 0 0000	0-5
			CGMN SBC D201 0 0050	5-10
	Former Sludge Disposal Area		CGMN SBC D201 0 0100	10-15
			CGMN SBC D201 DB 0100	10-15 (duplicate)
D201	, –	45	CGMN SBC D201 0 0150	15-20
D201	Disposal Area	73	CGMN SBC D201 0 0200*	20-25
			CGMN SBC D201 0 0250	25-30
			CGMN SBC D201 0 0300	30-35
			CGMN SBC D201 0 0350	35-40
			CGMN SBC D201 0 0400	40-45
			CGMN SBC D202 0 0000	0-5
İ			CGMN SBC D202 0 0050	5-10
			CGMN SBC D202 0 0100	10-15
D202	Former Sludge		CGMN SBC D202 0 0150	15-20
			CGMN SBC D202 0 0200	20-25
D202	Disposal Area	50	CGMN SBC D202 0 0250	25-30
			CGMN SBC D202 0 0300	30-35
1			CGMN SBC D202 0 0350	35-40
			CGMN SBC D202 DB 0350	35-40 (duplicate)
			CGMN SBC D202 0 0400	40-45
			CGMN SBC D202 0 0450	45-50



Soil		Total Depth of		
Boring	Area of	Boring		Sample Depth
Location	Assessment	(ft bgs)	Sample ID	(ft bgs)
Location	Assessment	(It bgs)	CGMN SBC D203 0 0000	0-5
			CGMN SBC D203 0 0000	5-10
			CGMN SBC D203 0 0000	10-15
			CGMN SBC D203 0 0150	15-20
ľ	·		CGMN SBC D203 0 0130	20-25
D203	Former Sludge	50	CGMN SBC D203 0 0250	25-30
2203	Disposal Area		CGMN SBC D203 0 0300	30-35
		· ·	CGMN SBC D203 DB 0300	30-35 (duplicate)
	•		CGMN SBC D203 0 0350	35-40
į			CGMN SBC D203 0 0400	40-45
			CGMN SBC D203 0 0450	45-50
			CGMN SBC FTA01 0 0000	0-5
			CGMN SBC FTA01 0 0050	5-10
FTA01	Fire Training	25	CGMN SBC FTA01 0 0100	10-15
	Area		CGMN SBC FTA01 0 0150	15-20
			CGMN SBC FTA01 0 0200	20-25
			CGMN SBC FTA02 0 0000	0-5
			CGMN SBC FTA02 0 0050	5-10
ETAGO	Fire Training	25	CGMN SBC FTA02 0 0100	10-15
FTA02	Area	25	CGMN SBC FTA02 DB 0100	10-15 (duplicate)
			CGMN SBC FTA02 0 0150*	15-20
			CGMN SBC FTA02 0 0200	20-25
			CGMN SBC FTA03 0 0000	0-5
	Fire Training		CGMN SBC FTA03 0 0050	5-10
FTA03	Area	25	CGMN SBC FTA03 0 0100	10-15
1	Alca		CGMN SBC FTA03 0 0150	15-20
			CGMN SBC FTA03 0 0200	20-25
			CGMN SBC WPA01 0 0000	0-5
	Former		CGMN SBC WPA01 0 0050	5-10
WPA01	Wastewater	25	CGMN SBC WPA01 0 0100	10-15
771101	Pond Area	23	CGMN SBC WPA01 DB 0100	10-15 (duplicate)
			CGMN SBC WPA01 0 0150*	15-20
			CGMN SBC WPA01 0 0200	20-25
			CGMN SBC B1501 0 0000	0-5
	Building 15		CGMN SBC B1501 0 0050	5-10
B1501	Area	25	CGMN SBC B1501 0 0100	10-15
	1 - 1 - 1 - 1		CGMN SBC B1501 0 0150	15-20
l	1		CGMN SBC B1501 0 0200	20-25



Soil Boring Location	Area of Assessment	Total Depth of Boring (ft bgs)	Sample ID	Sample Depth (ft bgs)
D501	Former Solids Burn Pit (D5)	25	CGMN SBC D501 0 0000 CGMN SBC D501 0 0050 CGMN SBC D501 0 0100 CGMN SBC D501 0 0150* CGMN SBC D501 0 0200	0-5 5-10 10-15 15-20 20-25
D801	Former Waste Disposal Area (D8)	25	CGMN SBC D801 0 0000 CGMN SBC D801 0 0050* CGMN SBC D801 0 0100 CGMN SBC D801 0 0150 CGMN SBC D801 0 0200	0-5 5-10 10-15 15-20 20-25
BKG01	Background near MW-7	25	CGMN SBC BKG01 0 0000* CGMN SBC BKG01 0 0050 CGMN SBC BKG01 0 0100 CGMN SBC BKG01 DB 0100 CGMN SBC BKG01 0 0150 CGMN SBC BKG01 0 0200	0-5 5-10 10-15 10-15 (duplicate) 15-20 20-25
BKG02	Background near MW-5	25	CGMN SBC BKG02 0 0000 CGMN SBC BKG02 0 0050 CGMN SBC BKG02 0 0100 CGMN SBC BKG02 DB 0100 CGMN SBC BKG02 0 0150 CGMN SBC BKG02 0 0200	0-5 5-10 10-15 10-15 (duplicate) 15-20 20-25

ft bgs – feet below ground surface
\* Sample submitted for grain size and total organic carbon (TOC) analyses.



Soil Boring Installation and Sampling - Four soil borings (D101, D102, D103, and D104) were advanced in the area of the Former HF Tar Neutralization Pit as shown in Figure 3-3. Soil borings D101 and D102 were advanced to a depth of 25 feet below ground surface (ft bgs). Soil borings D103 and D104, located on the south (presumed downgradient) side of the former pit, were advanced to a depth of 70 ft bgs.

## 3.2.2.2 D2 Area – Former Sludge Disposal Area

<u>Background</u> - After replacement of the original wastewater treatment pond and construction of new wastewater treatment ponds in the early 1960s, sludge disposal occurred in the designated D2 – Former Sludge Disposal Area. As shown in Figure 3-3, the D2 Area is located to the west of and adjacent to the D1 Area. Historic information indicated that sludge or dredgings were removed from a pond after they were allowed to dry out and then disposed in the D2 Area. This site was closed and covered sometime between 1973 and 1975. Visual inspection of the site indicates that it is a man-made topographically high area approximately 4 acres in size.

Soil Boring Installation and Sampling - Three soil borings (D201, D202, and D203) were advanced within the footprint of the D2 – Former Sludge Disposal Area to assess the sludge thickness and the underlying native soil. The soil borings were advanced to depths of 44 ft bgs (D201), 50 ft bgs (D202), and 50 ft bgs (D203).

### 3.2.2.3 D5 – Former Solids Burn Pit

<u>Background</u> - The designated D5 Area – Former Solids Burn Pit Area was located to the southeast of Building 34 and directly west of the current wastewater treatment operations. Building 34 has since been demolished and removed and the D5 Area has been covered with 3 to 7 feet of fill. Historic information indicated that this area was used for burning organic solid wastes and disposal of inorganic solid wastes generated from plant production operations. Skimmings of sludge from the original wastewater pond were reportedly placed in this area. Burning of the solids was fueled by limited additions of waste solvents. There are now no visual ground surface indications of the boundaries of this site.



Soil Boring Installation and Sampling - A soil boring (D501) was advanced to a depth of 25 ft bgs in the area formerly used to burn solid wastes, which were generated on-site. The area is currently covered with gravel and used for parking tractor trailers. The soil boring was located within the presumed D5 area based on historic photographs and maps for the facility.

## 3.2.2.4 D8 – Former Waste Disposal Area

<u>Background</u> - This is a former construction debris and damaged container disposal area is located immediately north of the pumphouse for PW-6 in a steep ravine. An Interim Remedial Measure (IRM) was conducted with MPCA approval at the D8 Area during November 1985. Approximately 200 damaged containers and container fragments were removed and disposed off-site. Due to the extreme steep slopes at the D8 Area and the low level of organics encountered, the MPCA and 3M agreed that some of the inaccessible containers could be covered and left in place. Surface management activities were conducted as part of the IRM. These included brush clearing and construction of access roadways prior to excavation, covering with soil, regrading, and seeding after excavation. The area is now completely revegetated.

Soil Boring Installation and Sampling - Soil boring D801 was advanced immediately downgradient of the D8 - Former Waste Disposal Area to a depth of 25 ft bgs. Access to this area is very restricted due to the steep terrain and the boring was located at the base of the slope in the ravine downgradient of the D-8 Area.

### 3.2.2.5 Fire Training Area

<u>Background</u> - As shown in Figure 3-3, the Fire Training Area is located on the western portion of plant operations. The area was utilized as early as 1968 to test fire fighting foams. The fire fighting foams are proprietary 3M products that contain FCs.

Various structures were used for training and waste containment in this area. Originally, shallow pans were used for setting fires. In 1970, an underground storage tank (UST) replica was constructed for training to contain fires at UST sites. Based on historic information, prior to 1971, much of the residuals and liquids from the firefighting



exercises discharged to area drainages and then to the drainageway located west of this area. In 1972, a UST was constructed to collect fluids and wastes from the pans. The tank contents were removed quarterly and hauled to the on-site wastewater treatment plant.

In 1981, 3M constructed a lined pond in the Fire Training Area to collect fluids from the fire fighting activities. Accumulated fluids would be pumped into a tanker truck and discharged to the on-site wastewater treatment plant.

Soil Boring Installation and Sampling - Three borings (FTA01, FTA02, and FTA03) were advanced in the vicinity of the Fire Training Area on the southwest portion of the facility. Due to the presence of a newly-constructed containment pond, the soil boring locations were adjusted from those indicated in the FC Work Plan. The adjusted locations provided the same areal coverage. All three borings were advanced to a depth of 25 ft bgs.

## 3.2.2.6 Building 15 Area

<u>Background</u> - Building 15 is the location of electrochemical fluorination (ECF) cells used in FC production.

Soil Boring Installation and Sampling - One soil boring (B1501) was advanced southeast of Building 15 in the plant area to evaluate potential impact to the soil from past FC management in this area. The location was selected downgradient of the building as shown in Figure 3-3. The soil boring was advanced to a depth of 25 ft bgs.

#### 3.2.2.7 Former Wastewater Pond Area

<u>Background</u> - Wastewater treatment has occurred at the facility since operations began in 1947. The original wastewater pond was located in the area east of Building 26 and south of Building 41 and was operated until construction of the present day wastewater treatment system in the early 1960s. Skimmings of sludge from the original pond were reportedly disposed on-site in the designated D5 – Former Solids Burn Pit Area.



Soil Boring Installation and Sampling - One soil boring (WPA01) was advanced to a depth of 25 ft bgs within an asphalt parking area east of Building 26 and south of Building 41 at the site of the original wastewater treatment pond. This was confirmed through the review of historic photographs of the facility.

## 3.2.2.8 Background Areas

<u>Soil Boring Installation and Sampling</u> - Two soil borings were advanced in areas having no history of plant activity north of the facility to serve as background control points. The borings were advanced adjacent to monitoring wells MW-7 (soil boring BKG01) and MW-5 (soil boring BKG02).

## 3.2.3 Description of Surface Soil Sampling

In May 2005, 50 soil samples were collected at 25 locations (0 to 6" and 6 to 24" bgs at each location) across the site. These locations were concentrated in known or potential areas where FCs were handled but also were distributed at a lesser frequency over general active plant areas and background locations to provide a plant-wide understanding of the occurrence of FCs in surface soils. Surface soil samples were field-located based on the following criteria:

- Sample locations were biased toward areas that did not show any evidence of recent disturbance, filling, or grading.
- Sample locations were biased toward areas of most likely impact from past
  activities at the site, such as areas immediately adjacent to disposal locations or
  within drainage swales downgradient of former potential FC management areas.

Historic photographs and aerial photographs also were used to position surface sample locations appropriately.

Two samples were collected from each surface soil sampling location. The first sample was collected from surface grade to a depth of approximately six inches. In areas of gravel or asphalt, the sample was collected immediately below the gravel layer. Soil from six to 24 inches in depth was collected using stainless steel bucket augers. For each sampling interval, soil was placed into a clean stainless steel bowl for homogenization.



Once blended, the soil was placed into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory. In accordance with the FC Work Plan, duplicate media samples and rinsate blank samples were also collected as part of the sampling protocol. Table 3-4 presents a summary of the surface soil sampling activities.

# 3.3 DESCRIPTION OF THE SEDIMENT AND SURFACE WATER ASSESSMENT

In accordance with the FC Work Plan and MPCA-requested Work Plan modifications, WESTON conducted sediment and surface water sampling at the east and west coves and the Mississippi River during the week of August 8, 2005.

#### 3.3.1 East and West Coves

On August 10, 2005, WESTON collected six sediment and two surface water samples from the east and west coves. The sampling locations (EC-1 through EC-3 at the east cove and WC-1 through WC-3 at the west cove) are shown in Figure 3-4.

On August 12, 2005, in accordance with the FC Work Plan, WESTON collected a sediment and a surface water sample at a location (EU-1) in the upstream drainageway to the east cove and a sediment sample at a location (WU-1) in the upstream drainageway to the west cove. A surface water sample could not be collected in the west cove drainageway since there was no water present. The upstream cove sampling locations are shown in Figure 3-4.

At each of the three sampling locations in the east and west coves, a sediment sample was collected from the 0-10 cm and 10-20 cm depth intervals using a polycarbonate tube sampler. In the upstream drainageways, the sediment sample was collected from the 0-10 cm depth interval. Sediment samples were homogenized in metal trays with disposable polyethylene liners and placed into pre-cleaned laboratory-supplied bottles, sealed and labeled.



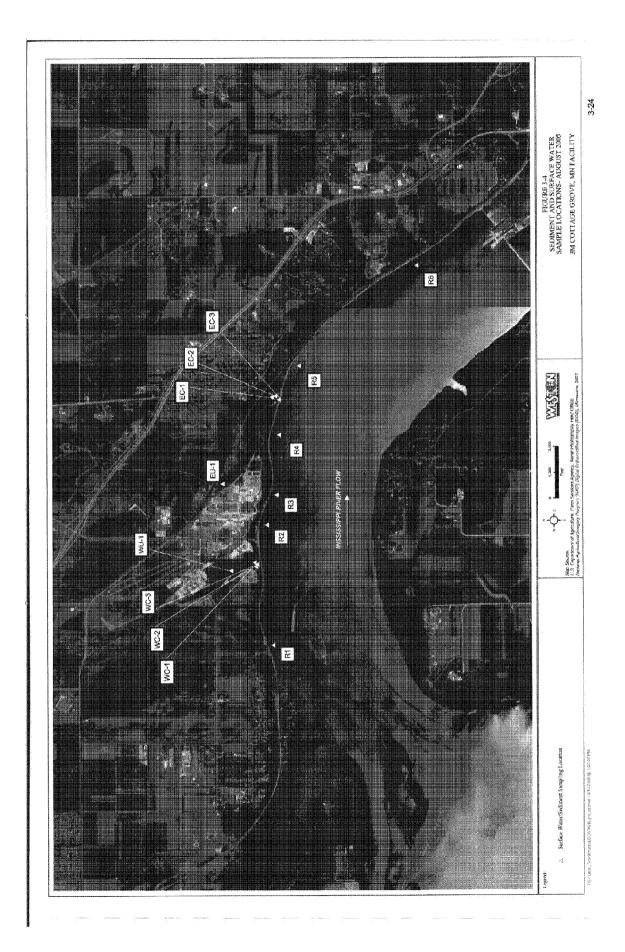
Table 3-4 Summary of Surface Soil Samples 3M Cottage Grove, MN Facility

Area	Site Description	Sample ID	Sample Depth	Sample Description
Aita	Former HF Tar	CGMN SS D101 0 0000	(in bgs) 0-6	Black silty sand
D1	Neutralization	CGMN SS D101 0 0000 CGMN SS D101 0 0005	6-24	Black silty sand
Di	Pit	CGMN SS D101 0 0003	6-24	Duplicate Duplicate
	111	CGMN SS D101 DB 0003	0-24	Silty sand with black organics
	Former Sludge	CGMN SS D201 0 0000 CGMN SS D201 0 0005	6-24	Silty sand with black organics
D2	Disposal Area	CGMN SS D201 0 0003	0-24	Black silty sand
	Disposal Area	CGMN SS D202 0 0000	6-24	Dk brown silty sand
		CGMN SS D202 0 0003	0-24	Black silty sand
		COMIN SS DOOL 0 0000	0-0	Dk brown silty sand with green
	*	CGMN SS D501 0 0005	6-24	layer (unknown)
D5	Former Solids	CGMN SS D501 0 0003	0-24	Black silty sand
DJ	Burn Pit Area	CGMN SS D502 0 0000	6-24	Brown silty sand
		CGMN SS D502 0 0000	0-24	Black sand
		CGMN SS D503 0 0000	6-24	Brown sand
		CGMN SS D503 0 0003	0-24	Black silty sand
D6	Former Ash	CGMN SS D601 0 0005	6-24	Black silty sand
<i>D</i> 0	Disposal Area	CGMN SS D601 0 0003	6-24	Duplicate Duplicate
	Former Waste	CGMN SS D801 DB 0003	0-24	Black gravelly sand
D8	Disposal Area	CGMN SS D801 0 0000 CGMN SS D801 0 0005	6-24	Gravelly sand
	Disposal Alea	CGMN SS FTA01 0 0000	0-24	Black silty sand
			6-24	
DOD 4	Fire Training	CGMN SS FTA01 0 0005	<del></del>	Brown clayey silty sand
FTA Fire Training Area		CGMN SS FTA01 DB 0005	6-24	Duplicate
		CGMN SS FTA02 0 0000	0-6	Black silty sand
		CGMN SS FTA02 0 0005	6-24	Brown silty sand
	Incinerator			
	Complex – IC01			
	southeast of	CCM DI GG ICOL O 0000	0.6	Down on to over
	complex IC01 southeast	CGMN SS IC01 0 0000	0-6	Brown sandy gravel
	of complex	CGMN SS IC01 0 0005	6-24	Dork brown gravelly sand
IC	IC02 southwest	CGMN SS IC01 0 0003	0-24	Dark brown gravelly sand Black sandy gravel
-	of complex	CGMN SS IC02 0 0000	6-24	Dark brown sandy gravel
	IC03 northwest	CGMN SS IC02 0 0003	0-24	Brown sandy gravel
	1	CGMN SS IC03 0 0000	6-24	Reddish brown gravelly sand
		CGMN SS IC03 0 0003	0-24	Black silty sand
of complex IC04 northeast of complex				Black sitty saild
	complex	CGMN SS IC04 0 0005	6-24	Black silty sand
		CGMN SS B1501 0 0000	0-6	Dark brown silty sand
	Building 15	CGMN SS B1501 0 0005	6-24	Black silty sand
General		CGMN SS B1502 0 0000	0-6	Dark brown silty sand
General Plant Area		CGMN SS B1502 0 0005	6-24	Black silty sand
		CGMN SS B1601 0 0000	0-6	Dark brown silty sand
	Duilding 16	CGMN SS B1601 0 0005	6-24	Black silty sand
	Building 16	CGMN SS B1602 0 0000	0-6	Dark brown silty sand
		CGMN SS B1602 0 0005	6-24	Black silty sand
		CGMN SS B2201 0 0000	0-6	Brown sandy gravel
	Building 22	CGMN SS B2201 0 0005	6-24	Brown sandy gravel to silty sand
		CGMN SS B2201 DB 0005	6-24	Duplicate



Area	Site Description	Sample ID	Sample Depth (in bgs)	Sample Description
General	Building 25	CGMN SS B2501 0 0000	0-6	Brown sandy gravel
Plant Area	Duilding 25	CGMN SS B2501 0 0005	6-24	Brown gravelly sand
	Building 26/	CGMN SS B2601 0 0000	0-6	Brown sandy gravel
	Building 7	CGMN SS B2601 0 0005	6-24	Brown gravelly sand
		CGMN SS B6801 0 0000	0-6	Brown sandy gravel
	Building 68	CGMN SS B6801 DB 0000	0-6	Duplicate
		CGMN SS B6801 0 0005	6-24	Black silty sand
	D.: 1141 100	CGMN SS B10201 0 0000	0-6	Black silty sand
	Building 102	CGMN SS B10201 0 0005	6-24	Dark brown silty sand
ļ	D-:14i 112	CGMN SS B11201 0 0000	0-6	Black silty sand
	Building 112	CGMN SS B11201 0 0005	6-24	Black silty sand
	Background	CGMN SS BKG01 0 0000	0-6	Black silty sand
BKG	Sample- Northeast	CGMN SS BKG01 0 0005	6-24	Black silty sand

in bgs - Inches below ground surface



3MA01551832



One surface water sample was collected at each cove and co-located with a sediment sample (locations EC-1 and WC-1). The water depth at both of the locations was less than 10 feet in depth. Therefore, in accordance with the Work Plan, each surface water sample was collected into a polyvinyl chloride (PVC) niskin bottle in the coves at approximately 0.6 the total water depth. The surface water sample from the east cove upstream drainageway was collected into a pre-cleaned unspiked sample bottle. Aliquots of the water samples were transferred into appropriate spiked laboratory-supplied bottles, sealed and labeled. A YSI meter was used to measure and record the following surface water sample parameters in the field: temperature, conductivity, dissolved oxygen (DO), pH, oxidation-reduction potential (ORP), and turbidity. A hand-held Global Positioning System (GPS) unit was used to record positional data.

The sediment and surface water samples were placed into ice chests cooled to approximately 4°C. Sample information was entered onto a COC that accompanied the samples to the laboratory. The samples were submitted to Exygen Research Laboratory in State College, Pennsylvania for FC analyses.

## 3.3.2 Mississippi River

On August 9, 2005, WESTON launched a boat into the Mississippi River to collect sediment and surface water samples in accordance with the FC Work Plan. Also, one additional downstream location to those presented in the FC Work Plan was sampled. The sampling locations (R1 through R6) are shown in Figure 3-4.

At each sampling location in the Mississippi River, a sediment sample was collected from the top 10 cm of sediment using a ponar sampler. The sample was homogenized in metal trays with disposable plastic liners and placed into pre-cleaned laboratory-supplied bottles and labeled.

For the collection of surface water samples, the depth of water at each location was measured using a depth finder. At locations R2, R3, R4, R5, EC-1 and WC-1 the water depth was less than 10 feet in depth. Therefore, in accordance with the Work Plan, each surface water sample was collected into a PVC niskin bottle at approximately 0.6 the



total water depth. At locations R1 and R6 the water depth was greater than 10 feet. Therefore, in accordance with the Work Plan, the water sample at these locations was composited from discrete samples collected at approximately 0.2 and 0.8 the total water depth. Aliquots of each water sample were transferred into appropriate spiked laboratory-supplied bottles, sealed and labeled. A YSI meter was used to measure and record the following surface water sample parameters in the field: temperature, conductivity, DO, pH, ORP, and turbidity. Buoy markers were placed at the sampling locations, and a hand-held GPS unit was later used to record positional data.

# 3.4 DESCRIPTION OF THE MISSISSIPPI RIVER FISH SAMPLING PROGRAM

Collections of fish were performed in the Mississippi River in the vicinity of Cottage Grove, Minnesota under the scientific collection permit (SCP) Special Permit No. 13031 issued by the Minnesota Department of Natural Resources Fish Management Section of the Division of Fish and Wildlife. Prior to the collection effort, the Area Fisheries Manager and the Regional Fisheries Manager were notified of the pending sampling activities. No threatened or endangered species were encountered and all collections were performed in accordance with the SCP conditions. A collection activities report was submitted to MDNR on January 30, 2006 in accordance with the requirements of the SCP. A copy of this report is provided in Appendix C.

Fish collections were performed between August 8, 2005 and August 12, 2005 at three reaches near the 3M Cottage Grove facility. Specimens were collected of smallmouth bass (*Micropterus dolomieu*), channel catfish (*Ictalurus punctatus*) and bluegill sunfish (*Lepomis macrochirus*). While sufficient channel catfish specimens were captured to meet the numeric targets of the FC Work Plan, smallmouth bass were not as abundant and those captured were used for filet tissue samples. Bluegill sunfish were more abundant than smallmouth bass in the reaches sampled and were collected to augment the smallmouth bass samples. Bluegill sunfish were used in lieu of smallmouth bass for the whole body samples from all three sampling reaches. While the target of 5 smallmouth bass samples were collected for filet tissue analyses from the upstream reach (Reach 1), only three smallmouth bass filet samples were collected from the other two sampling



reaches. As a result, two bluegill sunfish filet samples were collected from each of the three sampling reaches to allow for comparisons of analytical results.

Sample collection gear included electrofishing for smallmouth bass and bluegill sunfish and trotlining for catfish. Non-target species were released. A total of 62 fish were collected including 11 smallmouth bass, 30 channel catfish and 21 bluegill sunfish. Whole body or filet tissue samples were prepared from the collected specimens for chemical analyses, preserved by freezing with dry ice, and shipped to the Exygen Research in State College, Pennsylvania for FC analyses. Sample identification codes are of the form CGMN-F01-xxxxxxx-050812 with the following conventions for location, species and sample type in the –xxxxxxx- string:

- First character indicates the sampling reach (1, 3 or 5).
- Second and third characters indicate the species where IP = channel catfish, MD = smallmouth bass and LM = bluegill sunfish.
- Fourth character indicates the sample type where F = filet tissue and W = whole body tissue.
- Last character(s) indicate either sample number within a location, species and sample type (01 05) or a composite sample (C).

For example, the sample designated CGMN-F01-3IPW04-0-050812 is the fourth channel catfish whole body tissue sample from Reach 3 and CGMN-F01-5MDFC-0-050812 is the Reach 5 smallmouth bass filet tissue composite sample.

Figure 3-5 shows the collection locations and the sample IDs. Tabulated morphometric data on the fish whole body and filet tissue samples are provided in Tables 3-5 and 3-6, respectively.

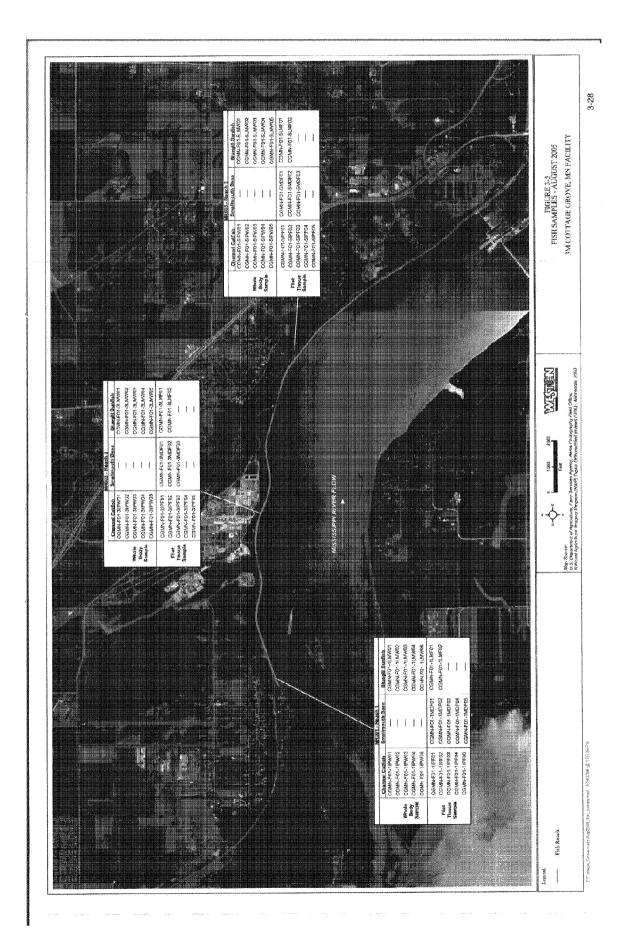


Table 3-5 Fish Whole Body Tissue Samples

	Reach 1 - W	Reach 1 - Whole Body Samples		
<u>.</u>		(con con) 49 con con 1 1 con con	Comment of the contract of the	Total Mainth (m)
Sample ID	Common Name	lotal Length (mm)	Fork Length (mm) Total Weight (g)	lotal Weignt (g)
CGMN-F01-1IPW01-0-050812	Channel catfish	195	174	54
CGMN-F01-1IPW02-0-050812	Channel catfish	343	295	265
CGMN-F01-1IPW03-0-050812	Channel catfish	445	375	009
CGMN-F01-1IPW04-0-050812	Channel catfish	443	395	296
CGMN-F01-1IPW05-0-050812	Channel catfish	550	485	1617
CGMN-F01-1LMW01-0-050812	Bluegill sunfish	124	120	44
CGMN-F01-1LMW02-0-050812	Bluegill sunfish	135	129	20
CGMN-F01-1LMW03-0-050812	Bluegill sunfish	120	112	37
CGMN-F01-1LMW04-0-050812	Bluegill sunfish	129	120	44
CGMN-F01-1LMW05-0-050812	Bluegill sunfish	120	113	32
	Reach 3 - W	Reach 3 - Whole Body Samples		
Sample ID	Common Name	Total Length (mm)	Fork Length (mm) Total Weight (g)	Total Weight (g)
CGMN-F01-3IPW01-0-050812	Channel catfish	222	191	74
CGMN-F01-3IPW02-0-050812	Channel catfish	335	278	252
CGMN-F01-3IPW03-0-050812	Channel catfish	330	279	250
CGMN-F01-3IPW04-0-050812	Channel catfish	505	439	626
CGMN-F01-3IPW05-0-050812	Channel catfish	552	491	1630
CGMN-F01-3LMW01-0-050812	Bluegill sunfish	142	134	64
CGMN-F01-3LMW02-0-050812	Bluegill sunfish	128	121	46
CGMN-F01-3LMW03-0-050812	Bluegill sunfish	140	133	62
CGMN-F01-3LMW04-0-050812	Bluegill sunfish	132	125	22
CGMN-F01-3LMW05-0-050812	Bluegill sunfish	125	120	45
	Reach 5 - W	Reach 5 - Whole Body Samples		
Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)
CGMN-F01-5IPW01-0-050812	Channel catfish	562	512	1548
CGMN-F01-5IPW02-0-050812	Channel catfish	397	350	481
CGMN-F01-5IPW03-0-050812	Channel catfish	268	515	1643
CGMN-F01-5IPW04-0-050812	Channel catfish	552	491	1440
CGMN-F01-5IPW05-0-050812	Channel catfish	483	450	1100
CGMN-F01-5LMW01-0-050812	Bluegill sunfish	86	98	19
CGMN-F01-5LMW02-0-050812	Bluegill sunfish	122	118	40
CGMN-F01-5LMW03-0-050812	Bluegill sunfish	100	95	21
CGMN-F01-5LMW04-0-050812	Bluegill sunfish	114	109	34
CGMN-F01-5LMW05-0-050812	Bluegill sunfish	100	92	20

Table 3-6 Fish Filet Tissue Samples

Reach 1 - Filet Tissue Samples - Bass/Sunfish
Smallmouth base 387
Smallmouth bass
Smallmouth bass
Smallmouth bass
Smallmouth bass
Bluegill sunfish
Bluegill sunfish
Reach 3 - Filet Tissue Samples - Bass/Sunfish
Common Name Total
Smallmouth bass
Smallmouth bass
Smallmouth bass
Bluegill sunfish
Bluegill sunfish
Reach 5 - Filet Tissue Samples - Bass/Sunfish
Common Name Total Length (mm)
Smallmouth bass
Smallmouth bass
Smallmouth bass
Bluegill sunfish
Bluegill sunfish
Reach 1 - Filet Tissue Samples - Channel Catfish
Common Name Total Length (mm)
Channel catfish
Channel catfish
Channel catfish
Channel catfish

\* Both right and left side filets included in sample to provide adequate sample mass for analyses.

Table 3-6 Fish Filet Tissue Samples

	Reach 3 -	Reach 3 - Filet Tissue Samples - Channel Catfish	- Channel Catfish		
Sample ID#	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-3!PF01-0-050812	Channel catfish	625	570	. 2250	317
CGMN-F01-3IPF02-0-050812	Channel catfish	640	573	2500	479
CGMN-F01-3IPF03-0-050812	Channel catfish	200	645	3250	528
CGMN-F01-3IPF04-0-050812	Channel catfish	290	710	3500	540
CGMN-F01-3IPF05-0-050812	Channel catfish	640	580	3000	603
, ; ;	Reach 5 -	Reach 5 - Filet Tissue Samples - Channel Catfish	- Channel Catfish		
Sample ID#	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-5IPF01-0-050812	Channel caffish	260	200	2000	392
CGMN-F01-5IPF02-0-050812	Channel caffish	029	900	2500	355
CGMN-F01-5IPF03-0-050812	Channel caffish	089	630	3250	646
CGMN-F01-5IPF04-0-050812	Channel catfish	67.2	630	3250	406
CGMN-F01-5IPF05-0-050812	Channel catfish	620	260	2000	319



# 4. RESULTS OF THE FIELD ASSESSMENT

#### 4.1 SUMMARY OF THE ANALYTICAL DATA REDUCTION PROCESS

Analytical data for FCs have been reported in Interim Reports from the Exygen and the 3M laboratories. In instances where quality control (QC) data on spike or surrogate spike recoveries associated with a sample exceed the 70 to 120% range of acceptance for an accuracy of +/- 30%, QC data were reviewed and the accuracy assessed on a sample by sample basis (i.e. +/- 40 %, +/- 50%, or +/- 60%). For data outside an assessed accuracy of +/- 60% or where the endogenous concentrations of the analyte in a medium were over three times greater than the highest spike concentration, the data are not reported (NR). Additional analytical work, including method development, is in progress by 3M in an attempt to resolve these QC issues and provide quantitative results for these samples. Other data reported with non-numerical values include results that are assigned NQ (not quantified) because they are below the Limit of Quantitation (LOQ) and results that are assigned ND (not detected) because the analyte was not detected at or above the Limit of Detection (LOD).

In addition to each primary sample analysis, a replicate sample analysis was performed. In aqueous media, a field duplicate sample analysis was also performed in addition to the primary and replicate analyses for each sample. The primary, replicate and, where available, duplicate results were reduced to a single value in order to simplify reporting. The data reduction process consisted of calculating the average concentration (arithmetic mean) for sets comprised of numeric values. In instances with mixed numeric values and non-numeric values (ND or NQ), the numeric values were carried through to represent the media concentrations. For those limited sets composed of ND and NQ values, the NQ values were carried through to represent the media concentrations. It should be noted that the data reduction convention described above is conservative and may result in overestimation of actual concentrations.



#### 4.2 GROUNDWATER

#### 4.2.1 Groundwater Elevations

As summarized in Subsection 2.5, groundwater elevation data collected at the 3M Cottage Grove facility in March of 2005 (Figure 2-5) indicate a southerly groundwater gradient toward the Mississippi River from the 3M property. Pumping of the production wells influences water levels most significantly in the central part of the plant area and is reduced with increasing distances from this area.

The extent of pumping influence, as indicated by drawdown in monitoring wells, is represented on cross section B-B' (Figure 4-1). The cross section is drawn in an east-west direction along the Mississippi River (Figure 4-2). As indicated on Figure 4-1, a depression in the water table is apparent in the area of the pumping wells PW-5 and PW-6 and extends in an eastward direction to MW-16. Beyond MW-16 in an easterly direction, the drawdown influence due to pumping is not confirmed.

## 4.2.2 Summary of Analytical Data

The groundwater analytical data for the Cottage Grove facility wells are summarized in Table 4-1. Figures 4-2 and 4-3 depict PFOA and PFOS groundwater concentrations, respectively, adjacent to the wells in which they were detected. A copy of the groundwater analytical data package (without appendices) is provided in Appendix D.

It is important to note that, as approved by the MPCA, a copy of all of the analytical data packages (for samples collected under this data assessment program) have been provided in Appendix D without their appendices due to their large size and to facilitate paper reduction. The data packages including appendices are on file with WESTON and can be provided upon request.

Due to the QC issues as discussed in Section 4.1, the analytical results for PFBS, PFHS and PFOA are NR for the groundwater sample from well MW-19. Additional analytical work is being performed in an effort to provide quantitative analytical results for the MW-19 sample and, if successful, will be reported when available.



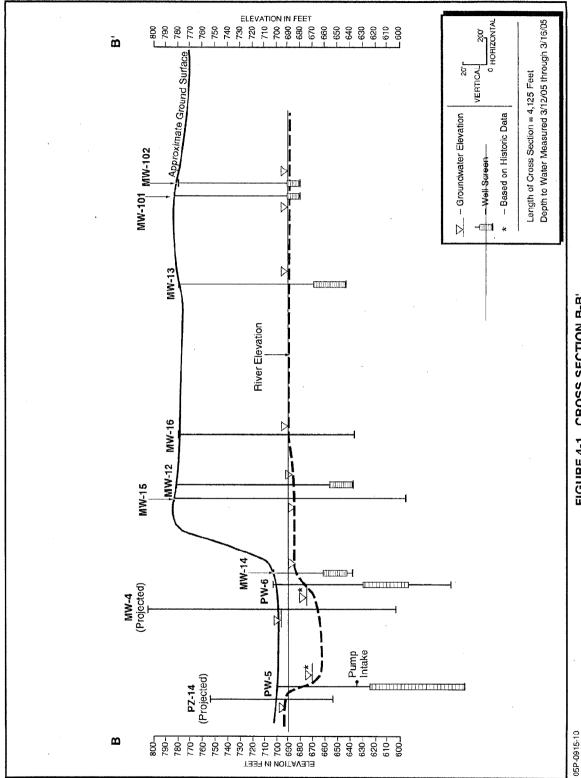


FIGURE 4-1 CROSS SECTION B-B'
3M COTTAGE GROVE, MN FACILITY

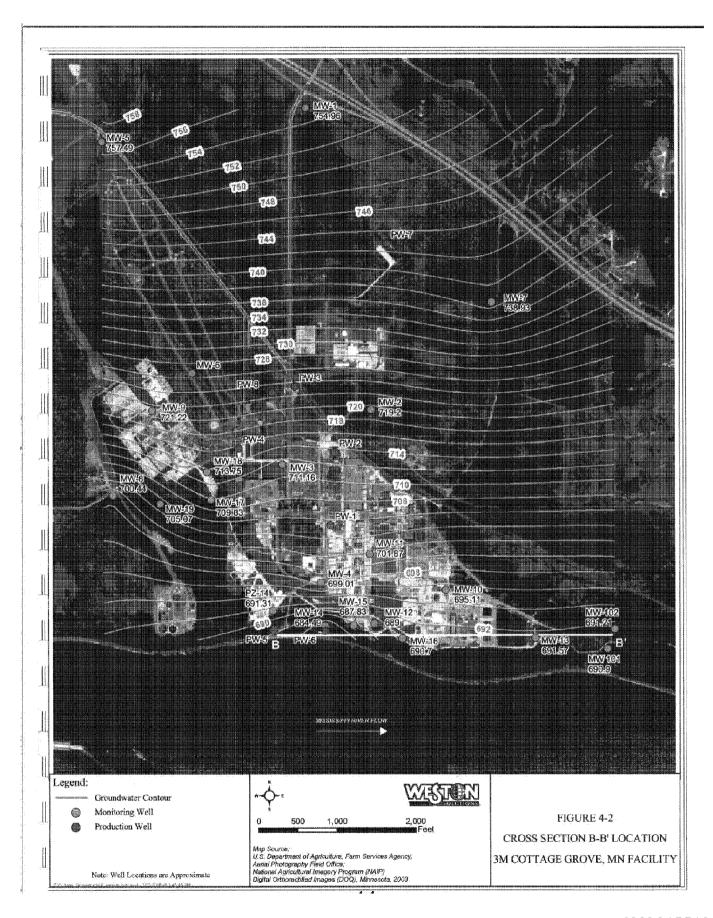




Table 4-1 Summary of FC Concentrations in Cottage Grove Groundwater Samples - March and May 2005

,	DEDC	DELLO	2500	DE0.4
	PFBS Average	PFHS Average	PFOS Average	PFOA Average
Well ID	(ppb, ug/L)	-	(ppb, ug/L)	
MW-1	0.076	0.058	0.686	1.14
MW-2	0.050	0.053	ND	1.67
MW-3	0.394	0.352	0.199	8.24
MW-4	15.4	2.13	0.168	9.83
MW-5	NQ	NQ	0.150	0.749
MW-7	0.051	ND	0.129	0.282
MW-8	0.0567	0.171	0.549	0.882
MW-9	0.129	0.358	0.266	0.963
MW-10	16.5	0.386	2.15	2.22
MW-11	13.0	1.96	11.1	70.7
MW-12	180	43.8	198	1863
MW-13	1.45	1.87	16.5	19.0
MW-14	603	29.6	79.3	967
MW-15	1.94	0.537	11.7	6.48
MW-16	13.4	1.83	33.8	21.5
MW-17	0.402	0.487	0.607	1.80
MW-18	0.354	0.980	0.877	2.57
MW-19	NR	NR	0.0597	NR
MW-101	26.8	1583	324	150
MW-102	38.5	87.6	49.8	163
PZ-14	0.372	0.518	0.566	2.38



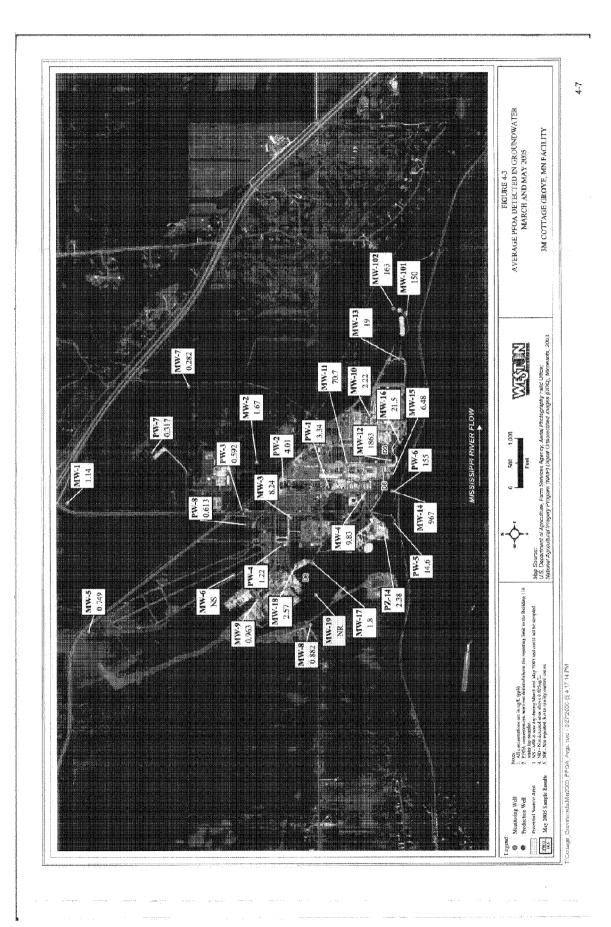
Table 4-1 Summary of FC Concentrations in Cottage Grove Groundwater Samples - March and May 2005

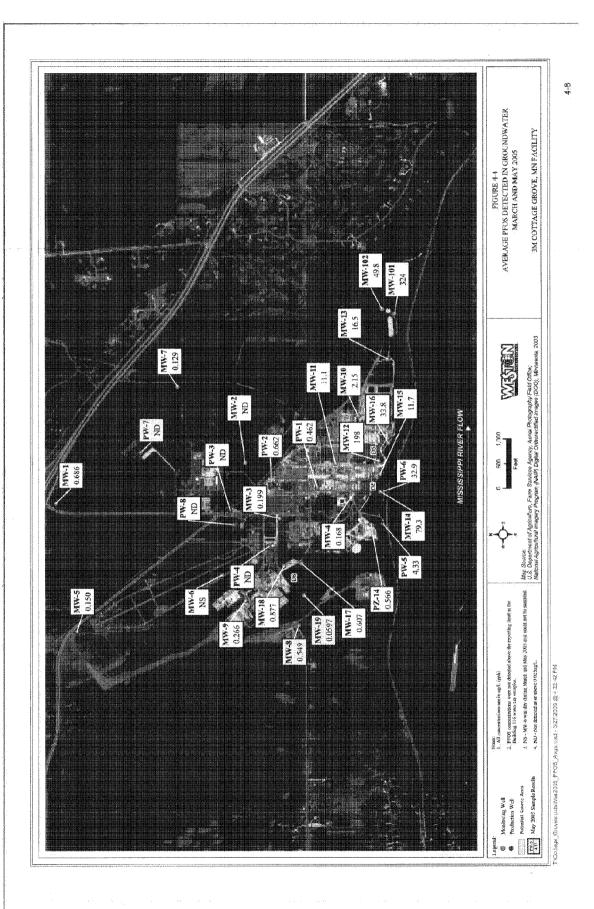
Well ID	PFBS Average (ppb, ug/L)	PFHS Average (ppb, ug/L)	PFOS Average (ppb, ug/L)	PFOA Average (ppb, ug/L)
PW-1	0.524	0.167	0.462	3.34
PW-2	0.248	0.172	0.662	4.01
PW-3	NQ	ND	ND	0.592
PW-4	0.118	0.157	ND	1.22
PW-5.	2.22	1.88	4.33	14.6
PW-6	47.9	4.78	32.9	155
PW-7	ND	ND	ND	0.317
PW-8	NQ	ND	ND	0.613
B116 (Cafeteria)	ND	ND	ND	ND

ND = Not detected at or above 0.025 ug/L.

NQ = Not quantifiable = Measured concentration between 0.025 ug/L and the Limit of Quantitation (LOQ), which is 0.050 ug/L.
 NQ value is not factored into the average concentrations.

NR = Not reported due to quality control issues.





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It is important to note that FCs were not detected in the water samples collected from the water faucet in the Building 116 cafeteria. Water from this faucet has been pre-treated with a granular activated carbon system for removal of FCs.

The remaining analytical data indicate that FCs have been detected in groundwater primarily at and near areas where historic disposal had occurred (i.e., D5 – the Former Solids Burn Pit Area, D8 – a Former Waste Disposal Area, and D1 – the Former HF Tar Neutralization Pit) with much lower concentrations detected with increasing distance from the disposal areas. The highest total concentration of FCs was detected in the groundwater sample from monitoring well MW-12, which is located downgradient of the western portion of D5 - the Former Solids Burn Pit Area. The average PFOA concentration was 1,863 µg/L (ppb) and the average PFOS concentration was 198 ppb.

Wells MW-14 and PW-6 are located downgradient of D8 - Former Waste Disposal Area. At monitoring well MW-14 and production well PW-6, the average PFOA concentrations detected in groundwater were 967 and 155 ppb, respectively, and the average PFOS concentrations were 79.3 and 32.9 ppb, respectively. The highest site-wide average PFBS concentration (603 ppb) in groundwater samples was detected at MW-14.

Monitoring wells MW-101 and MW-102 are located on the south and north side of D1 - Former HF Tar Neutralization Pit, respectively. At monitoring wells MW-101 and MW-102, the average PFOA concentrations detected in groundwater were 150 and 163 ppb, respectively, and the average PFOS concentrations were 324 and 49.8 ppb, respectively. The PFOS concentration at MW-101 was the highest site-wide average PFOS concentration detected in all the groundwater samples. Also, the highest site-wide average PFHS concentration (1,583 ppb) in groundwater samples was detected at MW-101.

### 4.2.3 LOI Wells - Groundwater Analytical Data

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The groundwater analytical data collected under the LOI program generally was consistent with the FC concentrations detected in the groundwater samples collected from the same locations, i.e., MW-4, MW-7, MW-101, PZ-14, and Bldg. 116 tap (cafeteria), in March and May 2005 FC assessment. A summary of the LOI analytical data results from samples collected from June 2003 to June 2005 is provided in Table 4-2. It is



Table 4-2 Summary of LOI Analytical Data - June 2003 through June 2005

		PFOSA	PFBS	PFHS	PFOS	PFOA
		Average	Average	Average	Average	Average
Location	Date	(ppb, ug/L)				
	2/7/22					40.0
MW-4	6/5/03	ND	5.51	7.31	5.00	10.2
MW-4	10/21/03	ND	2.57	2.75	0.975	8.99
MW-4	5/19/04	ND	7.4	5.59	3.43	16.7
MVV-4	9/29/04	ND	7.61	2.48	3.93	NA
MW-4	6/21/05	NA	3.27	2.2	0.132	9.87
MW-7	6/5/03	ND	ND	ND	ND	0.314
MW-7	10/21/03	ND	ND	ND	ND	0.330
MW-7	5/19/04	ND	ND	ND	NQ	0.367
MW-7	9/29/04	ND	ND	ND	ND	NA
MW-7	6/21/05	NA	ND	ND	ND	0.242
MW-101	6/5/03	ND	19.3	1123	224	136
MW-101	10/21/03	ND	16.4	885	120	156
MW-101	5/19/04	1	23.8	938	188	233
MW-101	9/29/04	ND	42.9	999	253	NA
MW-101	6/21/05	NA	20.2	1410	235	146
PZ-14	6/5/03	ND	, 1.02	1.85	0.676	4.81
PZ-14 PZ-14	10/21/03		1.02	1.05	0.826	4.06
PZ-14	5/19/04	ND	1.605	1.53	0.872	4.76
PZ-14 PZ-14	9/29/04	ND	2.51	1.55	0.873	NA
		I .		0.414	0.514	1.70
PZ-14	6/21/05	INA .	0.236	0.414	0.514	1.70
Distribution Loop Sample	6/5/03	0.0525	1.70	1.82	9.44	27.9
Distribution Loop Sample	10/21/03	NQ	0.616	0.444	2.30	6.43
Distribution Loop Sample	5/19/04	0.0632	1.63	1.85	7.12	23.5
Distribution Loop Sample	9/29/04	NQ	0.205	1.08	3.95	NA
Bldg. 116 Tap	6/21/05		ND	ND	ND	ND

Source: LOI analytical data was obtained from 3M and summarized in this table.

PFOSA = Perfluorooctanesulfonamide

NA = Not analyzed for this compound.

ND = Not detected at or above 0.025 ug/L.

NQ = Not quantifiable = Measured concentration is between 0.025 ug/L and the Limit of Quantitation (LOQ), which is 0.050 ug/L. NQ value is not factored into the average concentrations.



important to note that the LOI "distribution loop" samples, which are water samples collected at Bldg. 116 from June 2003 to September 2004, indicate the presence of FCs. During this time period, bottled water was supplied to Bldg. 116 for drinking. No FCs were detected in the LOI sample collected from the Bldg. 116 tap in June 2005. This is consistent with the March 2005 FC assessment results and reflects the fact that a GAC unit had been installed at Bldg. 116 (cafeteria) to remove FCs from the water prior to use.

### 4.2.4 Woodbury Site

The March, April, and May 2005 groundwater analytical data for the Woodbury Site pumping wells and combined discharge, as well as the discharge from the non-contact process water retention pond at the Cottage Grove facility, are summarized in Table 4-3. Figures 4-5 and 4-6 depict PFOA and PFOS groundwater concentrations, respectively, adjacent to the wells in which they were detected. A copy of the groundwater and combined non-contact cooling water analytical data package (without appendices) is provided in Appendix D.

The data indicate that for the FCs analyzed, PFHS and PFBS were present at higher concentrations in the water samples with lower concentrations of PFOA and PFOS detected. The detected average PFHS concentrations ranged from 1.03 to 23.3 ppb and the detected average PFBS concentrations ranged from 0.337 to 11 ppb. The detected average PFOA concentrations ranged from 0.153 to 3.12 ppb and the detected average PFOS concentrations ranged from 0.0562 to 2.29 ppb. The water samples containing the highest concentrations of FCs were collected from Woodbury Site pumping well R4. It is important to note that no FCs were detected in any sampling round in groundwater samples collected from Woodbury Site pumping well R2.

Finally, FC concentrations in the combined discharge from the Woodbury Site pumping wells were consistent with concentrations in the discharge from the non-contact process water retention pond at the Cottage Grove facility for all three sampling rounds.



Table 4-3
Summary of FCs in Woodbury Site Groundwater Samples - March, April, May 2005

Well ID	Sampling Round	PFBS Average (ppb, ug/L)	PFHS Average (ppb, ug/L)	PFOS Average (ppb, ug/L)	PFOA Average (ppb, ug/L)
R1	1	3.47	2.61	0.069	2.32
R1	2	1.90	2.45	0.062	2.33
R1	3	1.83	2.31	0.0562	2.26
R2	1	ND	ND	ND	ND
R2	2	ND	ND	ND	ND
R2	3	ND	ND	ND	ND
R3	1	0.478	1.17	0.109	0.153
R3	2	0.366	1.20	0.144	0.186
R3	3	0.337	1.03	0.0945	0.159
R4	· 1	11.0	19.7	2.29	2.82
R4	2	6.24	20.4	2.20	3.12
. R4	3	5.72	23.3	1.83	2.78
CWM	1	6.09	10.3	1.23	1.96
CWM	2	7.26	11.6	1.20	2.18
CWM	. 3	3.51	10.3	0.916	1.99
CWD	1	5.62	8.47	1.34	3.18
CWD	2	7.34	9.61	1.28	2.61
CWD	3	3.40	7.76	1.38	3.22

ND = Not detected at or above 0.025 ug/L

R1 = Recovery well

CWM = Combined discharge from Woodbury pumping wells

CWD = Non-contact cooling water discharge from retention pond at Cottage Grove Sampling Round: 1 - 3/14/05, 2 - 4/5/05, 3 - 5/12/05



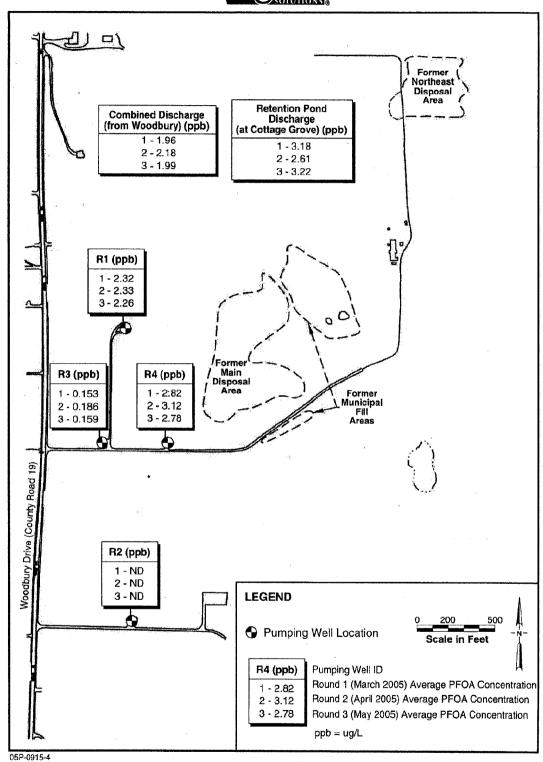


FIGURE 4-5
AVERAGE PFOA DETECTED IN GROUNDWATER – MARCH, APRIL, MAY 2005
WOODBURY SITE



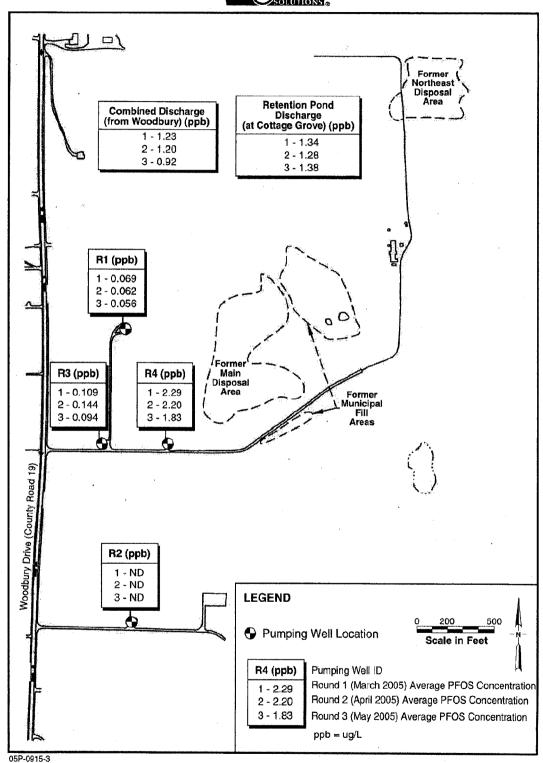


FIGURE 4-6
AVERAGE PFOS DETECTED IN GROUNDWATER – MARCH, APRIL, MAY 2005
WOODBURY SITE



### 4.3 SOIL

The analytical results data for the Cottage Grove soil samples are summarized in Tables 4-4, 4-5, and 4-6 which contain the FC, TOC, and sieve grain size distribution data, respectively. Figures 4-7 and 4-8 depict PFOA and PFOS soil concentrations, respectively. A copy of the groundwater analytical data package (without appendices) is provided in Appendix D.

Due to quality control issues discussed in Section 4.1, quantitative results for certain samples could not be reported and are flagged NR in the tables and figures. Additional analytical work is being performed by 3M in an effort to provide quantitative analytical results for these samples and, if successful, will be reported when available.

<u>Surface Soil Samples</u> - PFOS and PFOA were found at concentrations greater than the detection limit at all locations sampled. Concentrations of PFOS ranged from 1.19 to 1,820 ng/g (ppb) in surface soils (0-6" bgs) and from 1.47 to 1,625 ppb in the shallow subsurface (6-24" bgs) soils. Concentrations of PFOA ranged from 0.902 to 164 ppb in surface soils and from 0.618 to 75.9 ppb in the shallow subsurface soils.

In contrast, PFBS concentrations ranged from non-detect (ND; < 0.2 ppb wet weight) in 12 of the 25 locations to a maximum of 5.98 ppb in surface soil samples. In the shallow subsurface (6-24" bgs) soil samples, PFBS ranged from ND (16 locations) to a maximum of 11.8 ppb. Concentrations of PFHS in surface soils and shallow subsurface soils ranged from ND (6 locations) to 281 ppb and ND (7 locations) to 43.2 ppb, respectively.

Soil Boring Samples - PFOS and PFOA were found at concentrations ranging from ND to 12,350 ppb and from ND to 10,900 ppb, respectively. The highest concentrations of PFOS and PFOA in subsurface soils were present in the D2 and D1 Areas. Concentrations of PFBS and PFHS in the soil boring samples ranged from ND to 22 ppb (highest at the Fire Training Area in FTA 03) and from ND to 1,550 ppb (highest at the D2 Area in D203), respectively.

The following sections provide a discussion of the results of the soil assessment on an area-by-area basis.

Summary of FC Concentrations Detected in 3M Cottage Grove Soil Samples - May 2005

				PFBS	PFHS	PFOS	PFOA
			Sample Depth	Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>
Sample ID	Sample Location <sup>(1)</sup>	ion <sup>(1)</sup>	Interval (ft bgs)	Dry Weight (ppb,ng/g)	Dry Weight (ppb,ng/g)	Dry Weight (ppb,ng/g)	Dry Weight (ppb,ng/g)
Surface Soil Samples							
CGMN-SS-B10201-0-0000	Outeido Building 102	SC 040004	0-0.5	QN	0.469	28.9	1.93
CGMN-SS-B10201-0-0005	Outside building 102	<b>33</b> B 1020 I	0.5 - 2	QN	g	76.0	1.39
CGMN-SS-B11201-0-0000	Outcide Duilding 112	SC 011201	9'0-0	Ø	1.01	62.9	7.63
CGMN-SS-B11201-0-0005	Outside Building 112	33 B   120	0.5 - 2	ND	ØN	13.4	3.16
CGMN-SS-B1501-0-0000		SC B1501	0 - 0.5	5.98	ÖN	13.6	19.5
CGMN-SS-B1501-0-0005	Orteide Building 15	00 0 00	0.5 - 2	NO	ON	0.74	13.3
CGMN-SS-B1502-0-0000		SS B1502	0-0.5	1.34	0.549	15.6	8.79
CGMN-SS-B1502-0-0005		00 D1302	0.5 - 2	ND	QN	2.19	7.77
CGMN-SS-B1601-0-0000		SS B1601	0 - 0.5	3.95	ΔN	2.70	1.72
CGMN-SS-B1601-0-0005	Outside Building 16	<b>55</b> E1551	0.5 - 2	11.8	0.747	187	12.5
CGMN-SS-B1602-0-0000		SS B1602	0 - 0.5	2.64	1.61	157	5.05
CGMN-SS-B1602-0-0005		00 B 1002	0.5 - 2	0.758	5.77	273	75.9
CGMN-SS-B2201-0-0000			0 - 0.5	ÖN	ND	2.14	0.902
CGMN-SS-B2201-0-0005	Outside Building 22	SS B2201	0.5 - 2	ND	QN	17.4	1.92
CGMN-SS-B2201-DB-0005			0.5 - 2	QN O	Q	17.6	2.04
CGMN-SS-B2501-0-0000	Outeide Building 25	SC B2501	0-0.5	0.884	1.52	499	58.2
CGMN-SS-B2501-0-0005	Outside Duilding &	<b>33</b> D230 I	0.5 - 2	ON	2.35	101.0	38.8
CGMN-SS-B2601-0-0000	Orteide Building 28	Se Bagni	9.0-0	1.24	1.20	71.5	13.3
CGMN-SS-B2601-0-0005	Catalue Danding 20	33 DZ001	0.5 - 2	NQ	2.33	418	18.1
CGMN-SS-B6801-0-0000			0-0.5	5.00	13.7	833	151
CGMN-SS-B6801-DB-0000	Outside Building 68	SS B6801	0 - 0.5	4.88	15.9	904	164
CGMN-SS-B6801-0-0005			0.5 - 2	2.19	6.32	542	32.8
CGMN-SS-B801-0-0000	D8 Area	SC D804	0 - 0.5	ON	0.888	525	7.80
CGMN-SS-B801-0-0005	00 Alea	SS 500 I	0.5 - 2	QN	1.27	983	38.4
CGMN-SS-BKG01-0-0000	Background	Se BKG01	0-0.5	QN	QN	15.3	3.32
CGMN-SS-BKG01-0-0005	Dackground	100010	0.5 - 2	QN	QN	8.12	3.41
CGMN-SS-D101-0-0000		,	0 - 0.5	ND	ND	14.0	4.66
CGMN-SS-D101-0-0005	D1 Area	SS D101	0.5 - 2	ND	Q	19.9	1.03
CGMN-SS-D101-DB-0005			0.5 - 2	ΩN	QN	20.2	0.618



				PFBS	PFHS	PFOS	PFOA
			Sample Depth	Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>
Sample ID	Sample Location <sup>(1)</sup>	tion <sup>(1)</sup>	(ft bgs)	Dry weignt (ppb,ng/g)	Dry weignt (ppb,ng/g)	(ppb,ng/g)	(ppb,ng/g)
urface Soil Samples							
GMN-SS-D201-0-0000		. 1000	0-0.5	Q	1.62	65.4	4.65
GMN-SS-D201-0-0005	2	1070 66	0.5-2	N	1.09	68.4	7.58
GMN-SS-D202-0-0000	DZ AFEG	0000	0-0.5	NQ	4.78	1195	23.7
GMN-SS-D202-0-0005		2020 88	0.5 - 2	NQ	89'9	1625	53.1
GMN-SS-D501-0-0000		CC DE01	0 - 0.5	ΝQ	1.67	147	11.2
GMN-SS-D501-0-0005		000 00	0.5 - 2	0.624	1.34	2.48	6.74
GMN-SS-D502-0-0000	2	CO DECC	0 - 0.5	ND	0.802	6.78	4.43
GMN-SS-D502-0-0005	200	2000 ee	0.5 - 2	ØN	8.12	<b>717</b>	13.2
GMN-SS-D503-0-0000		CO DEUS	9.0-0	QN	1.14	49.3	11.1
SMN-SS-D503-0-0005		SOCO SS	0.5 - 2	QN	ON	20.7	2.51
GMN-SS-D601-0-0000			9.0 - 0	NQ	0.919	51.4	17.1
GMN-SS-D601-0-0005	D6 Area	SS D601	0.5 - 2	ND	ÖN	40.8	27.2
3MN-SS-D601-DB-0005			0.5 - 2	ND	ğ	40.8	31.0
3MN-SS-FTA01-0-0000			0 - 0.5	ND	5.28	42.6	4.39
GMN-SS-FTA01-0-0005		SS FTA01	0.5 - 2	ND	1.68	37.7	2.68
GMN-SS-FTA01-DB-0005	Fire Training Area		0.5 - 2	ND	1.83	34.5	2.73
GMN-SS-FTA02-0-0000		SC ETADO	0 - 0.5	4.79	281	1820	89.1
GMN-SS-FTA02-0-0005		201760	0.5-2	1.60	43.2	450	21.2
GMN-SS-IC01-0-0000		Se Ions	0 - 0.5	ND	0.893	27.7	1.23
GMN-SS-IC01-0-0005		100100	0.5 - 2	ND	1.40	45.2	1.95
GMN-SS-IC02-0-0000		2001 33	0 - 0.5	ND	NO	9.49	1.98
GMN-SS-IC02-0-0005	yolamo Caratosical	2001 00	0.5 - 2	ND	QN	6.32	0.874
GMN-SS-IC03-0-0000	mental complex	SO 1003	0 - 0.5	ND	QN	1.19	1.41
GMN-SS-IC03-0-0005		2001 00	0.5 - 2	ND	QN	1.47	5.40
GMN-SS-IC04-0-0000		VUJ1 33	0 - 0.5	ND	ND	8.51	1.23
GMN-SS-IC04-0-0005		\$00.00	0.5-2	Q	2	19.7	2.21

Sample ID	Sample Location <sup>(1)</sup>	ion <sup>(1)</sup>	Sample Depth Interval (ft bas)	PFBS Average <sup>(2)</sup> Dry Weight (pob.ng/q)	PFHS Average <sup>(2)</sup> Dry Weight (ppb.ng/q)	Average <sup>(2)</sup> Dry Weight (ppb.ng/q)	PFOA Average <sup>(2)</sup> Dry Weight (oobno/a)
Soil Boring Samples							
CGMN-SBC-B1501-0-0000			9-0	1.76	2.88	619	62.9
CGMN-SBC-B1501-0-0050			5 - 10	1.54	2.78	166	166
CGMN-SBC-B1501-0-0100	Outside Building 15	SB B1501	10 - 15	0.671	2.12	103	191
CGMN-SBC-B1501-0-0150			15 - 20	0.475	0.798	NR R	88.3
CGMN-SBC-B1501-0-0200			20 - 25	0.868	ÖN	1865	81.6
CGMN-SBC-BKG01-0-0000			0-5	ND	ΩN	0.607	0.545
CGMN-SBC-BKG01-0-0050			5 - 10	QN	Q	Ø	0.726
CGMN-SBC-BKG01-0-0100		SE BKG01	10 -15	. QN	QN	QN	0.515
CGMN-SBC-BKG01-DB-0100		ו הפעם הכ	10 -15	ND	QN	ON	0.704
CGMN-SBC-BKG01-0-0150			15 - 20	ND	ΩN	ON ON	NO
CGMN-SBC-BKG01-0-0200	Rackaraind		20 - 25	QN	QN	0.486	0.977
CGMN-SBC-BKG02-0-0000	מפעאפו		0 - 5	QN	QN	1.94	NQ
CGMN-SBC-BKG02-0-0050			5 - 10	Q	₽.	ă	NO
CGMN-SBC-BKG02-0-0100		SB BKG02	10 -15	2	2	2	ØN
CGMN-SBC-BKG02-DB-0100		200010 00	10 -15	ND	Q.	QN	ΝQ
CGMN-SBC-BKG02-0-0150			15 - 20	ON	QN	Q	0.611
CGMN-SBC-BKG02-0-0200			20 - 25	ND	QN	QN	0.958
CGMN-SBC-D101-0-0000	-		0-5	Ö	1.48	46.2	5.39
CGMN-SBC-D101-0-0050			5 - 10	5.81	7.24	46.4	59.2
CGMN-SBC-D101-0-0100		SB D101	10 - 15	2.00	31.65	64.4	181
CGMN-SBC-D101-DB-0100			10 - 15	2.02	30.4	67.0	189
CGMN-SBC-D101-0-0150			15 - 20	1.19	6.79	9.79	25.4
CGMN-SBC-D101-0-0200	D1 Area		20 - 25	0.781	3.41	36.0	18.1
CGMN-SBC-D102-0-0000			0-5	1.99	8.30	NR	NR
CGMN-SBC-D102-0-0050			5 - 10	2.67	35.6	396	778
CGMN-SBC-D102-0-0100		SB D102 [	10-15	0.483	21.7	134	662
CGMN-SBC-D102-0-0150			15 - 20	ğ	5.33	35.8	120
CGMN-SBC-D102-0-0200			20 - 25	ğ	7.06	252	134



				PFBS	PFHS	PFOS	PFOA
<u>.</u>	(1) and it and (1)	(j)	Sample Depth Interval	Average <sup>(2)</sup> Dry Weight	Average <sup>(2)</sup> Dry Weight	Average <sup>(2)</sup> Dry Weight	Average <sup>(2)</sup> Dry Weight
Soil Boring Samples	Sample Local	lion	(sfg ii)	(6,6,1,0,0)	(B/Bii,udd)	(8/8), (2/d)	(B/B); (add)
CGMN-SBC-D103-0-0000			0-5	QN	QN	84.2	12.7
CGMN-SBC-D103-0-0050			5 - 10	ND	0.727	794	162
CGMN-SBC-D103-0-0100	-		10-15	ND	0.843	923	532
CGMN-SBC-D103-0-0150			15 - 20	NO	2.67	219	2340
CGMN-SBC-D103-DB-0150	-		15 - 20	ΩN	2.77	227	2425
CGMN-SBC-D103-0-0200			20 - 25	0.816	10.6	574	1510
CGMN-SBC-D103-0-0250			25 - 30	1.41	12.9	384	NR
CGMN-SBC-D103-0-0300		SB D103	30 - 35	ÖN	6.53	226	154
CGMN-SBC-D103-0-0350			35 - 40	0.671	14.6	352	65.4
CGMN-SBC-D103-0-0400			40 - 45	0.773	34.9	351	108
CGMN-SBC-D103-0-0450			45 - 50	NR	9.04	202	85.0
CGMN-SBC-D103-0-0500			50 - 55	ON	4.17	182	53.9
CGMN-SBC-D103-0-0550			55 - 60	NQ	3.84	119	163
CGMN-SBC-D103-0-0600			60 - 65	ND	4.50	189	168
CGMN-SBC-D103-0-0650			65 - 70	Ø	7.90	259	171
CGMN-SBC-D104-0-0000	D1 Area		9-0	4.71	8.07	A.	X.
CGMN-SBC-D104-0-0050			5 - 10	ND	12.3	771	306
CGMN-SBC-D104-DB-0050			5-10	ΩN	12.1	701	254
CGMN-SBC-D104-0-0100			10-15	ON	23.6	378	1390
CGMN-SBC-D104-0-0150			15 - 20	0.482	129	109	4520
CGMN-SBC-D104-0-0200			20 - 25	0.574	58.1	9.89	2495
CGMN-SBC-D104-0-0250			25 - 30 ft	0.579	38.2	103	2030
CGMN-SBC-D104-0-0300		7070	30 - 35	0.624	35.8	310	375
CGMN-SBC-D104-0-0350		50 U 04	35 - 40	0.711	63.9	184	192
CGMN-SBC-D104-0-0400			40 - 45	ØN	35.8	122	62.3
CGMN-SBC-D104-0-0450			45 - 50	ØN	24.0	122	164
CGMN-SBC-D104-DB-0450			45 - 50	ØN	24.5	123	162
CGMN-SBC-D104-0-0500			50 - 55	NQ	8.16	88.1	359
CGMN-SBC-D104-0-0550			55 - 60	ğ	6.06	81.1	318
CGMN-SBC-D104-0-0600			9 - 09	QN ND	60.9	135	181
CGMN-SBC-D104-0-0650			65 - 70	2	3.57	133	143



				PFBS	PFHS	PFOS	PFOA
-		\$	Sample Depth Interval	Average <sup>(2)</sup> Dry Weight	Average <sup>(2)</sup> Dry Weight	Average <sup>(2)</sup> Dry Weight	Average <sup>(2)</sup> Dry Weight
Soil Boring Samples	Sample Location(1)	ion	(ft bgs)	(b/gu/qdd)	(b/gu'ddd)	(b/buʻqdd)	(b/gu,ddd)
CGMN-SBC-D201-0-0000			0-5	QN	2.99	724	32.5
CGMN-SBC-D201-0-0050			5 - 10	ğ	26.2	2515	363
CGMN-SBC-D201-0-0100			10 - 15	ND	5.10	254	52.8
CGMN-SBC-D201-DB-0100			10 - 15	ND	5.99	348	62.4
CGMN-SBC-D201-0-0150		נטנים מט	15 - 20	3.49	313	11950	4885
CGMN-SBC-D201-0-0200		35 0201	20 - 25	1.49	48.6	2180	726
CGMN-SBC-D201-0-0250			25 - 30	4.67	69.2	772	642
CGMN-SBC-D201-0-0300			30 - 32	2.02	58.7	339	909
CGMN-SBC-D201-0-0350	•		35 - 40	0.550	34.6	50.0	315
CGMN-SBC-D201-0-0400		,	40 - 45	0.983	37.0	4.39	234
CGMN-SBC-D202-0-0000			0-5	0.616	34.1	6135	322
CGMN-SBC-D202-0-0050			5 - 10	3.74	291	6820	5610
CGMN-SBC-D202-0-0100			10 -15	0.671	32.1	1495	574
CGMN-SBC-D202-0-0150			15 - 20	3.07	184	12350	2850
CGMN-SBC-D202-0-0200			20 - 25	1.41	55.9	6575	689
CGMN-SBC-D202-0-0250	, ,	SB D202	25 - 30	1.18	20.1	775	247
CGMN-SBC-D202-0-0300	חל אופש		30 - 35	2.25	37.5	794	853
CGMN-SBC-D202-0-0350			35 - 40	2.75	30.3	84.0	466
CGMN-SBC-D202-DB-0350			35 - 40	3.70	33.8	71.6	506
CGMN-SBC-D202-0-0400			40 - 45	2.60	86.5	199	1000
CGMN-SBC-D202-0-0450			45 - 50	10.1	120	106	1135
CGMN-SBC-D203-0-0000			9-0	0.93	32.7	3825	245
CGMN-SBC-D203-0-0050			5 - 10	4.07	314	9620	2135
CGMN-SBC-D203-0-0100			10 -15	8.38	369	7310	4885
CGMN-SBC-D203-0-0150	·		15-20	21.2	1550	10370	10900
CGMN-SBC-D203-0-0200			20 - 25	17.8	953	10020	7915
CGMN-SBC-D203-0-0250		SB D203	25 - 30	4.91	50.3	758	466
CGMN-SBC-D203-0-0300			30 - 35	7.25	58.8	46.6	581
CGMN-SBC-D203-DB-0300			30 - 35	9.3	47.1	43.6	424
CGMN-SBC-D203-0-0350			35 - 40	1.62	73.7	12.6	627
CGMN-SBC-D203-0-0400			40 - 45	2.21	31.9	9.34	169
CGMN-SBC-D203-0-0450		-	45 - 50	4.44	25.5	19.8	62.0



Table 4-4 (continued)

Sample ID	Sample Location <sup>(1)</sup>	ion <sup>(1)</sup>	Sample Depth Interval (ft bos)	Average <sup>(2)</sup> Dry Weight (ppb.ng/a)	Average <sup>(2)</sup> Dry Weight (pob.no/a)	Average <sup>(2)</sup> Dry Weight	Average <sup>(2)</sup> Dry Weight
Soil Boring Samples				66.	66	<i>(</i> 2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	/e.e/
CGMN-SBC-D501-0-0000			0-5	1.46	18.7	2310	NR.
CGMN-SBC-D501-0-0050			5-10	1.73	65.0	827	1375
CGMN-SBC-D501-DB-0050	במיט ארו	SB 0504	5 - 10	1.63	64.6	840	1225
CGMN-SBC-D501-0-0100	DO 2148	i nen ae	10-15	1.47	25.7	693	295
CGMN-SBC-D501-0-0150			15 - 20	ND	0.444	46.8	42.5
CGMN-SBC-D501-0-0200			20 - 25	NQ	0.952	34.5	21.8
CGMN-SBC-D801-0-0000			0-5	0.549	2.72	262	155
CGMN-SBC-D801-0-0050			5 - 10	2.86	4.88	528	334
CGMN-SBC-D801-0-0100	D8 Area	SB D801	10 - 15	1.76	5.97	694	543
CGMN-SBC-D801-0-0150			15 - 20	0.734	2.76	313.	91.3
CGMN-SBC-D801-0-0200			20 - 25	1.18	4.60	370	202
CGMN-SBC-FTA01-0-0000			0-5	9.98	371	NR R	211
CGMN-SBC-FTA01-0-0050			5 - 10	2.09	93.7	75.6	45.3
CGMN-SBC-FTA01-0-0100		SB FTA01	10 - 15	2.05	33.6	21.7	17.0
CGMN-SBC-FTA01-0-0150			15 - 20	1.48	54.3	24.9	36.5
CGMN-SBC-FTA01-0-0200			20 - 25	1.65	198	82.2	NR
CGMN-SBC-FTA02-0-0000			0 - 5	NQ	28.6	378	9.29
CGMN-SBC-FTA02-0-0050			5 - 10	ND	8.32	48.7	2.11
CGMN-SBC-FTA02-0-0100	Fire Training Area	SE ETANO	10 - 15	N Q	6.37	12.8	1.84
CGMN-SBC-FTA02-DB-0100		7001.190	10 -15	QN	6.67	12.3	1.99
CGMN-SBC-FTA02-0-0150			15 - 20	QN	19.8	18.1	3.99
CGMN-SBC-FTA02-0-0200			20 - 25	QN	22.2	16.1	5.13
CGMN-SBC-FTA03-0-0000			0-5	22.0	301	863	403
CGMN-SBC-FTA03-0-0100			5 - 10	1.06	10.6	12.3	57.3
CGMN-SBC-FTA03-0-0100		SB FTA03	10-15	NO	1.96	1.85	15.1
CGMN-SBC-FTA03-0-0150			15 - 20	ND	0.750	1.35	5.12
CGMN-SBC-FTA03-0-0200		<b>I</b>	20 - 25	0.977	7.71	1.72	148

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### Table 4-4 (continued)

(I elumeS	Sample I ocation <sup>(1)</sup>	lon <sup>(1)</sup>	Sample Depth Interval (# hos)	PFBS Average <sup>(2)</sup> Dry Weight	PFHS Average <sup>(2)</sup> Dry Weight	PFOS Average <sup>(2)</sup> Dry Weight	PFOA Average <sup>(2)</sup> Dry Weight
Soil Boring Samples			/26	18:5	/8.5	16.6	(8.6(a.d.)
CGMN-SBC-WPA01-0-0000			0-5ft	ÖN	ğ	131	32.2
CGMN-SBC-WPA01-0-0050			5 - 10 ft	QN	ğ	42.6	19.3
CGMN-SBC-WPA01-0-0100	Former Wastewater	CD WOADA	10 -15 ft	QN	Ŋ.	58.0	21.3
CGMN-SBC-WPA01-DB-0100	Pond Area	I DE VIVE AU	10 -15 ft	QN	ğ	56.1	16.2
CGMN-SBC-WPA01-0-0150			15 - 20 ft	1.75	6.42	805	27.7
CGMN-SBC-WPA01-0-0200			20 - 25 ft	5.96	NR	NR	NR

(1) See Figures 3-3, 4-5, and 4-6 for sample and area locations.
 (2) Concentrations shown are the arithmetic means of the primary sample and laboratory replicate sample results.
 ND = Not detected at or above 0.2 ng/g (wet weight).
 NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control issues. DB = Field duplicate sample



Table 4-5

### Summary of TOC Concentrations in 3M Cottage Grove Soil Samples - May 2005

Sample ID	Sample Location <sup>(1)</sup>	)	Sample Depth Interval (ft bgs)	TOC (mg/kg)
CGMN-SBC-D101-0-0200	D1 Area	SB D101	20-25	380
CGMN-SBC-D103-0-0350	D1 Area	SB D103	35-40	240
CGMN-SBC-D103-0-0500	D1 Area	SB D103	50-55	240
CGMN-SBC-D104-0-0100	D1 Area	SB D104	10-15	350
CGMN-SBC-D104-0-0450	D1 Area	SB D104	45-50	310
CGMN-SBC-D201-0-0200	D2 Area	SB D201	20-25	1400
CGMN-SBC-D501-0-0150	D5 Area	SB D501	15-20	990
CGMN-SBC-D801-0-0050	D8 Area	SB D801	5-10	3100
CGMN-SBC-B1501-0-0100	Outside Building 15	SB 1501	10-15	530
CGMN-SBC-FTA02-0-0150	Fire Training Area	SB FTA02	15-20	5700
CGMN-SBC-WPA01-0-0150	Former Wastewater Pond Area	SB WPA01	15-20	3200
CGMN-SBC-BKG01-0-0000	Background	SB BKG01	0-5	860

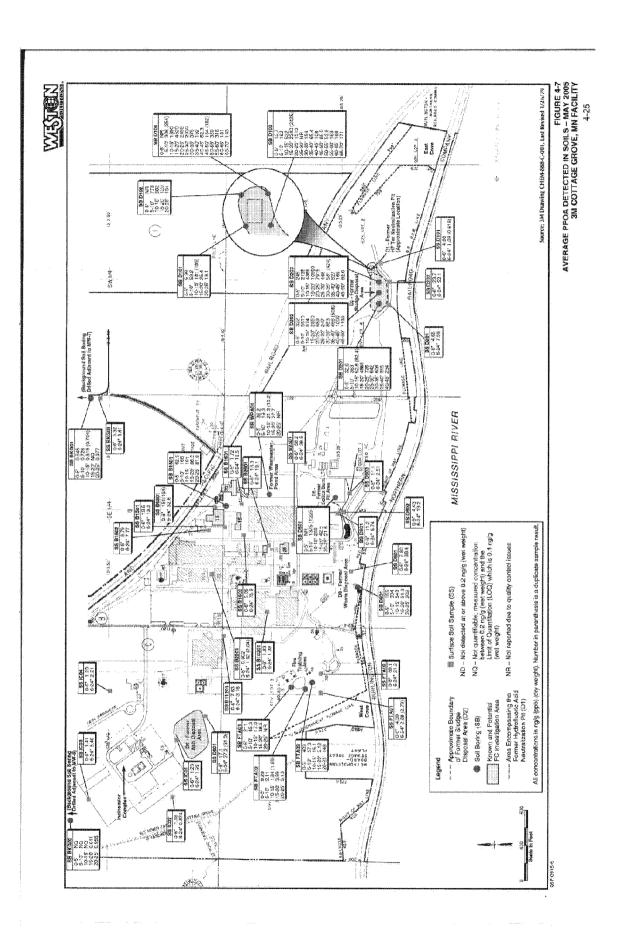
<sup>(1)</sup> See Figure 3-3 for sample and area locations.

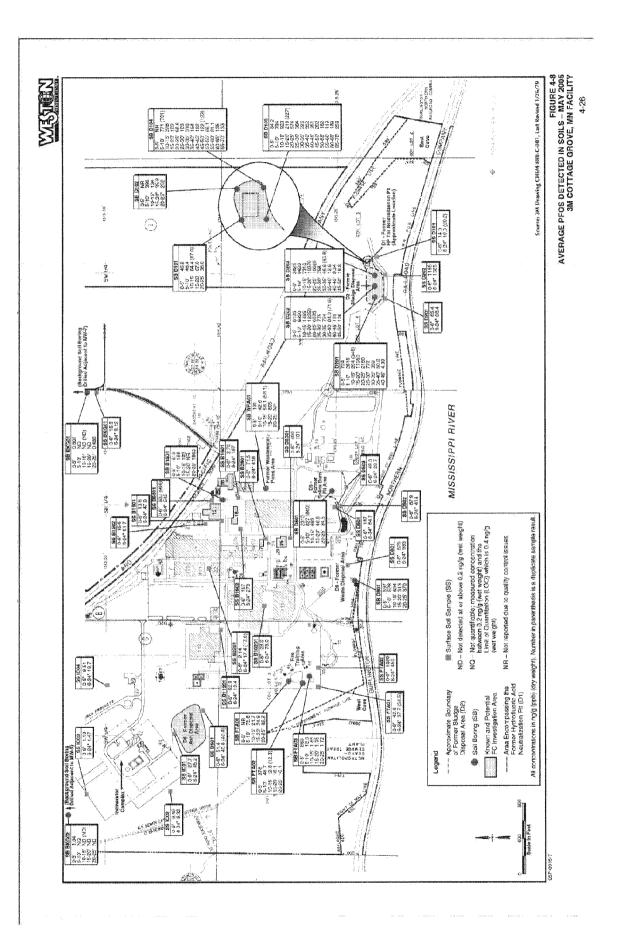
## Summary of Sieve Grain Size Distribution in 3M Cottage Grove Soil Samples - May 2005

			Sample Depth											
			Interval			D100	D90	030	010					
Sample ID	Sample Location (1)		(ft bgs)	ខ	2	(mm)	(mm)	(mm)	(mm)	% Gravel	% Sand	% Silt and Clay	% Silt	% Clay
CGMN-SBC-D101-0-0200	D1 Area	SB D101	20-25	1.63	6.83	12.5	6.0	9.0	0.1	7.3	85.0	7.6	ď	ď
CGMN-SBC-D103-0-0350	D1 Area	SB D103	35-40	99.0	7.01	19	9.0	0.2	0.1	7.3	85.1	9.2	ď	S)
CGMN-SBC-D103-0-0500	D1 Area	SB D103	50-55	- 2.5	3.34	19	9.0	0.4	0.2	4.7	91.0	4.3	S	ß
CGMN-SBC-D104-0-0100	D1 Area	SB D104	10-15	1.32	3.78	19	8.0	0.5	0.5	5.8	88.3	5.9	S.	S.
CGMN-SBC-D104-0-0450	D1 Area	SB D104	45-50	1.25	2.76	12.5	0.5	0.3	0.5	<del>ر</del> د	96.3	2.4	g	ď
CGMN-SBC-D201-0-0200	D2 Area	SB D201	20-25	2.24	20.27	4.7	0.1	0.0	0.0	0.0	46.2	53.8	43.8	10.0
CGMN-SBC-D501-0-0150	D5 Area	SB D501	15-20	1.31	3.06	9.5	0.5	0.3	0.5	0.5	93.2	6.2	S	S
CGMN-SBC-D801-0-0050	D8 Area	SB D801	5-10			4.7	0	0		0.0	4.7	95.3	76.3	19.0
CGMN-SBC-B1501-0-0100	Outside Building 15	SB 1501	10-15	1.51	4.90	19	0.5	0.3	0.7	4.2	87.7	8.1	S	g
CGMN-SBC-FTA02-0-0150	Fire Training Area	SB FTA02	15-20	1.21	3.12	12.5	0.5	0.3	0.2	1.7	93.6	4.8	SP	S
CGMN-SBC-WPA01-0-0150	Former V	SB WPA01	15-20	1.62	143.41	9.5	0.3	0	0	0.0	65.4	34.6	20.6	14.0
CGMN-SBC-BKG01-0-0000	Background	SB BKG01	0-5	1.26	3.47	19	0.7	9.4	0.2	9.9	98.6	4.8	S	S.

(1) See Figure 3-3 for sample and area locations.

Co=Coefficient of Gradiation=D30²(D60 x D10)
Cu = Uniformity coefficient=D60/D10
D10 = The maximum size of the smallest 10 percent of the sample.
D30 = The maximum size of the smallest 30 percent of the sample.
D60 = The maximum size of the smallest 60 percent of the sample.
D100 = The maximum size of 100 percent of the sample.
SP - Poorly graded sand.







### 4.3.1 D1 Area - Former HF Tar Neutralization Pit

<u>Soil Description</u> – The soil boring logs for the D1 area indicate that the soil consists of predominantly of light yellow brown silty medium- to coarse-grained sand. WESTON did not observe any discoloration or odors.

Analytical Data - In the D1 Former HF Tar Neutralization Pit Area, the highest FC concentrations were detected in the two soil borings on the presumed downgradient/south side of this area (D103 and D104) in the 5 to 30 ft bgs depth range and decreased below 30 ft bgs in the native soils. PFOA was detected at higher concentrations than PFOS in these borings with concentrations ranging from 12.7 to 4,520 ppb relative to the PFOS concentrations that ranged from 68.6 to 923 ppb.

### 4.3.2 D2 Area – Former Sludge Disposal Area

<u>Soil Description</u> – Observation of soil samples from the borings indicated the presence of fill (i.e., sludge material) associated with the D2 Area to approximately 22 to 29 ft bgs. The fill consisted of yellow brown to olive to dark gray poorly sorted silty sand with varying amounts of organic material and paint chips. The fill was locally stained dark gray to black. At soil boring D203, elevated OVM readings were recorded in the fill with the maximum reading occurring at 16 to 18 ft bgs. OVM readings were not detected in soil below the fill material. The underlying soil consists predominantly of yellowish brown to olive brown silty medium- to coarse-grained sand. Soil at D203 was typically light gray to olive sand. Residual glacial outwash gravels were observed locally.

Analytical Data - The highest FC concentrations in soil samples were detected in the D2 Former Sludge Disposal Area. The maximum concentrations of PFOS (12,350 ppb), PFOA (10,900 ppb), and PFHS (1,550 ppb) were detected at soil borings D202, D203, and D203, respectively. In this area, the higher FC concentrations occur in the 0 to 25 ft bgs samples, which is within the sludge material. Additionally, in each of the D2 Area soil borings (D201, D202, and D203), PFOS generally is found at higher concentrations than PFOA in the 0 to 25 ft bgs samples. PFOS was detected with concentrations of 1,195 and 1,625 ppb in the 0-6 in and 6-24 in bgs depth, respectively, at surface soil



location D202. PFOA generally is found at higher concentrations than PFOS at the lower depth intervals in the native soils underlying the area.

### 4.3.3 D5 Area – Former Solids Burn Pit

<u>Soil Description</u> — Observation of soil from the one boring D501 constructed in the D5 Area indicated the presence of predominantly olive brown silty coarse-grained sand to six ft bgs. Soil from six to 14 ft bgs consists of black silty medium-grained sand with some gravel, ash and charcoal. Soil below 14 feet bgs consists of light yellowish brown silty medium-grained sand to boring termination at 25 feet bgs. WESTON did not observe any odors for the entire boring.

Analytical Data - In the D5 Area soil boring D501, higher concentrations of PFOA and PFOS (295 to 1,375 ppb PFOA and 693 to 2,310 ppb PFOS) occurred in the 0 to 15 ft bgs depth range and concentrations dropped significantly (less than 50 ppb) at lower depths. The surface soil samples downgradient of this area contained lower concentrations except for one soil sample collected at D502 in the 6 to 24 in bgs interval, which contained at PFOS concentration of 414 ppb.

### 4.3.4 D8 Area - Former Waste Disposal Area

<u>Soil Description</u> – Observation of soil from boring D801 indicated the presence of predominantly of dark yellowish brown clayey sandy silt to a depth of 14 ft bgs. Bluish gray clayey sandy silt to strong brown silty sand were observed from 14 to 16 feet bgs followed by olive silty fine-grained sand and light yellowish brown silty sand to boring termination at 25 feet bgs. WESTON did not observe any waste material, discoloration or odors.

Analytical Data - Concentrations of PFOS and PFOA (155 to 543 ppb PFOA and 528 to 694 ppb PFOS) were detected in the 0 to 15 ft bgs depth range and concentrations greater than 100 ppb were detected down to boring termination at 25 ft bgs. The surface soil sample (D801) in this area contained PFOS concentrations of 525 and 983 ppb in the 0-6 in and 6-24 in bgs surface soil samples, respectively.



### 4.3.5 Fire Training Area

<u>Soil Description</u> – Observation of soil from the three borings indicated the presence of predominantly light yellowish brown silty sand to gravelly silty sand. The sand ranged from fine-grained to coarse-grained. Glacial outwash gravel was locally abundant. WESTON did not observe any discoloration or odors.

Analytical Data - In this area, PFOS concentrations of 378 and 863 ppb were found in the shallow interval of 0 to 5 ft bgs of borings FTA02 and FTA03 respectively, with significantly lower concentrations (ranging from 1.35 to 82.2 ppb) at lower depth intervals. It should be noted that the area around boring FTA03 has been substantially altered with the construction of a new run-off control basin. PFOS was detected at concentrations of 1,820 and 450 ppb in the surface soil samples (0–6 and 6–24 in bgs, respectively) collected at sampling location FTA02, which is in a drainageway from the Fire Training/Contractor Yard Area. It was also found that at the Fire Training Area, the detected concentrations of PFHS generally were greater than the detected concentrations of PFOA.

### 4.3.6 Building 15 Area

<u>Soil Description</u> – Observation of soil from the boring indicated the presence of a dark brown silty sand to a depth of approximately 8 feet bgs followed by predominantly a light yellowish brown silty sand to boring termination. WESTON did not observe any discoloration or odors.

Analytical Data - At the Building 15 area, PFOS concentrations were detected in soil boring B1501 at the shallow interval of 0 to 5 ft bgs (619 ppb) and at a depth of 20 to 25 ft bgs (1,865 ppb). It had also been detected at concentrations of 833/904 (duplicate) and 542 ppb in the surface soil samples (0-6" and 6-24" bgs, respectively) collected at sampling location B6801, which is adjacent to the soil boring.

### 4.3.7 Former Wastewater Pond Area

<u>Soil Description</u> – Observation of soil from the boring indicates the presence of asphalt and crushed rock to a depth of approximately one foot bgs. Soil from one foot to six feet

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bgs consisted of black to very dark grayish green silty to clayey silty sand. Soil below a depth of six feet bgs consisted of olive brown silty sand to 16 feet bgs followed by very dark bluish gray silty sand with a strong odor from 16 feet to boring termination at 25 ft bgs. The lower soil horizon exhibited strong odors and OVM readings up to 90 units. No other indication of residue or waste material was noted.

Analytical Data – PFOS was detected at a concentration of 805 ppb at a depth of 15 to 20 ft bgs in soil boring WPA01. The concentrations of PFOA detected in this boring were lower.

### 4.3.8 Other Site Areas

<u>Incinerator Complex and D6 Area</u> - Four surface soil sampling (0–6" and 6–24" bgs) locations (IC01, IC02, IC03, and IC04) were situated around the incinerator complex and one (D601) was downgradient of the D6 - Former Ash Disposal Area. The concentrations of PFOS detected in these areas ranged from 1.19 to 45.2 ppb. The concentrations of PFOA ranged from 1.23 to 31.0 ppb.

Non-FC Management Areas - Three surface soil sampling (0-6" and 6-24" bgs) locations were situated around Buildings 112 (B11201), 102 (B10201), and 22 (B2201), which were not associated with FC management operations. The concentrations of PFOS detected in these areas ranged from 2.14 to 76.0 ppb. The concentrations of PFOA ranged from 0.902 to 7.63 ppb.

FC Management Areas - Four surface soil sampling locations (0–6" and 6–24" bgs) were situated adjacent to Buildings 16 (B1601 and B1602), 7 (B2601), and 25 (B2501), which were associated with FC management operations. The concentrations of PFOS detected in these areas ranged from 2.70 to 499 ppb. The concentrations of PFOA ranged from 1.72 to 75.9 ppb.

### 4.3.9 Background

Soil Description - Observation of soil boring BKG01 indicated soil consisting predominantly of light olive brown silty coarse-grained sand to olive yellow clayey silty



medium-grained sand to 21 feet bgs. Weathered dolomite was encountered at 21 feet bgs with auger refusal encountered at 22 feet bgs.

Observation of soil boring BKG02 indicated a dark reddish brown silty coarse-grained sand to approximately six ft bgs followed by light olive brown silty sand to 23.5 ft bgs. The soil becomes gravelly at 18 ft bgs. Auger refusal was encountered at 23.5 ft bgs and dolomite cuttings. WESTON did not observe any discoloration or odors at either of the borings.

<u>Analytical Data</u> – The concentrations of PFOS detected in the background area soil borings (BKG01 and BKG02) ranged from ND to 1.94 ppb. It was detected in the surface soil sample (BKG01) at concentrations of 15.3 and 8.12 ppb at the 0-6" and 6–24" bgs depth, respectively.

The concentrations of PFOA detected in the background area soil borings ranged from NQ to 0.977 ppb. It was detected in the surface soil sample (BKG01) at concentrations of 3.32 and 3.41 ppb at the 0-6" and 6-24" bgs depth, respectively.

### 4.4 SEDIMENT AND SURFACE WATER

The sediment analytical data for the Cottage Grove facility are summarized in Table 4-7. Figure 4-9 depicts the average PFOS/PFOA sediment concentrations adjacent to the locations where they were detected. A copy of the analytical data package (without appendices) is provided in Appendix D.

The surface water analytical data for the Cottage Grove facility are summarized in Table 4-8 and field-measured surface water sample parameters are summarized in Table 4-9. Figure 4-9 depicts the average PFOS/PFOA surface water concentrations adjacent to the locations where they were detected. A copy of the analytical data package (without appendices) is provided in Appendix D.



Summary of FC Concentrations Detected in Sediment Samples - August 2005 Cottage Grove, MN Table 4-7

1				PFBS	PFHS	PFOS	PFOA
			Sample Depth	Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>
			Interval	Dry Weight	Dry Weight	<b>Dry Weight</b>	<b>Dry Weight</b>
Sample ID	Sample Location <sup>(1)</sup>	(1)	(cm)	(ppp,ug/g)	(ppb,ng/g)	(bbb,ng/g)	(bbb,ng/g)
CGMN-SD-MR001-0-050809		R1	0-10	ND	QN	ØN	ND
CGMN-SD-MR002-0-050809		R2	0-10	ND	ND	NQ	ND
CGMN-SD-MR003-0-050809	Mississippi Biver	R3	0-10	0.680	1.67	8.28	13.2
CGMN-SD-MR004-0-050809		72	0-10	ND	ND	NQ	ØN
CGMN-SD-MR005-0-050809		R5	0-10	ND	ΩN	6.13	1.13
CGMN-SD-MR006-0-090809		R6	0-10	ND	QN	1.35	ND
CGMN-SD-WU011-0-050812	Upstream of West Cove	WU-1	0-10	QN	1.43	15.8	1.55
CGMN-SD-WC011-0-050810		7 (79)	0-10	QN	6.43	9.89	13.6
CGMN-SD-WC012-0-050810		ر خ	10-20	ΩN	86.8	69.2	19.4
CGMN-SD-WC021-0-050810		2000	0-10	ØN	10.6	91.1	32.4
CGMN-SD-WC022-0-050810	west cove	7-> A	10-20	ØN	7.32	36.9	38.7
CGMN-SD-WC031-0-050810		2000	0-10	ΔN	2.18	15.2	4.11
CGMN-SD-WC032-0-050810		? }	10-20	ΔN	2.08	18.5	4.46
CGMN-SD-EU011-0-050812	Upstream of East Cove	EU-1	0-10	ND	0.866	10.1	18.9
CGMN-SD-EC011-0-050810		7.7.1	0-10	1.35	1.61	49.3	12.7
CGMN-SD-EC012-0-050810		- د س	10-20	1.10	1.28	31.9	13.5
CGMN-SD-EC021-0-050810	i i i i i i i i i i i i i i i i i i i		0-10	4.12	5.82	267	28.7
CGMN-SD-EC022-0-050810	East Cove	7-5	10-20	6.61	2.45	58.4	16.5
CGMN-SD-EC031-0-050810		٥	0-10	1.47	2.85	110	26.5
CGMN-SD-EC032-0-050810		? u	10-20	2.27	1.19	24.2	11.7

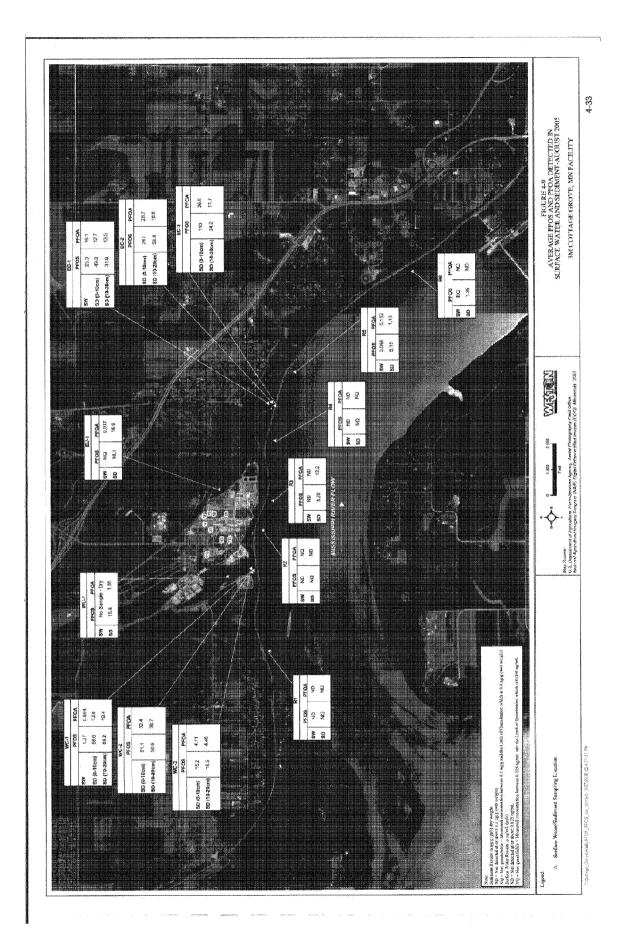
(1) See Figure 4-7 for sample locations.

(2) Concentrations shown are the arithmetic means of the primary sample and laboratory replicate sample results. NQ value is not

factored into the average calculations.

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantifiable (LOQ) which is 0.4 ng/g (wet weight).





# Table 4-8

Summary of FC Concentrations Detected in Surface Water Samples - August 2005

Cottage Grove, MN

			PFBS	PFHS	PFOS	PFOA
			Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>	Average <sup>(2)</sup>
Sample ID	Sample Location <sup>(1)</sup>	(1)	(ppb, ng/mL)	(ppb, ng/mL)	(ppb, ng/mL)	(ppb, ng/mL)
CGMN-SW-MR001-0-050809		R1	QN	QN	O <sub>N</sub>	QN
CGMN-SW-MR002-0-050809		R2	0:020	220.0	9	ğ
CGMN-SW-MR003-0-050809	Mississippi River	R3	ÖΝ	Q	9	9
CGMN-SW-MR004-0-050809		R4	ØN	ΩN	Q	Q
CGMN-SW-MR005-0-050809		R5	0.097	ÖN	0.098	0.132
CGMN-SW-MR006-0-050809		R6	Ø	QN	Ö	ÖN
CGMN-SW-EU011-0-050812	Upstream of East Cove   EU-1	EÙ-1	NQ	ON	ON	0.077
CGMN-SW-EC011-0-050810	East Cove	EC-1	13.1	4.71	25.3	16.1
CGMN-SW-WC011-0-050810	West Cove	WC-1	0.082	0.36	1.27	0.694

(1) See Figure 4-7 for sample locations.

(2) Concentrations shown are the arithmetic means of the primary sample and laboratory replicate sample results. NQ value is not

factored into the average calculations.

ND = Not detected at or above 0.025 ng/mL

NQ = Not quantifiable = Measured concentration between 0.025 ng/mL and the Limit of Quantitation (LOQ) which is 0.050 ng/mL.



Summary of Field-Measured Parameters in Surface Water Samples - August 2005 Mississippi River and Coves Cottage Grove, MN Table 4-9

Sample				Temperature	Conductivity	Dissolved Oxygen		Oxidation- Reduction	Turbidity	Water
Location <sup>(1)</sup> Sample ID	Sample ID	Latitude	Longitude	ပ္	(us/cm²)	(mg/L)	Hd	Potential	(utn)	Depth (ft)
R1	CGMN-SW-MR001-0-050809	44 47.045	44 47.045 092 55.792	27.25	0.61	9.14	8.64	-42.5	15.5	11
R2	CGMN-SW-MR002-0-050809	44 47.083	092 54.712	26.70	0.61	7.56	9.6	-47.2	14.4	8.6
R3	CGMN-SW-MR003-0-050809	44 47.019	092 54.447	26.55	09.0	6.75	8.57	-42.1	17.8	10
R4	CGMN-SW-MR004-0-050809	44 47.003	092 53.908	26.70	09.0	7.01	8.59	-56	15.7	5.6
R5	CGMN-SW-MR005-0-050809	44 46.875	44 46.875 092 53.292	26.80	0.61	7.1	8.61	-45.2	10.2	9
R6	CGMN-SW-MR006-0-050809	44 46.119	44 46.119 092 52.399	27.40	0.62	9.83	8.65	-56.5	48.6	24
EC-1	CGMN-SW-EC011-0-050810	44 47.003	44 47.003 092 53.596	25.11	1.14	10.18	8.14	-25.5	1.6	_
WC-1	CGMN-SW-WC011-0-050810	44 47.005	44 47.005 092 63.586	22.90	0.63	5.91	8	-279.8	17.4	1
							1		1	

(1) See Figure 4-7 for sample locations.



### 4.4.1 East and West Coves

### 4.4.1.1 Sediment

The average PFOS concentrations detected in sediment samples at the east cove ranged from 24.2 to 267 ppb and at the west cove they ranged from 15.2 to 91.1 ppb. The average PFOA concentrations detected at the east cove ranged from 11.7 to 28.7 ppb and at the west cove they ranged from 4.11 to 38.7 ppb. No significant concentration differences were found for PFOS or PFOA in the two sample depths at the west cove and for PFOA in the two sample depths at the east cove, the detected average PFOS concentrations were higher in the 0–10 cm sample depth than in the deeper 10–20 cm sample. The upstream sediment average concentrations of PFOS and PFOA for the east and west cove drainageways were all in the same range with average detected concentrations from 1.55 to 18.9 ppb.

### 4.4.1.2 Surface Water

The average concentration of FCs detected in the east cove surface water sample were greater than the concentrations detected in the west cove sample. The highest detected average concentrations in the east cove were 25.3 and 16.1 ppb, respectively, for PFOS and PFOA. The average concentration of PFOA detected in the upstream surface water sample at the east cove was 0.077 ppb. The remaining FCs were NQ in this surface water sample. A surface water sample was not collected upstream of the west cove because the drainageway was dry at the time of sampling.

### 4.4.1.3 NPDES Analytical Data

After treatment, wastewater is discharged into the ravine located east of the WWTP ponds, at an NPDES station identified as SD 001. The ravine flows into the east cove. The NPDES FC analytical data collected at station SD 001 since 2000 has been summarized in Tables 4-10 through 4-12.



Table 4-10 Summary of NPDES FC Analytical Data - 2000 to 2003

	Sample	Carbo	xylates		Sulfonates	
1		PFHA	PFOA	PFBS	PFHS	PFOS
	Date	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Jan-March 2000 <sup>1</sup>	-	123.5	1991.3	873.6	17.4	1403,6
Sept-Oct 2000 <sup>2</sup>	-	28.7	216.3	63.7	11.3	262.0
December 2002	-	91.0	180.0	51.0	5.80	550.0
January 2003	1/15/03	20.4	80.1	42.4	6.5	200
January 2003	1 ' '	20.1	77.9	45.6	6.7	177
January 2003 Av	erage 🛒		79.0	44.0	6.6	189
February 2003	2/12/03	16.8	80.0	32.4	5.4	64.8
February 2003		16.4	78.8	31.0	5.9	61.7
February 200314	Verage :	16.6	79.4	31.7	5.6	4 63.3
March 2003	2/12/02	11.8	74.3	13.8	5.5	61.4
March 2003	3/12/03	12.0	74.7	13.8	5.6	74.7
Marab 2008 Ave	agelt 🚚 🗀	11,9	74.5	13.8	5.6	5.68.1
April 2003		34.1	112.0	2370	6.6	60.1
April 2003	4/23/03	34.8	109.0	2180	6.7	72.0
April 2003 Avera	ge Land	34,5	- 110.5	2275.0	6.6	1,66.1
May 2003	5/15/03	15.1	95.0	31.5	5.8	44.1
May 2003	-	14.9	101.0	32.3	5.8	41.2
May 2005 Average	e t	15.0	98.0	31.9	5.8	42.7
June 2003	6/11/03	4.9	18.9	2140.0	5.8	96.3
June 2003		5.3	16.4	2260,0	5.8	94.9
June 2003 Avera	je wat	5.1	17:7	2200.0	518	95.6
July 2003	7/16/03	16.9	77.4	3270.0	5.7	55.1
July 2003	,,	15.8	79.7	3680.0	5.7	55.7
July 2008 Averag	er a	16.4	78.6	347510	527	55.4
August 2003	8/7/03	14.8	79.7	78.7	5.5	63.7
August 2003	• •	14.2	85.2	78.0	5.3	43.2
August 2003 Ave	rage	14.5	82.5	78.4	- 5.4	53.5
September 2003	9/10/03	11.2	53.3	406.0	5.3	51.7
September 2003	· · · ]	11.4	55.5	354.0	5.4	55.3
September 2003.	Average -	<b>37 11.3</b>	54.4	380.0	5.4	4,59.5
October 2003	10/8/03	16.3	73.9	87.1	6.2	34.3
October 2003		17.9	102.0	78.7	6.7	71.6
October 2003 Ave	rage	<b>4.17.1</b>	88.0	82.9	6.4	53.0
November 2003 November 2003	11/5/03	16.0	60.1	111.0	5.1	34.8
		17.2	67.8	89.7	5.6	42.8
November 2003 A	verage	16.6	64.0	100.4	5.3	38.8
December 2003 December 2003	12/10/03	15.5	64.7	28.9	4.6	15.5
December 2003 A		15.3	66.5	30.0	4.9	16.8
	verage	<u>+ 15,4 - </u>	65.6	29.5	4.7	16,2
2003 Average	ļ	16.2	74.3	728.5	E 7	
2003 STD	. [	6.7	23,3	1177.7	5.7	66.2
		J./	4313	TT//./	0.6	42.7

Source: NPDES analytical data was obtained from 3M and summarized in this table.

PFHA - Perfluorohexanoic acid

STD - Standard Deviation

<sup>1-</sup> Averaged data taken from 8 data points.

<sup>2 -</sup> Averaged data taken from 3 data points.



Table 4-11
Summary of NPDES FC Analytical Data - 2004

	Summary o			al Data - 20	004	
1	Sample	Carbo	xylates		Sulfonat	es
1	Date	PFHA	PFOA	PFBS	PFHS	PFOS
		(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
January-04		0.57	1.60	0.70	0.23	0.82
January-04	+	0.67	1.74	0.72	0.25	0.80
January 2004 Av	/erage	0.62	1.67	0.71	0,24	0.81
February-04		12.6	127.0	30.7	3,3	38.4
February-04	+1	11.8	102.0	28.3	3.4	28.7
February 2004VA	verage	12.2	114,5	29.5	3.34	33.6
March-04		15.9	73.3	31.2	2.4	13.3
March-04	11	16.9	75.9	36.5	1.9	18.8
Merch 2000/Aske		16.4	74.6	33,9	2.2	16.1
April-04		4.1	8.9	26.3	0.2	2.0
April-04	1	4.5	9.5	34.1	0.3	2.0
April 2004 Avera	ge a a a s	4.3	49,2	30.2	0.2	2.0
May-04		9.1	36.8	130.0	1.0	5.9
May-04		8.9	34.3	134.0	1.0	6.1
May 2004 Average		9.0	35.6	:132.0	1.0	6.0
June-04		19.3	2.5	776.0	0.2	0.9
June-04		17.9	2.5	721.0	0.2	1.2
June 2004 Avera		18.6	2.5	748.5	0.2	#14.110# A
July-04	. //1///////	14.7	81.1	844.0	2.6	16.3
July-04 July 2004 Averag		13.3	73.4	1040.0	2.5	16.1
	[-]	14.0	77.34	942,0	2.5	16.2
August-04	8/4/04	7.0	3.0	410.0	0.2	0.4
August-04 August 2004 Ave	' '	6.3	2.7	421.0	0.2	0.5
September-04	age	6.7	2.9	.415.5	0.2	0.4
September-04	9/1/04	6.8	8.0	31.6	0.3	1.3
September 2004		7.3	7.9	32.7	0.3	1.4
October-04	Average	7.0	8.0	32.2	0,3	1.3
October-04	10/13/04	0.4	1.0	20.6	0.5	0.4
October 2004 Ave	12.00	0.4	1.0	21.0	0.5	0.5
November-04		0.4	110	20.8	0.5	0.4
November-04	11/11/04	9.9	32.8	90.2	0.8	5.2
November 2004 A	Verage	9.3 <b>9.6</b>	32.5	125.0	0.9	5.0
December-04		7.8	32,7	107.6	0.9	5.1
December-04	12/1/04	7.2	28.3	99.1	1.5	5.9
December 2004 A	Verage	7.5	29.0	139.0	1.3	6.0
		4.17	28.7	119,1	1.4	6.0
2004 Average	1	8.9	32.4	217.7	1.1	7.4
2004 STD		5.7	37.4	316.1	1.1	10.0
				3-0.1	4.4	10.0

Source: NPDES analytical data was obtained from 3M and summarized in this table.

PFHA - Perfluorohexanoic acid STD - Standard Deviation



Table 4-12 Summary of NPDES FC Analytical Data - 2005

		Carbo	xylates		C16	
	Sample	PFHA	PFOA	PFBS	Sulfonate	PFOS
	Date	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
January-05		7.8	19.2	96.1	1.5	
January-05	1/12/05	7.5	20.0	80.9	1.1	1.5
January 2005 Av	erage	7.6	19.6	88.5	1.3	1.6 1.6
February-05		13.4	22.2	75.1	1.9	
February-05	2/3/05	14.0	23.8	72.3	1.9	3.5
Eebruary 2005 A	verage L.A.	13.7	23.0	73.7	1.9	4.1
March-05		21.1	262.0	145.0	4 4002213000000000000000000000000000000000	3.84
March-05		20.7	264.0	151.0	2.8 3.0	7.3
March 2005 Aver	age t	20.9	263.0	143.0	2.9	7.8
April-05	l l	14.4	26,1	186.5	2.8	7.64
April-05	4 . 4/////5	13.9	24.7	167.0	2.8	4.0
April 2005 Avera		14.1	25.4	176.8	2.8	4.1
May-05		4.7	4.3	276.0	2.6	
May-05		4.8	4.3	308.0	2.5	2.4
May 2005 Averag	ë .	4.7	4.3	292.0	2.5	2.1 2.2
June-05		6.5	41.9	161.0	3.0	9.7
June-05	6/9/05	6.6	48.0	158.0	3.2	9.7
June 2005 Avera	de Litt	6.5	45.0	159.5	3.1	9.7
July-05		5.7	46.7	43.6	2.4	15.6
July-05	7/6/05	5.9	42.4	50.7	2.3	13.7
July 2005 Averag	ermi in	5.84	44.6	47.1	2.3	14.7
August-05	9/19/05	5.7	32.0	12.3	1.8	8.5
August-05	8/18/05	6.0	28.4	11.0	1.8	9.1
Alignet 2005 Ave	rage	5.9	30.2	11.6	1.8	8.8
September-05	9/15/05	0.4	1.2	7.8	0.6	0.4
September-05		0.4	1.2	7.7	0.6	0.4
September 2005	Average 🦦 🖺	0,43	1,2-	7.7	0.6	0.4
October-05	10/6/05	0.8	1.9	7.4	0.4	0.5
October-05	'''	0.8	1.9	7.4	0.4	0.5
October 2005 Ave	rage :	0.84.	1.9	7.4	0.4	0.5
November-05	11/2/05	5.8	66.6	26.8	2.2	8.9
November-05	, ,	5.5	52.5	25.8	2.2	8.4
November 2005 A	verage .	5.7	59.6	26,3	2,2	8.6
December-05	12/7/05	1.2	0.9	32.6	1.1	0.4
December-05		1.2	0.9	35.0	1.1	0.5
December 2005 A	verage	1,2		33.8	1.1	0.4
2005 Average	ľ	7.3	43.2	00.4		
2005 STD	l	6.1	71.9	89.4	1.9	5.2
		0.1	/1.9	88.2	0.9	4.6

Source: NPDES analytical data was obtained from 3M and summarized in this table.

PFHA - Perfluorohexanoic acid STD - Standard Deviation



The most recent ranges of monthly average FC concentrations detected in 2005 are: PFOA - 0.9 to 263 ppb, PFOS - 0.4 to 14.7 ppb, PFHS - 0.4 to 3.1 ppb, and PFBS - 7.4 to 292 ppb.

### 4.4.2 Mississippi River

### 4.4.2.1 Sediment

In the Mississippi River, the highest average sediment concentrations of PFOS (8.28 ppb) and PFOA (13.2 ppb) were detected at sample location R3, which is adjacent to the operating plant portion of the 3M property. This was the only location at which PFBS and PFHS were detected. The following is a summary of the findings at the other sampling locations, which are shown in Figure 4-9:

- R1 and R2 Average sediment concentrations of PFOA and PFOS were ND or not quantifiable (NQ).
- R4 Average sediment concentrations of PFOA and PFOS were not quantifiable NQ.
- R5 Average sediment concentrations of PFOA and PFOS were 1.13 and 6.13 ppb, respectively.
- R6 Average sediment concentrations of PFOA and PFOS were ND and 1.35 ppb, respectively.

### 4.4.2.2 Surface Water

In the Mississippi River, PFOS and PFOA were ND or NQ at locations upgradient or adjacent to the operating plant (locations R1 to R4) as depicted in Figure 4-9. However, PFBS and PFHS were detected at location R2 adjacent to the plant with average concentrations of 0.050 and 0.077 ppb, respectively. The highest concentrations of FCs were detected at downstream location R5. The average detected PFOS, PFOA, and PFBS concentrations at this location were 0.098, 0.132, 0.097 ppb, respectively. The detected PFHS concentration at location R5 was NQ. Concentrations of FCs detected in the farthest downstream sample location R6 were NO or ND.

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### 4.5 MISSISSIPPI RIVER FISH

Summaries of FC concentrations in the fish whole body and filet tissue samples are provided in Tables 4-14 and 4-15. A copy of the analytical data packages (without appendices) is provided in Appendix D.

Tissue sample mass was limited for some whole body and filet samples from smaller bluegill sunfish and smallmouth bass specimens in the sample group necessitating analysis of 1 gram aliquots for these samples instead of 5 gram aliquots as stated in the FC Work Plan. Because recoveries of PFOA matrix spikes in the 1 gram aliquot fish samples were below acceptance criteria, PFOA results for these individual specimen samples are not reported (NR). In order to provide quantitative results representative of the sample types and locations, composite samples of the remaining tissue homogenate from each of these 17 fish samples were prepared from like species, sample type and location yielding 6 composite samples (see Table 4-13). Analyses of PFOA in the composite fish samples met acceptance criteria and are reported with the results of the individual fish tissue samples.

PFOA concentrations in whole body tissue samples from the upper reach (Reach 1) upstream of the 3M facility ranged from 0.881 ng/g (ppb) in a channel catfish sample to 1.52 ppb in a bluegill sunfish sample. PFOS concentrations in whole body tissue samples from Reach 1 ranged from 11.0 ng/g (ppb) in a channel catfish sample to 75.4 ppb in a bluegill sunfish sample. Filet tissue PFOA results for Reach 1 ranged from non-detect in all channel catfish samples and the bluegill sunfish composite sample to 0.972 ppb in a smallmouth bass filet tissue sample. PFOS concentrations in the Reach 1 samples ranged from 2.34 ppb in a channel catfish sample to 178 ppb in a smallmouth bass sample. Bluegill sunfish filet tissue samples from Reach 1 contained 30.3 and 32.3 ppb PFOS.

PFOA concentrations in whole body tissue samples from the middle reach (Reach 3) adjacent to the 3M facility ranged from 0.774 ppb in a channel catfish sample to 37.9 ppb in a bluegill sunfish sample. PFOS concentrations in whole body tissue samples from Reach 3 ranged from 12.6 ppb in a channel catfish sample to 9000 ppb in a bluegill sunfish sample. The other four bluegill sunfish whole body samples from this reach



### Table 4-13 Composite Fish Samples

Composite Sample ID and Description	Initial Sample ID
CGMN-F01-1LMFC-0-050812	CGMN-F01-1LMF01-0-050812
Reach 1 Bluegill sunfish filet composite	CGMN-F01-1LMF02-0-050812
CGMN-F01-3LMFC-0-050812	CGMN-F01-3LMF01-0-050812
Reach 3 Bluegill sunfish filet composite	CGMN-F01-3LMF02-0-050812
CGMN-F01-3MDFC-0-050812	CGMN-F01-3MDF01-0-050812
Reach 3 Smallmouth bass filet composite	CGMN-F01-3MDF02-0-050812
	CGMN-F01-3MDF03-0-050812
CGMN-F01-5LMWC-0-050812	CGMN-F01-5LMW01-0-050812
Reach 5 Bluegill sunfish whole body composite	CGMN-F01-5LMW02-0-050812
, ,	CGMN-F01-5LMW03-0-050812
	CGMN-F01-5LMW04-0-050812
	CGMN-F01-5LMW05-0-050812
CGMN-F01-5LMFC-0-050812	CGMN-F01-5LMF01-0-050812
Reach 5 Bluegill sunfish filet composite	CGMN-F01-5LMF02-0-050812
CGMN-F01-5MDFC-0-050812	CGMN-F01-5MDF01-0-050812
Reach 5 Smallmouth bass filet composite	CGMN-F01-5MDF02-0-050812
	CGMN-F01-5MDF03-0-050812



Table 4-14 Mississippi River - Summary of Whole Fish Analytical Results, ppb (wet weight)

Sample Total Length, Total Weight, g  Channel catfish 1 195 54  Channel catfish 2 24
3
4
5
Bluegill sunfah 1
7 2
2 4
150
7.7
19
13
14
15
8 = 8
6
10
11 - 46
2
1
2
4
0
0
9
40.47.40.0.40
Composite - Bruegiil sumish 15,16,17,18 & 19

Notes:

Sample results reported on a wet weight basis

In instances where a sample and sample duplicate pair contain a numerical result and a non-detect result, the numerical value is presented.

NR = Not reported due to quality control result failures.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

NA = Not a target analyte for composite sample analyses.



Table 4-15 Mississippi River - Summary of Fish Filet Analytical Results, ppb (wet weight)

Reach	Sample	Total Length,	Total Weight, g	PFOA, ng/g	PFOS, ng/g	PFBS, ng/g	PFHS, ng/g
1	Channel catfish 6	750	4500	QN	2.97	QN	GΝ
1	Channel catfish 7	200	2800	ΟN	2.34	QV	QN
1	Channel catfish 8	540	1750	QV	4.02	QV	QN
1	Channel catfish 9	099	2500	QN	80.6	QN	QN
1	Channel catfish 10	562	1750	QV	11.7	S	GN
-	Smallmouth bass 1	387	692	0.948	178	2	Q
-	Smallmouth bass 2	320	454	0.972	89.8	QN .	ND
-	Smallmouth bass 3	231	178	0.856	19.0	QN	ON
-	Smallmouth bass 4	228	162	0.796	53.2	Q	QN
-	Smallmouth bass 5	230	166	0.904	45.0	QN	QN
-	Bluegill sunfish 6	180	155	S.	32.3	QN	QN
1	Bluegill sunfish 7	155	92	Æ	30.3	QN	QN
1	Composite - Bluegill sunfish 6 & 7	Ϋ́	ΑN	Q	AN	NA	NA
က	Channel catfish 16	625	2250	VDV	75.8	GN	- QV
8	Channel catfish 17	040	2600	. ND.	. 95.2	ON .	VD:
6	Channel catfish 18	002	3250	ND	5.60	GN	ON
၉	Channel cattish 19		3500		6.786	OV	ON
3	Channel catfish 20	640	3000	ND	10.7	ON .	GN
3	Smallmouth bass 6	- 160	63	- NR	589	QN	-QN
၉	Smallmouth bass.7	227	. 475	- NR	140	QN	ON
8	Smallmouth bass 8	222	175	NR	1320	ON	ND
၉	Composite - Smallmouth bass 6.7 & 8	NA.	NA	0.580	. NA	NA .	NA
3	F Bluegill sunfish 13	145	65	NR	709	ND	Ŋ
3	Bluegill sunfish 14	150		NR-	7.69:	GN	ND
က	Composite - Bluegill sunfish 13 & 14	AN	NA Y	3.21	NA	NA	NA
5	Channel catfish 26	290	2000	0.622	69.2	ND	ND
5	Channel catfish 27	029	2500	ND	11.7	ND	ND
2	Channel catfish 28	089	3250	1.16	2.86	QN	ΟN
2	Channel catfish 29	672	3250	1.71	42.0	ND	QV
5	Channel catfish 30	620	2000	1.34	7.74	Ŋ	ND
5	Smallmouth bass 9	220	158	NR	290	3.33	QN
2	Smallmouth bass 10	250	274	NR	5150	QN	ND
2	Smallmouth bass 11	240	214	NR	884	Q	QN
5	Composite - Smallmouth bass 9,10 & 11	NA	NA	1.04	NA	AA	NA
5	Bluegill sunfish 20	140	72	NR	331	ND	ND
5	Bluegill sunfish 21	139	69	NR	330	QN	ND
5	Composite - Bluegill sunfish 20 & 21	ΑN	٧¥	0.504	NA	NA	NÀ

Notes:
Sample results reported on a wet weight basis
Sample results reported on a wet weight basis
In instances where a sample and sample duplicate pair contain a numerical result and a non-detect result, the numerical value is presented.

NR = Not reported due to quality control result failures

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample)

NA = Not a target analyte for composite sample analyses



contained PFOS at concentrations ranging from 55.4 and 334 ppb. Filet tissue PFOA results for Reach 3 included non-detect for all channel catfish samples, 0.58 ppb in the smallmouth bass filet composite sample and 3.21 ppb in the bluegill sunfish filet composite sample. PFOS concentrations in Reach 3 filet tissue samples ranged from 5.60 ppb in a channel catfish sample to 1320 ppb in a smallmouth bass sample. PFOS concentrations in bluegill sunfish filet tissue samples from Reach 3 were 59.7 and 709 ppb.

PFOA concentrations in whole body tissue samples from the lower reach (Reach 5) downstream from the 3M facility were 1.41 to 2.54 ppb in the channel catfish whole body samples and 0.600 ppb in the bluegill sunfish whole body composite sample. PFOS concentrations in whole body tissue samples from Reach 5 ranged from 39.9 ppb in a channel catfish sample to 629 ppb in a bluegill sunfish sample. Filet tissue PFOA results for Reach 5 included non-detect to 1.71 ppb in channel catfish samples, 0.504 ppb in the bluegill sunfish filet composite sample and 1.04 ppb in the smallmouth bass filet composite sample. PFOS concentrations in Reach 5 filet samples ranged from 2.86 ppb in a channel catfish sample to 5150 ppb in a smallmouth bass sample. PFOS concentrations in bluegill sunfish filet tissue samples from Reach 5 were 331 and 330 ppb.



### 5. REVIEW OF DOCUMENTATION ON HISTORICAL WASTE DISPOSAL SITES

### 5.1 FILE REVIEW

A file review was conducted by WESTON in January and April of 2005. In accordance with the FC Work Plan, this review was conducted to collect information on the historic 3M Cottage Grove facility waste generation, waste disposal, or treatment both on-site and off-site.

In January 2005, WESTON reviewed 3M files for the Cottage Grove facility. Subsequently, in March 2005, WESTON requested from the MPCA a list of archived files and the size of active (nonarchived) files for the following sites: Washington County Landfill, 3M Chemolite/Cottage Grove facility, 3M Oakdale Site, Woodbury Site, Kerrick (Pine County Landfill), and the Commercial Chemical/Pollution Control, Inc. (PCI) facilities. In April 2005, WESTON reviewed MPCA and 3M files for these sites. Documents that WESTON tagged for review included those that could possibly provide information on waste generation and disposal or treatment. These included regulatory correspondence, permits, site assessment reports, site remediation reports, site closure reports, personal notes, site drawings, sketches, etc.

The findings from the file review, relative to the off-site waste disposal locations utilized by the Cottage Grove facility were submitted to the MPCA during a June 10, 2005 meeting at their offices. Table 5-1 is a summary of the findings regarding the waste disposal locations utilized by Cottage Grove. Following the meeting, 3M and WESTON had a conference call with MPCA on June 13, 2005 regarding additional information that had been obtained on the Commercial Chemical Company/Pollution Controls, Inc. (PCI) sites in Newport, Minnesota and Savage, Minnesota. This additional information/documentation showed that FC-related wastes were not disposed at either of these locations and that all FC-related wastes for the time period of interest (i.e. 1960-1971) were either disposed at the Woodbury Site or on-site.



Table 5-1 Off-Site Waste Disposal Locations - 3M Cottage Grove, Minnesota

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Facility ID	Waste Disposed	Est. Period of Use	Priority for Investigation	Comments
Oakdale Site	Liquid and solid industrial waste	1956-1960	High	Investigation underway
Woodbury Site	Liquid and solid industrial waste	1960-1966	High	FC wastes remain buried at the site
Great Northern Oil Co plant, in Bruno, MN	Wastewater/ phenol waste	1965	Low	Waste was not FC-related
Kerrick Site, Pine County, MN*	Liquid and solid industrial waste	1967 & 1969	Low	Low waste volume was disposed in this area and this volume has been removed and incinerated
Commercial Chemical Company in Newport, MN (incinerator)	Wet scrap	1960-1962 (pick up of solvent) 1962-1964 (incineration)	Medium	FC-wastes may have been managed at this facility
Commercial Chemical Company/Pollution Control, Inc. in Savage, MN (incinerator)	Wet scrap	1964-1971	Medium	FC-wastes may have been managed at this facility
Pig's Eye Dump	Dry scrap; burned out drums and inert ash from Chemolite incinerator	1971	Low	Pigs Eye primarily was used for dry scrap disposal and one-time disposal of incinerator residue from July 1971 to December 1971
Washington County Landfill (Lake Jane Landfill)	WWTP sludge, incinerator scrubber sludge, iron oxide sludge, and ash from quench chamber of incinerator	1971-1974	High	Investigation underway
Pine Bend Landfill, IGH, MN-BFI (aka Phoenix) Former NPL Site	WWTP sludge and boiler ash	Mid 1970s/ Early 1990s	Medium	WWTP sludge was managed at this facility.
Anoka County (Uncertain of other names)	WWTP sludge	1980s	Medium	WWTP sludge may have been managed at this facility.
Rosemount - SKB (USPCI/Laidlaw) (3-4 mi away from Pine Bend)	WWTP sludge and nonhazardous industrial waste from demolition of old incinerator in 2002	Mid 1990s to mid-2003	Medium	WWTP sludge was managed at this facility.
Superior FCR - ONYX Buffalo, MN	WWTP sludge	Mid-2003 to present	Low	WWTP sludge was disposed at this facility after cessation of FC production.

<sup>\*</sup>Materials recovered and brought back to incinerator for disposal

5-2



### 5.2 INTERVIEWS WITH FACILITY PERSONNEL

WESTON interviewed current and former 3M employees in the winter and spring of 2005 to corroborate and supplement the information collected from the file review on the historic 3M Cottage Grove facility waste generation, waste disposal, and treatment.

A new item discussed during the facility personnel interviews was the possible existence of a former on-site sludge disposal pit, which was operated prior to the D2 – Former Sludge Disposal Area. No documentation of this pit was evident in the file review and it has not been assessed. It is uncertain when operations at the former sludge disposal pit started. This former on-site sludge disposal pit has now been designated as D9.



### 6. DATA ASSESSMENT AND IDENTIFICATION OF DATA NEEDS

The following sections provide an overview, by medium, of the results and observations of the 3M Cottage Grove facility FC assessment. The overview is followed by a description of additional data needs, where they have been identified.

### 6.1 GROUNDWATER

Cottage Grove Facility – It was found that the groundwater analytical data collected from 2003 to 2005 under the LOI program were consistent with the groundwater data collected under this FC assessment.

No FCs were detected in the water sample collected from the Building 116 cafeteria tap. The water at this location is treated with granular activated carbon prior to use.

The highest FC concentrations were detected in groundwater samples from monitoring wells MW-12 downgradient of the D5 – Former Solids Burn Pit Area, MW-14 downgradient of the D8 – Former Waste Disposal Area, and MW-101 downgradient of the D1 – Former HF Tar Neutralization Pit. In these areas, PFOA concentrations ranged from 150 to 1,863 ppb and PFOS from 80 to 324 ppb. Compared to the PFOA concentrations detected in groundwater samples from monitoring wells MW-12 and MW-14, lower concentrations of PFOA were detected in the groundwater samples from monitoring wells MW-101 and MW-102 at the D1 Area.

The highest FC concentrations detected in groundwater samples collected from pumping wells were detected at pumping well PW-6 (155 ppb PFOA). PW-6 is downgradient of the D8 Area. Groundwater elevation data collected from the monitoring wells in March 2005 show that the influence of the pumping wells is most significant in the central plant area and is reduced with increasing distance from this area.

With respect to groundwater at the 3M Cottage Grove facility, the following data needs have been identified:



- The file review and personnel interviews indicated that there may be a former sludge disposal pit (D9), which had not been assessed previously. This is located between the wastewater treatment plant and the D2 Area and will be referred to as the D9 Area. Groundwater quality and movement in the area of the D9 former sludge disposal pit has not been characterized.
- The potential movement of groundwater to surface water, particularly downgradient of the D8, D5 and D2 Areas, has not been characterized.

Woodbury Site: Of the four pumping wells at the Woodbury Site, pumping well R4 contained the highest FC concentrations (19.7-23.3 ppb PFHS, 5.72-11 ppb PFBS, 2.78-3.12 ppb PFOA and 1.83-2.29 ppb PFOS). This well has the highest pumping capacity and is the closest pumping well to the main disposal area. At pumping wells R1 and R3, detected concentrations of PFBS and PFHS ranged from 0.337 to 3.47 ppb and 1.03 to 2.61 ppb, respectively. PFOA and PFOS were detected in these wells at concentrations ranging from 0.153 to 2.33 ppb and 0.0562 to 0.144 ppb, respectively. No FCs were detected at pumping well R2, which is located farthest from the main disposal area. FCs were detected in the pumping well combined discharge at comparable concentrations to the discharge from the Cottage Grove non-contact process water retention pond. This indicated that additional FCs were not introduced to the water pumped from the Woodbury Site as it was used at the Cottage Grove plant. Thus, the pumping wells at the Woodbury Site have been characterized and no further assessment of the Woodbury Site appears to be warranted at this time.

### **6.2 SOIL**

The highest concentrations of FCs in soils were found in the D2 and D1 Areas. In the D2 – Former Sludge Disposal Area, the highest FC concentrations (up to 12,350 ppb PFOS¹) were found in the sludge. Lower concentrations (ranging from 4.39 to 794 ppb PFOS) were detected in the underlying native soil, which occurs below approximately 20 to 25 ft bgs. PFOS generally is found at higher concentrations than PFOA in the 0 to 25 ft bgs soil (sludge) samples. It was also found at higher concentrations (1,195 and 1,625 ppb) at a surface soil location downgradient of this area. PFOA generally is found at higher concentrations than PFOS at the lower depth intervals from 25 to 50 ft bgs in the native

<sup>&</sup>lt;sup>1</sup> For reference, the Minnesota Department of Health (MDH) has established Soil Reference Values for industrial sites of 200,000 ug/kg (ppb) PFOA and 40,000 ppb PFOS.



soils underlying the D2 Area. The highest concentration of PFHS (1,550 ppb) detected in soils at the site was found in the D2 sludge at the 15 to 20 ft bgs depth interval.

In the D1 – Former HF Tar Neutralization Pit Area, the highest FC concentrations (up to 4,520 ppb PFOA) were detected in soils from the borings outside the pit in the 5 to 30 ft bgs depth range in borings constructed just outside the location of the pit structure and decreased below 30 ft bgs in the native soils (ranging from 53.9 to 375 ppb). PFOA generally was detected at higher concentrations than PFOS in the borings from this area.

In the D5 – Former Solids Burn Pit Area, concentrations of PFOS (up to 2,310 ppb) and PFOA (up to 1,375 ppb) were detected in soil samples to a depth of approximately 15 ft bgs in the one soil boring constructed in this area. Lower concentrations (34.5 and 46.8 ppb PFOS and 21.8 and 42.5 ppb PFOA) were detected at lower depths. Some gravel, ash, and charcoal were noted in the boring log for soils a 6 to 14 ft bgs indicating that this boring encountered the previous D5 activities (i.e., burning) Surface soil samples collected downgradient of this area generally contain lower FC concentrations, which suggest that potential surface transport via erosion is not significant.

In the D8 – Former Waste Disposal Area, concentrations of PFOA (up to 543 ppb)and PFOS (up to 983 ppb) were detected in subsurface soils to a depth of 15 ft bgs and at a surface soil sample location downgradient of this area. The soil descriptions did not indicate any observation of waste material, discoloration, or odors.

At the Fire Training Area, PFOS was detected at concentrations up to 1,820 ppb primarily in shallow soils to a depth of 5 ft bgs, with significantly lower concentrations detected at lower depths. It is noted that the area around boring FTA-03 has been substantially altered with the construction of a new run-off control basin.

At the Building 15 (location of the former electrochemical fluorination cells) Area, PFOS was detected at concentrations up to 833/904(duplicate) ppb in shallow soils (0–5 ft bgs) and 1,865 ppb at a depth of 20 to 25 ft bgs. At the Former Wastewater Pond, PFOS was detected at a concentration of 805 ppb at a depth of 15 to 20 ft bgs. A strong odor and



higher TOC level was noted for the 15 to 25 ft bgs interval in the former wastewater pond boring; however, no visual indication of residue or waste material was noted.

Surface soil samples (0-6 and 6-24 in bgs) collected in the vicinity of buildings where FCs were managed (Buildings 7, 16, and 25) generally indicated higher concentrations of FCs than samples collected in the vicinity of buildings where FCs were not managed (Buildings 22, 102, and 112), the incinerator complex, and the D6 – Former Ash Disposal Area.

The following data needs have been identified for soils at the 3M Cottage Grove facility:

- D5 Former Solids Burn Pit Area. This area, which is approximately 2 acres in size, has not been defined with respect to the horizontal extent and concentrations of FCs. Historic records and information did not show a distinct limit for D5 but only a general area. Only one boring was located in this area and soil samples from this boring exhibited concentrations of FCs primarily at 0 to 15 ft bgs.
- D8 Former Waste Disposal Area. Due to access issues, this area is not defined
  with respect to the horizontal extent of any remaining waste burial, which was not
  previously removed.
- D9 Former Sludge Disposal Pit. This newly identified area has not been assessed or characterized and will be referred to as the D9 Area.

### 6.3 SEDIMENT AND SURFACE WATER

<u>Sediment</u> - FCs were detected in sediment. Generally, upstream levels were less than downstream.

PFOA sediment concentrations in the east cove (11.7 to 28.7 ppb) are comparable to the west cove (4.11 to 38.7 ppb). PFOS sediment concentrations in the east cove (24.2 to 267 ppb) are higher than at the west cove (15.2 to 91.1 ppb). Higher PFOS concentrations were detected in the shallow sediments (0-10 cm) of the east cove than in the deeper sediments (10-20 cm).

In the Mississippi River, average sediment concentrations at sample locations R1, R2, and R4 were NQ or ND. Average sediment concentrations of 8.28 ppb PFOS and 13.2 ppb PFOA were detected at sample location R3, which is adjacent to the operating plant



portion of the property. This was the only location where PFBS and PFHS were detected.

<u>Surface Water</u> - The average concentrations of FCs in the east cove water sample were greater than the concentrations detected in the west cove water sample. In the Mississippi River, PFOA and PFOS concentrations were ND or NQ at the R1 through R4 sampling locations. The only quantifiable levels of PFOS and PFOA (0.098 and 0.132 ppb, respectively) in the water samples were detected at downstream location R5.

Regarding the NPDES data, it is evident that the concentrations of FCs in the site have decreased treated wastewater discharge significantly since 2000.

With respect to sediment and surface water, the following data needs have been identified:

- Concentrations, if any, of FCs in groundwater entering the river (pore water) are not known.
- Distribution, if any, of FCs in surface waters and sediment extending across the river are not known.

### 6.4 MISSISSIPPI RIVER FISH

The analytical results indicate that FCs have been detected in fish samples (whole body and filet) collected from three reaches of the Mississippi River in the immediate vicinity of the Cottage Grove facility. The FCs were detected in each of the three species sampled: Channel catfish, Bluegill sunfish, and Smallmouth bass.

The following conclusions have been identified for the Mississippi River fish:

- The current data set represents one limited round of fish sampling conducted in the Mississippi River.
- Pending analytical work being performed on additional fish samples by the MPCA, further discussions may be warranted relative to additional data needs.



## 7. RECOMMENDATIONS FOR THE FUTURE COURSE OF ACTION

Substantial characterization has been completed at the 3M Cottage Grove facility as part of the work conducted in 2005. However, data needs (additional information that will be useful for assessment) were identified and should be addressed in order to define the most effective path forward. These additional field activities are presented in the following recommendations.

### Groundwater

- Based on accessibility, install a total of three to five groundwater monitoring wells, if feasible (based on physical constraints and access considerations), downgradient of the D2 and D5 areas toward the river.
- Install two to three groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area) to determine groundwater quality and flow direction.
- Define the hydraulic capture and effect of pumping wells PW5 and PW6 by collecting water level and drawdown data from existing monitoring wells. This may be coordinated with a planned shutdown of PW-6 in early May due to incinerator maintenance.

### <u>Soil</u>

- D5 Former Solids Burn Pit Area. Install an additional three to five soil borings to 25 ft bgs to further characterize the extent of FCs in this area.
- D8 Former Waste Disposal Area. Review information on past survey and remediation activities conducted in this area. Based on a review of this information and accessibility, determine if a geophysical survey would be necessary to further define the horizontal extent of any remaining waste burial at this location.
- D9 Former Sludge Disposal Pit. Install two to four soil borings to 25 ft bgs to characterize the extent of FCs, if any, in this area.



### Pore Water/Surface Water/Sediment

- Collect pore water samples using shallow hand-driven well points at approximately 25 locations in the Mississippi River along the facility shoreline to assess possible groundwater discharge through bottom sediments and into the river.
  - 20 equally spaced sampling locations along approximately 4,000 ft of shoreline between the D8 Area and the east cove. These sampling locations will be established based on the results of a flow net analysis to estimate zone of groundwater discharge to the river.
  - Five locations in the reach between the west cove and monitoring well MW-14 to detect any groundwater discharge.
- Collect paired surface water/sediment samples at the following sampling locations:
  - Pore water sampling locations (25 samples).
  - East and west coves and associated drainageways (up to 6 samples).
- Collect surface water samples along a transect across the Mississippi River in Reach 3/5 area (estimate 10-15 sampling nodes).

### Fish/Aquatic Biota

Review pending MPCA fish sampling results. Discuss with MPCA, Minnesota
Department of Health (MDH), Minnesota Department of Natural Resources
(MDNR) plans for additional fish sampling in the river to determine the path
forward.

Table 7-1 provides a summary of the recommended Phase 2 FC assessment, which would be performed under the existing HASP and FC Work Plan. Pending approval of this Data Assessment Report by the MPCA, the anticipated schedule for major elements of the Phase 2 assessment includes:

- MPCA approval of the Data Assessment Report April/May 2006.
- Field work, data analysis, and compilation May to September 2006
- Interim Progress Report September 2006.
- Phase 2 FC Data Assessment Report December 2006.

Figure 7-1 provides a bar chart which shows anticipated performance and completion of individual activities for the Phase 2 assessment program.



# Table 7-1 Summary (by Media) of the Phase 2 FC Assessment 3M Cottage Grove, MN Facility

Media	No. of Samples/Locations/Description of Activity
1. Groundwater	a. Install 3 to 5 groundwater monitoring wells downgradient of D2 and D5. Collect up to 5 groundwater samples.
(Up to 8 samples*)	(Up to 8 samples*) b. Install 2 to 3 groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area).  Collect up to 3 groundwater samples.
	c. Conduct hydraulic study of pumping wells PW-5 and PW-6 which will be coordinated with the upcoming scheduled shutdown of PW-6 for incinerator maintenance.
2. Soil (Up to 45 samples*)	<ul> <li>a. Up to 45 sub-surface soil samples collected from 5 to 9 soil borings as follows:</li> <li>- Up to 25 soil samples at D5 Area - Former Solids Burn Pit Area. One composite soil sample for each 5 ft interval (3 to 5 borings to 25 ft).</li> </ul>
	- Up to 20 soil samples at D9 Area - Former Sludge Disposal Pit. One composite soil sample for each 5 ft interval (2 to 4 borings to 25 ft).
	<ul> <li>b. Based on a review of past information and accessibility constraints, determine if a geophysical survey of the D8 -</li> <li>Former Waste Disposal Area would be necessary.</li> </ul>
3. Pore Water	a. 25 pore water samples in the Mississippi River as follows:
(Approx. 25	- Conduct groundwater flow net analysis to locate pore water stations.
sambres )	<ul> <li>20 water samples between the D8 Area and the east cove.</li> <li>5 water samples in the reach between the west cove and MW-14.</li> </ul>
4. Surface Water	a. At least 46 surface water samples collected as follows:
(At least 46	- 25 surface water samples at pore water sampling locations (paired with sediment) in the Mississippi River.
samples*)	- Up to 6 surface water samples at the east and west coves and associated drainageways (paired with sediment).
	b. Up to 15 surface water samples along a transect across the Mississippi River in Reach 3/5 area.
5. Sediment	a. At least 31 sediment samples collected as follows:
(At least 31	- 25 sediment samples at pore water sampling locations (paired with surface water) in the Mississippi River.
samples*)	- Up to 6 samples at the east and west coves and associated drainageways (paired with surface water).

<sup>\*</sup> Actual number will be based upon conditions encountered in the field.



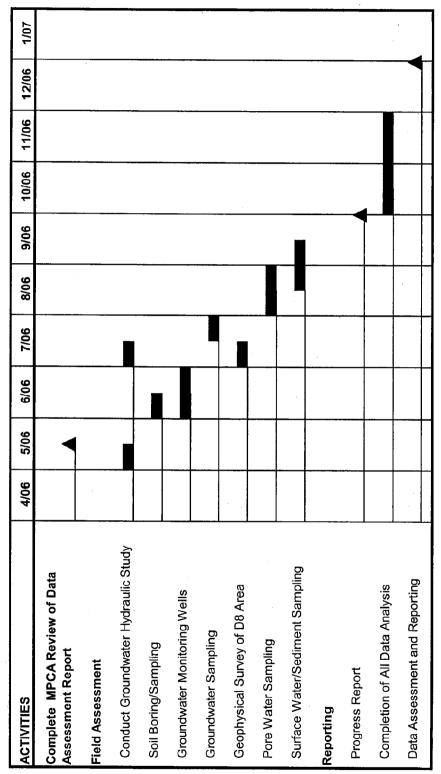


FIGURE 7-1 SCHEDULE FOR THE PHASE 2 FC ASSESSMENT 3M COTTAGE GROVE, MN

7-4



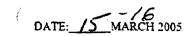
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Lindholm, G.F., Helgensen, J.O., Broussard, W.L, and Farrell, D.F. 1974. Water Resources of the Lower St. Croix River Watershed, East-Central Minnesota. Hydrologic Investigations Atlas HA-490; U.S. Geological Survey. Reston, Virginia.

www.co.washington.mn.us Website containing county land use and demographic information.

# APPENDIX A WELL EVACUATION/SAMPLING FORMS

Confidential Client - Cor : Grove, Minnesota WESTON W.O.: 02181-602-010-0001



	WELL	EVAC	JATION	SAMPL	NG FO	RM				
GENERAL INFORMATION	٧							······		
Well No.: MW-01	<u></u>	<del>,,</del>		Weather Sunny Cloudy Rain Temp:						
Sampling Team:	/WW			Sampler's Signature:						
WELL INFORMATION										
Protective Casing: (http://	Darraged		····	Concrete B	25e:	intaci	Dama;	ged		
ocked: YES /	Well Diam	eter: 6 in	ch.		-	į				
WELL EVACUATION INFO	ORMATI	ON	23.0	F						
A. Total Depth (Top of Casing = TO		(25)	200:00		ation Meth	od				
B. Depth to Water (DTW) (TOC):		1	37.71	( )	BAILER					
C. Column of Standing Water (C=A	-B): 129	3 2	1101	60	2-Inch Gr 4-Inch Gr					
D. Purge factor			1.76		Other (S					
	inu	_ X	1.47	-			·		_	
E. One Well Volume: 194.5 36-159										
F. Three Well Volumes (gall	ions): 583	3.4 H	0.07	TOTA	T AOI	LUME	PURGE	D:_ <del>//</del>	<del>录 58</del> 5	
INDICATOR PARAMETER		3-15-05	3-16-0	75						
Time	1436	1439	0835	0855	0915	0935				
Gallons Purged	7	<i>1930</i>	43	65	80	100	360	470	580	
Temperature (°C):	9.94	999	999	10.01	10.00	1007	10.09	9.94	10.00	
Specific Conductivity (s):	613	119	693	689	695	680	702	711	710	
Dissolved Oxygen (mg/L):	1.90	197	122	157	164	Z24	223	2.13	2.17	
pH:	1	7111	7.0	7 21	7 31	107	2.53	7,57	7.55	
<u> </u>	652	F.71	100	7	70,07	7.67	7:			
Visual Turbidity (L, M, H):	m	m	m	m	m	<u></u>	_m_	m	M	
NAPL Observed: YES / NO	<del>                                     </del>		<u> </u>	Well Pur	ned Dry	VFS	(00	-		
ODOR: YES / NO			· · · · · · · · · · · · · · · · · · ·	Well Pumped Dry: YES / CO						
		Other	<del>,</del>	1						
							· · · · · · · · · · · · · · · · · · ·			
SAMPLE COLLECTION I	INFORM	ATION			SAMPL	E DATE	: <u> </u>	11/0/0	35	
Sample No.	<u> </u>		Time	i	S	ample N	0.		Time	
	Sample 110.									
			10:20	Rinsate B	ank: YES	7 NO			:!	
Media Sample ID:			10:70	Rinsate B	ank: YES	7 NO	·			
Media Sample ID: Parameters: 1 ) 8260 VOC & Isop	oropyi Ether		10:30	ID NO.:	ank: YES					
Media Sample ID:  Parameters: ( ) 8260 VOC & Isop ( X ) Fluorochemicals	ropyi Ether		10:40	ID NO.:	v: Exygen 3048 Re	Research				
Media Sample ID:  Parameters: ( ) 8260 VOC & Isop ( X ) Fluorochemicals ( X ) pH	,,•		40:50	ID NO.: Laborator	y: Exygen 3048 Re State Co	Research Search Driv ollege, PA i	6801			
Media Sample ID:  Parameters: ( ) 8260 VOC & Isop ( X ) Fluorochemicals	,,•		jv: 30	ID NO.: Laborator Contacts:	y: Exygen 3048 Re State Co Kent Linds	Research Search Driv ollege, PA i from (3M)	680) John F	laherty		
Media Sample ID:  Parameters: ( ) 8260 VOC & Isop ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductar	,,•		10:30	ID NO.: Laborator Contacts:	y: Exygen 3048 Re State Co	Research Search Driv ollege, PA i from (3M)	680) John F	Flaherty 31-8032		
Media Sample ID:  Parameters: ( ) 8260 VOC & Isop ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductar	,,•		10:30	ID NO.: Laborator Contacts:	y: Exygen 3048 Re State Co Kent Linds	Research Search Driv ollege, PA i from (3M)	680) John F			
Media Sample ID:  Parameters: ( ) 8260 VOC & Isop ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductar	,,•		(i): 40	ID NO.: Laborator Contacts: Phone:	y: Exygen 3048 Re State Co Kent Linds	Research Search Driv ollege, PA i from (3M)	680) John F			
Media Sample ID:  Parameters: ( ) \$260 VOC & Isop ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductal ( X ) Temperature ( ) ( ) ( )	ince	गार्ट 3	COMM	ID NO.: Laborator Contacts: Phone:	y: Exygen 3048 Re State Co Kent Linds 651-778-53	Research Issearch Onvollege, PA i Itrom (3M)	6801 John F S14-23			
Media Sample ID:  Parameters: ( ) \$260 VOC & Isop ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductal ( X ) Temperature ( ) ( ) ( )	ince	TIEFS,	COMM	ID NO.: Laborator Contacts: Phone:	y: Exygen 3048 Re State Co Kent Linds 651-778-53	Research Issearch Onvollege, PA i Itrom (3M)	6801 John F S14-23	31-8032		
Media Sample ID:  Parameters: ( ) 8260 VOC & Isop ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductar	ince	THES, I not Sos; Fina	COMM	ID NO.: Laborator Contacts: Phone:	y: Exygen 3048 Re State Co Kent Linds 651-778-53	Research Issearch Onvollege, PA i Itrom (3M)	6801 John F S14-23	31-8032	10	

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47)	8"-2.61; 10"-4.08 (gallons per linear foot of water)
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	WELI	EVAC	UATION/	SAMPI	ING FO	RM			
GENERAL INFORMATION	₹							0	
Well No.: MW-02				Weather: Sunny Clouds Rain Temp:					
Sampling Team: WW K		Sampler's Signature:							
WELL INFORMATION									
Protective Casing: Intact	Damaged			Concrete	Base:	Intac	/ Dama	ged	
Locked: YES /	(NO)			Well Dias	neter: 6 in	ch.			
WELL EVACUATION INFO	ORMAT	ON	920	WW	J				
A. Total Depth (Top of Casing = TO	C):				cuation Meth	od			
B. Depth to Water (DTW) (TOC):	······································		35.91	( ) ••••	BAILER 2-Inch Gr	und fos			
C. Column of Standing Water (C=A	-B):		.09	(	4-Inch Gr	undfos			
D. Purge Factor		x '	1.47	( )	Other (S	pecity)			
E. One Well Volume:		8	95						
F. Three Well Volumes (gail	TOT	AL VOI	LUME	PURGE	D: 3				
INDICATOR PARAMETEI	RS			<u> </u>					
Time		1053	ł						
Gallons Purged	1030	0	<del></del>		<del> </del>		<del>                                     </del>	1	
	2	<u> </u>	-					-	
Temperature (°C):	9.74	9.6			-		<u> </u>	<del> </del>	<del> </del>
Specific Conductivity (s):	550	579	<u> </u>			L		ļ	<del> </del>
Dissolved Oxygen (mg/L):	1.06	1.17		•				ļ	<del> </del>
pH:	7.74	7.63	1					<u> </u>	
Visual Turbidity (L, M, H):	4	4				<u> </u>			
NAPL Observed: YES / NO	2			Well Pumped Dry: YES / NO					
ODOR: YES /				Other:					
Odor Type: ( ) Solvent ( ) S	Septic ( )	Other							
SAMPLE COLLECTION I	NFORM	ATION			SAMPI	E DAT	E:		
Sample No.			Time			Time			
Media Sample ID:			<del> </del>	Sample No. T					
				ID NO.:					
Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals (X) pH (X) Specific Conductance (X) Temperature ( )						escarch Dri ollege, PA trom (3M)	16801 John	Flaherty 31-8032	
( )									
			COMM						,
Best Cornels, Res	NOV ED	LOUR	TU WA	9~	Well Pumpo Previous Vo	-	YES ged: 65 gal	/ NO	
Allis 5					Well Requi	res Mainte	mance? (	YES /	NO
					Access Req	uires Mair	tenance?	YES /	<u>(CO)</u>

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47 8"-2.61; 10"-4.08 (gallons per linear foot of water)

	WELL	. EVAC	JATION	SAMPLI	NG FOI	RM			
GENERAL INFORMATION									
Well No.: MW-03				Weather: Sunny Cloudy Rain Temp: 23 F					
Sampling Team: KJ/A	M/W	W/17	1	Sampler's Signature:					
WELL INFORMATION		7							
Protective Casing: Intact /	Damaged			Concrete Base: Intact Darmaged					
Locked: YES /	мо.>			Well Diameter: 6 inch.					
WELL EVACUATION INFO	RMAT	ION	196.75	7					
A. Total Depth (Top of Casing = TOC	C):			Well Evacu		<b>o</b> d		1.	
B. Depth to Water (DTW) (TOC):		- 1-	99.40	( )	BAILER 3-Inch Gro	undios			
C. Column of Standing Water (C=A-	B):	3	7.35	مېستىن	4-Inch Gn	unatos			
D. Purge Factor		x	1.47	( )	Other (S	pecity)			i
E. One Well Volume:		1	43-10	-					
F. Three Well Volumes (gallons): 429.3					T AOI	UME I	PURGE	D:	
INDICATOR PARAMETER	Stoppe	e start	Pump						
Time	Time 09/3 0935 0953				1114	1123	1132		
Gailons Purged	2	110	220	2300	330	385	440		
Temperature (°C):	1. 20	10.80	10.79	10.82	10.82		10.80		
	10.39	772	745	73.2	732	7/2	745		
Dissolved Oxygen (mg/L):	86/	9.98	9.17	10.96	10.96	9.89	9.68		<del>i</del>
	8.5C		· · · · · · · · · · · · · · · · · · ·	·		7.29	7.29		<del> </del>
pH:	7.48	7.39	7.34	7.31	7.31		1		<del> </del>
Visual Turbidity (L) M. H):		<u> </u>	12	1-	<i>L</i>	1	<u> </u>	-	<del>                                     </del>
NAPL Observed: YES / NO		<u> </u>		Well Pumped Dry: YES / (NO)					1
NAPL Observed: YES / NO.	<del>)                                    </del>		,,,,	Other:					
Odor Type: ( )Solvent ( )S	eptic ( )	Other		1					
SAMPLE COLLECTION I		ATION			SAMPI	E DATI	Č:		
	NEORM	AITON	Time	T		Sample N			Time
Sample No.			<del>                                     </del>	Ringste R	lank: YES				
Media Sample ID:				ID NO.:	, , , ,				
Parameters: 1 8260 VOC & Isopi	opyl Ether		1	Laborator	y: Exygen	Research			
(X) Fluorochemicals				3048 Research Drive					
(X) pH (X) Specific Conductor	nce			State College, PA 16801					
(X) Temperature				Contacts: Kent Lindstrom (3M) John Flaherty					
<i>t</i> )				Phone:	651-778-53	352	814-2	31-8032	
( )									
			COM	MENTS					
LOCK REMOVED W.	TIT BO	ET CUT	reres, u		Weit Pump		YES	/ NO	
70 LOCK				11	Previous V	olume Purş	ged: 130 ga	lions	
				,	Well Requi	res Mainte	nance! 🤇	YES	NO
				1	Access Req	uires Main	tenance?	YES /	(vo)

urge Factors: 2"- 0.16; 4"- 0.65	6"-1.4); 8"-2.61;	10"-4.08 (gallons per lin	lear foot of water
2	<b>\</b> /		

	WELI	L EVAC	TUATION	SAMPI	ING FO	RM				
GENERAL INFORMATION	Ī				$\overline{}$		_			
Well No.: MW-04		<del></del>		Weather Samy Cloudy Rain Temp: 32						
Sampling Team: TF /A	M	,		Sampler's Signature:						
WELL INFORMATION		****								
Protective Casing: (Intact)	Damaged	<del></del>		Concrete Base: (Intact ) Damaged						
Locked: YES /	(NO)			Well Diameter: 6 inch.						
WELL EVACUATION INFO	ORMAT	ION	133.20						_	
A. Total Depth (Top of Casing = TO	C):	T	200.00	Well Evac	uation Meth	nod				
B. Depth to Water (DTW) (TOC):		-	108.25	( )	BAILER 2-Inch Gi	ound for				
C. Column of Standing Water (C=A	-B):		4120	├ `\	4-Inch G	runditos				
D. Purge Factor		x	1.47	( )	Other (S	pectry)				
E. One Weil Volume:			34.87	-				<u> </u>		
F. Three Well Volumes (gallons): 406				TOTA	AL VOI	LUME	PURGE	D: <del></del>	25	
INDICATOR PARAMETE	of Start Rusp									
		·								
Time	1246	1304	/323	1405	1423	1433	1440			
Gallons Purged	0	110	280	START	330	385	420			
Temperature (°C):	9,98	13.17	13.20	7	13 30	13.27	1330			
Specific Conductivity (s):	1054	1047			1071		1074			
Dissolved Oxygen (mg/L):	9.51	12.01		1	12.43	<del></del>	T			
pH:	7.42	7:13		/	7.15	7.15	2.12			
Visual Turbidity (L, M, H):	La	2	1	/	1	1	7			
	-	<del>                                     </del>			<del> </del>	<del> </del>		<del></del>		
NAPL Observed: YES / (NO	<del> </del>	<u> </u>		Well Pumped Dry: YES NO						
ODOR: YES / NO	<del>)</del>			Other:						
Odor Type: ( ) Solvent ( ) S	eptic ()	Other		1						
SAMPLE COLLECTION I	NEORM	ATION		SAMPLE DATE:						
			Time	1					Time	
Sample No.			, tope	Rineare S		Sample N	···-			
Media Sample ID:			-	Rinsate Blank: YES / NO						
Parameters: ( ) 8260 VOC & Isop	ropyl Ether		<u> </u>	Laboratory: Exygen Research						
(X) Fluorochemicals				3048 Research Drive						
(X) pH					State College, PA 16801					
( X ) Specific Conductance ( X ) Temperature				Contacts: Kent Lindstrom (3M) John Flaherty						
( )				Phone:	651-778-53	352	814-23	1-8032		
( )										
			COMM	IENTS						
LOCK REMOVED W	1 Be-	T CU	TEPS		Well Pump	ed Dry:	YES /	NO		
	,		•		Previous V	olume Pur	ged: 112 gall	ous		
					Well Requi	res Mainte	папсе?	(ES)	SO	
il .				li li	,			_	_	

Purge Factors: 2"-0.16; 4"-0.65 6"-1.47 8"-2.61; 10"-4.08 (gallons per linear foot of water)

WELL EVACUA	TION/SAMPLING FORM				
GENERAL INFORMATION					
Well No.: MW-05	Weather: Sunny Cloudy Rain Temp: 28				
Sampling Tearn: KS/W/M	Sampler's Signature:				
WELL INFORMATION					
Protective Casing: Infact / Damaged	Concrete Base: Intac / Darmaged				
Locked: YES / NO Lut lock of	Well Diameter: 6 inch.				
WELL EVACUATION INFORMATION 209	8.70 <i>ଭ</i> ଞ				
	10.90 Well Evacuation Method				
B. Depth to Water (DTW) (TOC): -5/-	57 ( ) BAILER 57 ( ) 2-Inch Grundtos				
C. Column of Standing Water (C=A-B): 157	13 Caralinch Grundites				
D. Purge Factor X	( ) Other (Specify)				
E. One Well Volume: 230	98				
F. Three Well Volumes (gallons):	94 TOTAL VOLUME PURGED: 695				
INDICATOR PARAMETERS					
Time 1055 1115 11	130 1159 1235 1255				
	360 460 560 695				
4					
	184 9.70 9.68 9.71				
	7/4 7/4 7/8 705				
11:3 307	.16 257 2.62 2.66				
	68 7.72 7.70 7.65				
Visual Turbidity (L, M, H): Z					
1 NTS ( 10 )	Wall San J Park VES (NO)				
NAPL Observed: YES / NO	Well Pumped Dry: YES* / (NO) Other:				
Odor Type: ( ) Solvent ( ) Septic ( ) Other	- Other				
	SAMPLE DATE: 3/14/05				
SAMPLE COLLECTION INFORMATION					
Sample No.	Time Sample No. Time				
Media Sample ID:	Rinsate Blank: YES / NO				
2000/00 A J	ID NO.				
Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals	Laboratory: Exygen Research 3048 Research Drive				
(X) H	State College, PA 16801				
( X ) Specific Conductance ( X ) Temperature	Contacts: Kent Lindstrom (3M) John Plaherty				
( )	Phone: 651-778-5352 814-231-8032				
( ) -					
	COMMENTS				
LOCK PENEURO W/ BOLT CUTTE	Well Pumped Dry: YES / NO				
<u>, , , , , , , , , , , , , , , , , , , </u>	Previous Volume Purged: 227 galloss				
	Well Requires Maintenance? YES:				
	Access Requires Maintenance? YES / (0)				

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Co. : Grove, Minnesota WESTON W.O.: 02181-0-0001

WELL	L EVAC	JATION	SAMP	LING FORM				
GENERAL INFORMATION				00				
Well No.: MW-06			Weather	Sunny Cloudy Rain Temp: 00				
Sampling Team: K5/WW			Sampler's	s Signature:				
WELL INFORMATION								
Protective Casing: (Intact) / Damaged			Concrete	Base: Intact Damaged				
Locked: YES / NO			Well Dia	imeter: 6 inch.				
WELL EVACUATION INFORMAT	ION /	03.20	(1313)	<b>Y</b>				
A. Total Depth (Top of Casing = TOC):		219:00		acuation Method				
B. Depth to Water (DTW) (TOC):	- 1	DRY		BAILER Control of the second o				
C. Column of Standing Water (C=A-B):				+-inch Grundtos				
D. Purge Factor	x	1.47	(	) Other (Specify)				
E. One Well Volume:	One Well Volume:							
F. Three Well Volumes (gallons):				AL VOLUME PURGED:				
INDICATOR PARAMETERS			1					
Time								
Gallons Purged								
7.00	<del> </del>	ļ						
Temperature (°C):								
Specific Conductivity (s):								
Dissolved Oxygen (mg/L):				·				
pH:	<u> </u>							
Visual Turbidity (L, M, H):	ļ							
	<u> </u>	<u> </u>						
NAPL Observed: YES / NO ODOR: YES / NO	·		Well Pumped Dry: YES. / NO Other:					
	Other		Other:					
SAMPLE COLLECTION INFORM	IATION			SAMPLE DATE:				
Sample No.		Time		Sample No. Time				
Media Sample ID:			Rinsate Blank: YES / NO					
			ID NO.:					
Parameters: ( ) 3260 VOC & isopropyl Ether ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductance ( X ) Temperature				Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty				
( ) ( ) ( )				e: 651-778-5352 814-331-8032				
	_	COMM	ENTS	State Day 100				
LOCK LARS REMOVED WITH DETL DLT @ 103.20 PUBLE + SAMPLE	BUT CL	1772#5 Lii 70		Well Pumped Dry: YES NO Previous Volume Purged: 166 gallons				
Phere De les les	,			Well Requires Maintenance? (YES) / NO				
PUREY + SAMPLE				Access Requires Maintenauce? YES / (0)				

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

	WEL	L EVAC	UATION	/SAMPI	ING FO	RM			
GENERAL INFORMATION	١				<b>→</b>				
Well No.: MW-07		-		Weather: Sunny Cloudy Rain Terrip: 34					
Sampling Team: KS. AM	. Bu			Sampler's Signature:					
WELL INFORMATION									
Protective Casing: (intact)	Damaged			Concrete Base: Guac / Damaged					
Locked: YES	(NO)	JW		Well Diameter: 6 inch.					
WELL EVACUATION INFO	ORMAT	ION /	40.24	Oher)					
A. Total Depth (Top of Casing = TO	C):		146.00		uation Meti	od			
B. Depth to Water (DTW) (TOC):		-	55.07	( )	BAILER 2-Inch Gr	rundtos			
C. Column of Standing Water (C=A	-B):		85.17	×	4-Inch G	rundios			
D. Purge Factor x			1.47	T 1	Other 13	pecity)			
			25.19	-	<del></del>		·····	<del></del>	<del></del>
F. Three Well Volumes (gallons): 375.6				TOTA	AL VOI	LUME	PURGE	ED:	
INDICATOR PARAMETER	RS.		<del></del>						
Time	1405	1420	1421	1431	1439	1445			
Gallons Purged	4	135	200	1	320	375		†	<del> </del>
Temperature (°C):	010				7			+	
Specific Conductivity (s):	4.70	9.90	9.90	9.86	9.90	9.88		<del> </del>	<del> </del>
	375	577	578	577	578	578			<del> </del>
Dissolved Oxygen (mg/L):	1.07	0.62		0.61	0.61	0.61			ļ
pH:	7,63	7,3/	7.3/	7.26	729	726		<u> </u>	-
Visual Turbidity (L, M, H):	1		1	2		1		-	
		<u> </u>			<u> </u>			<del>ل</del> ے	<u> </u>
NAPL Observed: YES / NO			<del></del>	Well Pumped Dry: YES / NO					
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S	entic ( )	Other	<del></del>	Otner:					
								1. 1	
SAMPLE COLLECTION I	NFORM	ATION			SAMPI	E DATE	<u>ک</u> ــــــــــــــــــــــــــــــــــــ	1/4/6	'>
Sample No.			Time			ample N	0.		Time
Media Sample ID:			16:35						
				ID NO.: Laboratory: Exygen Research					
Parameters: ( ) 8260 VOC & Isopr ( X ) Fluorochemicals ( X ) pH ( X ) Specific Conductar ( X ) Temperature ( )	Contacts:	3048 Re	search Driv bliege, PA 1 from (3M)	6801 John	Flaherty 31-8032				
			COMM	ENTS					
LOCK REMOVE	D W	1/ Bo.	J	1	Vell Requi	•	<u>_</u>	dions VES VES	

Purge Factors: 2"-0.16; 4"-0.65; 6"- (.47; 8"-2.61; 10"-4-08 (gallons per linear foot of water)

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Confidential Client - Cor Grove, Minnesota WESTON W.O.: 02181-6-2-010-0001

DATE: 16 MARCH 2005

W	ELL EVACUATION	ON/SAMPLING FORM					
GENERAL INFORMATION		- VALUE					
Well No.: MW-08		Weather: Sunny Cloudy Rain Temp:					
Sampling Team:		Sampler's Signature:					
WELL INFORMATION		and a signature:					
Protective Casing: (Inter: / Dames	ed	Concrete Base: Concrete Base:					
Locked: YES /(NO)		- Damageo					
WELL EVACUATION INFORMA	TION						
. Total Depth (Top of Casing = TOC):	10.	15 (WW)					
B. Depth to Water (DTW) (TOC):		Well Evacuation Method  BAILER					
Column of Standing Water (C=A-B):	- (06.00	( ) 2-Inch Grundfos					
). Purge Factor	100.4	Till ( ) ()ther (Spenific)					
One Well Volume:	X 1.47						
	156.4	<u> </u>					
7. Three Weli Volumes (gattom);	4693	TOTAL VOLUME PURGED:					
NDICATOR PARAMETERS							
Time							
Gallons Purged	-						
emperature (°C):							
pecific Conductivity (s):							
Dissolved Oxygen (mg/L):							
H:	-						
isual Turbidity (L, M, H);	<del> </del>						
(2, 11).	-						
APL Observed: YES / NO							
DOR: YES / NO		Well Pumped Dry: YES / NO					
Odne Types ( ) S. J.	Other	Other:					
AMPLE COLLECTION INFORM	ATION	SAMPLE DATE:					
Sample No.	Time	Sample No. Time					
dia Sample (D:		Rinsate Blank: YES / NO					
		ID NO.:					
ameters: ( ) 8260 VOC & Isopropyl Ether ( X ) Fluorochemicals		Laboratory: Exygen Research					
(X) pH		3048 Research Drive					
(X) Specific Conductance		State College, PA 10801					
F 3		Contacts: Kent Lindstrom (3M)   John Flaherty   Phone: 651-778-5352   \$14-231-8032					
( ) ( )		Phone: 651-778-5352 814-231-8032					
	COMMI	ENTS					
PESICNATED PUMP WI	- COMMI	Well Proceedings					
TIME STORAGE	couract box						
INOPPERTIENTE W/ BOLT		Previous Volume Purged: 152 gallons					
LOCK FEWER W/ BOLT	CUTTERS	Well Requires Maintenance? (E)					
		Access Requires Maintenance? YES / XO					

Purge Factors: 2"-0.16: 4"-0.65: 6"-1.47: 8"-2.61: 10"-408 (gaillons per linear foot of water)

Confidential Client - Cottage Grove, Minnesota WESTON W.O.: 02181-002-010-0001

1/	min	•
76	MAZ	
DATE:	MAY MARCH	2005

	Wet	I EXZA	CUATION	UCA NAD	I INC EC	\D <b>\</b> 4		. T	<del>e Tital</del> ayan in in
		LEVA	CUATION	VOAIVIL	LING FC	/KM			
GENERAL INFORMATIO	N			T.:.		$\bigcirc$		حمير	····
Well No.: MW-08				<u> </u>	Sunny Clo	udy (Rain/	2000	<b>D</b> U 5	
Sampling Team: Tr				Sampler's	Signature:	7=	K		
WELL INFORMATION						0	*		
Protective Casing: Intact	Damageo	1	<u> </u>	Concrete	Base:	Intac	t / Dama	ged	
Locked: YES	NO		:	Well Dia	meter: 6 în	och.		Harting and the same of the sa	
WELL EVACUATION INF	ORMAT	ION							
A. Total Depth (Top of Casing = To	DC):		173.00	Well Eva	cuation Met				
B. Depth to Water (DTW) (TOC):		-	65.45						
C. Column of Standing Water (C=A	B):		102.50	<b>l</b> { } }	4-Inch G	rundfos			
D. Purge Factor		3	1.47	( )	Other (S	pecify)			
E. One Well Volume:	-		158		·	·········			
F. Three Well Volumes (gailous): 47 4					AL VO	LUME	PURGE	D: <u>4</u>	90
INDICATOR PARAMETE	RS			<u></u>				<del></del>	
	1355		-1 00 1 D		1 44.4		<u> </u>	τ	
Gailons Purged	<del></del>	7705	14 18		1510	1520		154 C	
Oalions I urged	0	55	160	V/C	240	320	420	490	
Temperature (°C):	1025	10.24	10.26	/	10.24	10.26	10.26	10.26	
Specific Conductivity (s):	611	605	- 599		60%	519	599	598	
Dissolved Oxygen (mg/L):	9.89	7.28	6.44	1	6.38	6.37	634	6.35	
pH:	7.05	6.60	5 651		6.48	6.50		6.50	
Visual Turbidity (L, M, H):									+
							·		
NAPL Observed: YES / NO	2	<u></u>		Well Pumped Dry: YES / (NO )					L
ODOR: YES / NO	3			Other:				<del></del>	
Odor Type: ( ) Solvent ( ) S	eptic ()	Other							
SAMPLE COLLECTION I	NFORM	ATION	1		SAMPL	E DATE	: 16 /	Mayo	25
Sample No.			Time			ample No	Automorphism and Printer Common or added the ac-		Time
Media Sample ID:			1	Rinsate Blank: YES /(NO)					
CGMN GW MW8.	0 05	0516	1545	ID NO.:			······································		
Parameters: ( ) 8260 VOC & isopr				Laborator	y: Exygen R	lesearch			
(X) Fluorochemicals (X) pH				-		earch Drive			
(X) Specific Conductance			State College, PA 16801						
(X) Temperature			Contacts: Kent Lindstrom (3M)   John Flaherty   Phone: 651-778-5352   814-231-8032						
( )				1 110110.	351-776-353	2	014-231	* <b>6</b> W2	
( )			COMP						
			COMMI		/aff Dress 3		VEC		
NEED LOCK.				4	ell Pumped	•	YES /	NO ,	_
				P	revious Voli	ıme Purgeo	i: 152 galio		
				1	elt Require			es / <	T. 1
		الويونات		A	ecess Requi	res Mainter	nance? Y	ES /	NQ)

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

WELL EV	ACUATION	SAMPLING FORM
GENERAL INFORMATION		
Well No.: MW-09		Weather: Sunny Cloudy Rain Temp: 10%
Sampling Team: K5/WW		Sampler's Signature:
WELL INFORMATION		
Protective Casing: Index / Damaged	·	Concrete Base: (Intact)/ Damaged
Locked: YES / (NO)		Well Diameter: 2 jach. 4" (WW)
WELL EVACUATION INFORMATION	1.500	7 7 1 14 (4)
A. Total Depth (Top of Casing = TOC):	107.99	
D. Denk or Ware (DTM) (TOC).		( ) BAILER
C. Column of Standing Water (C=A-B):	- 47.17	( ) 4-Inch Grundfos Dean ATEO
	60.78	_ ( ) Other (Specify)
E. One Well Volume:		<u> </u>
E. One Wen Voiding.	39.50	100
F. Three Well Volumes (gallons):	11852	TOTAL VOLUME PURGED: /メリ
INDICATOR PARAMETERS		
Time 1448 14.	55 1505	1512 1517
Gallons Purged 3 31		100 120
		1018 216
1 0.00/10/		7093 / (7.99
	668	676 677
Dissolved Oxygen (mg/L): 1.35 C.1	60.88	1.17 3.55
pH: 7.63 7.0	8 F.SI	7.41 7.4
Visual Turbidity (L, M, H): L	1	<u> </u>
NAPL Observed: YES / SO		Well Pumped Dry: YES / 60
ODOR: YES / NO		Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other		
SAMPLE COLLECTION INFORMATIO	N	SAMPLE DATE:
Sample No.	Time	Sample No. Time
Media Sample ID:		Rinsate Blank: YES / NO
		ID NO.:
Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals		Laboratory: Exygen Research
(X) PH		3048 Research Drive
(X) Specific Conductance		State College, PA 16801
(X) Temperature		Contacts: Kent Lindstrom (3M)   John Flaherty   Phone: 651-778-5352   814-231-8032
( )		0175017000
( )	СОММ	ENTS
	00:41:71	Well Pumped Dry: YES / NO
		Previous Volume Purged: 61 gallons
		Well Requires Maintenance? YES
		Access Requires Maintenance? YES O

Purge Factors: 2"- 0.16; (4"-0.65) 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client - Cotage Grove, Minnesota WESTON W.O.: 02181-002-010-0001

DATE: _/5	MARCH	2005

	WEL	L EVA	UATIO!	N/SAMP	LING FO	)RM				
GENERAL INFORMATIO	N							<del></del>		
Well No.: MW-10				Weather	Sunny CD	udy Rain	Temp:	340		
Sampling Team: TF /AM	1				Signature:				<del></del>	
WELL INFORMATION										
Protective Casing: Intact	Damageo	i		Concrete	Rase:	(nto)	et / Dam	2004		
Locked: YES	(NO)			Well Dias		nch.	, Dain	ageo		
WELL EVACUATION INF	TRMAT	TON	2011	.t					<del></del>	
A. Total Depth (Top of Casing = To		1011	241.50	Fiven Eve	cuation Met	L.J			·	
B. Depth to Water (DTW) (TOC):		-		2	BAILER					
C. Column of Standing Water (C=A	D\.		93.77		2-Inch G 4-Inch G	rundfos	and			
D. Purge Factor	<del></del>	<del></del>	147.77		Other (S	Specify)	cur.			
		X	2.61		DEDICAT	ED PUMP	!			
E. One Well Volume:			385,67							
F. Three Well Volumes (gallom):				TOT	AL VO	LUME	PURGE	E <b>D</b> :		
INDICATOR PARAMETERS						1962				
Time	1335	Hoe	1430	1500	1530	1630	1700	1710		
Gallons Purged	0	137	302	467	632	793	1129	1182-		
Temperature (°C):	10.37	_	9.89		9.87	9.84	7.83	0.83		
Specific Conductivity (s):	270				7.8	1	1			
Dissolved Oxygen (mg/L):	270	365	597	600	579	601	601	607		
pH:	12	0 - 1	<del> </del>	1	-		7 (1)	- //		
Visual Turbidity (L, M, H):	103/	8.21	7.46	7,44	7.49	7-42	7.41	7.40		
			+	ļ	-	<del> </del>		ļ		
NAPL Observed: YES / NO	5.45	15.5°	13.5	2:3	50.50	15.5				
ODOR: YES / NO		·····		Other:	nped Dry:	YES	/ NO			
Odor Type: ( ) Solvent ( ) S	entic ( )	Other		Galer:						
				1						
SAMPLE COLLECTION I	NFORM	ATION			SAMPL	E DATE	):			
Sample No.			Time		S	ample N	0.		Time	
Media Sample ID:				Rinsate Blank: YES / NO						
				ID NO.:						
Parameters: ( ) 8260 VOC & Isopr (X) Fluorochemicals	opyl Ether			Laborator	y: Exygen l					
(X) H						search Driv				
(X) Specific Conductan	ce			State College, PA 16801						
(X) Temperature				Contacts: Kent Lindstrom (3M) John Flaherty						
( )				Phone:	651-778-53.	52	814-23	81 <i>-</i> 8032		
( )				L						
	,		СОММ							
				V	Vell Pumpe	d Dry:	YES /	NO		
· ·				P	revious Vol	iame Purgo	ed: 360 gai	ions		
				V	Vell Require	es Mainten	ance?	YES /	NO	
				A	ccess Requ	ires Mainte	mance?	YES /	NO	

Purge Factors: 2"- 0.16: 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

WELL	EVACUATION	V/SAMPLING FORM						
GENERAL INFORMATION			·					
Well No.: MW-11		Weather: Sunny Cloudy Rain Temp: /2						
Sampling Tearn: Am / TF		Sampler's Signature:						
WELL INFORMATION		Chrom Mine	<del>}                                    </del>					
Protective Casing: Intact / Damaged	· · · · · · · · · · · · · · · · · · ·	Concrete Base: Intact / Darnaged	7					
Locked: YES / NO		Well Diameter: 4 inch.						
WELL EVACUATION INFORMATIO	ON 186.6	0						
A. Total Depth (Top of Casing = TOC):		Well Evacuation Method						
B. Depth to Water (DTW) (TOC):	- 102.90	# ( ) Dallen						
C. Column of Standing Water (C=A-B):	83.7	( ) 4-Inch Grundfos						
D. Purge Factor	x 0.65	( ) Other (Specify)						
E. One Well Volume:	34.40	·						
F. Three Well Volumes (gallons):	16321	TOTAL VOLUME PURGED:						
INDICATOR PARAMETERS								
Time 9:59 11	C-11 10:27	10:38 10:39 10.10 1042 10:44	*					
	7	150 153 156 159 165						
		10.95 10.97 10.94 10.94 10.94						
	145 6.55	056 657 656 634 657						
	1.41 7.27	7.01 7.01 7.00 7.11 7.18						
7.77 J	35 9,54	9.61 9.60 9.63 9.64 9.65						
Visual Turbidity (L, M, H):	4	L L L L L						
NAPL Observed: YES / MO								
ODOR: YES / NO		Well Pumped Dry: YES / (NO)						
Odor Type: ( ) Solvent ( ) Septic ( ) Oti	ker							
SAMPLE COLLECTION INFORMAT	TON	SAMPLE DATE: 3/12/05						
Sample No.	Time	Sample No.	ime					
Media Sample ID:	1540	Rinsate Blank: YES NO						
CGMNGWMWI10050312		ID NO.:						
Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals		Laboratory: Exygen Research						
(X) pH	9.65	3048 Research Drive						
(X) Specific Conductance (X) Temperature	10.54	State College, PA 16801  Contacts: Kent Lindstrom (3M) John Flaherty						
		Phone: 651-778-5352 814-231-8032						
( )								
	COMMI	ENTS						
		Well Pumped Dry: YES / NO						
		Previous Volume Purged: 40 gallons						
		Well Requires Maintenance? VES / NO	)					
		Access Requires Maintenance? YES / NO						

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear fool of water)

Confidential Client - Cc e Grove, Minnesota WESTON W.O.: 02181-602-010-0001

DATE: 14 MARCH 2005	DATE:	14	_MARCH	2005
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	WELI	EVAC	UATION	/SAMPI	ING FO	RM		·	
GENERAL INFORMATION	Ÿ				<del>†</del>	_			
Well No.: MW-12		7 1		Weather:	Sunny Clo	udy Rain	Temp:	22:	=
Sampling Tearn: KJ/WW					Signature:				-1-
WELL INFORMATION	<i></i>		····	<u> </u>			<del></del>		
Protective Casing: (Intact) /	Damaged	· · · · · · · · · · · · · · · · · · ·		Concrete I	Sace.	iota	ct / Dam	aged	
Locked: YES	NO			Well Dian		nch.	ct / Dan	a\$ca	
WELL EVACUATION INFO	ODMAT	ON	110 -						
		ION	141,03		uation Met		<del></del>		
<ul><li>A. Total Depth (Top of Casing = FO</li><li>B. Depth to Water (DTW) (TOC):</li></ul>		<del></del>		weil Evac	BAILER				
	2:		93.63	\ <b>X</b>	2-Inch G				
C. Column of Standing Water (C=A)  D. Purge Factor	B):		47.4	( )	4-Inch C				
		X	0.65	_					
E. One Welf Volume:			30.81						
F. Three Well Volumes (gall	2.43	TOT	AL VO	LUME	PURGI	ED: <u>3</u>			
INDICATOR PARAMETER	RS								
Time	08.30	1335	0340						!
Gallons Purged	6	175	35			<b>†</b>	1	1	ļ
T (9C):		7.3			<u> </u>	-		+	i
		11.19	3.54	<del> </del>	ļ	<del> </del>		<del>-</del>	1
Specific Conductivity (s):		247	10,73				<u> </u>	ļ	<u> </u>
Dissolved Oxygen (mg/L):		0.09	0.3		ļ		ļ		
pH:	8.96	7.76	4.40						<u> </u>
Visual Turbidity (L)M, H):	i i	1-	M						<u> </u>
NAPL Observed: YES / (NO	<u> </u>			Wall Day		YES	] 		<u> </u>
ODOR: YES / (NO				Other:	nped Dry:	(15	<u> </u>		
Odor Type: ( ) Solvent ( ) S	eptic ( )	Other		Other:					
				!					
SAMPLE COLLECTION I	NFORM	ATION			SAMP	LE DAT	E:		
Sample No.			Time			Sample ?	io.		Time
Media Sample ID:	<del>,</del>			Rinsate B	lank: YES				
				ID NO.:					
Parameters: ( ) 8260 VOC & isopr	ropyl Ether		<del> </del>	Laboratory: Exygen Research					
(X) Fluorochemicals				3048 Research Drive					
(X) pH (X) Specific Conductance 276				State College, PA 16801					
(X) Temperature 9,54				Contacts: Kent Lindstrom (3M) John Flaherty					
			-	Phone:	651-778-5	352	814-3	231-8032	
( )									
			COMM	IENTS					
Removed Lock	1.1.	D ./	0.11-	1	Vell Pump	ed Dry:	(VES)	/ NO	
Removed Lock a	w.Xh	5014	- وتصاليف	۱ ا	Previous V	olume Pur	ged: 90 gal	lons	
				1		res Mainte		NES /	SO
				Į.	•				<u> </u>
				Ľ	erress iced	uires Main	tenance.	YES /	7.7

Purge Factors: 2"+0.16; 4"+0.65; 6"+1.47; 8"+2.61; 10"-4.08 (gallons per linear root of water)

Confidential Client - Con...ge Grove, Minnesota WESTON W.O.: 02181-002-010-0001

	. 2		
DATE:	10	MARCH	2005

	WELL E	VACUA	ATION	/SAMPL	ING FO	RM		-	
GENERAL INFORMATION	¥ .								
Well No.: MW-13				Weather: 5	Sunny Clou	kdy Rain	Temp:	<i>Z</i> 5	<u>*</u>
Sampling Team: K-5	TWW		***************************************	Sampler's S	ignature:	The me	20	4	2
WELL INFORMATION							7		
Protective Casing: Intact /	Damaged			Concrete B	ase:	Intac	) Dama;	ged	
Locked: YES /	NO			Well Diam	eter: 4 in	ich.			
WELL EVACUATION INF	ORMATION	V							
A. Total Depth (Top of Casing = TO	C):	T	134.00	Well Evaci	uation Met	nod			
B. Depth to Water (DTW) (TOC):		- 9	2.03	( )	BAILER 2-Inch Gr				
C. Column of Standing Water (C=A	·B):	111	97	(2)	4-inch Gr	rundfos			
D. Purge Factor		X	0.65	( )	Other (S	ipecify)		•	
E. One Well Volume:		27	28	-	<del>·</del>				
F. Three Well Volumes (gallons): 81-84				TOTA	T AOI	LUME	PURGE	D:_0	7.5
INDICATOR PARAMETER	RS.		**************************************						<del>, , , , , , , , , , , , , , , , , , , </del>
Time	1430 14	135	1440	1445	1450	1455			
Gallons Purged	10 3	7.5	43	1.2.5	80	97.5			
Temperature (°C):	16:00 11	7111	11.02	1111					
		.44 /	1.53	11.61	11-35	11.40	1		<del></del>
•			474	524	534	532			_
Dissolved Oxygen (mg/L):		-80	17.0	0.99	122	1.25			
pH:	8.23 7	_بور.	7.69	2.57	7.46	7.45			
Visual Turbidity (L, M, H):	M 1	$H \downarrow$	4	4	M	1		<del>                                     </del>	
NAPL Observed: YES / NO	<b></b>			Well Pum	and Davi	YES	/ (NO	<u> </u>	
ODOR: YES / CO	<del>,</del>		·····	Other:	ped Dry.	123	1 (10		
Odor Type: ( ) Solvent ( ) S	eptie ( ) Oth	er							
				<u> </u>					
SAMPLE COLLECTION I	NFORMAT	ION			SAMPI	E DATE	:_ <i></i>		
Sample No.			Time			ample N	0.		Time
Media Sample ID:				Rinsate Blank: YES /NO					
CGMWGWMW/30	050312		1630						
Parameters: ( ) 8260 VOC & Isopr (X) Fluorochemicals		,	_	Laboratory: Exygen Research					
Hq(X)		7.45		3048 Research Drive State College, PA 16801					
(X) Specific Conductance 532 (X) Temperature 11,40				Contacts: Kent Lindstrom (3M) John Flaherty					
( )		· / · / ·		Phone:	651-778-53	52	814-23	1-8032	
( )									
			COMM	ENTS				_	_
LOIK WAS LUT TO	CAN	Acces;	5	V	Vell Pumpe	ed Dry:	YES /	NO	D
LUIN WWD LUI		.,	•	P	revious Va	lume Purg	ed: 16 galle	DID.	
				i.,	V. # 15 1.			vee.	i NO
X .				y v	ven Kednii	res Mamter	ance?	163	, ,,,,,

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

WELL EVA	ACUATION	N/SAMPLING FORM
GENERAL INFORMATION		
Well No.: MW-14		Weather: Sunny Cloudy Rain Temp: 2
Sampling Team: KT/WW	<del></del>	Sampler's Signature:
WELL INFORMATION		
Protective Casing: Intact / Damaged		Concrete Base: Intact Darriaged (VI)
Locked: (Cot /oc)	Koff	Well Diameter: 4 inch.
WELL EVACUATION INFORMATION	59.00	0 (3)
A. Total Depth (Top of Casing = TOC):		Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 36.85	( ) BAILER ( ) 2-Inch Grundios
C. Column of Standing Water (C=A-B):	3215	( ; +-inch Grundtos
D. Purge Factor	X 0.65	t ) Other (Specify)
E. One Well Volume:	20.9	
F. Three Well Volumes (gallons):	62.7	total volume purged: $24$
INDICATOR PARAMETERS		4
Time 0802 080	05 0808	
Gailons Purged / / /	24	
Tormeropire (SC) (4.5.3 (4.5.3)	0 0 - 2	
Temperature (°C): 10.52 10.5		
Specific Conductivity (s): 528 525	5 531	
Dissolved Oxygen (mg/L): 10.39 34		
pH: 7.38 7.0	8 F.02	
Visual Turbidity (L, M, H): H /	7 m	
	1	
NAPL Observed: YES / NO		Well Pumped Dry: YES NO
ODOR: YES / OO Other		Other:
Oddr Type: ( ) Solvent ( ) Septic ( ) Other		
SAMPLE COLLECTION INFORMATIO	)N	SAMPLE DATE:
Sample No.	Time	Sample No. Time
Media Samole iD:		Rinsate Blank: YES - NO
		ID NO.:
Parameters: 8260 VOC & Isopropyl Ether		Laboratory: Exygen Research
(X) Fluorochemicals (X) pH		3048 Research Drive
X   Specific Conductance		State College, PA 16801  Contacts: Kent Lindstrom (3M) John Planerty
X > Temperature		Phone: 651-778-5352 814-231-8032
1	COMM	MENTS
11 >		Well Pumped Dry: YES / NO
Neeps new lock		Previous Volume Purged: 15 gallous
		Well Requires Maintenance? YES NO
		Access Requires Maintenance? VES NO

Purge Factors: 2"+0.65; 4"+0.65; 6"+1.47; 8"+2.61; (0"++08) gollons per linear foot of water)

WELL EVAC	UATION	N/SAMPLING FORM	
SITE INFORMATION			
Well No.: MW-15		Weather Sunn Cloudy Rain Temp: 150F	
Sampling Team:		Sampler's Signature	
WELL INFORMATION		Chan Marie Contraction of the Co	
Protective Casing: inter: : Damaged		Concrete Base: (Intact ) Damaged	
Locked: YES / NO		Well Diameter: 4 inch.	
WELL EVACUATION INFORMATION	86.54		
A. Total Depth (Top of Casing = TOC):	186.00		
B. Depth to Water (DTW) (TOC):	76.08	( ) BAILER ( — ]-inch Grundfos	
	0.46	+inch Grundfos	
D. Purge Factor X	0.65	( ) Other (Specify)	
	9.80		
TO THE ANALYSIS NAMED AND ADDRESS OF THE PARTY OF THE PAR	76.40	TOTAL VOLUME PURGED: 192.	5
INDICATOR PARAMETERS	1600		***************************************
Time 1545 1550	_		
Gallons Purged 75 25	70	1/610 1620 1630 1635	
11.3 00	1/0	103 140 175 192.5	
Temperature (°C): 9.04 9.93	10.04		
Specific Conductivity (s): 334 394	523	546 549 550 550	
Dissolved Oxygen (mg/L): 0.29 0.14	0.04	0.28 0.33 0.31 0.35	
pH: 8.64 8.54	7.71	7.54 7.50 7.50 7.48	
Visual Turbidity (L, M, H): M	H	4 4 4 4	
NAPL Observed: YES / (10) ODOR: YES / (10)		Well Pumped Dry: YES / YO	
		Other:	
Odor Type: ( ) Solvent ( ) Septic ( ) Other			
SAMPLE COLLECTION INFORMATION		SAMPLE DATE: /2	وسنسوس
	Time		
Sample No.  Media Sample ID:	\$ 14DE		line
CGMNGWMW15 0050312	10.10	Rinsate Blank: YES NO	
Parameters: ( ) \$260 VOC & Isopropyi Ether	1645	Laboratory: Exygen Research	
(X) Fluorochemicals	a	3048 Research Drive	•
(X) pH (X) Specific Conductance 556	<u>~</u>	State College, PA 16801	:
(X) Temperature 9.83	7	Contacts: Kent Lindstrom (3M) John Figherty	
<b>₹ :</b> <b>4</b> .)		Phone: 651-778-5352 8 (4-23) 43032	
( )			Š
	COMM		
LOCK WAS LUT TO LAND ALLS	<b>グ</b>	Well Pumped Dry: YES (50)	ļ
		Previous Volume Purged: 60 gallons	į
		Well Requires Maintenance? (ES) / NO	<u>.                                    </u>
		Access Requires Maintenance? YES / GO	/

Purge Factors: 2"-0 16: 4"-0.65 %"-1.47, 8"-2.61; 10"-4-08 (gaillons per linear foot of water)

WE	LL EVAC	TIATION	VSAME	INCR	DM			
SITE INFORMATION				~uG r'(				
Well No.: MW-16	<del></del>		Weather	Sunny Clo	Daire	Tama	724	
		<del></del>	<u></u>		uuy kain		230	
			Sampler	s Signature:	[ free	- 1/L		
WELL INFORMATION	·		·				$\triangle$	
Protective Casing: Intact // Damage Locked: YES / NO	ed		Concrete			ct / Dam	aged	
		·		meter: (4 i	nch.			
WELL EVACUATION INFORMA	TION	14/2/10					_	
A. Total Depth (Top of Casing = TOC):		140.00	Well Eva	cuation Met				
B. Depth to Water (DTW) (TOC): - 93.78			يز) [	BAILER 2-Inch G				
C. Column of Standing Water (C=A-B):		47.31		4-inch G	rundfos			
D. Purge Factor	X	0.47	85	Other (	Specify)			
E. One Well Volume:	3	0.75						·
F. Three Well Volumes (gallons):	9	2.27	тот	AL VO	LUME	PURGE	ED:	
INDICATOR PARAMETERS		·	<del></del>					
Time //:50	12:22	12:47	1 1 2	1.			Ţ——	1
Collons Dimond				<del></del>	ļ	<del> </del>	<del> </del>	-
	55	980	103					
Temperature (°C): 11.57	10.79	10.85	10.85					
Specific Conductivity (s): 251	848	816	814					
Dissolved Oxygen (mg/L): 335	4.44	0.39	0.38					7
pH: 9.78	7.98	7.72	7.59	1				1
Visual Turbidity (L, M, H): 4	L	4	1				†	+
								<del>                                     </del>
NAPL Observed: YES / (NO)		<u> </u>	Well Pur	nped Dry:	YES	/ NO	<u>i.                                    </u>	
ODOR: YES / (O)			Other:					
Odor Type: ( ) Solvent ( ) Septic ( )	) Other		1					
SAMPLE COLLECTION INFORM	IATION			SAMPI	E DATE	:_ <i>12</i>		
Sample No.		Time		S	ample N	0.		Time
Media Sample ID:			Rinsate B	lank: YES	<b>№</b> 0			
CGMNGW MW 16 0050	312	1636	ID NO.:					
Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochernicals		-	Laborator	y: Exygen i				
(X) Plucrochermeaus (X) pH	7.59				search Driv			
(X) Specific Conductance	814		Ca		ilege, PA 1			
(X) Temperature	10.8	<u> </u>		Kent Lindst			iaherty	
( )			i iione;	651-778-53	J4	814-23	1-8032	
( )								
	, .	COMM						
well Lak were removed	un be	Recl		Vell Pumpe	a Dry:	YES /	NO	
			1	revious Vo	ume Purge	d: 30 galle	ens	
			ľ	Vell Requir	s Mainten	ance?	YES /	NO
				eccess Requ	ires Mainte	enance?	YES /	NO

Purge Factors: 2"- 0.16; 4"- 0.65-6"- 1.47; 8"-2.61; 10"-4 08 (gallons per linear foot of water)

WELL EVA	CUATIO	N/SAMPLING FORM
SITE INFORMATION		VISAUL LENG FORM
Well No.: MW-17		Weather: Sunny Could Rain Terms:
Sampling Team: KS/WW/FM		Weather: Sunny Could Rain Temp:
WELL INFORMATION		Sauther 2 2 duting:
Protective Casing: (Struct) / Damaged		IC 2
Locked: VES / NO		Concrete Base: Intact / Damaged Well Diameter:
WELL EVACUATION INFORMATION		
A. Total Depth (Top of Casing = TOC):	114.3	
B. Depth to Water (DTW) (TDC):	112.00	T A DAMED
C. Column of Standing Water (C=A-B):	75,2	1/01. (1:40)
D. Purse Factor	57.08	Tia ( ) Other (Specify)
E. One Well Volume:		<i>(</i> 2)
	35.4	
F. Three Well Volumes (gallens):	76.2	TOTAL VOLUME PURGED: 78
INDICATOR PARAMETERS		
Time 1338 1340	1343	1341 1348 1352 1354
Gallons Purged 2	16	
Temperature (°C): 10.55 10.95		
Specific Confusion (2) 75-4		1105 11.04 11.06 11.04
1/2/4 / 7/0	762	762 761 760 759
7,000 1100		1.64 / 67 1.68 1.70
U.10 7.33		7.46 7.46 7.40 7.41
Visual Turbidity (L, M, H):	12	2 2 32 2
NAPL Observed: YES / XO		
NAPL Observed: YES / (O) ODOR: YES / (O)		Well Pumped Dry: YES (O)
Odor Type: ( ) Solvent ( ) Septic ( ) Other	······································	Other:
(/0.000)		
SAMPLE COLLECTION INFORMATION		SAMPLE DATE:
Sample No.	Time	
Media Sample ID:	1 HINE	Sample No. Time
		Rinsate Blank: YES / NO
Parameters: ( ) \$260 VOC & Isopropyi Ether	<u> </u>	Laboratory: Exygen Research
(N) Fluorochemicals		3048 Research Drive
(X) pH (X) Specific Conductance		State College, PA 16801
(X) Temperature		Conmets: Kent Lindstrom (3M) John Flaherty
( )		Phone: 651-778-5352 814-231-8032
( )		
	СОММІ	
/		V
Cut Lock off Fine Di-		Well Pumped Dry: YES / NO
Cit Lock off for Purpe		Well Pumped Dry: YES / NO Previous Volume Purged: 23 gallons
Cut Lock off for Purpe		

Purge Pactors:	2"-0.1¢.	J"- 0.65;	<b>)</b> 6"- 1.47;	8"-2.61;	: 10°4.08 (gallons per linear foot of wate	:r\
**************	······································	بمستنب			and against per intent toot of wate	. ,

Confidential Client - Cot Grove, Minnesota WESTON W.O.: 02181-0-2-010-0001

	14		
JATE:		_MARCH	2005

WELL INFORMATION  Well No.: MW-18 Sampling Team: K J W J J J J Sampler's Signature:  WELL INFORMATION  Protective Casing anger / Damaged   Concrete Base:   Well Diameter: Linguist   Damaged   Damaged   Well Diameter: Linguist   Damaged
Sampler's Signature:  WELL INFORMATION  Protective Casing: [august / Damaged   Concrete Base: Intages   Damaged   Well Diameter: Impk.   Damaged
WELL INFORMATION  Protective Casing: Ing. / Darraged   Concrete Base:   Intacy   Darraged   Concrete Base:   Darraged   Concrete Base:   Darraged   Concrete Ba
WELL INFORMATION  Protective Casing: Ing. / Darraged   Concrete Base:   Intacy   Darraged   Concrete Base:   Darraged   Concrete Base:   Darraged   Concrete Ba
WELL EVACUATION INFORMATION  A. Total Depth (Top of Casing = TOC):  B. Depth to Water (DTW) (TOC):  C. Column of Standing Water (C=A-B):  D. Purge Factor  E. One Well Volumes (gallons):  F. Three Well Volumes (gallons):  Time      58      200      202      204      208    Gallons Purged   2   10   20   30   40   50    Temperature (°C):    69   11   62   11   63   11   44   11   44    Dissolved Oxygen (mg/L):    23   1   26   128    Visual Turbidity (L, M, H):    M    M    M    M    M     NAPL Observed: YES    10    Other
Well Diameter:   Linck   Well Diameter:   Linck   Well Evacuation Nethod   Baller   Depth (Top of Casing = TOC):   92.00   Well Evacuation Method   Baller   Depth to Water (DTW) (TOC):   - 69.07   Sec.   Depth to Water (DTW) (TOC):   - 69.07   Sec.   Depth to Water (C=A-B):   24,13   Sec.   Depth to Water (C=A-B):   Depth to Water (C=A-B):   24,13   Sec.   Depth to Water (C=A-B):   Depth to Water (C=A
A. Total Depth (Top of Casing = TOC):  B. Depth to Water (DTW) (TOC):  C. Column of Standing Water (C=A-B):  D. Purge Factor  E. One Well Volume:  F. Three Well Volumes (gations):  Time     56    200    202    30    40    50    Gallons Purged   2   10   20   30   40   50    Temperature (°C):   6.96    1.62    1.63    1.46    1.44    1.44    Dissolved Oxygen (mg/L):   2,2    3,26    3,27    4,37    4,47    4,47    PH:   2,59    3,49    3,49    4,49    4,49    4,49    Visual Turbidity (L, M, H):
A. Total Depth (Top of Casing = TOC):  B. Depth to Water (DTW) (TOC):  C. Column of Standing Water (C=A-B):  D. Purge Factor  E. One Well Volume:  F. Three Well Volumes (gations):  Time     56    200    202    30    40    50    Gallons Purged   2   10   20   30   40   50    Temperature (°C):   6.96    1.62    1.63    1.46    1.44    1.44    Dissolved Oxygen (mg/L):   2,2    3,26    3,27    4,37    4,47    4,47    PH:   2,59    3,49    3,49    4,49    4,49    4,49    Visual Turbidity (L, M, H):
B. Depth to Water (DTW) (TOC):  C. Column of Standing Water (C=A-B):  D. Purge Factor  E. One Well Volume:  (A) /5. 68 + .37  E. One Well Volumes (gastons):  Time      56      200      202      204      206      206    Gallons Purged   2   /0   20   30   40   50    Temperature (°C):    6.96      6.92      6.93      4.94      4.94      4.94    Dissolved Oxygen (mg/L):    2    3    4    4    4    4    4    4
C. Column of Standing Water (C=A-B):  D. Purge Factor  E. One Well Volume:  (C)
D. Purge Factor  E. One Well Volume:  (C)
E. One Well Volume: (P) /5. 68 H.347 (C)  F. Three Well Volumes (gations): 34.0 TOTAL VOLUME PURGED: 50  INDICATOR PARAMETERS  Time     58    200    202    204    206    208    Gallons Purged   2   10   20   30   40   50    Temperature (°C):   69    1.62    1.63    1.48    1.44    1.44    Specific Conductivity (s):   730    763    764    772    773    774    Dissolved Oxygen (mg/L):   ,   21    1.26    1.28    1.39    1.43    1.47    pH:   7.54    7.48    7.44    7.45    7.44    7.43    Visual Turbidity (L, M, H):
F. Three Well Volumes (gations):    34.6
Time
Time
Time
Gallons Purged   2   10   20   30   40   50     Temperature (°C):   10.96   11.62   11.63   11.46   11.44     Specific Conductivity (s):   730   763   764   772   773   774     Dissolved Oxygen (mg/L):   2   1.26   1.28   1.39   1.43   1.47     pH:
Temperature (°C):
Specific Conductivity (s): 730 763 769 772 773 774
Specific Conductivity (s): 730 763 769 772 773 774
Dissolved Oxygen (mg/L): 1,21 1,26 1,28 1.39 1.43 1.47 pH: 7.59 7.48 7.47 7.45 7.44 7.43  Visual Turbidity (L, M, H): M M M M M M M  NAPL Observed: YES / 80  ODOR: YES / 80  Odor Type: ( ) Solvent ( ) Septic ( ) Other
PH: 7.59 7.48 7.47 7.45 7.44 7.43  Visual Turbidity (L, M, H): M M M M M M  NAPL Observed: YES / 80  Odor Type: ( ) Solvent ( ) Septic ( ) Other  Well Pumped Dry: YES / 80  Other:
Visual Turbidity (L, M, H): M M M M M M M M M M M M M M M M M M M
NAPL Observed: YES / 100 Well Pumped Dry: YES / 100 Other:  Odor Type: ( ) Solvent ( ) Septic ( ) Other
ODOR: YES / KG Other: Odor Type: ( ) Solvent ( ) Septic ( ) Other
ODOR: YES / KG Other: Odor Type: ( ) Solvent ( ) Septic ( ) Other
Odor Type: ( ) Solvent ( ) Septic ( ) Other
SAMPLE COLLECTION INFORMATION SAMPLE DATE:
Sample No. Time Sample No. Time
Media Sample ID: Rinsate Blank: YES / NO
ID NO.:
Parameters: ( ) 8260 VOC & Isopropyi Ether Laboratory: Exygen Research
(X) Fluorochemicals 3048 Research Drive
(X) pH State College, PA 16801
(X) Temperature Contacts: Kent Lindstrom (3M) John Flanerty
Phone: 631-778-5352 314-231-8032
COMMENTS
NO LOIN ON WELL, DEDRATER FUMP Well Pumped Dry: YES ( NO)
Previous Volume Purged: 15 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES /

Purge Factors, 2"-0.16(4"-0.65) 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client - Co\* 'e Grove, Minnesota WESTON W.O.: 02181- -010-0001

	2773T T Y277.4	~~	10 + 3 CD	V TVC TOTAL
	vell eva(	CUATION	SAMP	LING FORM
SITE INFORMATION				
Well No.: MW-19			Weather	Sunny Cloudy Rain Temp:
Sampling Team: K5/W	W		Sampler	's Signature:
WELL INFORMATION				
	maged )		Concrete	e Base: (intact)/ Damaged
Locked: YES / NC			Well Dia	ameter: 4 inch.
WELL EVACUATION INFOR	MATION			
A. Total Depth (Top of Casing = TOC):	1	120.00	Well Eva	acuation Method
B. Depth to Water (DTW) (TOC):	-	52.93		2-Inch Grundfos Orskussko
C. Column of Standing Water (C=A-B):		2.07		) 4-Inch Grundios /
D. Purge Factor		<u> </u>		) Other (Specify)
E. One Well Volume:				
E. One wen volume:	- 2	13.59		
F. Three Well Volumes (gallons)	1	30.77	тот	TAL VOLUME PURGED:
INDICATOR PARAMETERS				
Time				
Gallons Purged		<del>- </del>		
		<del>                                     </del>		
Temperature (°C):			<u> </u>	
Specific Conductivity (s):		4		
Dissolved Oxygen (mg/L):		<u> </u>	ļ	
pH:	1			
Visual Turbidity (L, M, H):				
NAPL Observed: YES / NO	<del></del>		Well Pu	umped Dry: YES / NO
ODOR: YES / NO			Other:	
Odor Type: ( ) Solvent ( ) Septie	( ) Other			
SAMPLE COLLECTION INFO	ORMATION	1		SAMPLE DATE:
Sample No.		Time		Sample No. Time
Media Sample ID:			Rinsate	Blank: YES / NO
			ID NO.:	
Parameters: 1 3260 VOC & Isopropyl	Ether		Laborat	tory: Exygen Research
(X) Fluorochemicals				3048 Research Drive
( X ) Specific Conductance			Contact	State College, PA 16801 ts: Kent Lindstrom (3M) John Flaherty
(X) Temperature			i i	e: 651-778-5352 814-231-8032
( )		COMA	FVTC	
Contirm Total Depth of Well				Well Pumped Dry: YES / NO
Landa TOE CONVEN	, איט בט	درو ۱۸	WELL	
War were a west as	ILL A PURAT	TONAL,		Previous Volume Purged: 35 gallons
UNABLE TO PURE T	SAMPLE			Well Requires Maintenance? VES NO
V/41.50-				Access Requires Maintenance? YES (0)

turge fractors: 2"- 0.16; (**- 0.63)	6"-1.47; 8"-2.61; 10"-4.08 (gations per linear	foot of water)
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Confidential Client - Counge Grove, Minnesota WESTON W.O.: 02181-002-010-0001

	16	May 2005
DATE:		<del>\takei</del>   2005

WEL	L EVACUATION	SAMPLING FORM
SITE INFORMATION	<u> </u>	
Well No.: MW-19		Weather: Sunny Cloudy Rain Jamny 605
Sampling Team: 7+		Sampler's Signature:
WELL INFORMATION		77
Protective Casing: (Intac) / Damaged		Concrete Base: Intac / Damaged
Locked: USES / (NO)		Well Diameter: (inch)
WELL EVACUATION INFORMAT	ION	
A. Total Depth (Top of Casing = TOC):	120.00	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- <2.33	( ) BAILER
C. Column of Standing Water (C=A-B):	670	(AC) 2-Inch Grundfos ( ) 4-inch Grundfos
D. Purge Factor	x 0.47	( ) Other (Specify)
E. One Well Volume:	72	
E. One well volume.		
F. Three Well Volumes (gailons):	100	TOTAL VOLUME PURGED: 10
INDICATOR PARAMETERS		
Time 1/ ico	16:05	
Gallons Purged	10	
Temperature (°C):	/ /	
Specific Conductivity (s):	<del>                                     </del>	
	<del>-                                   </del>	
Dissolved Oxygen (mg/L):	4V	
pH:	V/ -	
Visual Turbidity (L, M, H):		
	/	
NAPL Observed: YES / NO		Well Pumped Dry: YES / NO
ODOR: YES / NO Odor Type: ( ) Solvent ( ) Septic ( )	Other	Other:
Oddr Type: ( ) Sorreste ( ) Septie ( )	Ouci	
SAMPLE COLLECTION INFORM	ATION	SAMPLE DATE: 12 MAY 05
Sample No.	Time	Sample No. Time
Media Sample ID:		Rinsate Blank: YES ( NO )
CGMN GW MW19 0 050	517 0810	ID NO.:
Parameters: ( ) 8260 VOC & Isopropyl Ether	- , , , , , , , , , , , , , , , , , , ,	Laboratory: Exygen Research
(X) Fluorochemicals (X) pH		3048 Research Drive
(X) Specific Conductance		State College, PA 16801
(X) Temperature		Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032
( )		Phone: 651-778-5352 814-231-8032
<b>〈 〉</b>		
	COMM	
Confirm Total Depth of Well  MRASURED TO AT	64.85	
Dana AR IN DAE TE RE	ENOLE	Tribus volume i argen. Seganons 70 977
PROBABLY ONE TO BOX	<b>3</b> 8	Well Requires Maintenance? YES / NO
Collarin Fulle	(ZIMI)	Access Requires Maintenance? YES / NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

WELL EV	ACUATION/	SAMPLING FORM
SITE INFORMATION		
Well No.: MW-101		Weather: Sunny Coudy Rain Temp: 13
Sampling Team: K5 / W W		Sampler's Signature: Moon Moorel
WELL INFORMATION		
Protective Casing: (next) Damaged		Concrete Base: Intact / Damaged
Locked: YES / NO		Well Diameter: 2 inch.
WELL EVACUATION INFORMATION	101.90	
A. Total Depth (Top of Casing = TOC):	100:00	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 94.97	( BAILER ) 2-inch Grundfos
C. Column of Standing Water (C=A-B):	7.03	( ) 4-Inch Grundfos
D. Purge Factor	x 0.16	( ) Other (Specify)
E. One Well Volume:	1.13	
F. Three Well Volumes (gallous):	3.37	TOTAL VOLUME PURGED: 3.5
INDICATOR PARAMETERS 09 30		
Time Open 09		0945
Gallons Purged O Z	3 2.0	3.0
200 (2.21 (2.	40 6161	
Temperature (°C): 8.2 9.	42 4.61	9.40
183.1.16	190 2317	XAII
	04 0.37	1117
pH: 7.03 7.	13 7.28	
Visual Turbidity (L, M, H):	$m \mid m$	<u>  M                                   </u>
		Well Pumped Dry: YES / 60
NAPL Observed: YES / 60/		Other:
ODOR: YES / Oder Type: ( ) Solvent ( ) Septic ( ) Other		- Cinci.
Oder Type: ( ) Solvent ( ) Separe ( )		
SAMPLE COLLECTION INFORMATI	ON	SAMPLE DATE: 12
	Time	Sample No. Time
Media Sample ID:		Rinsate Blank: YES NO
CGMNGWMW10 10050312	1405	ID NO.:
Parameters: ( ) 8260 VOC & Isopropyl Ether	7400	Laboratory: Exygen Research
(X) Fluorochemicals	7.32.	JO48 Research Drive
(X) pH (X) Specific Conductance	12/1	State College, PA 16801  Contacts: Kent Lindstrom (3M) John Flaherty
(X) Temperature	4.40	Phone: 651-778-5352 814-231-8032
( )		
( )	COM	MENTS
		Well Pumped Dry: YES / NO
		Previous Volume Purged: 2 gallons
		Well Requires Maintenance? YES (0)
		Access Requires Maintenance? YES
9		

Purge Factor(: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear that of water)

Confidential Client - Cot Grove, Minnesota WESTON W.O.: 02181-0-2-010-0001

DATE: 12	MARCH	2005
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	WELL	EVAC	UATION	/SAMPL	ING FO	RM			
SITE INFORMATION			·						
Well No.: MW-102				Weather: S	unny Clo	idy Rain	Temp:	157	<del>-</del>
Sampling Team:	WW			Sampler's Signature:					/_
WELL INFORMATION			·			And Car			
Protective Casing: Intact /	Millaged	3		Concrete Ba	ase:	Intac	t Dama	aged	<u> </u>
Locked: YES	NO			Well Diame	eter: 2 ir	ıch.		_	
WELL EVACUATION INF	ORMATI	ON	94.67						
A. Total Depth (Top of Casing = TO	C):			Well Evacu	ration Met	hod		***************************************	
B. Depth to Water (DTW) (TOC):	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-9	1,97		BAILER 2-Inch G				
C. Column of Standing Water (C=A	\-B):		2.7	( )	4-Inch G	rundios			
D. Purge Factor		X	0.16	( )	Other (S	Specity)			
E. One Well Volume:			43	_					
				<b>505</b>			DINGI		11-
F. Three Well Volumes (gat	lons):		3	TOTA	T VO	LUME	PURGE	rn:	7.5
INDICATOR PARAMETE	DC								
	<del></del>		1		······	<del></del>	1	<del></del>	
Time	Mis 2	1050	1075	1010	<del></del>	<del> </del>		-	
Gallons Purged	0.25	0.50	10	15					
Temperature (°C):	9.40	4.83	9.18	9.02					
Specific Conductivity (s):	75.2	765	767	770					
Dissolved Oxygen (mg/L):	0.72	0.69	1.17	1.19					
pH:	7.44	7.60	7.11	760					
Visual Turbidity (L. M, H):	M	14	1-1	H					
						i -			•
		·		137-11 Fb.	ned Dry:	·YES	/ (NO	5	
NAPL Observed: YES / NO	)			wei rum	fice oil.				
NAPL Observed: YES / NO				Other:	inca or y .				
ODOR: YES / (NO	<u>ر</u>	Other		<u> </u>	ica ory.				
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S	Septic ( )			<u> </u>		LE DATI	E: //	<b>え</b>	W
ODOR: YES / (NO Odor Type: ( ) Solvent ( ) S	Septic ()		Time	<u> </u>	SAMPI			ス	Time
ODOR: YES / (NO Odor Type: ( ) Solvent ( ) S SAMPLE COLLECTION S Sample No	Septic ()		Time	Other:	SAMPI	Sample N		<u>ر</u>	Time
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S SAMPLE COLLECTION I Sample No Media Sample ID:	Septic ()	ATION		Other:	SAMPI	Sample N		2	Time
ODOR: YES / (NO Odor Type: ( ) Solvent ( ) S SAMPLE COLLECTION S Sample No	Septic () INFORM.	ATION	Time	Other: Rinsate BI	SAMPI	Sample N		۷	Time
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION I  Sample No Media Sample ID:  CG MG GWM Wiol 20  Parameters: ( ) 8260 VOC & Isop (X) Fluorochemicals	Septic () INFORM.	ATION	1615	Other: Rinsate BI	SAMPI	Sample N	io.	2	Time
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION I  Sample No Media Sample ID:  CG MGWMWiol of (X) Fluorochemicals (X) pH	Septic ( ) INFORM 2503/2 propyl Ether	ATION	1615	Rinsate Bl ID NO.: Laboratory	SAMPI (ank: YES v: Exygen 3048 R State C	Research escarch Drivollege, PA	io.		Time
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION I  Sample No Media Sample ID:  CG MG GWM Wiol 20  Parameters: ( ) 8260 VOC & Isop (X) Fluorochemicals	Septic ( ) INFORM 2503/2 propyl Ether	ATION  7.6	1615	Rinsate Bi ID NO.: Laboratory Contacts:	SAMPI (sank: YES v: Exygen 3048 R State C Kent Linds	Research escarch Driviollege, PA	ve 6801	Flaherty	Time
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION    Sample No Media Sample ID:  CG ANGW Miol of Parameters: ( ) 8260 VOC & isop (X) Fluorochemicals (X) pH (X) Specific Conducta (X) Temperature	Septic ( ) INFORM 2503/2 propyl Ether	ATION  7.6	1615	Rinsate Bi ID NO.: Laboratory Contacts:	SAMPI (ank: YES v: Exygen 3048 R State C	Research escarch Driviollege, PA	ve 6801		Time
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION    Sample No Media Sample ID:  C.G. M.G. M. Mol. 96 Parameters: ( ) 8260 VOC & Isop (X ) Fluorochemicals (X ) pH (X ) Specific Conducta (X ) Temperature	Septic ( ) INFORM 2503/2 propyl Ether	ATION  7.6	1615	Rinsate Bi ID NO.: Laboratory Contacts:	SAMPI (sank: YES v: Exygen 3048 R State C Kent Linds	Research escarch Driviollege, PA	ve 6801	Flaherty	Time
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION I  Sample No Media Sample ID:  C.G. M.G.W.M. 103.00  Parameters: ( ) 8260 VOC & isop (X ) Fluorochemicals (X ) pH (X ) Specific Conducts (X ) Temperature ( ) ( )	Septic ( ): INFORM 2503/2 propyl Ether	7.6 7.6 7.0	/6/5	Rinsate Bi ID NO.: Laboratory Contacts: Phone:	SAMPI sank: YES v: Exygen 3048 R State C Kent Linds 651-778-5	Research escarch Dri follege, PA strom (3M)	ve 6801 John 814-2	Flaherty 231-8032	
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION I  Sample No Media Sample ID:  C.G. M.G.W.M. 103.00  Parameters: ( ) 8260 VOC & isop (X ) Fluorochemicals (X ) pH (X ) Specific Conducts (X ) Temperature ( ) ( )	Septic ( ): INFORM 2503/2 propyl Ether	7.6 7.6 7.0	/6/5	Rinsate Bi ID NO.: Laboratory Contacts: Phone:	SAMPI (sank: YES v: Exygen 3048 R State C Kent Linds	Research escarch Dri follege, PA strom (3M)	ve 6801	Flaherty	
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION    Sample No Media Sample ID:  CG ANGW Miol of Parameters: ( ) 8260 VOC & isop (X) Fluorochemicals (X) pH (X) Specific Conducts (X) Temperature	Septic ( ): INFORM 2503/2 propyl Ether	7.6 7.6 7.0	/6/5	Rinsate Bi ID NO.: Laboratory Contacts: Phone:	SAMPI  (sank: YES  v: Exygen 3048 R State C  Kent Linds 651-778-5	Research escarch Driviollege, PA istrom (3M) 352	ve 6801 John 814-2	Flaherty 231-8032	
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S  SAMPLE COLLECTION I  Sample No Media Sample ID:  C.G. M.G.W.M. 101 00  Parameters: ( ) 8260 VOC & isop (X ) Fluorochemicals (X ) pH (X ) Specific Conducta (X ) Temperature ( ) ( )	Septic ( ): INFORM 2503/2 propyl Ether	7.6 7.6 7.0	/6/5	Rinsate Bl ID NO.: Laboratory Contacts: Phone:	SAMPI  sank: YES  Exygen 3048 R 3048 R State C  Kent Linds 651-778-5.	Research escarch Driviollege, PA istrom (3M) 352	Ve 6801 John 814-2	Flaherty 231-8032	

Purge Factors (2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4-08 (gallons per linear foot of water)

Confidential Client - Cor Grove, Minnesota WESTON W.O.: 02181-6-2-010-0001

IARCH 2005

WELL EV	ACUATION	/SAMPLING FORM				
SITE INFORMATION						
Well No.: PZ-14		Weather: Sunny Clouds Rain Temp: /				
Sampling Tearn: KJ WW AM		Sampler's Signature:				
WELL INFORMATION						
Protective Casing: Maria / Damaged		Concrete Base: Intact Damaged	***************************************			
Locked: YES / NO		Well Diameter: 2 inch.				
WELL EVACUATION INFORMATION	197.7	7				
A. Total Depth (Top of Casing = TOC):		Well Evacuation Method	· · · · · · · · · · · · · · · · · · ·			
B. Depth to Water (DTW) (TOC):	-64.26	( ) BAILER ( 2-rich Grundfos				
C. Column of Standing Water (C=A-B):	123.45	( ) 4-inch Grundfos				
D. Purge Factor	x 0.16	( ) Other (Specify)				
E. One Well Volume:	19.75					
F. Three Well Volumes (gations):	59.25	TOTAL VOLUME PURGED: 72.	.5			
INDICATOR PARAMETERS						
Time 16 20 163	5 11.30	11.35	*******			
Gallons Purged / 77	3 50	716				
700. 7.25	17 1111	10.3				
Temperature (°C): 7, 35 /0.	37 10.41	10.60				
	19 212	2/4				
	74 0.06	<del>                                      </del>				
	6/ 9.21	8.41				
Visual Turbidity (L, M, H): M	<u> </u>	H .				
NAPL Observed: YES / NO		Well Pumped Dry: YES (NO)				
NAPL Observed: YES / (NO)		Well Pumped Dry: YES / NO				
Odor Type: ( ) Solvent ( ) Septic ( ) Other		Outer.				
SAMPLE COLLECTION INFORMATION	ON	SAMPLE DATE:				
Sample No.	Time	Sample No.	Time			
Media Sample ID:		Rinsate Blank: YES / NO				
Media Sample 10.		ID NO.:				
Parameters: ( ) 8260 VOC & Isopropyl Ether	1	Laboratory: Exygen Research				
(X) Fluorochemicals		3048 Research Drive				
(X) pH (X) Specific Conductance		State College, PA 16801				
(X) Temperature		Contacts: Kent Lindstrom (3M) John Flanerty				
		Phone: 651-778-5352 814-231-8032				
( )	###					
	COMM					
But costes used To Ac	most wo	Well Pumped Dry: YES / (50)				
PZ-14 WELL IS SMALLER OF 2		Previous Volume Purged: 5 gallous				
			0			
		Access Requires Maintenance? YES /	(O)			

Purge Factors: 2"- 0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

	WELL EVA	CUATION	/SAMPL	ING FO	RM			
SITE INFORMATION								
Well No.: PW-01			Weather: Sunny Cloudy Rain Temp: 109				2	
Sampling Team: 77			Sampler's	Signature:	7	Jen .		2
WELL INFORMATION	· · · · · · · · · · · · · · · · · · ·	··						
Well Function: Fire Protection Supply			Well in op	cration at ti	me of samp	ling? Yes	(N	0)
Pump Constructed with a flow meter?	Yes	No	Caiculated	Flow Rate:	729 gailor	is (Average f	or 2004)	
WELL EVACUATION INF	ORMATION	:						
A. Total Depth (Top of Casing = TO	C):	205.00		uation Meth				
B. Well Diameter: 20 inch and 14 in	cb (inches)	20				ONE WELL M WELL HE		
C. Average Annual Pumping Rate (2			PURGET	THREE VO	LUMES T	O CLEAR I	INES AN	D WELL
D. Calculated Purge Volume (gallon	s)	2105	flow rate	meter, calc	wate parg	e voiume bas	ed on esta	blished
		(01)		·		<del></del>		
F. Three Well Volumes (gall	one):	6316	TOTA	L VOI	LUME	PURGE	D: 8/	100
INDICATOR PARAMETER	સ્ક		<u>[</u>					
Time	07:42	07:5	7.2				s	
Gallons Purged		810		<del>-                                     </del>				
Flow Meter Reading								
Flow Meter Reading	56772480	00 5677	32700		······			
					<del></del>			
400	<u> </u>		Ŧ:	<b> </b>				
Temperature (°C):				ļ	<b> </b>			ļ
Specific Conductivity (s):								
pH:	<u> </u>		131 11 53		YES	/( NO		
NAPL Observed: YES / NO ODOR: YES / NO	<del>\$</del>		Other:	ped Dry:	TES	1 NO	<del></del>	
	eptic ( ) Other		-					
Oder Type: ( ) Contract ( ) C					s			
SAMPLE COLLECTION I	NFORMATIO	N		SAMPI	E DATE	: <u>///</u>	MAR C	35
Sample No.		Time			ample N	_		Time
Media Sample ID:			Rinsate B	lank: YES	(NO)			
CGMN GW PWI	0050314	0252	ID NO.:					
Parameters: ( ) 8260 VOC & Isopr (X) Fluorochemicals	opyl Ether		Laborator	y: Exygen I				
(A) PHIOTOCHCINICALS			3048 Research Drive					
			State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty					
		ı	651-778-53		814-23	•		
						·		,
		COMM				1000		
SAMPLE PORT OF	ITH RAS	STIC TI	P.	Vell Pumpe	d Dry:	YES /	(NO)	•
				olume Par	ged:			
				Vell Requir	es Mainten	ance?	YES /	<b>∞</b> >
				Access Requ	ires Maint	enance?	YES / (	(10)

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1:47; 8"-2:61; 10"-4:08 (gallons per linear-foot of water)

	WELL	EVA(	UATION	i/SAMP	LING FO	)RM			
SITE INFORMATION									
Well No.: PW-02				Weather:	Sunny /Clo	udy Rain	Temp:	205	
Sampling Team: 7		****	<del></del>	Sampler's	Signature:	<del></del>			
WELL INFORMATION						4-	700		
Well Function: Process Water Loop			<del></del>	Welling	nemition at t	ine of same	bing? Yes		No )
Pump Constructed with a flow meter?	(Yes)	No	<u> </u>	4			ns (Average	_	
WELL EVACUATION INF		N		1			- (Ittologe	10, 200-,	
A. Total Depth (Top of Casing = To			205.00	Well Fus	custion Met	hod			
B. Well Diameter: 20 inch (inches)			205.00	IF WEL	L IS ACTI	Æ PURGI	E ONE WEI	L VOLU	мето
C. Average Annual Pumping Rate (	2004) (gpm)	_		CLEAK	SAMPLE I THREE V	LINE FROI	M WELL H	EAD. IF	INACTIVE ND WELL
D. Calculated Purge Volume (gallor	<b>15</b> )	$\dashv$	1974	lf no flor	meter, cal		e volume be		
		_		flow rate					,
F. Three Well Volumes (gallons):			5924	тот	AL VO	LUME	PURGE	D: 60	000
INDICATOR PARAMETE	RS								
Time	0259	<del>)</del>	08:0	27				<del></del>	T
Gallons Purged			600				<u> </u>		+
Flow Meter Reading	- 27/24	ς				-	<del> </del>		+
Flow Meter Reading	22363Y	<u> 200</u>	2236	30800	<u>'</u>	<del></del>			
	<u> </u>								
			_					<del></del>	
Temperature (°C):					<u> </u>				
Specific Conductivity (s):									
pH:									
NAPL Observed: YES / NO	?			Well Pur	nped Dry:	YES	/ (NO	<del>)                                    </del>	
ODOR: YES / NO	7			Other:					
Odor Type: ( ) Solvent ( ) S	eptic ()OI	her							
SAMPLE COLLECTION I	NFORMA:	TION			SAMPI	E DATE	: 14 /	74R C	<b>3</b> 5
Sample No.			Time		S	ample N	0.		Time
Media Sample ID:				Rinsate B	lank: YES	NO	<del></del>		
CGMN GW PWZ	0 0503	14	0807	ID NO.:					
Parameters: ( ) 8260 VOC & Isopr	opył Ether			Laborator	y: Exygen				
(X) Fluorochemicals						search Driv	-		
				Camara		illege, PA 1		labare	
				Contacts: Kent Lindstrom (3M)   John Flaherty   Phone: 651-778-5352   814-231-8032					
						= =			
			COMM	ENTS	*****				
SAMPLE PORT 1	ALL MI	ETA	۲.	T	Veli Pumpe	d Dry:	YES /	NO	,
·			- '	١,	olume Pur	ged:			1
				8		es Mainten	ance?	YES /	(NO)
				Į,	ccess Requ	ires Mainte		YES /	NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client - Col. \_e Grove, Minnesota WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

	WELL EVA	CUATION	V/SAMIP	LINGFO	)RM			
SITE INFORMATION								
Well No.: PW-03			Weather	Summy Clo	udy Rain	Temp:	205	
Sampling Team: TF	<del></del>		<u> </u>	Signature:	<del></del>			<del></del>
WELL INFORMATION			<u> </u>					
Well Function: Process Water Loop			Well in o	peration at t	me of same	oling? Yes		
Pump Constructed with a flow meter?	YES !	No				ns (Avenage		No.
WELL EVACUATION INFO	RMATION					···· (itrange	10. 2007)	
A. Total Depth (Top of Casing = TOC	);	205.00	Well Eva	cuation Me	hori			<del> </del>
B. Well Diameter: 24 inch and 16 inch	24	IF WEL	L IS ACTIV	E. PURG	E ONE WEI	LL VOLU	METO	
C. Average Annual Pumping Rate (20)	04) (gpm)	924	PURGE	SAMPLE I THREE VO	LINE FRO DLUMES :	M WELL H TO CLEAR	EAD. IF I LINES AN	NACTIVE ID WELL
D. Calculated Purge Volume (gallons)		3006	If no flov	v meter, cal	culate pur	e volume ba	sed on est	ablished
		flow rate	·.					
F. Three Well Volumes (gailon	9020	тот	AL VO	LUME	PURGE	D://	320	
INDICATOR PARAMETERS			<u> </u>		······································			
Time (	a8 14	08:	24	Ţ			<del></del>	
Gallons Purged 0			20	<del>                                     </del>		<del> </del>		
Flow Meter Reading	Charles and the same	+",-	20	-				
Tion Michael Roseing		_		-			······································	
T(9.C)			<u> </u>	<u> </u>			,	
Temperature (°C):								
Specific Conductivity (s):				ļ				
pH:					<u> </u>			
NAPL Observed: YES / NO ODOR: YES / NO	· · · · · · · · · · · · · · · · · · ·			aped Dry:	YES	/ (NO	) .	
Odor Type: ( ) Solvent ( ) Sept	ic ( ) Other		Other:				•	
out type ( ) sover ( ) sept	e ( ) Other							
SAMPLE COLLECTION IN	ORMATION	<b>3</b>		SAMPI	F DATE	: 14 /	non	2 <
Sample No.		Time						Time
Media Sample ID:			Pincate P	lank: YES	ample N	D.		11000
CGMN GW PW3	a acas 14	10824	ID NO.:	Mark. 1 Lo	(10)	·····		
Parameters: ( ) 8260 VOC & Isopropy		10827		y: Exygen I	Cesearch			
(X) Fluorochemicals					search Driv	e		
			State College, PA 16801					1
			Contacts: Kent Lindstrom (3M)   John Flaherty   Phone: 651-778-5352   814-231-8032					1
							1-8032	
								1
		COMM	ENTS			<del></del>		
				Vell Pumpe	i Dry:	YES /	(NO)	
				olume Pur	red:			
			1	ett Require	•	10047 V	ES 1	
			ı	ccess Requi				
				veda	· co : TENER	mance: )	ES /	.""

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

	WELL EV	VACUATION	V/SAMI	LING F	ORM			
SITE INFORMATION								
Well No.: PW-04		<del></del>	Weather	: Sunny Ck	ody Rain	Temp:	200	
Sampling Team:			Sampler	s Signature:	~~			
WELL INFORMATION						7 3	<u> </u>	<del></del>
Well Function: Process Water Loop			Well in o	operation at t	ime of same	ling? Yes	<del>}</del>	No
Pump Constructed with a flow meter?	Yes	(No)			-	ns (Average	/ for 2004)	110
WELL EVACUATION INF	ORMATION		<u> </u>					
A. Total Depth (Top of Casing = TO		205.00	Well Ev	scuation Me				
B. Well Diameter: 24 inch and 16 in		203.00	IF WEL	L IS ACTI	VE, PURG	E ONE WEL	L VOLU	ME TO
C. Average Annual Pumping Rate (		817	CLEAR	SAMPLE	LINE FRO	M WELL H TO CLEAR	EAD. IF	INACTIVE
D. Calculated Purge Volume (gailor	13)	3828	4:			re volume ba		
		1 333	flow rat	<b>e</b> . ,				* * * * *
F. Three Well Volumes (gall	11,487	тот	AL VO	LUME	PURGE	D: /	2255	
INDICATOR PARAMETE	RS	<u> </u>	<u> </u>	-				,
Time	08.31	021	4 6		<del></del>	1		T
Gallons Purged	0	12 2		-				
Flow Meter Reading		1/2,2	- 2 2	_				+
1 10 W 112 COL 1 COLORED								
Temperature (°C):		·	1		1		T	-
Specific Conductivity (s):				<del>                                     </del>	<del> </del>		<b></b>	+
pH:			<del> </del>	<del></del>	<del> </del>	<del> </del>		+
NAPL Observed: YES / NO	<del></del>		Well Pro	mped Dry:	YES	/ NO	<del></del>	<u>.l</u>
ODOR: YES / (NO	5		Other:			<del>```</del>		
Odor Type: () Solvent () S	eptic ()Other	· · · · · · · · · · · · · · · · · · ·						
							A	
SAMPLE COLLECTION I	NFORMATIO	ON		SAMPI	E DATE	: 14 /	AR C	ړ ځ
Sample No.		Time			ample N			Time
Media Sample ID:			Rinsate I	Blank: YES		<del></del>		<b></b>
CEMNOW PW40	050314	0846	ID NO.:		-			<del>                                     </del>
Parameters: ( ) 8260 VOC & Isopr			Laborato	ry: Exygen	Research			<del></del>
(X) Fluorochemicals					search Driv	-		
	ŕ				ollege, PA	5801		
			<b>\$</b>	: Kent Linds		John F		
			Phone: 651-778-5352 814-231-8032					
		COM	ENTE					
		COMM		Well Pumpe	d Days	YES /	/NO )	
SAMPLING PAR	T ALL	META	. 1	•	•	123 /		
SAMPLING POR PURGE BASED OF RATE FOR 2004	RECOR	DED FL	ן עו ם	Volume Pur	_			73
Rose En soul			1	Well Requir	es Mainten	ance?	res /	(NO)
KATE FOR ZODY			],	Access Requ	ires Maint	mance?	VES /	NO-

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client - Cot Grove, Minnesota WESTON W.O.: 02181-002-010-0001

DATE:	,	U		
DATE:	1	7	MARCH	2005

WELL	. EVAC	CUATION	/SAMP	LING FO	RM		<del>'                                    </del>	
SITE INFORMATION	+-							
Well No.: PW-05			Weather: Sunny Cloudy Rain Temp: 20 5					
Sampling Team: 7		<del></del>	Sampler	Signature:	<del></del>	- 12		
WELL INFORMATION			<u> </u>			7		
Well Function: Process Water Loop			Well in o	peration at ti	me of same	ling?/ Yes	<del>`</del>	No
Pump Constructed with a flow meter? (Yes	No	<del></del>	Calculate	d Flow Rate	: I,481 gall	lons (Averag	e for 2004)	)
WELL EVACUATION INFORMATI	ON				***************************************			
A. Total Depth (Top of Casing = TOC):		205.00	Well Eva	cuation Med	hod	<del></del>		
B. Well Diameter: 36 inch and 24 inch (inches)		36				E ONE WEI		
C. Average Annual Pumping Rate (2004) (gpm)		1481				M WELL H TO CLEAR		
D. Calculated Purge Volume (gallons)		6343	if no flor		culate purg	je volume ba	sed on est	ablished
			INDM LINE					,
F. Three Well Volumes (galions):	19,030	тот	AL VO	LUME	PURGE	D: 2/	000	
INDICATOR PARAMETERS								
Time 08:5	3	09:0	X					T
Gallons Purged 0		21,0	00	<b>†</b>			<del></del>	
Flow Meter Reading		121,						
1 tow trictor reading		+		<del> </del>				
				ļ		<u> </u>	-	
		<del> </del>		ļ	,		· · · · · · · · · · · · · · · · · · ·	
Temperature (°C):			ļ					
Specific Conductivity (s):				<u> </u>	<u> </u>			
pH:								
NAPL Observed: YES / NO	······································			nped Dry:	YES	/ (NO-	2	
ODOR: YES /			Other:					
Odor Type: ( ) Solvent ( ) Septic ( ) C	)ther		<u> </u>					
SAMPLE COLLECTION INFORMA	TION			SAMPL	E DATE	: 14	MAR	03~
. Sample No.		Time		_	ample N		-	Time
Media Sample ID:		<del>                                     </del>	Rinsate B	lank: YES		·····		·
CGMN GW PWS @ 0503	14	09:08	ID NO.:					
Parameters: ( ) 8260 VOC & isopropyl Ether		· · · · · · · · · · · · · · · · · · ·	Laborato	y: Exygen I			······································	
(X) Fluorochemicals			3048 Research Drive					
			State College, PA 16801					
				Contacts: Kent Lindstrom (3M)   John Flaherty   Phone: 651-778-5352   814-231-8032				
				3.4.63				
,		COMM	ENTS					
		······································	1	Vell Pumpe	d Dry:	YES /	(NO)	
			1	olume Pur	ged:			$\sim$ 1
			1	Vell Require	•	ance?	YES /	
			8	ccess Requ			YES / (	NON
			<u> </u>					

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

WELL EVACUATION/SAMPLING FORM									
SITE INFORMATION									
Well No.: PW-06		* *	Weather: Sunny Cloudy Rain Temp: 205						
Sampling Team: 77	····		Sampler	s Signature:	77	1/1	6		
WELL INFORMATION			!						
Well Function: Incinerator Supply		<del></del>	Well in	peration at t	ime of same	oling? (Yes	<u> </u>	No	
Pump Constructed with a flow meter?	Pump Constructed with a flow meter? Yes (No					ns (Average	ر for 2004)	-	
WELL EVACUATION INF	ORMATION		<del>*************************************</del>				· · · · · · · · · · · · · · · · · · ·		
A. Total Depth (Top of Casing = To	205.00	Well Ev	cuation Met	hod					
B. Well Diameter: 24 inch (inches)		20	IF WEL	L IS ACTIV	VE, PURG	e one wei M well h	T AOLU	ME TO	
C. Average Annual Pumping Rate (		576				M WELL H			
D. Calculated Purge Volume (gallor	ns)	2631	If no flo flow rat		culate pur	ge volume ba	sed on es	tablished	
			resta tes	F					
F. Three Well Volumes (gal	7893	тот	AL VO	LUME	PURGE	D: <	57		
INDICATOR PARAMETE	RS		•					*************	
Time	07:13	091	4	1					
Gallons Purged	0	52		1		<del> </del>			
Flow Meter Reading				<del> </del>			<del></del>		
Temperature (°C):			· · · · · · · · · · · · · · · · · · ·	<del> </del>	<u> </u>		1		
Specific Conductivity (s):				+	ļ	<u> </u>			
pH:			<del> </del>	+	<del> </del>	<del> </del>			
NAPL Observed: YES / NO	<del></del>		Wall for	mped Dry:	YES	/ INO	<u> </u>		
ODOR: YES / MO	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Other:	imper Dry:	165	/ Ino	)		
Odor Type: ( ) Solvent ( ) S	· · · · · · · · · · · · · · · · · · ·		J					·	
SAMPLE COLLECTION I	NFORMATIO	N		SAMPI	E DATE	: 14 P	TAR C	25	
Sample No.		Time			ample N			Time	
Media Sample ID:	· · · · · · · · · · · · · · · · · · ·		Rinsate	Slank; YES					
COMN BW PWG	0050314	0914	ID NO.:						
Parameters: ( ) 8260 VOC & Isopr ( X ) Fluorochemicals	opyl Ether		Laborato	ry: Exygen i		······································			
( A.) Fluorochemicals					search Driv	*			
			Contrata	State Co Kent Lindst :	illege, PA 1		lah		
						John Fi 814-23	•		
Phone: 651-778-5352 814-231-8032									
			<u> </u>						
ACCORDING TO PLAT	AERTONER	C COMM	ENTS			•			
ACCORDING TO PLAST PERSONALL COMMENTS  WELL RUNS CONTINUOUS 17 50 Well Pumped Dry: YES / NO  PURGED SAMPLING BRT / MINUTE Volume Purged:  BEFOR SA-PLING. Well Requires Maintenance? YES / NO									
PURGED SAMPLIA	G BRT	דאע בהו חקל	Æ .	Volume Pur	ged:				
BEFOR SA-PLIA	6.			Well Requir	es Mainten	ance?	ÆS /	(NO)	
				Access Requ	ires Mainte	enance?	YES /	(NO)	

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Cc e Grove, Minnesota WESTON W.O.: 02181-002-010-0001

WELI	L EVA	CUATION	/SAMPI	LING FO	)RM	<del></del>		****
SITE INFORMATION								
Well No.: PW-07	***************************************		Weather: Sunny Cloudy Rain Temp: 30 5					
Sampling Team:		<del></del>	Sampler's	Signature:				
WELL INFORMATION								
Well Function: Trap Field Water Supply		<u> </u>	Well in or	eration at t	ime of samp	ling? Y	PS	No
Pump Constructed with a flow meter? Yes	/No	<del>?</del>	1	neter: 4 inc	•		~ (	
WELL EVACUATION INFORMATI	ION		L					·
A. Total Depth (Top of Casing = TOC):		200.00	Weil Evac	uation Me	had			
B. Depth to Water (DTW) (TOC):		-75.00				usty recor	rded mess	rement (2 <b>9</b> 04)
C. Column of Standing Water (C=A-B):	_	125.00						
D. Purge Factor	х	0.65						
E. One Well Volume:		81.00						
F. Three Well Volumes (galions):		244.00	тот	AL VO	LUME	PURG	ED:	
INDICATOR PARAMETERS					***		·····	
Time	T-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1				·:		·	
Gallons Purged		1		<u> </u>		<del>                                     </del>		<del> </del>
Flow Motor Positing		<del>- </del>		<del> </del>		<u> </u>		
Flow Meter Reading			<u> </u>					
				<u> </u>				
Temperature (°C):		1						
Specific Conductivity (s):								
pH:				<del></del>				
NAPL Observed: YES / NO		<u></u>	Well Pun	ped Dry:	YES	/ N	0	
ODOR: YES / NO		· · · · · · · · · · · · · · · · · · ·	Other:		<del></del>		·	
Odor Type: ( ) Solvent ( ) Septic ( ) C	Other							
								<i>T</i>
SAMPLE COLLECTION INFORMA	MOITA			SAMPI	E DATE	;:		
Sample No.	·	Time		S	ample N	0.		Time
Media Sample ID:			Rinsate B	ank: YES				
			ID NO.:		-			
Parameters: ( ) 8260 VOC & Isopropyl Ether			Laborator	y: Exygen l	Research			*
(X) Fluorochemicals					search Driv			
	,				ilege, PA 1			
		i	Kent Linds: 651-778-53			Flaherty		
			rnone: (		J£	814-	231-8032	
		COMM	ENTS					
WELL LINES FROZE.	~	No	N	Veli Pumpe	d Dry:	YES	/ NO	
SAMPLE COLLECTE	Q		V	olume Pur	ged:			
DAMPLE COLLECTIVE	•		l l		es Mainten	ance?	YES /	NO
			Į.	•	ires Mainte		YES /	NO
			-  ^	rres vela	riez istatur	ura uce:	IES /	NV .
						·		

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client - Co. ,e Grove, Minnesota WESTON W.O.: 02181-002-010-0001

7A Y ADOH 2005

	WELL EV	ACUATIO	ON	SAMPI	ING FO	RM			
SITE INFORMATION									
Well No.: PW-07				Weather Sunny Cloudy Rain Temp:					
Sampling Team: T				Sampler's	Signature:	15:	1	Re-	
WELL INFORMATION						Î			·
Well Function: Trap Field Water Supp	oly			Well in op	eration at ti	ne of samp	ling? Ye	, (	No
Pump Constructed with a flow meter?	Yes (	No.		Well Dian	neter: 4 inch	<b>e</b> s .			
WELL EVACUATION INFO	ORMATION								
A. Total Depth (Top of Casing = TO	C):	200.	00		uation Meth				
B. Depth to Water (DTW) (TOC):		-75.	00	Depth to	water basec	i on previo	usly record	ied measur	rement (2004)
C. Column of Standing Water (C=A	Column of Standing Water (C=A-B):		00						
D. Purge Factor		x 0.6	5						
E. One Well Volume:		81.	00						
F. Three Well Volumes (gall	244.0	00	тота	AL VOI	LUME	PURG	ED:		
INDICATOR PARAMETER	RS	<u> </u>							
Time	1156					11:21			
Gallons Purged						25C			
Flow Meter Reading	(0 - 0 00				10 apm				
1 104 Meter Resemb	10900				109	7-71			
						50	<u> </u>		
- 400		7	7×		200	250	<del> </del>	1	-
Temperature (°C):	9.73c 7.			9.34	7.38	9.40		<del></del>	
Specific Conductivity (s):		3 562		562	565	562			<del> </del>
pH:	7.08 60	14 6.7	5	6.84	6.87	6.86 YES	/ NO	<del>/</del>	
NAPL Observed: YES / NO ODOR: YES / NO		<del></del>		Other:	oped Dry:	1 123	, ,,,,,	҉>—	
ODOR: YES / NO Odor Type: ( ) Solvent ( ) S	eptic ()Other	•		Ouser:					
Oddr Type: ( ) Solvent ( ) S	chuc ( ) Oulei								
SAMPLE COLLECTION I	NFORMATION	ON			SAMPI	E DATE	i: <u>/6</u>	Mile	05
Sample No.	<del></del>	Time	e		S	ample N	0.	7	Time
Media Sample ID:				Rinsate B	lank: YES	(NO)			
CG.M.U GW PW7 0	050516	11:2	5	ID NO.:	٠				
Parameters: ( ) 8260 VOC & isopr	ropyl Ether			Laborator	y: Exygen				
(X) Fluorochemicals		• .				search Driv blege, PA 1			
				Contacts:		•		Flaherty	
		Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032							
		601		CATTO					
		CO	M.M	ENTS I	Veil Pumpe	d Dry	YES	/ NO	
	•			1	7	•	1 63	,	
			٠	ı	Volume Pur	-	_	ruec :	NO.
				8	Vell Requit			YES /	NO NO
					Access Requ	ires Maint	enance?	YES /	NO
	•				-				والمعارض والمسترانية

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Cr e Grove, Minnesota WESTON W.O.: 02181-602-010-0001

	Jł		
DATE:	19	MARCH	2005

	WEL	L EVAC	UATION	SAMP	ING FO	RM			
SITE INFORMATION									
Well No.: PW-08				Weather:	Sunny Clo	udy Rain	Temp:	205	
Sampling Team: 77-			······································	Sampler's	Signature:	7			
WELL INFORMATION			·	L				-	
Protective Casing: (Intact /	Damaged			Concrete	Base:	(intac	Dama	ged	
Locked: YES /	NO			Well Diar	neter:	4			
WELL EVACUATION INFO	DRMAT	ION		<u> </u>					
A. Total Depth (Top of Casing = TO	C):	T	208	Well Evac	uation Met	hod			
B. Depth to Water (DTW) (TOC):			108		16 . CTM				
C. Column of Standing Water (C=A-	8):		100	CLEARS	SAMPLE I	INE FROM	e sufficie M well h	FAR	
D. Purge Factor			65	SAM	PLED	FROM	BAS	EMEN - RE	7
E. One Well Volume:		, ,,,,	65	Sind	$\kappa = \omega$	ELL G	מנים אי	77 <i>/</i> 3~	•
F. Three Well Volumes (gallo	es):	1	95	I			PURGE		
INDICATOR PARAMETER	S			1					
Time	1020	10:21	1040	1052	11:05	H: 20	11:30	11:35	
Gallons Purged	0	3,53		97.4	· · · · · · · · · · · · · · · · · · ·	177	205	219	
Temperature (°C):			14 000	<del></del>	13.21	13.26	1		
Specific Conductivity (s):			665	670	620	670	670	, <b>V</b>	
Dissolved Oxygen (mg/L):			803	6/0	670	670	5,0	P7	
pH:			0 0	9 8 7	9.76	10.03	9.98	<del>                                      </del>	
Visual Turbidity (L, M, H):			7.01	1.07	77 8 100		11.78	<del>                                     </del>	
GPM	<i>3.5</i> 3	3.53	3.0	285	2.85	2.85	2.85	1/	
NAPL Observed: YES / NO	<u>J. 7 U</u>	<u> </u>	1 2		iped Dry:	YES	/ (NO	<del>\</del>	
ODOR: YES / NO	<del></del>			Other:		•		<del></del>	
Odor Type: ( ) Solvent ( ) Se	ptic ()	Other							
							,	~ ~	,,=
SAMPLE COLLECTION IN	FORM	ATION			SAMPI	E DATE	: <u>///</u>	TIAR	7.2
Sample No.			Time			ample N	0.		Time
Media Sample ID:					lank: YES	/(NO			
CGMNGW PW80		314	11:35	ID NO.:				1	<del>-</del>
Parameters: ( ) 8260 VOC & Isopro (X) Fluorochemicals	ipyi Ether			Laborator	y: Exygen	Research Search Driv	•		
(X) pH			<del></del>			dlege, PA			
(X) Specific Conductant (X) Temperature	æ .			Contacts:	Kent Linds			laherty	
				Phone:	651-778-53	52	814-23	31-8032	
( )									
			COMM	ENTS					
WELL DEPTH AND	WATE	R DE	PTH	HT.	Veli Pumpe	d Dry:	YES /	NO	
FROM PREVIOUS A	KECOR	LOE 10	DATA	.	revious Va	iume Purg	ed:		
				,	Vell Requir	es Mainten	ance?	YES / <sub>/</sub> (	NO
					ccess Requ	ires Maint	enance?	YES / X	NO)

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; S"-2.61; 10"-4.08 (gallons per linear foot of water)

	WELL EVAC	CUATION	/SAMPI	ING FO	RM			
SITE INFORMATION								
Well No.: B116			Weather:	Sunny Clou	dy Rain	Temp:	20 F	_
Sampling Team: 7			Sampler's	Signature:	7	2. K	<del>/</del>	
GENERAL INFORMATION	3		<u> </u>					
Location: Kitchen Sink (after carbon)			System in	operation at	time of san	apling? (Yes	3	No
System Constructed with a flow meter	Yes (N	<del>40</del> )	ľ	•				į
WELL EVACUATION INFO			<u> </u>					
A. Total Depth (Top of Casing = TO			Well Evac	uation Meth	od		·	
B. Well Diameter: 20 inch and 14 in			RAN	TAP	AT .	APPROXI 5 min	MATE	-7
C. Calculated Purge Volume (gallon			2	5PM	FOR 1	5 min	MIK	5 X
D. Calculated Purge Volume (gallon	s)		1 '	/	•			
			<u> </u>					
F. Three Well Volumes (gain	ons):		тот	AL VOI	UME	PURGE	D:	
INDICATOR PARAMETER	RS		A					
	0936	09 9	7					
Gallons Purged								
	0	30	·	-		! 		
Flow Meter Reading					<u></u>			
(0)			1					
Temperature (°C):		<u> </u>	<u> </u>					-
Specific Conductivity (s):								
pH:						ايبيا		
NAPL Observed: YES / NO	<i></i>			nped Dry:	YES	/ NO	<u> </u>	
ODOR: YES /			Other:					
Odor Type: ( ) Selvent ( ) S	eptic ()Other		1					
SAMPLE COLLECTION I	NFORMATION			SAMPL	E DATI	: <i>14 /</i> 2	Par	05
Sample No.		Time	T	S	ample N	0.		Time
Modia Sample ID:		<b>†</b>	Rinsate B	lanic YES	/NO			
(CANGW BILL	050314	0951	ID NO.:					
Parameters: ( ) 8260 VOC & Isopa	opyl Ether		Laborator	ry: Exygen				
(X) Fluorochemicals					search Driv			
			Contract	State Co Kent Lindst:	ilege, PA 1	6801 John Fl	laherty	
			1	651-778-53		814-23	-	
								<u></u>
		COMM	IENTS					
SA-PLEO KITCH	(EN SINK	(	ľ	Weli Pumpe	d Dry:	YES /	NO	
3/-1 2.00 /2.72	· · · · · · · · · · · · · · · · · · ·	-	1	Volume Pur	ged:		_	_
			п	Well Requir		rance?	YES //	NO
			I.	Access Requ	ires Maint	enance?	yes 🔥	NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

APPENDIX B	
SOIL BORING LOGS	

FSIA Investigation Cottage Grove, Minnesota

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SITE NAME: PROJECT NO.:																	
	1 1	***************************************				32	Cottage Gr. 02181-002-0	Grove, MN Facility 02-010-0061	, ,				E.	ELEV (TOC)	و و	**	
Ara Name: Drilling Contractor: Drilling Equipment: Logged By:						D1 F Ame HSA Etha	회원 일	ner IIF Tir Neutralbaton Pu ne Engliseering & Teding indwell	Elst 1 1 4				Depti Depti Boring	EASTING: Depth to Water (ft bgs) fold Boring Depth (ft bgs) Depth to Refusal (ft bgs): Boring Diameter (inches):	it bgs) (ft bgs) t bgs); webes);	NN XX X	Location Type: ( ) CaoProbe ( ) Well  (X ) Soil Bacing ( ) Other: Completion Zane: (X ) Overburden ( ) Bedrock Completion Type: ( ) Monitoring Well  (X) Abandoned by Grout
-					anjea-u		Moisture	Moisturs	. 5	Grain Size		chgneu8	MAO	ell Column	eloma2 lio		
(franch) (ft	(ft bgs)	ę.,	6" 6"	9 09	-	+5	£	Muneel	5	8	ö	***************************************	Dails	Millian		-	-
0	_	2	2	3.4	5		98W	st 2.5y 2.5/2	_	-	4	Soft	٦	25.55.55		Black, Tonsoil	
-	7	+	4	H	4 5	$\vdash$	╌	$\blacksquare$	9	60 30	01	ᄪ				Brn. Silty SAND, po	Brn. Silty SAND, poorly sorted, fine grain
2	4	1	4	4	7	+	20 Mst	st 7.5YR 4/4	0 6	60 30	10	Loose	Ť			As Above	isa bantanangang ing ing pangangang bantan mananan ta dalam unususus an anamananan an anamanan mem
4	٥	2	-	$\dashv$	+	-+	50 Mst	st 10YR 5/6	0 7	70 20	91 (	Luose				Ylw. Brn. Silty SAN	Ylw. Brn. Silty SAND, poorly sorted, medium grain
9	<b>.</b>	5	+	-	4	4	50 Mst	st 10YR 5/6	0	70 20	01 (					As Above	***************************************
×	2	9	$\dashv$	┪	1		+		0	70 20	01	Loose				As Above	eterito goptu enertited debitita del unitratorio interitation in interitation del contratorio del contratorio d
01	12	-{		+	ij	4	70 Mst		_	80 20	0	Loose	·			Lgt. Ylw. Brn. Silty.	Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain
12	4	-[	<del>-</del> i	+	-	-	+	st 2.5Y 4/6	<b>20</b>	80 20	0	Loose				As Above	na teren wereten erreren france en erreren geben weren en e
4	9	9	16	22 27	7 38	_[	40 Mst	st 2.5Y 4/6	20	20	0	Loose				Lgt. Ylw. Bm. Silty	Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain, with dolomite
		+			4	4	+	-		-						gravel	
0	9	+	+	+	+	4	+	4	20	_	9	Loose				As Above	***************************************
01	3 6	+	<del>-</del>	+	+	4	+	-			0	Loose				Lgt. Ylw. Bm. Silty	Lgr. Ylw. Bm. Silty SAND, moderatly sorted, coarse grain
07	77	,	25	35 34	3	8	D WS	st 2.5Y 4/6	2	60 20	0	Loose				Lgt. Ylw. Brn. Silty.	Lgt. Viw. Brn. Silty SAND, moderatly sorted, medium grain, with dolomite
23	+	+	÷	+	+	+	÷	-		_		-				gravel	
***************************************	4	<del>-</del>	2	<u>,</u>	+	4	-		÷	-	0	Poose				Lgt. Ylw. Bm. Silty.	Lgt. Ylw. Bm. Silty SAND, moderatley sorted, coarse grain
47	9	2	_		= -	+	70 Mist	st 2.5Y 4/6	0	80	0	Luose	+			As Above	
		1	+	-	-	1	1		1	-						***************************************	
***************************************		H	H		H	H	$\ \cdot\ $									***************************************	allerierierie en erie per perpetica de de constante en servica de constante en estado de constante de constante
***************************************	-	+	+	+	+	1	-			+							***************************************
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		-	-			Н			П							***************************************	***************************************
		1	+	-	4	4	$\parallel$			4			Ę	3-10-8-10-5	Fine M	S. 10.8. c.g.: Fine. Medium., and Coast-grain size	by: below ground surface

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Column Court   Colu							1							71.87	EL EV (CRND)	11.5	-	Page 1 of 1	DATE:	24 May 05
Second State   Comparison   C	CLIENT: SITE NAME: PROJECT NO. Aria Ame: Drilling Contracto Drilling Rquipmen Longed By:							Idential III 402-01 II 402-01 Corner III rican En	ve, MN kaelity 16.4901 16.4901 F. Tar Neutralization glacceleg & Tariling cell	<del></del>				ELLEY ELLEY NORT EAST Depit to W. Total Boring Boring Diam	(COC) THING: ING: ING: Depth (II) West (Inch.			rage to 1  scatton Type: ( ) Gei  suppletton Zone: (X )  ompletton Type: ( ) (X )	ubrobe () Well ill Borby () Oh Overburden () Abandoren Well Abandoren Well Other (Provide C)	rout Commonis
1,000   2   2   3   3   5   80   Mist   2.57 444   0   60   30   10   Loose   10   10   10   10   10   10   10   1		mple		low Co	Ę	enjev-u				Grai	n Size		Strength			elqme8 No3				
2         2         3         3         5         80         Msi         2.5Y444         0         60         30         10         Loose           4         1         1         2         3         3         80         Wed         2.5Y444         0         60         30         10         Loose           6         2         3         3         8         Msi         2.5Y444         0         60         30         10         Loose           10         8         10 <td< th=""><th>Н</th><th>(pks)</th><th>5</th><th></th><th>H</th><th>Ţ</th><th>5</th><th></th><th>Munsell</th><th>Н</th><th></th><th>5</th><th></th><th></th><th></th><th></th><th></th><th>Lithic Descri</th><th>lption</th><th></th></td<>	Н	(pks)	5		H	Ţ	5		Munsell	Н		5						Lithic Descri	lption	
4         1         2         3         3         80         Wed         2.5Y 4/4         0         60         30         10         Loose           6         2         3         3         6         50         Mst         2.5Y 4/4         0         60         30         10         Loose           10         8         10         10         20         80         Mst         2.5Y 4/4         0         60         10         Loose         10	0	7	2	$\vdash$			Н			-	30	2	2000	$\frac{33}{1}$	$\mathbb{R}^{1}$	Brn. Silty	SAND, poor	rly sorted, fine grain	T	
6       2       3       3       3       6       50       Mst       2.57 4/4       0       60       30       10       Loose         10       8       10       10       20       80       Mst       2.57 4/4       0       60       30       10       Loose         11       8       10       10       20       80       Mst       2.57 4/6       0       0       Loose         14       21       30       Mst       2.57 4/6       30       0       Loose       0       10 <td>2</td> <td>*</td> <td>-</td> <td>1</td> <td>+</td> <td>+</td> <td>+</td> <td>+</td> <td>_</td> <td>+</td> <td>8</td> <td></td> <td>30Se</td> <td>***</td> <td>.Ţ</td> <td>As Abov</td> <td></td> <td></td> <td>***************************************</td> <td>ribania (men halpunen manere bu</td>	2	*	-	1	+	+	+	+	_	+	8		30Se	***	.Ţ	As Abov			***************************************	ribania (men halpunen manere bu
10 8 10 10 10 20 Mst 2.514,4 0 80 20 0 Loose 1	*	9 9	7	+	-	+	+	+	-		2 2		2000	<b>X</b>		As Abov		***************************************		
12 6 10 11 17 21 80 Mst 2574/6 30 40 10 Loose 14 21 32 22 21 54 60 Mst 2574/6 30 40 30 0 Dense 16 10 11 13 14 24 50 Mst 2574/6 30 40 30 0 Loose 20 10 6 10 14 16 70 Mst 2574/6 0 80 20 0 Loose 21 16 12 14 12 26 70 Mst 2574/6 0 80 20 0 Loose 22 16 12 14 12 26 70 Mst 2574/6 0 80 20 0 Loose 23 24 16 Mst 2574/6 0 80 20 0 Loose 24 7 8 8 11 16 80 Mst 2574/6 0 80 20 0 Loose 25 24 16 Mst 2574/6 0 80 20 0 Loose 26 27 2 16 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	*	e   S	7 0	+	4	<del>-</del>	+	+	-	-	2 2		aso.	X	\. \	WIY 191	Rm Silty S.	AND well sorted fi	ne prain	
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16   10   11   13   14   24   50   Mst   2.57 4/6   30   40   30   0   Loose   18   12   10   11   9   21   70   Mst   2.57 4/6   0   80   20   0   Loose   19   10   10   10   10   10   10   10	12	_	77	┿	<u>.                                    </u>	+-	⊢	┯	L		-	-	CHSC			Lgt. Ylw	Brn. Silty G	ravely SAND, very	poorly sorted, cou	arse grain
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22     16     12     14     12     26     70     Mst     2.5Y 4/6     0     80     20     0     Lose     As Above       24     7     8     8     11     16     80     Mst     2.5Y 4/6     0     80     20     0     Lose     As Above       25     24     16     16     Mst     2.5Y 4/6     0     80     0     Dense     4s Above       4s     4bove     4s     4s Above     4s Above     4s Above       4s     4s     4s     4s     4s     4s       4s     4s     4s     4s     4s     4s     4s       4s     4s     4s     4s     4s     4s     4s       4s     4s     4s     4s     4s     4s     4s       4	18		9	-	_							_	3800			As Abov	e	111111111111111111111111111111111111111		2 127 100 101 177 177 177 177 177 177 177 17
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FSIA Investigation Cottage Grove, Minnesola

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Commercial Registration   Part   Commercial Registration   Part   Commercial Registration   Part   Commercial Registration   Part   P	PROJECT NO.:		***********	Mercanian.	-			Cottage 02 181-00	e Grove, MN 002-816-060	Zeove, MN Facility 2-910-0401		÷				ELEV (TOC)			
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1   70   Wet   7.5YR 4.44   0   601 30   10   Loose   0.00     2   70   Wet   7.5YR 4.44   0   601 30   10   Loose   0.00     3   70   Wet   7.5YR 4.44   0   601 30   10   Loose   0.00     4   70   Wet   7.5YR 4.44   0   601 30   10   Loose   0.00     5   80   Mst   2.5Y 6.44   0   80   20   0   Loose   0.00     6   80   Mst   2.5Y 6.44   0   80   20   0   Loose   0.00     7   80   Mst   2.5Y 6.44   0   80   20   0   Loose   0.00     8   9   Wet   2.5Y 6.44   0   80   20   0   Loose   0.00     9   80   Wet   2.5Y 6.44   0   80   20   0   Loose   0.00     10   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     11   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     12   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     13   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     14   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     15   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     16   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     17   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     18   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     19   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     10   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     11   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     12   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     13   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     14   90   Mst   2.5Y 6.44   0   80   20   Loose   0.00     15   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     16   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     17   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     18   80   Mst   2.5Y 6.44   0   80   20   Loose   0.00     19   80   80   80   80   80   80   80   8	0	7	3	4	4	4	-	\$	Wet	7.5VR 4/4	+	-	9	1	T	12.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.		6.00	Lithic Description
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6         70         Wet         7.5YR 444         0         60         30         10         Loose           18         80         Mss         2.5Y644         0         80         20         0         Loose           9         80         Mss         2.5Y644         0         80         20         0         Loose           9         Mss         2.5Y644         0         80         20         0         Loose         00           10         Mss         2.5Y644         0         80         20         0         Loose         0           9         Mss         2.5Y644         0         80         20         0         Loose         0           13         80         Mss         2.5Y644         0         80         20         0         Loose         0           13         80         Mss         2.5Y644         0         80         20         Loose         0           21         80         Mss         2.5Y644         0         80         20         Loose         0           22         80         Wss         2.5Y644         0         80         20         Loose <td>4</td> <td>٥</td> <td>7</td> <td>7</td> <td>~</td> <td>4</td> <td>~</td> <td>2</td> <td>Wet</td> <td>7.5YR 4/4</td> <td><del>; -</del></td> <td>-</td> <td></td> <td>9600</td> <td>00</td> <td></td> <td>I</td> <td>As Above</td> <td>ersi Sishiisiliyiya isa maaneeyyyyyya (miane) asa (aree asammaa pay yyytinyyy sidandyyy simin</td>	4	٥	7	7	~	4	~	2	Wet	7.5YR 4/4	<del>; -</del>	-		9600	00		I	As Above	ersi Sishiisiliyiya isa maaneeyyyyyya (miane) asa (aree asammaa pay yyytinyyy sidandyyy simin
18   80   Mst   2.5Y 644   0   80   20   0   Loose     9   80   Mst   2.5Y 644   0   80   20   0   Loose     19   80   Mst   2.5Y 644   0   80   20   0   Loose     10   90   Mst   2.5Y 644   0   80   20   0   Loose     10   90   Mst   2.5Y 644   0   80   20   0   Loose     11   80   Mst   2.5Y 644   0   80   20   0   Loose     12   80   Mst   2.5Y 644   0   80   20   0   Loose     13   80   Mst   2.5Y 644   0   80   20   0   Loose     14   90   Mst   2.5Y 644   0   80   20   0   Loose     15   80   Mst   2.5Y 644   0   80   20   0   Loose     16   80   Mst   2.5Y 644   0   80   20   0   Loose     17   80   Mst   2.5Y 644   0   80   20   0   Loose     18   80   Mst   2.5Y 644   0   80   20   0   Loose     19   80   Mst   2.5Y 644   0   80   20   0   Loose     10   80   Mst   2.5Y 644   0   80   20   0   Loose     11   80   Mst   2.5Y 644   0   80   20   0   Loose     12   80   Mst   2.5Y 644   0   80   20   0   Loose     13   80   Mst   2.5Y 644   0   80   20   0   Loose     14   90   Mst   2.5Y 644   0   80   20   0   Loose     15   80   Mst   2.5Y 644   0   80   20   0   Loose     16   90   Mst   2.5Y 644   0   80   20   0   Loose     17   80   Mst   2.5Y 644   0   80   20   0   Loose     18   90   Mst   2.5Y 644   0   80   20   0   Loose     19   90   Mst   2.5Y 644   0   80   20   0   Loose     10   90   Mst   2.5Y 644   0   80   20   0   Loose     11   90   Mst   2.5Y 644   0   80   20   0   Loose     12   80   Mst   2.5Y 644   0   80   20   0   Loose     13   90   Mst   2.5Y 644   0   80   20   0   Loose     14   90   Mst   2.5Y 644   0   80   20   0   Loose     15   80   Mst   2.5Y 644   0   80   20   0   Loose     16   90   Mst   2.5Y 644   0   80   20   0   Loose     17   80   Mst   2.5Y 644   0   80   20   0   Loose     18   90   90   90   90   90   90   90   9	9	20	_	7	4	S	9	2	Wei	7.5YR 4/4	÷	<u>j.                                    </u>	_	I noce				As Alexander	***************************************
18         80         Mst         2.5Y 644         0         80         20         0         Loose         0           7         80         Mst         2.5Y 644         0         80         20         0         Loose         0           9         Mst         2.5Y 644         0         80         20         0         Loose         0           9         HOD         Mst         2.5Y 644         0         80         20         0         Loose         0           23         80         Mst         2.5Y 644         0         80         20         0         Loose         0           13         80         Mst         2.5Y 644         0         80         20         0         Loose         0           13         80         Mst         2.5Y 644         0         80         20         0         Loose         0           19         80         Wst         2.5Y 644         0         80         20         0         Loose         0           21         80         Wst         2.5Y 644         0         80         20         0         Loose         0         0	∞	2	-	_				20	Mst	2.5Y 6/4	<del>;                                     </del>	1	_	2800	-			as Author	
9         80         Mst         2.57 6.44         0         80         20         0         Louse         0           7         80         Mst         2.57 6.44         0         80         20         0         Louse         0         0         1.00         0	2	2	9	٥	2	2	<b>2</b> 2	98	Mst	2.5Y 6/4	<del>i -</del>	-	+	Loose	Ť		I	As Above	
7         80         Mst         2.5Y 644         0         80         20         0         Loace           9         100         Mst         2.5Y 644         0         80         20         0         Loace           9         100         Mst         2.5Y 644         0         80         20         0         Loace           13         80         Mst         2.5Y 644         0         80         20         0         Loace           13         80         Mst         2.5Y 644         0         80         20         0         Loace           19         80         Wed         2.5Y 644         0         80         20         0         Loace           19         80         Wed         2.5Y 644         0         80         20         0         Loace           52         80         Wed         2.5Y 644         0         80         20         0         Loace           21         80         Mst         2.5Y 644         0         80         20         0         Loace           20         80         Mst         2.5Y 644         0         80         20         0	2	4	s	و	_	9	6	8	Mst	2.5Y 6/4	<u>-</u>	٠	+	Loose	0.0		Ī	of Vari Ren Ciles CA	ND and a second
10   90   Mst   2.57 644   0   80   20   Loage   1.00   Mst   2.57 644   0   80   20   0   Loage   0.0   Loage	7	2	<u>،</u>	^	4	×	7	8	Mst	2.5Y 6/4	-	<del>-</del>	+-	Loose	1		Ţ	As Above	iste, model any sorted, medium grain
9         100         Mst         2.5Y 644         0         80         20         0         Louge           23         80         Mst         2.5Y 644         0         80         20         0         Looge           13         80         Mst         2.5Y 644         0         80         20         0         Looge           21         80         Mst         2.5Y 644         0         80         20         0         Looge           52         80         Wet         2.5Y 644         0         80         20         0         Looge           52         80         Wet         2.5Y 644         0         80         20         0         Looge           34         100         Mst         2.5Y 644         0         80         20         0         Looge           24         90         Mst         2.5Y 644         0         80         20         0         Looge           26         80         Mst         2.5Y 644         0         80         20         0         Looge           26         80         Mst         2.5Y 644         0         80         20         0	2	≊	5	٥	4	3	2	8	Mst	2.5Y 6/4	┼-	-	<del>i</del>	Soor	Ī			Le Above	***************************************
23         80         Mst         2.5Y 644         0         80         20         0         Loose           13         80         Mst         2.5Y 644         0         80         20         0         Loose           19         80         Mst         2.5Y 644         0         80         20         0         Loose           52         80         Wet         2.5Y 644         0         80         20         0         Loose           34         100         Mst         2.5Y 644         0         80         20         0         Loose           21         80         Mst         2.5Y 644         0         80         20         0         Loose           24         90         Mst         2.5Y 644         0         80         20         0         Loose           26         80         Mst         2.5Y 644         0         80         20         Loose           26         80         Mst         2.5Y 644         0         80         20         Loose           26         80         Mst         2.5Y 644         0         80         20         Loose           17	≈	8	٥	4	~	7	6	3	Mst	2.5 Y 6/4	<del>}</del> -		<del>†</del> -	Loose	0		70,70	of Variation City CA	ND
13   80   Msi   2.57 6.4   0   80   20   0   Louge   0.0	2	2	_	~	5	15	23	2	Mst	2.5Y 6/4	<del>!</del> -	<del></del>	<del>-</del>	osco				of Variable City of	NO. moderatly sorted, coarse grain
21         80         Msi         25Y 644         0         80         20         0         Lose           52         80         Wei         2.5Y 644         0         80         20         0         Lose           52         80         Wei         2.5Y 644         0         80         20         0         Lose           34         100         Msi         2.5Y 644         10         80         10         0         Lose           24         90         Msi         2.5Y 644         0         80         20         0         Lose           26         80         Msi         2.5Y 644         0         80         20         0         Lose           26         80         Msi         2.5Y 644         0         80         20         0         Lose           17         80         Msi         2.5Y 644         0         80         20         0         Lose           14         90         Msi         2.5Y 644         0         80         20         0         Lose           14         90         Msi         2.5Y 644         0         80         20         0         Los	7	22	=	9	7	∞	2	80	Mst	2.5Y 6/4	<del>                                     </del>	<del>-</del>	┼-	J. Const	S			to About	ind, moderally sorted, medium grain
19         80         Weet         2.5 Y 6.4         0         80         20         0         Louse           52         80         Weet         2.5 Y 6.4         0         80         20         0         Looge           34         100         Mst         2.5 Y 6.4         10         80         10         0         Dense           21         80         Mst         2.5 Y 6.4         10         80         10         1.00x           24         90         Mst         2.5 Y 6.4         0         80         20         0         Louse           26         80         Mst         2.5 Y 6.4         0         80         20         0         Louse           17         80         Mst         2.5 Y 6.4         0         80         20         0         Louse           14         90         Mst         2.5 Y 6.4         0         80         20         0         Louse           14         90         Mst         2.5 Y 6.4         0         80         20         0         Louse           14         90         Mst         2.5 Y 6.4         0         80         20         0 <td< td=""><td>77</td><td>8</td><td>=</td><td>12</td><td>5</td><td>5</td><td>71</td><td>3</td><td>Mst</td><td>2.5Y 6/4</td><td><del>-</del></td><td>+</td><td>+</td><td>Loose</td><td>Ī</td><td></td><td>Ī</td><td>A Above</td><td>***************************************</td></td<>	77	8	=	12	5	5	71	3	Mst	2.5Y 6/4	<del>-</del>	+	+	Loose	Ī		Ī	A Above	***************************************
52         80         Wed         2.57 6.4         0         80         20         0         Looge           52         Wel         2.57 6.4         10         80         10         0         Dense           34         100         Mst         2.57 6.4         10         80         10         0         Loose           21         80         Mst         2.57 6.4         0         80         20         0         Loose           26         80         Mst         2.57 6.4         0         80         20         0         Loose           17         80         Mst         2.57 6.4         0         80         20         0         Loose           14         90         Mst         2.57 6.4         0         80         20         0         Loose         0           14         90         Mst         2.57 6.4         0         80         20         0         Loose         0           14         90         Mst         2.57 6.4         0         80         20         0         Loose         0	2 2	8	٥	œ	=	15	2	8	Wet	2.5Y 6/4		<del></del>	-	Locke	Ī		Ĺ	ls Above	***************************************
52         Wei         2.5 Y 64         10         R0         10         Dense           34         100         Mst         2.5 Y 64         10         80         10         0         Louse           21         80         Mst         2.5 Y 64         0         80         20         0         Louse           24         90         Mst         2.5 Y 64         0         80         20         0         Louse           17         80         Mst         2.5 Y 64         0         80         20         0         Louse           14         90         Mst         2.5 Y 64         0         80         20         0         Louse           14         90         Mst         2.5 Y 64         0         80         20         0         Louse           14         90         Mst         2.5 Y 64         0         80         20         0         Louse           14         90         Mst         2.5 Y 64         0         80         20         0         Louse	87	3	^			***************************************	22	02	ಶ*	2.5Y 6.4	-	<u> </u>	<del>! -</del>	Loose	Ť			Ls Above	aaraa ee aan dha dha ah a
34         100         Mst         2.5 Y 6/4         10         80         10         0         Louse           21         80         Mst         2.5 Y 6/4         0         80         20         0         Louse         0           24         90         Mst         2.5 Y 6/4         0         80         20         0         Luuse         0.0           20         80         Mst         2.5 Y 6/4         0         80         20         0         Luose           17         80         Mst         2.5 Y 6/4         0         80         20         0         Louse         1           14         90         Mst         2.5 Y 6/4         0         80         20         0         Louse         1           14         90         Mst         2.5 Y 6/4         0         80         20         0         Louse         1	7 7	3 8	į	1	3	33	22		¥ci	2.5Y 6/4		_	-	Dense				et. Ywl. Bm Silv SA	ND. understly early course orate, with second
34	3 5	7 5	7	× .	2	7	*	3	Mst	2.5Y 6/4		-	-	cose				Ls Above	Company of the Branch Company of the Branch
24         90         Mst         2.5Y 6/4         0         80         20         0         Luuse         0.0           20         80         Mst         2.5Y 6/4         0         80         20         0         Luose         10           17         80         Mst         2.5Y 6/4         0         80         20         0         Luose         10           14         90         Mst         2.5Y 6/4         0         80         20         0         Luose         10           14         90         Mst         2.5Y 6/4         0         80         20         0         Luose         10           14         90         Mst         2.5Y 6/4         0         80         20         0         Luose         10	7.5	5	: اه	<b>~</b> [:	2		7	2	Mst	2.5Y 6/4			-	Loose	Ť			et. Ywl. Brn Silty SA	ND, modernthy sorted, every grain
20         80         Mst         25Y 644         0         80         20         0         Loose           17         80         Mst         2.5Y 644         0         80         20         0         Loose           14         90         Mst         2.5Y 644         0         80         20         0         Loose           14         90         Mst         2.5Y 644         0         80         20         0         Loose           14         90         Mst         2.5Y 644         0         80         20         0         Loose	1	8 8	=[:	2		2	77	8	X X	2.5 Y 6/4		_	-	Loose	90		Ĺ	's Above	mention and the second
17         80         Mst         2.5Y 64         0         80         20         0         Loose           14         90         Mst         2.5Y 64         0         80         20         0         Loose         55555           14         90         Mst         2.5Y 64         0         80         20         0         Loose         55555           14         90         Mst         1         1         1         1         1         1	2	8	o !	2	=[	~]	20	စ္က	₩	2.5Y 6/4		_	⊢	Loose	Ë			s Above	
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Continue on Page 2	3	45	5	5	6	=	4	Ş	Mst	2.5Y 6/4	-	_	⊢	Loose			T. Carrier	S Above	The state of the s
Ig mg. c.g. Fire-Medius, and Coase-grain size	_						-	-					Ŝ	ntinuc or	n Page	2		***************************************	
	Sound Su		1					1			$\dashv$		Н		Į	f. m.g. c.g.: Fin	c. Mediu		***************************************

Confidential   Confidential	Grein Size Grein Grein Grein Size Grein Grein		ELLY (GRND): ELLY (GRND): NORTHING: NORTHING: EASTING: Beth is water (heb) Destine Destine (heb) Destine Destine (heb): Melit Column  OU  OU  OU  OU  OU  OU  OU  OU  OU  O		Tage 2 of 2   DATE: 18 May U.    Losation Type: ( ) GeoPrese ( ) Welf   NM
Sample   State   Sta	Grain Size Grain		EASTING: Black Water (f. bg. Black Special (f. bg. Welf Column  Welf Column		Libration Type: (.) GeoProbe (.) Well (X.) Soil Boring (.) Other: (Completion Zone: (Y.) Dyrphurden (.) Boltock (Completion Type: (.) Monitoring Well (X.) Abendoned by Great
Pie Biow Count	Srain Stan 8 S S C C C C C C C C C C C C C C C C C		Welf Column		Competion Zone; (X.) Dyspurder (.) Sources Competion Tree: (.) Monitoring Well (.) Other (Provide Comments) (.) Other (Provide Comments) y SAND, moderally sorted, medium grain
Sample         Electron of the color o	Srain Stae 8 St. C1 80 20 0 80 20 0				Lithic Description  V SAND, moderatly sorted, medium grain
Sample (tribys)         How Count         Processed (tribys)         Processed (tribys)<	Srain Size  S SI CI  S S SI CI  S S S S S S S S S S S S S S S S S S S				Lithic Description by SAND, moderally sorted, medium grain
Columbia   Gr   Gr   Gr   Gr   Gr   Gr   Gr   G	8 81 C1 86 20 0 88 20 0	<del>[                                    </del>		Lg. Ywl. Bm Sitt As Above As Above As Above	Lithic Description by SAND, moderatly sorted, medium grain
42         44         8         10         18         19         28         90         Mst         25Y 647         0         80         20         0         Loose           44         46         5         9         13         16         22         80         Mst         25Y 647         0         80         20         0         Loose           16         48         7         11         14         9         25         80         Mst         25Y 646         0         80         20         0         Loose           30         52         10         14         18         19         32         75         Mst         25Y 646         0         80         20         0         Loose           50         52         10         14         16         24         75         Mst         25Y 641         0         80         20         0         Loose           54         54         18         16         24         75         Mst         25Y 641         0         80         20         0         Loose           56         88         13         15         18         30         Mst	80 20 0 80 2b 0 80 2b 0 80 20 0	<del>▎▗▍▗▍▗▍</del> ▗┞ <del>▕</del>		Lgt. Ywl. Bm Silt As Above As Above As Above	y SAND, moderatly sorted, medium grain
44         46         5         9         13         16         22         80         Mst         25Y 6/7         9         20         0         Loase           16         48         7         11         14         9         25         80         Mst         25Y 6/7         0         80         20         0         Loase           48         30         10         14         16         24         75         Mst         2.5Y 6/7         0         80         20         0         Loase           50         52         10         14         16         24         75         Mst         2.5Y 6/7         0         80         20         0         Loase           52         54         10         15         16         23         34         80         Mst         2.5Y 6/1         0         80         20         0         Loase           56         58         16         16         27         80         Mst         2.5Y 6/1         0         80         20         0         Loase           60         61         16         16         17         30         Mst         2.5Y 6/15 <td< td=""><td>80 20 0 80 20 0</td><td></td><td></td><td>As Above As Above As Above</td><td></td></td<>	80 20 0 80 20 0			As Above As Above As Above	
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68 27 26 39 45 65 90 Mas 2.5Y 6/16 0 80 20 0 70 17 20 19 12 39 90 Mst 2.5Y 6/16 0 80 20 0	0 80 20 0	ense		As Above	
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				Terminated boring at 70 fbgs.	ng ut 70 fbgs.
				10 Can 14419-19-odd 1449 5 5 1 1 1949 1449 5 104 5 10 10 10 10 10 10 10 10 10 10 10 10 10	
The second secon			1_		
m*3)		_	fg.mg.cg: Fin	fg. m.g., e.g. Fine., Medium, and Coarse-grain size	size bes: below ground surface

FSIA Investigation Cottage Grove, Minnesola

OVERBURDEN BORING LOG

SITE NAME: PROJECT NO.: Area Name:	1																
		tanica metapatakana a		***************************************		Cottage 02181-0	e Grove, MN 002-010-060	Grove, MN Facility 92-010-0601						ELEV (TOC) <sup>b</sup> NORTHING:	ac Ç		
Drilling Contractor: Drilling Equipment:						Di Por Americ IISA	ner HF an Engla	Di Former HF Tar Newtralization Pit American Engineering & Testing HSA	=				Total Day	EASTING: Depth to Water (f) bgs) (stal Boring Depth (f) bgs)	5; (i) bgs) h (ii) bgs)		Location Type; ( ) GeoProbe ( ) Well: (X ) Soil Boring ( ) Other: Completion Zone: (X ) Overbarden ( ) Bedrock
	***************************************	***************************************			1 1 1.	Ethan	Caldwell						Borb	Depth to Refusal (f) bys): Boring Diameter (inches):	(inches): (aches):	<b>Y</b> Y	
Sample	2.5	É	, , Blow Count	<b>1</b>	enjev-u	Кесолегу	snutsioM	Color	5	Grain Sizo	,	chength	MVO	nmuioO lieW	elqmas Hos		
(ft bgs)	.9	ŧ	÷	.9		8		Munsell	3	8	ō	Andread and an artist of the last	Calta		Ŀ	1:	Littic Description
. 0	2   1	Ë	2	2	2	2	Dry	7.5YR 4/4	<u> </u>	_	╄	Loose	1_		E	Bm. Silty SAND, po	Bin. Silly SAND, poorly sorted, fine grain
2	4		4	₹	-	2	Δ	7.5YR 4/4	9	-	<del>.</del>	Loose	0.0		Ļ	Bm. Silty SAND, po	Bm. Silv SAND, toochy sorted, fine grain, with organic matter
4	6 2	3	~	3	9	22	Wet	7.5YR 4/4	9	0 30	2	Loose				As Above	
9	- 8	~	2	H	20	\$	Mst	2.5Y 6/4	98	0 20	0	Loose	0.0		_	Lgt. Ylw. Bm. Silty	Lgt. Ylw. Bm. Silty SAND, moderatly sorted, medium grain
_	10	7		-	7	ş	Mst	2.SY 6/4	08 0	020	0	Loose				As Above	
9	12 7	2	12	-1	22	8	Mst	2.5Y 6/4	08	0 20	o	Loose			Ų.	Lgt. Ylw. Bm. Silty	Silty SAND, moderatly sorted, coarse grain
	4		<b>о</b>	æ	ŝ	92	Mst	2.5Y 6/4	-	80 20	0	Loose				As Above	at in decession from the deviction was propriet from the transmirings of the depart Marketick belonger (to the dates
	16 \$	90	=	Ξ	61	75	Мзі	2.5Y 6/4	9	0 20	0	Loose	0.0			As Above	ALIAN TANÀN MANANTANAN MANANTAN
	9 81	9	9	4	13	8	Mst	2.5Y 6/4	08	0 20	0	Lose				As Above	dott urtenn i örsst errerrenningen ut etgat basen tenurerrerreste base del Midd Pro brægens der pipt i samt
	20 5	~	_	9	9	ક્ર	Mst	2.5Y 6/4	0	80 20	٥	Loose				As Above	
	22 \$	3	7	-	2	ક	Mst	2.5Y 6/4	80	80 20	0	Loose	0.0			As Above	and the state of t
	24 \$	٥	٥	12	<b>∞</b>	98	Mst	2.5Y 6/4	9	65 54	9	Loose				Lgt. Ylw. Bm. Silty	Lgt. Ylw. Brn. Silty SAND, well sorted, fine gain
	4	~			Ξ	<u>2</u>	Mst	2.5Y 6/4	9	60	0	Luose				As Above	
-	+	-	÷	+	2	æ	Wei	2.5Y 6/4	-	$\vdash$	٥	Loose				As Above	
58	<del>-</del>	+	2	0	27	2	Dy	SY 6/4	æ 0	80 80	3	Loose				Pale Olive Silty SAN	Pale Olive Silty SAND, moderatly sorted, fine grain
-	-	-	+		<b>*</b>	28	Š	5Y 6/4	æ	80 20	٥	Loose	0.0			Pale Olive Silty SAN	Pale Olive Silty SAND, very poorly sorted, coarse grain
+	_	_[	+		7	8	δΩ	5Y 6/4	0	-	0	Loose				Pale Olive Silty SAN	Pate Olive Silty SAND, moderally sorted, medium grain
+	36 5	-	+	-	9	2	Dy	5Y 6/4	ž o	80 20	0	Loose	0.0			As Above	
<del>- i</del>	38 6	+	+	+	2	≆	Dy	5Y 6/4	-	92 08	٥	Loose				As Above	
ij	40 6	- 1	4	٥	2	8	Ω	5Y 6/4	8	80 20	0	Loose				As Above	
-+	42 4	1	٥	=	9	7.5	Ω	5Y 6/4	ээ Э	80 20	0	Loose	0.0			As Above	
42	44 8	_	- 2	Ξ	71	<b>9</b>	Dry	SY 6/4	_	80 20	٥	Loose				As Above	randerse en de la company de la compa
	drawa de	· · · · · · · · · · · · · · · · · · ·	**********	Two constraint from	***************************************						J	Continue on Page 2	on Pag	te 2			
	4	4	4						H					fg. m.g., c.g.	Fine. N	fg. m.g., c.g.: Fine., Medium., and Cuarse grain size	tys: below ground surface

Complete Cheese   Complete Cheesee   Complete Cheese   Complete
Secting   Total Butter   Total But
Double to Refuel (if bys)
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(B. 19. C. S. Fire. Medium, and Coace grant state
Fig. 19, c. g.: Fire. Medium, and Coaces grant 1226
Fig. 19. C. St. Fire. Medium, and Coaces grant 1926
(g. it.g., c.g.: Fire. Medium, and Coace grant stat
Fig. 17.8; C. St. Fire. Medium, and Coaces grant 8226
Fig. 19. c. g.: Fire. Medium, and Coace graw size
f.g. it.g., c.g.: Finer. Meckinar, and Course gran sace
f.g. in.g. c.g.: Fire-Medium, and Coarse-gram pize

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Compaction   Nation   Nation																			
Marchen Figure of Strains   American Proposal Area   Isaa   Isa	PROJECT NO.:							2 20 2 20 2 20 2 20 2 20 2 20 2 20 2 20	Inge Grov	e, MN Facility -6001	1 4					ELEV (TO NORTHIN	قِ يَ	***************************************	
High   Fithan Caldwell   Fit	amie: g Contrac	tor:			***************************************			7 V	Former S	udge Disposal Area	, ,				å	EASTING: th to Water (ft	: t bgs)	NN	Location Type: ( ) GeoProbe ( ) Well
Column   C	: Equipm By:	ent:			7			Z Z		-	, ,				Total	Boring Depth	(f) (f) (g)	25	Competion Zone: (X) Overburden ( ) Bedrock
Companies   Comp			I								, ,				Borts	g Diameter (h	iches):	: :	
1.   1.   1.   1.   1.   1.   1.   1.						merenten	nauturiana.												( ) Other (Provide Comments
Column   C		-					aulsy-			rolot		E E	ezi	thgn <del>a</del>	MVC	nmuloJ	ejdures		
Marie   Mari		Serva Serva	_	8	Ö ≥	į	u 			)				4\$	)	ilsW	Hos		
10   20   Mst   5Y 2 57   0   10   60   10   50ff     1	┪		┪	-		$\vdash$		ž		Munsell	Ğ	-	⊢-	  -	Sila		***************************************		Lithic Description
2         50         Mst         5Y 5/8         0         60         40         0         Loose           1         0         80         40         0         Loose         1           2         100         Wet         5Y 4/3         0         60         40         0         Loose           4         25         Wet         5Y 2/52         0         60         40         0         Loose           4         25         Wet         5Y 2/52         0         60         40         0         Loose           1         25         Wet         5Y 2/52         0         60         40         0         Loose           1         25         Wet         5Y 2/52         0         60         40         0         Loose           1         20         60         40         0         10         0         10         0         10         0         0         10         0         0         10         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	٠		_	4		_	_	_	$\vdash$	5Y 2.5/2	₩			ļ		37.55.55	F	Bik Sandy Sil T or	1
1         0         Nea         5Y 473         0         60         40         0         Loose           2         1000         Wea         5Y 473         0         60         40         0         Loose           4         25         Wea         5Y 2572         0         60         40         0         Loose           4         25         Wea         5Y 2572         0         60         40         0         Loose           1         20         Sat         5Y 644         0         90         10         0         Loose           1         80         Sat         5Y 2572         0         20         60         20         10         0         10         0         10         0         10         10         0         10         0         10         0         10         0         10         0         10         10         10         10         0         0         10         0         10         0         10         0         10         0         10         0         0         10         0         10         0         0         10         0         0         0 <t< td=""><td>2</td><td>4</td><td>2</td><td></td><td></td><td></td><td>2</td><td>Н</td><td>_</td><td>5Y 5/8</td><td><del>-</del></td><td><u>.                                    </u></td><td>;</td><td><u> </u></td><td></td><td></td><td></td><td>Olive, Silv SAND</td><td>sonic</td></t<>	2	4	2				2	Н	_	5Y 5/8	<del>-</del>	<u>.                                    </u>	;	<u> </u>				Olive, Silv SAND	sonic
2         100         Wet         5Y 43         0         60         40         0         Loose           2         100         Wet         5Y 43         0         60         40         0         Loose           4         25         Wet         5Y 2.5/2         0         60         40         0         Loose           4         20         Sat         5Y 64         0         90         10         0         Loose           1         70         Sat         5Y 25/2         0         20         60         20         Loose           1         80         Sat         5Y 25/2         0         20         60         20         V. SR           9         80         Sat         5Y 25/2         0         20         60         20         V. SR           4         80         Sat         2Y 25/2         0         20         60         Y. SR           4         80         Sat         2.5Y 41         0         90         10         0         10         0         0         0         0         0         0         0         0         0         0         0         0	4		_	_	_		_				<del>-</del> -		-					No Recovery	
2         100         West         5Y 4/3         0         60         40         D Loose           4         25         Wet         5Y 2.572         0         60         40         0         Loose           4         20         Sat         5Y 644         0         90         10         0         Loose           1         70         Sat         5Y 644         0         90         10         0         Loose           1         80         Sat         5Y 2.57         0         20         60         20         10         0         10         0         10         0         10         0         10         0         0         0         10         0 <td>9</td> <td>_</td> <td>~</td> <td>_</td> <td>_</td> <td>2</td> <td></td> <td>-</td> <td><u> </u></td> <td>5Y 4/3</td> <td>÷</td> <td><del></del></td> <td>1</td> <td>┿-</td> <td></td> <td></td> <td></td> <td>Olivi Bm Silvi SAN</td> <td>ID needle cortes mith block strains</td>	9	_	~	_	_	2		-	<u> </u>	5Y 4/3	÷	<del></del>	1	┿-				Olivi Bm Silvi SAN	ID needle cortes mith block strains
4         25         Wet         SY 2.572         0         60         40         1         Loose           4         20         Sat         5Y 644         0         90         10         0         Loose           1         70         Sat         5Y 644         0         90         10         0         Loose           1         80         Sat         5Y 2.57         0         20         60         20         V. Sfl           3         80         Sat         2.7 552         0         20         60         20         V. Sfl           4         80         Sat         2.5 7 552         0         90         10         0         V. Sfl           8         80         Sat         2.5 7 552         0         90         10         0         V. Sfl           4         80         Sat         2.5 7 41         0         90         10         0         Loose           42         90         Sat         2.5 7 41         0         90         10         0         Loose           17         90         Sat         2.5 7 41         0         90         10         Loose	~						<u> </u>	<u> </u>	-	_	+	<del>-</del>	-	<del></del>				As Above	12, JACHA 304 UQ, WHI UROK MAHHIIK
4         20         Sat         5Y 644         0         10         10         Loose           1         70         Sat         5Y 2572         0         50         10         0         Loose           1         80         Sat         5Y 2572         0         20         60         20         V. Sff           9         80         Sat         5Y 2572         0         20         60         20         V. Sff           8         80         Sat         2.5Y 572         0         90         10         0         V. Sff           9         90         Sat         2.5Y 441         0         90         10         0         Loose           42         90         Sat         2.5Y 441         0         90         10         0         Loose           42         90         Sat         2.5Y 443         0         90         10         0         Loose           17         90         Sat         2.5Y 443         0         90         10         0         Loose           26         90         Sat         2.5Y 443         0         90         10         Loose           <		- !	2 2	7	_				_	5Y 2.5/2	<del>-</del>		<u>.                                    </u>	<del> </del>				As Above	
70   Sat   SY 2.512   0   10   0   Loose     800   Sat   SY 2.512   0   20   60   20   V. Sft     900   Sat   SY 2.512   0   20   60   20   V. Sft     4 800   Sat   2.57 5/2   0   20   60   20   V. Sft     8 800   Sat   2.57 5/2   0   90   10   0   Loose     9 900   Sat   2.57 4/1   0   90   10   0   Loose     17 900   Sat   2.57 4/3   0   90   10   0   Loose     18 900   Sat   2.57 4/3   0   90   10   0   Loose     19 900   Sat   2.57 4/3   0   90   10   0   Loose     19 900   Sat   2.57 4/3   0   90   10   0   Loose     19 900   Sat   2.57 4/3   0   90   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     19 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Loose     10 900   Sat   2.57 4/3   10   80   10   0   Sat     10 900   Sat   2.57 4/3   10   80   10   0   Sat     10 900   Sat   2.57 4/3   10   80   10   0   Sat     10 900   Sat   2.57 4/3   10   80   10   0   Sat     10 900   Sat   2.57 4/3   10   80   10   0   Sat     10 900   Sat   2.57 4/3   10   80   10   0   Sat     10 900   Sat   2.57 4/3   10   80   10   0   Sat     10 900   Sat   2.57 4/3   10   80   10   10	1		-	7	_	2	4			5Y 6/4	┿	į.	٠	<del>!</del>				Pale Olive SAND	cay booth sorted coase arein
1         80         Sat         5Y 2 5/2         0         20         60         20         V. Sft           3         80         Sat         5Y 2 5/2         0         20         60         20         V. Sft           4         80         Sat         2.5Y 5/2         0         90         10         0         V. Sft           8         80         Sat         2.5Y 4/1         0         90         10         0         Louse           9         90         Sat         2.5Y 4/1         0         90         10         0         Louse           42         90         Sat         2.5Y 4/3         0         90         10         0         Louse           17         90         Sat         2.5Y 4/3         0         90         10         0         Louse           17         90         Sat         2.5Y 4/3         0         90         10         Louse           26         90         Sat         2.5Y 4/3         0         90         10         Louse           26         90         Sat         2.5Y 4/3         0         10         Louse           27         Wet	-		_		_	_	_	7		5Y 64	⊢	<del>-</del>	ـــ	┿-				Pale Olive, SAND, v	ery poorly sorbel coarse orain with oraining
0         80         Sat         5Y 2.572         0         20         60         20         V. SfI           4         80         Sat         2.57 5.72         0         20         60         20         V. SfI           8         80         Sat         2.57 4.11         0         90         10         0         Louse           9         90         Sat         2.57 4.11         0         90         10         0         Louse           42         90         Sat         2.57 4.13         0         90         10         0         Louse           17         90         Sat         2.57 4.3         0         90         10         0         Louse           13         90         Sat         2.57 4.3         0         90         10         Louse           26         90         Sat         2.57 4.3         0         90         10         Louse           26         90         Sat         2.57 4.3         10         80         10         Louse           26         90         Sat         2.57 4.3         10         80         10         Louse           27         Wet	1	<del>-</del>	_ 	0	_	4	-	ž	-	SY 2.5/2	<del>ļ</del> -	<del>-</del>	<u> </u>	<u> </u>				Blk, Clayey SILT	The state of the s
3         80         Sat         3Y 2.572         0         20         60         20         W.S.R.           8         80         Sat         2.5Y 572         0         90         10         0         Loose           9         90         Sat         2.5Y 41         0         90         10         0         Loose           42         90         Sat         2.5Y 41         0         90         10         0         Loose           42         90         Sat         2.5Y 41         0         90         10         0         Loose           42         90         Sat         2.5Y 43         0         90         10         0         Loose           13         90         Sat         2.5Y 43         0         90         10         0         Loose           26         90         Sat         2.5Y 43         0         90         10         Loose           30         Wet         2.5Y 43         0         90         10         Loose           4         100         Wet         2.5Y 43         0         10         Loose           4         100         Wet <t< td=""><td>=</td><td>-</td><td>_</td><td>-</td><td></td><td></td><td>_</td><td></td><td>_</td><td>5Y 2.5/2</td><td><del> </del></td><td>;</td><td><u>i                                      </u></td><td><u> </u></td><td></td><td></td><td></td><td>RIK Clavey SII T w</td><td>ith red and vellene reins chine</td></t<>	=	-	_	-			_		_	5Y 2.5/2	<del> </del>	;	<u>i                                      </u>	<u> </u>				RIK Clavey SII T w	ith red and vellene reins chine
4         8D         Sat         25Y 57.2         0         90         10         0         Loose           8         8D         Sat         2.5Y 4/1         0         90         10         0         Loose           9         9D         Sat         2.5Y 4/1         0         90         10         0         Loose           42         9D         Sat         2.5Y 4/3         0         90         10         0         Loose           42         9D         Sat         2.5Y 4/3         0         90         10         0         Loose           13         9D         Sat         2.5Y 4/3         0         90         10         0         Loose           26         9D         Sat         2.5Y 4/3         0         90         10         0         Loose           30         Sat         2.5Y 4/3         0         90         10         Loose           40         Wet         2.5Y 4/3         10         80         10         Loose           50         Wet         2.5Y 4/3         10         80         10         Loose           40         Wet         5.5Y 6/4         0 <td>7</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>3</td> <td></td> <td></td> <td>5Y 2.5/2</td> <td><u> </u></td> <td><del>!</del></td> <td><u> </u></td> <td><u>-</u></td> <td></td> <td></td> <td></td> <td>As Above</td> <td></td>	7		-		-		3			5Y 2.5/2	<u> </u>	<del>!</del>	<u> </u>	<u>-</u>				As Above	
8         80         Sat         2.57 4/1         0         90         10         0         Loose           9         90         Sat         2.57 4/1         0         90         10         0         Loose           42         90         Sat         2.57 4/3         0         90         10         0         Loose           42         90         Sat         2.57 4/3         0         90         10         0         Loose           13         90         Sat         2.57 4/3         0         90         10         0         Loose           26         90         Sat         2.57 4/3         10         80         10         0         Loose           30         Wet         2.57 4/3         10         80         10         0         Loose           4         100         Wet         2.57 4/3         10         80         10         0         Loose           2         75         Wet         2.57 4/3         10         80         10         0         Loose           4         100         Wet         57 6/4         0         70         20         Loose	2.	-÷	_	-		-	-		_	2.5Y 5/2	<del></del>	<u> </u>	i	<del>[</del> -				Light Olive Brn. SA]	VD. very boxely soded coarse orain elight etainin
9         90         Sat         2.57 4/1         0         90         10         0         Loose           42         90         Sat         2.57 4/1         0         90         10         0         Loose           42         90         Sat         2.57 4/3         0         90         10         0         Loose           17         90         Sat         2.57 4/3         0         90         10         0         Loose           18         90         Sat         2.57 4/3         0         90         10         0         Loose           20         Sat         2.57 4/3         0         90         10         0         Loose           30         West         2.57 4/3         0         90         10         0         Loose           4         70         West         2.57 4/3         0         90         10         Loose           5         7         West         2.57 4/3         10         80         10         Loose           6         7         West         2.57 4/3         10         80         10         Loose           7         West         5	2,	+	-	-	-	-	эс ,		_	2.5Y 4/I	<u> </u>		<u>:                                    </u>	_				Dk. Grav. SAND. ve	V Doorly sorted coarse crain slight stainting
42         90         Sat         2.57 4.1         0         90         10         0         Loose           42         90         Sat         2.57 4.3         0         90         10         0         Loose           17         90         Sat         2.57 4.3         0         90         10         0         Loose           26         90         Sat         2.57 4.3         0         90         10         Loose           30         80         Wet         2.57 4.3         10         80         10         Loose           26         75         Wet         2.57 4.3         10         80         10         Loose           24         100         Wet         5.57 4.3         10         80         10         Loose           24         100         Wet         5.7 6.4         0         70         10         Loose           24         100         Wet         57 6.4         0         70         10         Loose	22	+	_	$\dashv$	-	+	÷		-	2.5Y 4/I				-				As Above	
42         90         Sat         2.5Y 4/3         0         90         10         0         Looze           17         90         Sat         2.5Y 4/3         0         90         10         0         Looze           26         90         Sat         2.5Y 4/3         0         90         10         0         Looze           30         80         Wet         2.5Y 4/3         10         80         10         0         Looze           26         75         Wet         2.5Y 4/3         10         80         10         0         Looze           24         100         Wet         5Y 6/4         0         70         30         0         Looze           24         100         Wet         5Y 6/4         0         70         30         0         Looze           25         Ontinue on Page 2         10         10         10         10         10         10	77	<u>-</u>	4	<u>.</u>	-	-	4.	_	-	2.5Y 4/I								As Above	and describe the superior described and the superior of the superior of the superior of the superior or or or other superior or other supe
17         90         Sat         2.5Y 43         0         90         10         0         Loose           26         90         Sat         2.5Y 43         0         90         10         0         Loose           30         80         Wet         2.5Y 43         10         80         10         0         Loose           26         75         Wet         2.5Y 43         10         80         10         0         Loose           24         100         Wet         5Y 64         0         70         30         0         Loose           Accontinue on Page 2         Continue on Page 2         Continue	7.	<del>-</del>	0	-	+	+	+	-	+	2.5Y 4/3								Olive Brn. SAND, ve	ny poorty sorted, coarse grain
13         90         Sat         2.5Y 43         0         90         10         0         Loose           26         90         Sat         2.5Y 43         0         90         10         0         Loose           30         80         Wet         2.5Y 43         10         80         10         0         Loose           24         100         Wet         5.5Y 443         10         80         10         0         Loose           24         100         Wet         5Y 64         0         70         30         0         Loose           According on Page 2         Continue on Page 2         Continue         Continu	ř   1	÷	- [	+	+	+	+	+	+	2.5Y 4/3		_						As Above	The second secon
26         90         Sat         2.5Y 4/3         0         90         10         0         Loose           30         80         Wet         2.5Y 4/3         10         80         10         0         Loose           26         75         Wet         2.5Y 4/3         10         80         10         0         Loose           24         100         Wet         5Y 6/4         0         70         30         0         Loose           Continue on Page 2         Continue on Page 2         Continue         Cont	3		-	-	-	÷	- !		┪	2.5Y 4/3	_		_					As Above	
30         80         Wet         2.5Y 4/3         10         80         10         0         Loose           26         75         Wet         2.5Y 4/3         10         80         10         0         Loose           24         100         Wet         5Y 6/4         0         70         30         0         Loose           Continue on Page 2	7	÷	+	4	-	-	<del>-</del>	$\dashv$	+	2.5Y 4/3	-	-	Щ	-				As Above	mana de la companya de la compa
26         75         Wet         2.5Y 4/3         10         80         10         0         Loose           24         100         Wet         SY 6/4         0         70         30         0         Loose           Continue on Page 2	×	÷	-	+	<b>-</b>	-	<del>-</del>	_	-	2.5Y 4/3	_			_			_	Olive Brn. SAND, ve	SPY Exorty Sorted, coarse grain with gravel
24 100 Wed SY 64 0 70 30 0 Loose Continue on Page 2	***************************************	<del>-</del> i	+	- 1	-	-			_	2.5Y 4/3	_			-				As Above	and in the second transfer of the second transfer of the second s
Continue on Page 2	-	-		_	-				₩ct	5Y 6/4	<del>-</del>	<del>-</del>	<u> </u>	<del>-</del>				**************************************	
				-						Continue on Page 2		ì	1	ŧ.				Pale Olive, Silty SA)	D. moderatly sortest fine amin, horizonatal hedd
	-	4	4	-	4	4	4	4	4			Н	Н			E 19. C.B.	Hic. Me	lium., and Coarse-grain size	bis: below ground surface

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Cutter Grown MY Freilly   Cutter Grown MY	E NAME:		**********	**********	***********		Complete	Section of the sectio					KLEV (CRND)	G		Page 1 of 2 BATE, 15	15 May 05
Participal Physical Area   Participal Physical Area   Participal Physical Area   Participal Physical	PROJECT NO.:						tage Grov 81-002-010	e, MN Facility					ELEV (TOC		energy of the first term of th		
Filan Caldwell   Fila	•					i_i .i.	Former Si erican En	udge Disposal Area Uncering & Testing					EASTING: Depth to Water (# b.		WM	Location Type: ( ) GeoProbe ( ) Well (X) Soll Boring ( ) Other:	
Sample Grain Size Columnia (1974)  10) Grain Size Columnia (1974)  11) Grain Size Columnia (1974)  12) 4 5 3 4 7 1 4 50 Msi 757R 33 0 50 40 10 Louse Columnia (1974)  13) 6 6 1 7 8 11 50 Wet 757R 33 0 50 40 10 Louse Columnia (1974)  14) 13 1 1 0 1 1 0 0 1 1 100 Wet 757R 33 0 10 10 VSit Size Columnia (1974)  15) 11 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1							ू	=				;	otal Boring Depth (R Depth to Refusal (R D			Completion Zone: (X.) Overburden. (.) Bedrock Completion Type: (.) Monitoring Well	drock
Sample   Color County   Sample   Color Grain Size   Color Grain Size   Color Grain Size   Color Grain Size   Color Color   Color Color   Col	. â	**********			***************************************	1						-	soring Diameter (Inc.		9	(X) Abindoned by Grout	renta)
1			low C	ount				rotoO	Grain	Size	Attenents			siqmis2 lio8		And an arrange delection of the Control of C	
0         2         2         6         4         30         Mst         7.5YR 33         0         50         40         10         Louse         0.00           2         4         3         7         7         7         14         50         Mst         7.5YR 33         0         50         40         10         Louse         0.00           5         6         8         1         1         50         Wet         7.5YR 33         0         50         40         10         Louse         0.00           6         8         1         1         6         2         50         Wet         57.43         0         10         70         10         50         4         30         10         10         70         10         50         10	1	: .	5	ī. I			6	Munseti	S	_	5	5	╄	Ī		tithic Description	
4         3         7         7         14         50         Met         75YR 33         0         50         40         10         Loose         0           6         3         4         1         50         Wet         75YR 33         0         50         40         10         Loose         0           6         1         1         1         5         50         Wet         5743         0         10         VG	0	7	2					7	⊢	_		န္			Dk Br. Siky SAND.	noorly sorted medium orain	
5         3         4         11         50         Wet         75YR33         0         50         40         10         Loose           6         1         7         8         11         50         Wet         5Y43         0         10         VGR         43           10         6         1         5         5         Wet         5Y43         0         10         VGR         43           10         6         1         1         1         10         Wet         5Y252         0         15         VGR         80           13         1         0         1         1         10         Wet         5Y252         0         10         10         Loose         0           13         1         0         1         1         10         Wet         5Y252         0         30         10         Loose         10<	┥	~	7	7	7	_			-	-	-		0	Ĺ	Dk Br. Silty SAND,	poorly sorted, medium grain, with slight sta	ining
6         7         8         11         50         Wei         5Y 4/3         0         10         70         10         VSR         43           10         6         1         5         4         1         5         4         1         5         4         1         5         4         1         5         4         1         5         4         1         5         4         1         5         4         1         5         4         1         5         4         1         5         4         1         6         6         1	+	~	4		-	닉	-	7.	_	<u> </u>	<u> </u>	38		Ĺ	As above	aderrenamente monte en errenament managemente de la management de la managemente de la managemente de la management	
8         1         1         6         2         50         Wet         57433         0         10         VGR         43           10         6         7         5         4         12         50         Msi         5771         0         10         10         VGR         40           13         3         1         1         10         Wet         572.552         0         15         VGR         80           13         1         0         1         10         Wet         572.552         0         10         10         NGR           13         1         0         1         10         Wet         572.552         0         10         10         NGR           13         1         0         0         1         10         Wet         757.833         0         10         NGR         10         0         NGR         10         0         10         NGR         10         10         NGR         10         10         10         NGR         10         10         10         10         NGR         10         10         10         10         10         10         10	+	1	1	7	-	-	-	-	-		_	<u></u>			Olive, SILT, slight b	lack staining, strong odor	***************************************
10   6   7   5   4   12   50   Mst   SY 7/1   0   90   10   Loxes   0.0     12   3   1   1   0   2   75   Wet   SY 25/2   0   15   VSft   86.0     13   1   0	+	_	_	-	-	4	1	1000		_			3 (5.5.5.5)		As above	, 1990年 - 1990年 -	***************************************
12   3   1   0   2   75   Wel   SY 2.572   0   15   V.Sft.   86.0   SY 11   Loves   SY 711   0   60   30   10   Loves   SY 711   0   60   30   10   Loves   SY 711   0   60   30   10   Loves   SY 711   0   60   SY 8.0	-	9	7	+	+	-	-	-	-	щ		Н			Light Gray, SAND,	very poorly sorted, coarse grain, slight odor.	
13   1   0   1   100   Wet   5Y 7/1   0   60   10   Lloose   1   100   Wet   5Y 2.52   0   30   50   20   VSft   1   1   1   1   1   1   1   1   1	٠ŀ	3	_	_			-				_	_			BIK. SILT, strong od	or, brown motting.	
14.5   1   1   1   1   1   1   1   1   1	+	-	0	-	-	_	-		;		_	3.0			Light Gray, Silty SA	ND, poorly sorted, medium grain	
14   1   0   1   100   Wet   75YR 3/3   0   30   10   Loose   13.05     15   1   0	_!_	Ť		-1	-	<u> </u>	-	-				اند.			Blk. Sandy SILT, po	orly sorted with organic matter	
15   1   0   0   80   Wet   7.5YR 3/3   0   6.0   30   10   Loose   133.0	. :	1	***************************************	-	_	_					_	2			Dk Br. Siliv SAND	Why rooms control medium one with red as	But has
15   1   0   0   0   80   Wed   75YR 3/3   0   60   30   10   Loose   133.0     18   1   1   0   0   1   80   Wed   75YR 3/3   0   20   50   30   VSII.     20   1   2   0   0   1   80   Wed   75YR 3/3   30   40   30   0   Loose   133.0     21   1   1   0   0   1   100   Wed   75YR 3/3   30   40   30   0   Loose   133.0     22   1   1   0   0   1   100   Wed   75YR 3/3   30   40   30   0   Loose   133.0     23   1   4   17   100   Wed   75YR 3/3   30   40   30   0   Loose   18.0     24   1   1   1   100   Wed   75YR 3/3   30   40   30   0   Loose     25   1   4   1   1   100   Wed   75YR 3/3   30   40   30   0   Loose     26   1   1   2   1   3   4   1   100   Mst   5Y7/1   0   90   10   0   Loose     30   7   8   9   9   17   100   Wed   5Y7/1   0   90   10   0   Loose     31   2   3   4   4   7   100   Wst   5Y7/1   0   90   10   0   Loose     32   8   13   14   17   10   Wst   5Y7/1   0   90   10   0   Loose     33   4   5   7   100   Wst   5Y7/1   0   90   10   0   Loose     34   5   6   7   7   7   7   7   7   7   7   7	-		-	-	- 1					-		-			paint chips	very poorly source, incurain gain, with ten a.	and year
16	÷	-	0	-	-	+	-		_			-			As above	error in the state of the state	***************************************
18		-	-	+		-	┪	_	-	_		n.		Ĺ	Olive, SILT, slight o	dor, with organic liairs	***************************************
20         1         2         0         0         2         100         Wet         7.5YR 3/3         30         40         30         0         Losse         130         60         Losse         2         2         1         100         Wet         7.5YR 3/3         30         40         30         0         Losse         18.0         2           24         0         0         0         100         Wet         7.5YR 3/3         30         40         30         0         Losse         18.0           25         1         4         17         100         Wet         7.5YR 3/3         30         40         30         0         Losse         18.0         18.0           26         1         1         1         17         100         Wet         7.5YR 3/3         30         40         10         Losse         0.0           28         1         1         1         1         100         Mst         57/11         0         90         10         0         100         10         10         10         10         10         10         10         10         10         10         10         10	4	_	_	+	-	┪	+		<del>\$</del>		-			Ē	Ok Br. Silty, Gravely	Y, SAND, poorly sorted, with red paint chips	×
22         1         0         0         1         100         Wet         7.5YR 3/3         30         40         30         0         Loose         1         100         Wet         7.5YR 3/3         30         40         30         0         Loose         118.0         20         20         100         Wet         7.5YR 3/3         30         40         30         0         Loose         18.0         20         100         Wet         7.5YR 3/3         30         40         30         0         Loose         8         10         8         10         1	÷	-	7	+	-	-	-	-	<del>\$</del>			_			As above	Triversammanyer folderpe resevitansammana ett des ivreter i terrareditara — et turi reselt de r	***************************************
24         0         0         0         100         West         7.5YR 3/3         30         40         30         0         Loose         118.0           25         1         4         17         100         West         7.5YR 3/3         30         40         30         0         Loose         0         10         0         10         0         10         0         0         10         0		_	_	+	0	<u> </u>		_	4		щ	Sc				geligh constrainteach and bear directed have receptive and property or and property or an animal color and animal and an animal and an animal and an animal and animal and animal animal and animal an	
25         4         17         100         West         7.5YR 3/3         30         40         30         0         Locksc         0.0         Control           26         13         14         17         100         Mst         5Y 7/1         0         90         10         0         Locksc         0.0         Control	<del>-</del>	= -	0	1	+	-	<del>-</del>	_	9		H	_		Ĺ		orbitalistississississississississississississi	-
26         13         14         17         100         Mst         5Y 7/1         0         90         10         0         Loose         0.0         60	÷	_	4	+	÷	!	-	_			_	36		Ì		ornational historius metalorus pri pri pri pri pri del contraterio de contraterio de contraterio de contraterio	
28         11         12         11         9         23         100         Mst         5Y 7/1         0         90         10         0         Loose           30         7         8         9         9         17         100         Mst         5Y 7/1         0         90         10         0         Loose         6           32         8         13         14         14         27         100         Wcl         5Y 4/4         0         56         40         10         10         5	بِـ		***************************************	_	÷	į	-		-		$\vdash$	ii			Light Gray, SAND,	well sorted, fine grain	
30 7 8 9 9 17 100 Mst 5Y 7/1 0 90 10 0 Loose 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	-	=	2]	+	+	-	┽		3			se		Ì	Asabove	monte equal to the their them belong the asteronomy cores properties and general plays to the con-	
32 8 13 14 14 27 100 Wet 5y 4/4 0 50 40 10 Loose 0 0 55555	+	7	œ,	+	<del>-</del>	<u>Ļ</u>	-	5Y 7/1	3		-	35			Light Gray, SAND, 1	noderatly sorted, coarse grain	***************************************
The state of the s		×	=	-	-	ᆛ		5Y 4/4	0 20	46 _					Olive, Silty, SAND,	well sorted, fine grain	
Cantinue on Page 2		1	-1								Conti	ne on l	age 2		of the var band of events absorbed for the ways way; or who was	ermetermenter incarrentim midepreditistrici perciparationi de manda de manda de manda de manda de manda de man	
mg. c.g. Fine-, Medium-, and Coarse-grain size		1	1	+	+	4	_		-			_	fg.mg. c.g. Fin	re-, Medi	um and Coarse-gradu size	has below the base below ground surface	-

Control   Cont	Contage Greek, MN Pacifity   Contage Greek,	Contract Crows, Mix Pucific)	CLIENT							Confide	ential							200 A 3 1 3	7		PATE.
PATION:   PATI	Sample   S	Park	SITE NAME: PROJECT NO.:							Cortag	e Grove, 1	MN Facility 001	1 1			•		ELEY (10 NORTHIN	<u> </u>		PAIE
The control of the	Figure California   Figu	1974   1975	ca Name: Illing Contrac	er:		***************************************				N2 For	mer Slad an Engin	ge Disposal Area eering & Testing	F 1		٠		Ē	EASTING	e de		Location Type: ( ) Geofrabe ( ) Well (X) Soil Baring ( ) Other:
Sample   S	Sample Armony Market Biow Court II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Pupp in Neffacial (I by a long of the control of	Hing Equipm	ent:	-					IISA			, i				Ť	il Boring Depth	(F bgs)	- 20	Completion Zone: (X ) Overburden ( ) Bedrox
Sering Diameter (lacker)	Sample Grand Colon Maria Syryii 10 80 10 1 Loose 0.0 1	Column   C	ged By:		. Barbarbilla et e	*******	4	-		Schan							ă	oth to Refusal (I	fi togs);	ΥN	Completion Type: ( ) Monitoring Well
Color   Colo	Sample   Grain Size   Grain Siz	100   Mist   SY 771   10   90   10   Louse   10   10   10   10   10   10   10   1				***************************************							1 1	٠,			å	ring Diameter (I	nches):	9	(X) Abandoned by Grout () Other (Provide Comment
1   100   Mist   5Y 771   0   90   10   10   10   10   10   10	Characteristic   Char	18   100   Mst   5Y 771   0   90   10   Louge   0.0   1.0		eidme				<u> </u>	eulsv-n	Весолегу	Moisture	Color	9	rain S		Strength	MVO	reil Column	storms lies		
1   100   Mist   5Y 771   0   90   10   10   10   10   10   10	34   8   8   10   12   18   100   Mst   SY771   0   90   10   Loose     35   36   10   12   14   21   26   25   Mst   SY771   0   90   10   Loose     36   38   6   12   13   13   25   75   Mst   SY771   0   90   10   Loose     38   40   4   8   11   13   19   100   Mst   SY771   10   80   10   Loose     40   42   6   8   10   14   18   50   Mst   SY771   10   80   10   Loose     41   42   43   44   45   44   45   45   45   45	18   100   Mst   SY 771   0   90   10   Louge   0.0   Const.   C	+	(t bgs)	-		5 %		in section	3	-	Musel	ð		-	adrian market	Unite	- -	***************************************		thic Description
100   Mst   5Y 771   0 90   10   Louse   0.0	36   16   12   14   21   26   25   Mat   SY771   0   90   10   Looks   0   0   1   0   0   1   0   0   0   0	25   Mst   SY 771   0 90   0   Loose   0.0   See   1.0   Mst   SY 771   0 90   10   Loose   0.0   See   1.0   Mst   SY 771   10 90   10   Loose   0.0   See   1.0   Mst   SY 771   10 80   10   Loose   0.0   See   1.0   SY 771   10 80   10   Loose   0.0   See   1.0   Se	3.	_	_	~	2	2	<b>=</b>	3	Mist	5Y 7/1	٥		⊷	Looke	₽-	100000		I of Grav SAND	nuderalles annot medium orașin
15   Mst   5Y 7/1   0   90   10   Llose   0.0	36 38 6 12 13 13 12 75 Mst 5Y771 0 90 10 0 Loose 0.0	15   150   Mst   5Y 7/1   0 90 10   Loose   0.0   Mst   5Y 7/1   0 90 10   Loose   0.0   Mst   5Y 7/1   10 80 10   Loose   0.0   Loose   0.0   Mst   5Y 7/1   10 80 10   Loose   0.0   Mst   Mst   SY 7/1   10 80 10   Loose   0.0   Mst	3				Ξ	21	92	25	Mst	SY 7/1	0	<u>.                                    </u>	<del>-</del>	Loos	-			As above	
100   Mst   5Y 7/1   10   80   10   1,000c   0.00     8   50   Mst   5Y 7/1   10   80   10   0   1,000c   0.00     9   70   Mst   5Y 7/1   10   80   10   0   1,000c   0.00     9   70   Mst   5Y 7/1   10   80   10   0   1,000c   0.00     10   10   10   1,000c   0.00     10   10   1,000c	38 40 4 8 11 13 19 190 Mst 5Y 711 0 90 10 1 Lose 40 42 6 8 10 14 18 50 Mst 5Y 711 10 80 10 0 Lose 44 44 10 13 14 11 27 100 Mst 5Y 771 10 80 10 0 Lose 45 48 10 12 14 16 26 80 Mst 5Y 771 10 80 10 0 Lose 48 50 9 11 14 18 25 80 Mst 5Y 771 10 80 10 0 Lose 48 50 9 11 14 18 25 80 Mst 5Y 771 10 80 10 0 Lose 49 11 14 18 25 80 Mst 5Y 771 10 80 10 0 Lose 40 40 41 10 11 14 18 25 80 Mst 5Y 771 10 80 10 0 Lose 40 40 41 10 11 14 18 25 80 Mst 5Y 771 10 80 10 0 Lose 41 41 41 41 41 41 14 14 14 14 14 14 14 1	19   100   Mst   5Y 7/1   10   80   10   1 Loose	3			2	=	13	25	75	Mst	1/L X\$	0		_	Loose				As above	
27 100 Mst 5Y 7/1 10 80 10 0 Loose 0.0 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	44 10 13 14 11 27 100 Mst 5Y7/1 10 80 10 0 1.00xe 0.0 \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	18   50   Mst   5Y 7/1   10   80   10   1 Loose   0.0   Str.   10   80   10   0   1 Loose   10   Str.   10   10   10   10   10   10   10   1	1			æ	=	13	5	9	Mst	5Y 7/1	0		<u> </u>	Loose	<u> </u>			As above	***************************************
27 100 Mst 5Y 7/1 10 80 10 0 Loose  28 80 Mst 5Y 7/1 10 80 10 0 Loose  29 80 Mst 5Y 7/1 10 80 10 0 Loose  20 80 Mst 5Y 7/1 10 80 10 0 Loose  21 80 Mst 5Y 7/1 10 80 10 0 Loose  22 80 Mst 5Y 7/1 10 80 10 0 Loose  23 80 Mst 5Y 7/1 10 80 10 0 Loose  24 80 Mst 6 A 7/1 10 80 10 0 Loose  25 80 Mst 6 A 7/1 10 80 10 0 Loose  26 80 Mst 6 A 7/1 10 80 10 0 Loose  27 80 Mst 6 A 7/1 10 80 10 0 Loose  28 80 Mst 7/1 10 80 10 0 Loose  29 80 Mst 6 A 7/1 10 80 10 0 Loose  20 80 Mst 7/1 10 80 10 0 Loose  20 80 Mst 6 A 7/1 10 80 10 0 Loose  20 80 Mst 7/1 10 80 10 0 Loose  20 80 Mst 6 A 7/1 10 80 10 0 Loose  20 80 Mst 7/1 10 80 10 0 Loose  20 80 Mst 7/1 10 80 10 0 Loose  20 80 Mst 6 A 7/1 10 80 10 0 Loose  20 80 Mst 7/1 10 80 10 0 Loose  20 80 Ms	44 10 13 14 11 27 100 Mst SY7/1 10 80 10 0 Loose 46 7 8 11 14 19 70 Mst SY7/1 10 80 10 0 Loose 48 10 12 14 16 26 80 Mst SY7/1 10 80 10 0 Loose 50 9 11 14 18 25 80 Mst SY7/1 10 80 10 0 Loose  1	27 100 MSt SY 7/1 10 80 10 0 Loose 26 80 MSt SY 7/1 10 80 10 0 Loose 25 80 MSt SY 7/1 10 80 10 0 Loose 25 80 MSt SY 7/1 10 80 10 0 Loose 26 80 MSt SY 7/1 10 80 10 0 Loose 27 10 10 10 10 10 10 10 10 10 10 10 10 10	1		_	∞	2	7	æ -	8	Mst	5Y 7/1	Ξ		-	Loose	<u>.                                    </u>		1	Lgt. Gray, SAND,	moderates sorted, medium grain, with grante g
9 70   Mst   5Y 771   10 80   10 0   Loose   0.0   As above   10 80   10 0   Loose   0.0   0.0   1.0   0.0   1.0   0.0	46 7 8 11 14 19 70 Msr 5Y7/1 10 80 10 0 Loose	19   70   Mst   5Y 771   10   80   10   0   LLose   0.0   Constant   0   Consta	*	i			₹	=	27	8	Msı	SY 7/1	9	_		Loose	L_			As above	
25 80 Mst 5Y 7/1 10 80 10 0 LLoose 0.0 SSSS As above As a	48     10     12     14     16     26     80     Mst     5Y 7/1     10     80     10     0     Loose     0.0       50     9     11     18     25     80     Mst     5Y 7/1     10     80     10     0     Loose     0.0       10	25 80 Mst 5Y 771 10 80 10 0 LLosc 0.0 \$\text{Losc} \text{ As above}	*	i		æ	=	4	61	۶	Mst	177 YS	2		├_	Loose				As above	A. 1840-1840   M. 1850-1840   M. 1840-1840   M. 184
25 80 Mst 5Y 7/1 10 80 10 0 LLoose SSSSS To As above	50 9 11 14 18 25 80 Mst SY7/1 10 80 10 0 Llowe SSSSSS	25 80 Mst 5Y 7/1 10 80 10 0 LLouxe SST-55	4			2	7	91	92	8	Mst	SY 7/1	2			Luose	_			As above	***************************************
Clip in g. c.g.: Files, Motions, and Consequents		Fig. mg. c. g.: Fine. Medium. and Coarse gained bys: : belve ground vuries   Mositure: Dry, Moisi (Mst), Wetr, Saurabed (Sail)   Stength (StatClay), Very Scht (V. Stit), Solt, Film. Very Film; Very Film; Very Film; Very Film; Very Scht (V. Stit), Solt, Film; Very Film; Ver	4			=	7	<u>∞</u>	23	8	Mst	1/L AS			<u> </u>	Loose	<u></u>			As above	
Clip in g. c.g.: Files, Motions, and Consequence		Fig. mg. c.g.: Fine. Medium., and Coanse-grained   Sterigh (Static Clay), Solt, Film. Very Frm (V. Frm)   Sterigh (Static Clay), Sold, Film. Very Frm (V. Frm)		_															111111111111111111111111111111111111111	PROPERTY OF STREET, ST	
Clip in g. cg. Files, Motion, and Consequents		Fig. mg. c.g.: Fine. Medium, and Coanse-grained   Stength (State) (State) (State) (State) (State)   Stength (State) (State) (State) (State)   Stength (State) (State) (State)   Stength (State) (State)   State)   Stength (State) (State)   Stength (State) (State)   Stength (State) (State)   Stength (State) (State)   State)   Stength (State) (State)   State)   Stength (State) (State) (State)   State)   S		_								***************************************		H			_	•		77.01468474.044444.04.04.04.04.04.04.04.04.04.04.0	***************************************
Clip in g. c.g.; Files, Motions, and Consequents		To any and Cares grained  To any and Cares grained  To any Addisor, and Cares grained Sterior (State) Sterior		_	_							***************************************		-	Ļ	-		•	***************************************		**************************************
Clip in g. c.g.: Files, Motions, and Consequents		Te. m.g. c.g.: Fine. Medium, and Coanse grained Mosture: Ory, Moist (Mst), Wet, Saturated (Sat) Stength (SatGolgy, Very Sout (V. Stt), Solf, Film, Very Frm (V. Frm)		_	_		L					***************************************		H	lacksquare		-	,		194899 49444 144 (T)   1   14   14   14   14   14   14   14	
Clin Carre State		Te. m.g. c.g.: Fine. Medium, and Coanse grained Mosture: Ory, Moist (Mst), Wet, Saturated (Sat) Stength (SatGolgy, Very Social (Sat) Stength (SatGolgy, Very Social (Sat)												-	_		-	1	Manage Level of Lane		the hadrest strong for the head when the owners the strong to the strong strong three desired and the strong was
Clin Carre State		Committee   Comm												-			-	,			***************************************
Clin Carre State		Committee   Comm										***************************************		┞		Martin Andreas			7211 1000	***************************************	***************************************
C. E. Files, Medium, and Collections		(fg. m.g. c. g.; Fine. Medium, and Coarse grained  fig. m.g. c. g.; Fine. Medium, and Coarse grained Strength (StatClay), Very Scht (V. Stt), Solt, Film, Very Firm (V. Frm)										771 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181 : 181		<del> </del>	-		<u> </u>	-	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	***************************************	
C. F. Files, Medium, and Collections		Clg. mg. c. g. Fine. Andium., and Course grained   Special Course Grain Very Scht (V. Stit), Sold. Film. Very Frm (V. Stit)		-	-	į	1			1				H				1		·	ACAILE AC
C. E. F. Ife., Medius, and Collection		fig. m.g. c.g.: Fine. Medium, and Coanse grained fig. m.g. c.g.: Fine. Medium, and Coanse grained fig. m.g. c.g.: Fine. Medium, and Coanse grained Steering ISBACOBy). Very Sort (V. Stt), Sold. Film. Very Firm (V. Str),		_	4	1						***************************************						. ,			
(Eg. m.g. c.g.; Fine, Medium, and Connection)		Fig. m.g. c.g.; Fine. Medium, and Canse-grained   Special Strength (SM&Clay), Very Script, Sol. Film, Very Frm (V. Sm), Sol. Film, Very Frm (V. Sm)		-			-			-		***************************************	1	+	1		_	1		***************************************	
(Eg. ft) c. c. t. Files, Medium, and Control size		(Li, m.g. c.g.: Fine-, Medium, and Conne-grained by: : below ground surfer Mosture: Cry. Most (Mst), West, Saturated (Sat) Strength (SM&Clay), Very Scht (V. Stt), Soft, Firm, Very Frm (V. Frm)		-					Ţ				1	+	Ţ		-			***************************************	ORGANISTI PROSTER CONTRACTOR PROTECTOR CONTRACTOR ON COMPANYA AND AND AND AND AND AND AND AND AND AN
LE, TI G. C.L. FIRC. Mediup. and CORRESSING		Fig. m.g. c.g.: Fine- Medium, and Coanse-grained by: Evelve ground surface   Mosture: Ory, Moist (Mst), Wet, Saturated (Sat)   Strength (SR&Clay): Very Sort (V. Stt), Soft, Firm, Very Frm (V. Frm)		Н	Н	Ш						***************************************	T		1		-	-	711111111111111111111111111111111111111		and the state of t
		fg m.g. c.g.: Fine Medium, and Coane-grained bgc.: below ground surface Mosture: Ory, Moist (Mst), Wet, Saturated (Sat) Strength (SR&Clay): Very Sort (V. Stt), Soft, Firm, Very Frm (V. Frm)	1	4	4											-		fg, m.g., c.g.:	Fine, Me	tivre, and Course grain siz	
bgs.: below ground surface									Tu. m.g.	fg. m.g		I.: Firse. Medium., and	Coarse	rained d (Sat)			Pick B	CB, M.G. C.B.:	Fine, Me	lium, and Course grain siz	
Modsture: Cry, Moist (Mst), Wel. Salurated (Sal)	Moderne: Lry, Motel (MSI), Wel, Galurated (Sat)																Streng	th (Sand): Very	Loose (V	V. 511), 3011, Fiffin, very r Los), Loose, Danse, Ver	irim (V. Frin) ry Dense (V.Den)

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Cottage Grove, Minnesot

OVERBURDEN BORING LOG

Cuting Craw, MN Pacility   Caring Craw, MN Pac	VME:	***************************************			***************************************	***************************************											***************************************	I MAIE:
Part   Part   Tability   Part   Par	G. NO.:	- Annie de la companie de la compani					Cottage 02181-	6 Grove, 1	MN Facility 1001						BLEV (TO NORTHIN	ق يَ	1	
Sample (If beyo) 6.7 (1) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	Area Name; Drilling Contractor; Drilling Equipment; Logged By;	Haranan Haranan Haranan					Fire T. Amerik HSA Ethan		rea pecting & Testing		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			= <u> </u>	EASTING: up in to Water (il al Boring Depth pile to Related (il ring Diameter (il		25 25 NA NA 0 6	Location Type: ( ) GeoProbe ( ) Weil  Completion Zone: (X ) Soil Boring ( ) Other: Completion Type: ( ) Monitoring Weil  (X ) Abandoned by Grout  ( X ) Abandoned by Grout  ( ) Other (Provide Comments)
Milego   6°   6°   6°   6°   10   60   Dry   2.5Y 3/3   0   60   30   10 cose   10   60   Dry   2.5Y 3/3   0   60   30   10 cose   10   60   30   30   30   10 cose   10   60   60   60   60   60   60   60		·	Blow	Coun		aufsv-n	увсолый	erutsioM	Color	25	ılı Siz		Strength	MVO	Well Column	elqrine2 tio2		
0         2         2         4         6         6         10         60         30         10 cose           2         4         4         5         6         9         40         DDy         25Y3/3         0         60         30         Loose           4         5         6         9         40         DDy         25Y3/3         0         60         30         Loose           5         6         9         1         26         60         DDy         25Y3/3         0         60         30         Loose           6         8         13         15         11         20         60         DDy         25Y4/6         30         50         10         Loose           8         10         10         11         20         40         DDy         25Y4/6         30         50         0         Loose           10         12         17         30         Mst         25Y4/6         30         50         0         Loose           11         16         18         9         12         17         30         Mst         25Y4/6         30         50         0         Lo	+	-1	اة	ئ			<b>%</b>		Munsell		-	5		Š				Lithic Description
2         4         4         4         5         6         9         40         DDy         25Y3/3         0         60         30         Louse           4         5         6         9         4         5         6         9         10         Louse         8         10         Louse         8         10         11         20         60         DDy         2.5Y4/6         30         20         0         Louse         8         10         11         20         60         DDy         2.5Y4/6         30         20         0         Louse         9         1         1         1         1         1         10         1         1         20         0         DDy         2.5Y4/6         30         20         0         Louse         9         1	-	-	4	۶	9	0	9	Dry	2.5¥ 3/3	_	_	_	Loose				Olive. Brn. Clayey	illy SAND, propriy sorted, fine grain
4         5         6         9         25         49         5         6         30         10 Loose         6         30         10 Loose         6         8         13         15         11         26         60         DDy         2.5Y 4%         30         50         10 Loose         6         8         13         15         11         20         0         Loose         9         10	-	-	4	S	9	ç	9	Dry	2.5Y 3/3	<del></del>	-	·	Loose				As Above	reme Arraentennamalikansamentennemenentennemenkansamenenkansamenen en
5         6         17         11         26         60         Dry         2.5Y4%         30         20         0         Loose           8         10         16         11         30         60         Dry         2.5Y4%         30         50         0         Loose           8         10         10         11         20         40         Dry         2.5Y4%         30         50         0         Loose           10         12         8         7         10         12         17         30         Mst         2.5Y4%         30         50         0         Loose           12         14         16         18         20         Mst         2.5Y4%         30         0         1         Loose           16         18         10         10         11         25         50         Mst         2.5Y4%         0         80         20         0         Loose           16         18         20         10         80         20         0         Loose         25         24         6         1         Loose           20         22         24         13         16	-	-	6			26	9	Dry	2.5Y 3/3	_	_	-	Louse				As Above	i <del>elden</del> et (seplis til genå fall elden fiberskes fæli eftistet prissisten måns satsyrppræsed mæssars in man.
8 13 15 15 15 10 40 Dry 2.5Y4/6 30 50 Louse 8 10 10 11 9 11 20 40 Dry 2.5Y4/6 30 50 Louse 10 12 8 7 10 12 17 30 Mst 2.5Y4/6 30 50 0 Louse 11 14 16 8 9 12 17 30 Mst 2.5Y4/6 30 50 0 Louse 114 15 18 17 18 27 40 Mst 2.5Y4/6 30 50 0 Louse 115 20 19 9 9 13 18 70 Mst 2.5Y4/6 0 80 20 0 Louse 20 22 9 13 14 16 17 30 60 Mst 2.5Y4/6 0 80 20 0 Louse 21 24 25 10 11 80 Mst 2.5Y4/6 0 80 20 0 Louse 22 24 25 10 11 80 Mst 2.5Y4/6 0 80 20 0 Louse 23 24 25 10 11 80 Mst 2.5Y4/6 0 80 20 0 Louse 24 25 10 11 80 Mst 2.5Y4/6 0 80 20 0 Louse 25 24 25 10 11 80 Mst 2.5Y4/6 0 80 20 0 Louse 26 27 28 10 11 80 Mst 2.5Y4/6 0 80 20 0 Louse 27 24 25 10 11 80 Mst 2.5Y4/6 0 80 20 0 Louse 28 29 13 14 16 17 30 60 Mst 2.5Y4/6 0 80 20 0 Louse 29 20 10 10 10 10 10 10 10 10 10 10 10 10 10	-			-	=	56	ક	Dry	2.5Y 4/6	·	-	0	Loose			<u> </u>	Let. Ylw. Bm. Gra-	ely Silv SAND, very morely sorted coarse ordin
8   10   10   11   9   11   20   40   Dry   2.574%   30   50   0   Loase   Company			15	22	=	Š	જુ	Diy	2.5Y 4/6	•		-	Loose				As Above	
10   12   8   7   10   12   17   30   Mst   25Y4%   30   50   0   Locke   Company	-	-	=	2	=	30	\$	Δ'n	2.5Y 4/6		_		Loose	L			As Above	i i i destatato i interiori de destato de de
12   14   16   8   9   12   17   30   Mst   25Y4/6   30   50   0   Loose	_		7	2	12	17	õ	Mst	2.5Y 4/6		-	0	Louse	_			As Above	a von verrei et
14   16   10   17   18   27   40   Mst   25Y4%   30   50   0   Loose   16   18   15   15   10   11   25   60   Mst   25Y4%   0   80   20   0   Loose   18   18   20   10   Loose   19   20   2   2   2   2   2   2   2   2	-	-	∞	6	12	1	ಜ	Mst	2.5Y 4/6		-	-	Loose	L			As Above	PROPERTY OF THE PROPERTY OF TH
16 18 15 15 10 11 25 60 Mst 2.5Y46 0 80 20 0 Loose 18 20 10 9 9 13 18 70 Mst 2.5Y46 0 80 20 0 Loose 20 22 9 13 14 17 27 50 Mst 2.5Y46 0 80 20 0 Loose 22 24 11 14 16 17 30 60 Mst 2.5Y46 0 80 20 0 Loose 24 25 10 11 80 Mst 2.5Y46 0 80 20 0 Loose 25 10 11 80 Mst 2.5Y46 0 80 20 0 Loose 26 10 11 80 Mst 2.5Y46 0 80 20 0 Loose 27 26 11 14 16 16 17 11 80 Mst 2.5Y46 0 80 20 0 Loose 28 29 10 11 11 80 Mst 2.5Y46 0 80 20 0 Loose	-	4	2	-	2	27	\$	Mst	2.5Y 4/6	_	_	0	Loose				As Above	i adambikatiya na sayaya inganga kanana i
18 20 10 9 9 13 18 70 Mst 2.5Y4% 0 80 20 0 Loose 20 22 9 13 14 17 27 50 Mst 2.5Y4% 0 80 20 0 Loose 22 24 11 14 16 17 30 60 Mst 2.5Y4% 0 80 20 0 Loose 24 25 10 11 80 Mst 2.5Y4% 0 80 20 0 Loose 25 10 11 80 Mst 2.5Y4% 0 80 20 0 Loose 26 27 10 11 80 Mst 2.5Y4% 0 80 20 0 Loose 27 28 10 11 10 11 10 11 10 11 10 11 10 10 10			15	2	=	25	ક	Mst	2.5Y 4/6	-		<u> </u>	Logs				Let. Ylw. Brn. Silty	SAND, mxderatly sorted, fine grain
20 22 9 13 14 17 27 50 Msr 2.5Y4/6 0 80 20 0 Loose 22 1 11 14 16 17 30 60 Msr 2.5Y4/6 0 80 20 0 Loose 24 11 14 16 17 30 60 Msr 2.5Y4/6 0 80 20 0 Loose 24 1 1 1 80 Msr 2.5Y4/6 0 80 20 0 Loose 24 2 1 1 1 80 Msr 2.5Y4/6 0 80 20 0 Loose 24 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			6	6	2	<b>∞</b>	5	Mst	2.5Y 4/6	_	-	_	Loose	_			Let. Ylw. Bin. Siliv	SAND, moderativ sorted, medium grain
24 25 10 11 80 Mss 2.574/6 0 80 20 0 Loose SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS			2	4	13	27	S	Mst	2.5Y 4/6	+	-	-	Loose				As Above	THE REAL PROPERTY OF THE PROPE
24 25 10 11 80 Mst 2.5Y4/6 0 80 20 0 Loose		=	4	2	2	8	3	Mst	2.5Y 4/6	<del>}</del>	<del>-</del>	÷	Loose	-			Lot Vlay Res Siles	SAND productive endod fine main
	-	<u> </u>	=			Ξ	28	Mst	2 5Y 4/6	<del>!</del>	<u> </u>	Ī	000			-	As Above	or to the state of the second
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PROJECT NO.:	ł	***************************************	***************************************	************	***************************************	02181-00	-002-010	2-010-0001	,					ELEV (10C)	් ට	er en en en en en en en en en en en en en
Area Name:						1	Training	oing Area						KASTING	3	The state of the s
Drilling Contractor:		***************************************	***************************************				KAN ENE	American Engineering & Testing					å	Depth to Water (ft bgs)	(134)	NM
Logged By:		***************************************	***************************************		melo brack contracts	1	n Caldwell		. 1				Fota	Fotal Boring Depth (ft ligs)	fi ligs)	
	111					! ! !			. , .				Hort Hort	liepin to Ketussi (it bgt): Boring Diameter (inches):		NA Completion Type: ( ) Monitoring Weil  6 C (X) Abninology Grout ( ) Other (Provide Comments)
<b></b>	Sample	Ì			eulsv-n	Кесолегу	Projeture	Color	5	Grein Size	g	Strength	MVO	nmuioO lie	eldme2 lio	<b></b> •
(fringl) (fr	(ft hgs)	6" 6	6" 6"	. e	Tarted .	3		Munsell	ĕ	8 8	ē	den months	Intra	M	2	
0	7	2	3	5   5	9	5	Σ	5Y 4/4	-	+-	2	1800		1000		Lithic Description
2	4	2	3.4	5	7	40	Mst	5Y 4/4	+	-	2	2000	0.0		Ŧ	VIIV JIIIV JAIN JAIN JAIN SOUGH, IIIR BIJII As Abrilia
#	9	7	12	15 15	<b>5</b> 2	9	X. M.	2.5Y 4/6	÷-	-	2	2003				Let. Ylw. Bri. Silv SAND were months sorted was constructed in the
9	<del>-  </del> -	<del>-</del> ‡		<del>- }</del> -		$\vdash$				П						
٥	<del>-</del>	2 \	<del>-</del>	+		-	¥st	2.5Y 4/6		07 09	2	Pose				and property of the property o
6	3		-	21	\$	52	ž	2.5Y 4/6	20	20 20	2	Loose	data readon.			Let. Ylw. Bm. Gravely Silly SAND, very poorly sorted, very coarse grain
01	12	7	8 /	9	+-	+	Wet	2 5 V 4 //	10.	20	-		0.0		Ţ	PHETHERITATION COMMISSIONERS IN THE COMMISSION CONTINUES AND AND AND AND AND AND AND AND AND AND
12	4	2	8	_	17	8	Wet	2 SY 477	<u> </u>		9 0	T COST	3		-	Let. Ylw. Bri Silly SAND, poorly sorted, coarse grain, with gravel
<u>-</u>	91	<u>~</u> ∞	10 12	<u> </u>	22	3	Wet	2.5Y 4/8	<del>-i</del>	÷	, c	1 200			ļ	AS ABAYC  THE PROPERTY OF THE
91	æ	_	<del> </del>	-	=	8	Mst	2.5Y 4/9		-	<del>-</del>	3	00		Ī	AS ABOVE
<u>×</u>	161	_	2	=	┼	<u> </u>	Mst	2.5Y 4/10	<u> </u>	÷	+-		3			LEI. TIW. Bin Silly SAND, poorly sorted, medium grain, with gravel
61	2	-					Mst	2.5Y 4/11	<del>-</del>		╁	esec				A ABOVE  Let VII. Per Cib. CANID.
20	i	┪		7	3		Mst	2.5Y 4/12	2	<del>-</del>	0	ese	0.0		ĺ	Let Vin Der City CAND
22	_	<del>-</del>	12 12	<u>=</u>	+	-	Mst	2.5Y 4/13	10	70 20	0	Luose	***************************************			As Above
+7	9	25	2	-	25	-	Mst	2.57 4/14	10	70 20	0	Loose				AS Above
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		-	-		1	_	-		-	T						***************************************
	_		1		-	-		***************************************						<u>.i</u>	- Secondores	A WITH MATERIAL PROPERTY OF THE PROPERTY OF TH
		<u> </u>	H						-		-	-		j		***************************************
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	-	-	1	+	1						_	1	-+			
Clarication of Charles		1	1	-							_			.c. m.s. c.e.: Fi	no. Made	18.10.8. C.E. 190. Medium, and Course, argin class

7/20/2005

02181,002.010.0001

FSIA Investigation Cottage Grove, Minnesota

### OVERBURDEN BORING LOG

E: NO.: : miractor: ulpment:	***************************************				,									ŀ			l
D.: ractor: pasent:			************	***************************************	3	Sential							ELEY (GRND)	6		Page 1 of 1	DATE: 23 May 05
	***************************************				Cotta 02 t81	Cottage Crove, MN 02181-002-010-000	Coltage Crove, MN Facility 02181-002-010-0003						ELEV (TOC) <sup>b</sup> NORTHING:	الم	THE PERSON NAMED IN COLUMN STREET, SAN THE PERSON NAMED I		
	***************************************					Fire Training Area American Engineer	Fire Training Area American Engineering & Testing	,				å	EASTING: Depth to Water (ft bgs)	153		Location Type: ( ) GeoProbe (	( ) Well
Apped NY:					LISA	Coldwell						Togs	Total Boring Depth (ft bgs)	(såq)		Completion Zone: (X) Overburden () Bedrock	urden ( ) Bedrock
					1 7 7							Borl	Urpin to Kelmal (if Bgs): Boring Diameter (inches):	Dgs): :hc:s):	9 VA	Lompietion 17pe: ( ) Monitoring Well ( X ) Abandoned by Grout ( ) Other (Provide Connents)	( ) Monitoring Well (X ) Abundoned by Grout ( ) Other (Provide Conments)
Sample	á			anjev-u	Весолегу	enutaioM	Сою	Ö	Grain Size	. 56	Strength	MIAO	nmuloo liej	siqmač lioč			
┿	.9		9		3		leenmy	ð	8	2		Units				reference of selection	
0 2	- 2	┢	<del>-</del>		æ	Wes	SY 2.5/2	-	+-	-	Loose	-	100000		RIK Silv SAND no	riv coned medium/fina ami	1.
2 4	2 6	2	2	9	8	Dry	5Y 4/3	<del>+-</del>	<del></del>	<del>-</del>	Finn	0.0		***************************************	Offive Clayry Sandy Stl T	Olive Clayer Sandy SH T	
	7 13	=	_	24	ŝ	Dry	2.5Y 4/6	0	60 20	-	Loose				Let. Ylw. Bm. Silty	Let. Ylw. Bm. Silly SAND, very murby sorted, very conne grain with	erv coarse erain with
-	+		-												gravel		
8 9	7 5	4	21	2	9	Dry	2.5Y 4/6	g	40 20	2	Loose				Lgt. Ylw. Bm. Silty (	Lgt. Ylw. Brn. Silty Gravely SAND, very poorly sorted, very coarse grain	onted, very coarse grain
Î		+	+	-	-							-			with Taconite and Limestone gravels.	mestone gravels.	
2	- ‡	÷		<del>-</del>	8	Dry	2.5Y 4/6	e e	40 20	2	Loose				As Above		
12		4		33	9	XX	2.5Y 4/6	_ i	40 20	2	Loose				As Above		***************************************
4	7	_	2		\$	Mst	2.5Y 4/6	ž	40 20	2	Loose				As Above		Mirt 100 100 100 100 100 100 100 100 100 10
14 16	6 5	-	٥	Ξ	æ	Mst	2.5Y 4/6	-	80 20	0	roose	0.0			Let. Ylw. Brn. Silty S	Lgt. Ylw. Brn. Silly SAND, moderally sorted, coarse grain	rse grain
<u>×</u>		_	•	=	3	Σ	2.5Y 4/6	-	80 20	9	Loose				As Above	(ed) read (p) p) et es restat (s) (s) a palabana di Labana habana, as as asam (seens	1.W. 10. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
30	10	12	=	27	<b>9</b>	Mst	2.5Y 4/6	9	80 20	0	Louse				As Above	i'ul bi tabishee sedo pil suu yr 17 vrissin weerega see 16 ilikadaalaa i'u	WHAT THE COLUMN TO THE PARTY OF THE PROPERTY OF THE PARTY
22	-+	<u>ٺ</u>	<u></u> į	-	9	Mst	2.5Y 4/6	_	80 20	0	Loose	0.0			As Above	rabellabid katatal tirabilah in prisser atterities partaut.	With Millians and Additional Co. Mr. Carlotter Co. Co. Co. Co. Co. Co. Co. Co. Co. Co.
74	17 12	12	<u>~</u>	52	8	Dry	5Y 6/3	•	70 30	0	Loose				Pale Olive, Silty SAN	Pale Olive, Silty SAND, well sorted, very fine grain	in
24 25	9	-	-	ا ه	3	Di	SY 6/3		80 20	o	Loose				As Above		
***************************************	+	+			-		***************************************		-					-		***************************************	ARTHRONIA MANAGAMAMAMAMAMAMAMAMAMAMAMAMAMAMAMAMAMA
								G day.co	┝				; 	-	***************************************	istered consequences with the second consequence of the second consequ	***************************************
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	-	-							-	$\top$					***************************************	***************************************	***************************************
	H								H		***************************************					***************************************	***************************************
	-	4	4	1					-				fg. m.g., c.g.: F.	ine. Med	f.g. m.g., e.g.: Fine., Medium., and Coane-grain size	bgs: below ground surface	rince

30000000

																		SITE ID: WPA01
CLIENT		1	M4449141777771911911	***************************************	Alternative	-	Confident	cuttal							ELEV (CHND)	HND)		Page 1 of 1 DATE: 25 May 05
PROJECT NO.:	ö	***************************************	***************************************				Cottage Gr 02181-002-(		eve, MN Facility						RELEY (TOC)	<u> </u>	***************************************	· · · · · · · · · · · · · · · · · · ·
Area Name				***************************************	the state of the s		Former W		stewater Pond Area						EASTING	ë	***************************************	Location Type: ( ) GeoProbe ( ) Well
Dening Contractor	ractor						American		ingineering & Testing					đ	Depth to Water (ft bgs)	(g phr		(X) Soil Boring ( ) Other:
I nound Rv:	parent:		-			***************************************	NSV.	17.77						Ţoţ	Total Boring Depth (16 bgs)	(h (ii bgs)	in the state of th	Completion Zone: (X) Overburden ( ) Bedrock
· Cropped and		aretter.		*	deletion	· · · · · · · · · · · · · · · · · · ·	E CONTO	Emin Cardwell						ă .	Depth to Refusal (ft bgs):	(fr thgs)		Completion Type: ( ) Mouttoring Well
			***************************************	***************************************	***************************************	***************************************								Š	Borng Dameter (inches):	(inches):	***************************************	(X) Abandoned by Grout ( ) Other (Provide Comments)
						auisv-	COASIA	ərutsic	) olor	5	Grain Size	2	цъбиал	MVC	Сечита	Sample		
EL.EV.	Interval	2 7	B	Blow Count	1	u	e H	W	3				98	)	lem	Po2		
	£ŀ	٥		5	.9		Ē		Mungel	উ	8	ō	-	Units				Lithic Description
	-	0.5	-	-		0					Н						ASPHALT	
	0.5	_	-	-	1	٥											ABC STONE	
***************************************	┪	2	_	4	و	4	50	Š	Gley   2.5/N	0	50 30	8	Loose				Blk. Claycy Si	BIK. Clayey Sity SAND, pxyrly sorted, fine grain
***************************************	2 4	4 7	۰	٥	12	~	20	D J	Gley 1 3/2	0	50 30	8	Loose				V. Dk. Grayish	V. Dk. Grayish Green, Clayey Silty SAND, pourly sorted, fine grain
***************************************	+	0 5	2	15	15	22	3	D Z	Gley 1 3/3	0	50 30	8	<u> </u>				As Above	
***************************************	-			5	12	9	<u>@</u>	Msi	2.SY 4/4	0	30	9	Loose	00			Olive Br. Silly	Olive Br. Silty SAND, very monthy sorted, medium orain
	+	-	+	29	22	35	8	Msi	2.5Y 4/4	. <b>36</b>	80 20	0	Loose				Olive Br. Silty	Olive Br. Silty SAND, poorly sorted, medium grain
	<del>-</del>	12 7	2	∞	15	ន	3	Wet	2.5Y 4/4	0	80 20	0	Loose				As Above	were week and the second contract of the second second second second second second second second second second
	1 7	14	- 13		4	25	08	Wet	2.5Y 4/4	<b>30</b>	80 20	0	Loose	8			As Above	distric destrict in 1961/1961 in the second destriction of the second destriction of the second destriction of
	4			œ	91	=	08	Wei	2.5Y 4/4	0	80 20	0	Loose	<u> </u>			As Above	***************************************
	_			≆	Ξ	22	3	Da	Gley 2 4/1	<u>۔</u>		↓_	V. Den			Ļ	V Dk Rhieh	V DE Blieb Grav Gily CAND proved fine easing states of the
***************************************	-	20 20			2	2	8	Σ	Gley 2 4/1	0		0	Dense	90.0			Dk Bluish Gra	Dk. Bluish City Silty SAND reverte system (inc menin strains of the color
I bettel idealand represent	<del>-                                    </del>	22 9	6	2	Ξ	≏	ŝ	υy	Glcy 2 2.5/5PB	0	80 20	0	Loose	£		Ļ	Bluish Blk. Sift	Bluish Blk. Silty SAND, mynty sorted, fine grain, steene cylor
***************************************	+	74 4	4	9	8	2	3	Dry	Glcy 2 2.5/5PB	90	80 20	0	Loose	12.0			As Above	Ministerational and committee of the commence of the comment of th
	24 2	5 4	+	_		4	8	Dry	Gley 2.2.5/5PB	<b>30</b>	80 20	0	Loose				As Above	
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		-		1	1					1	4				f.g. m.g. c.g.:	: Fing-, A	Fine-, Meditan-, and Coarse-grain size	1 size below ground surface
Elevation of Top of Casing given in feet from mean sea level.	ool Casing	givenin	feet from	naem in	sea leve sea leve			hg. m.g. c. Moisture: 1	Lg. m.g., c.g.; Fine., Medium., and Coarse-grained Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)	oarse-gra sturated	(Sat)			Strengt	slow ground su h (Sat&Clay):	rface Very Sof	bgs.: below ground surface Strength (SittaClay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)	or Firm (V. Fm)

Strength (Sitt&Clay): Very Soft (V. Sft), Soft, Firm. Very Firm (V. Frm) Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

02181.002.010.0001

FSIA Investigation Cottage Grove, Minnesota

# OVERBURDEN BORING LOG

Contage Greek, M.N. Facility   Contage Greek, M.N. Facility	Confidence   Con	Dk. Bn. Sily SAND, very pk. As Above
Coltage Contage   Coltage   Coltag	Sample	Dk. Bn. Sily SAND, very pk. As Above
High	FASTING   Parish to Where (1 lbs)   Parish	Dk. Bm. Silty SAND, very pt As Above
Complete   Complete	Main   Paris	Dk. Bm. Silty SAND, very lx As Above
Column   C	Mail	alques lios
(%)         Munnell         Gr. 8         91         Chance           19         70         Dry         7.5YR 33         10         50         30         10         Louse           15         80         Dry         7.5YR 33         10         50         30         10         Louse         10	Use   Gr   Gr   Gr   Gr   Gr   Gr   Gr   G	
9 70   Dry 7.5YR 3.3   10 50 30   10   Louse	2 5 7 12 11 19 70 Dry 7.5YR 3/3 10 50 10 Louse	
17   80   Dry   7.57/R 3.3   10   50   30   10   Louse	4         8         9         8         7         17         80         Dpy         7.5YR 3.3         10         50         30         10         Loose         0.0           8         7         6         4         4         15         80         Dpy         7.5YR 3.3         10         50         10         Loose         0.0           10         5         2         2         4         4         70         Mst         2.5Y 6.4         0         80         20         0         Loose         0.0           11         5         2         2         4         4         50         Mst         2.5Y 6.4         0         80         20         0         Loose         0.0           16         4         4         4         8         50         Mst         2.5Y 6.4         0         80         20         0         Loose         0.0           18         4         4         4         8         50         Mst         2.5Y 6.4         0         80         20         0         Loose         0.0           20         5         4         4         5         8         60         Ms	
S   80   Dry   7.57R 3/3   10   50   30   10   Luose   0.0	S	
0   60   Msi   7.5/R 3/3   10   50   30   10   Luose   4   70   Msi   2.5 V 6/4   0   80   20   0   Luose   0 0   1   1   1   1   1   1   1   1	8       7       6       4       10       60       Msi       7.5YR 3/3       10       50       10       Loose         10       5       2       2       4       4       70       Msi       2.5Y 6/4       0       80       20       0       Loose       00         14       5       3       4       4       7       70       Msi       2.5Y 6/4       0       80       20       0       Loose       00       10	
4 50 Mst 25Y 64 0 80 20 0 Louse 0.0  8 50 Mst 25Y 64 0 80 20 0 Louse 0 80 20 20 20 20 20 20 20 20 20 20 20 20 20	10   5   2   2   4   4   50   Mst   259 64   0   80   20   0   Louse   0.0   1.0	
4         50         Mst         25Y 64         0         80         20         0         Louse           7         70         Mst         25Y 64         0         80         20         0         Louse         0           8         50         Mst         25Y 64         0         80         20         0         Louse         0           9         50         Mst         25Y 64         0         80         20         0         Louse         0           8         60         Mst         25Y 64         0         80         20         0         Louse         0           4         100         Mst         5Y 64         0         80         20         0         Louse         0           4         100         Mst         5Y 64         0         80         20         0         Louse         0           9         5         5         6         0         0         0         0         0         0         0           1         0         0         0         0         0         0         0         0         0         0         0	12	
7         70         Mst         25Y 6/4         0         80         20         Losse         6         As Above           8         50         Mst         25Y 6/4         0         80         20         Losse         0         As Above           8         60         Mst         25Y 6/4         0         80         20         Losse         As Above           8         80         Mst         5Y 6/4         0         80         20         Losse         As Above           4         100         Mst         5Y 6/4         0         80         20         Losse         As Above           4         100         Mst         5Y 6/4         0         80         20         Losse         As Above           4         100         Mst         5Y 6/4         0         80         20         Losse         As Above         Teminated boring at	14   5   3   4   4   7   70   Mst   25Y 6/4   0   80   20   0   Louse   1   4   8   50   Mst   25Y 6/4   0   80   20   0   Louse   0   5   5   4   4   5   8   60   Mst   25Y 6/4   0   80   20   0   Louse   0   5   5   4   4   5   8   60   Mst   25Y 6/4   0   80   20   0   Louse   0   5   5   4   4   5   8   60   Mst   25Y 6/4   0   80   20   0   Louse   0   5   5   4   4   6   8   80   Mst   25Y 6/4   0   80   20   0   Louse   0   5   5   4   4   100   Mst   5Y 6/4   0   80   20   0   Louse   0   5   5   5   4   4   100   Mst   5Y 6/4   0   80   20   0   Louse   0   5   5   5   5   5   5   5   5   5	
8         50         Mst         25Y 6/4         0         80         20         Loose         00         Street         As Above           8         60         Mst         25Y 6/4         0         80         20         0         Loose         As Above           8         80         Mst         25Y 6/4         0         80         20         1 Loose         0         As Above           13         80         Mst         5Y 6/4         0         80         20         1 Loose         0         Rs Above           4         100         Mst         5Y 6/4         0         80         20         1 Loose         0         Rs Above           4         100         Mst         5Y 6/4         0         80         20         1 Loose         0         Rs Above         As Above         Terminated builing at Above	16	
9         50         Mst         25Y 6/4         0         80         20         Loose           8         60         Mst         25Y 6/4         0         80         20         0         Loose         10         6/5         As Above           13         80         Mst         5Y 6/4         0         80         20         1 Loose         10         6/5         As Above         Fale Olive, Silty SAND, well sort           4         100         Mst         5Y 6/4         0         80         20         1 Loose         6/5         As Above, Terminated boring at 7           4         100         Mst         5Y 6/4         0         80         20         1 Loose         6/5         As Above, Terminated boring at 7	18         4         5         4         5         9         50         Mst         25Y 644         0         80         20         0         Louse         6         As Above           20         5         4         4         6         8         80         Mst         25Y 644         0         80         100         500         1 Louse         00         0         1 Louse         00         0         1 Louse         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	
8 60 Mst 25Y 6/4 0 80 20 0 Loose	20         5         4         4         5         8         60         Mst         25Y 644         0         80         20         0         Losse         0.0         Cost         As Above           24         6         6         7         8         13         80         Mst         5Y 644         0         80         20         0         Losse         0.0         Cost         Pale Olive, Sily SAND, well sun           25         5         4         4         100         Mst         5Y 644         0         80         20         0         Losse         0         Cost         As Above, Terminated boring at 7           1	
8 80 Mst 2.5Y 6/4 0 80 20 0 Loose 0.0 \$\infty\$ 8 100 Mst SY 6/4 0 80	22     7     4     4     6     8     80     Mst     2.5Y 6/4     0     80     20     0     Locose     0.0     SSSS       24     6     6     7     8     13     80     Mst     5Y 6/4     0     80     20     0     Locose     0.0     SSSSS       25     5     4     4     100     Mst     5Y 6/4     0     80     20     0     Locose     Coorse     As Above, Terminated boring at 7       1	
3   80   Mst   5	24 6 6 7 8 13 80 Mst 57 644 0 80 20 0 Loose 0.0 SSSS Pale Olive, Silty SAND, well son as a second se	
4 100 Mst 57 6/4 0 80 20 0 Louse	25 5 4 4 100 Mst SY 6/4 0 80 20 0 Loose	
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(E. H. C. S. F. He. S. McHine. and Coast-communications)		HARTHAN DIE MARKET PER ER HARTE EIN AUTHERE BESTELLE BEST
	f.g. m.g., c.p.: Fine- Medium- and Coase-grain size	is, c.g., fine, Medium, and Courseting size
f.g., Dt.g., c.g.: Fine, Medium, and Coprogrammed	bga.: hclo	E. Ing. C. E. T. Three Modulary and Course grain size

OVERBURDEN BORING LOG	ELEY (GRND)*; ELEY (TOC)* NORTHING:	EASTING; Depth to Water (ft bgs) NM Total Boring Depth (ft bgs) 25	Depth to Refusal (It bes): Boring Diameter (inches):	Cotor Size Strength OVM Soil Sample	Gr S SI CI Unite	15 60 15 10 Luose   \$\$\$\$\$	15 60 15 10 Loose	15 60 15 10 Loose	2 2	15 60 15 10 Loose	10 60 30 0 Loose 0.0 55555	10 60 30 0 Louse	10 60 30 0 1 200 0 0	T	0 80 20 0 Loose	0 80 20 0 Louse 0.0 (*; *; *;	0 80 20 0 Loose	10 /0 10 0 F00se 0.0	101	10 70 10 0 Loose			
URDEN BORII	, MN Facility -0001	D5 American Engineering & Testing 115A		Color	Munsell Gr		-		2.5Y 2.5/4 15		5Y 2.5/1 10	5Y 2.5/1 10	01 1/5 6 A5	T				7.3 Y 6/4 10	2.5Y 6/4 10				
VERB	Confidential Cottage Grove 02181-002-010	rican Eng	man Caldwell	arutaioM			-	-	àà		Щ	Dy	Ž	+			+	<u>د</u> د	Wet	┥			
0	Cotts 0218	DS Amei		Кесолегу	(%)		2 2	-	+	3	8	8	┿	75	Н		+	8	8	H	$\perp$		
				N-vaiue			<del>-                                    </del>	2 5	+-	7	7	5	6	9	10 20	2			=	œ	+	$\dashv$	
			***************************************	, rout	9 .9	1000	4		<del> </del>		4	+	5 4	3 4	<u> </u>	-	-	4	5 8	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	$\dashv$	
				Blow Count	9.	=	1	-	1	3		3	4	3	2	+		1	9	œ	$\dashv$		
			***************************************	Ē	9	4	+	7	. 5	2		2	4	4	7	S	9	<del> </del>	20	=			-
	1 1 1			9 <u>8</u>	1	-	5 ,	4 4	9	7	∞	≘	12	14	9	æ	8 8	†	24	52	$\dagger$	$\dashv \uparrow$	-
	ä	actor:		Sample	(ft bgs)	0		۲ ر	4	9	7	∞	=	13	4	9	× 5	1	22	24	T	11	1
. A	CLIENT: SITE NAME: PROJECT NO	Area Name: Drilling Contractor: Drilling Equipment:	Logked by:	ELEV.	(fra h)	***************************************																***************************************	- darameter property

02181.002.010.0001 Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

Area Name: Drilling Contractor: Drilling Equipment: Logged By:	tor: ent:						Cottage Cottag	ge Grove, MN -002-010-0001  can Engineer	Cottage Grove, MN Facility 02:81-002-010-0001  D8 American Engineering & Testing IISA Ethan Caldwell		, Nº			4 5 2 8	FLEV (TOC) <sup>b</sup> NORTHING: EASTING: EASTING: Deph to Water (ft bgs) Total Boring Deph (ft bgs) Deph to Refusal (ft bgs) Boring Dameter (inches):	Total	NM 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1.0cation Type: ( ) Geofrobe ( ) Well (X ) Seil Boring ( ) Other: Completion Zone: (X ) Overhurden ( ) Bedrock Completion Type: ( ) Monitoring Well (X) Abandoned by Grout
	Sample		Wild	Blow Count	1	enisv-n	Кесочегу	eruteioM	Сою	ō	Grain Size	92	rhgnant2	MVO	nmuloO ilaW	siduas Hos	J	The state of the s
(fi msi)	(ft bgs)	.9		.9	9		2		Munsell	ŏ	S SI	13		Units				Lithic Description
	1 0	8	2	Ц	Ц	\$	09	Dry	2.5Y 6/4	-							Lgt. Ylw. Brn. Grav.	Lgt. Ylw. Brn. Gravely Silty SAND, very poorly sorted, coarse grain
_	C1	-	_	4	5	4	3	Mst	10YR 4/6		8 3	0	Soft	-		-	8	Chycy Sandy SILT
	2 4	3	4	3	2	7	3	¥et	10YR 4/6	2	38	-+	Soft	0.0			As Above	Halife (Chiledelphia pri de 1911 ann ann an Chorne i Gerinn Sintesian Die 1907 FUI i III) paeth ann ann an
_	4 6	3	3	s	9		2	κeι	10YR 4/6		80	0	Soft	-		-	As Above	***************************************
_	<b>∞</b> •	3	3	4		7	50	સ જ	10YR 4/6		8	—}	Soft				As Above	**
_	× 8	_	~	3	٠,	٠	<b>9</b>	Wet	10YR 4/6	8	40 30	0	Soft	_			As Above	
_	0	12 2	~	3	4	9	8	Sat	10YR 4/6	8	40 30	30	Soft	0.0			As Above	***************************************
_	1.5	14	~	4	S	7	€	Sat	10YR 4/6		40 30	0	Sofi				As Above	
_	4	15 5	s,			12	8	Sat	GLEY2 5/1	_		30 0	Soft	0.0			Bluish Gray Claycy Sandy SILT	andy SILT
	5	92	<u> </u>	7	<del> </del>	2	æ	Sar	7.5TR 4/6	o	8 4	5 5	Loose	45			Strong Brn. Silty SAND, very fine grain	ND, very fine grain
_	91	18 7	<b>20</b>	6	6	17	<u>8</u>	Sat	5Y 4/3	ε	40	30 0	Loose	0.0			Olive Silty SAND, very fine grain	rry fine grain
_	æ ~2	20 3	7	S	7	7	8	Sat	5Y 4/3	ž	40	0	Loose				As Above	
,7	20 2	22 5	9	_	=	4	90	_	SY 4/3	ĸ	40	30	-	0.0		-	As Above	
(7	-	_	7	œ	•	5	8	Sat	2.5Y 6/4	0	80 2	20 0	Loose	62			Lgt. Ylw. Brn. Silty	Lgt. Ylw. Bm. Silty SAND, moderatly sorted, medium grain
. 7	24 2	25 7	$\dashv$	01		2	3	Sat	2.5Y 6/4	0	80	20	Loose	9			As Above	***************************************
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Columbic Growth Mrt Paulity   Calculate Growth Mrt Paulity	,,,,,,,	**********															
1856   Part	·		***************************************	***********			Ge Grove,	MN Facility 0001					3 5 X	EV (FOC PRTHING	 9 <del>1</del> 5 /4		of 1 DATE:
Column   C							Ground Kun Engi	neering & Testing					Ecath t Toni Bor Depth to Bortug D	NSTING: o Water (fill the Bepth (fill Refusal (fill)		NM 22 22 6	Location Type: ( ) Geoprobe ( ) Well. Completion Zone: (X ) Swelburden ( ) Bedrock Completion Type: ( ) Monitoring Well ( X ) Abandened by Grost ( ) Other (Provide Congress)
1 0   Well   25Y 5/6   0   80   20   0   Loose   0   0   0   Loose   0   0   0   Loose   0   0   0   Loose   0   Coose   Coo	re le	ă	W Co	¥	9UIEV-N	<b></b>	erutzioM	Celor	Gra	in Size		chength	MVO	nmuloO lieV	eldme2 Ho2		
1 0   0   0   0   0   0   0   0   0	Н		١			3		Munsell	-	-	ō	1	Unite	۸			Libit Description
1	2			H	-	_			Ļ	₩	$\vdash$	T	F:		Ĺ	No Recovery	
60   Wet   2.57 5/6   0   80   20   0   Loose   0.0     As Above   2.57 5/6   0   80   20   0   Loose   0   As Above   2.57 5/6   0   80   20   0   Loose   0   As Above   2.57 5/6   0   80   20   0   Loose   0   As Above   1   80   Wet   2.57 5/6   0   80   20   Loose   0   As Above   1   80   Wet   2.57 5/6   0   80   30   20   Loose   0   As Above   1   100   Wet   2.57 5/6   0   80   30   20   Loose   0   As Above   1   100   Wet   2.57 5/6   0   80   30   20   Loose   0   As Above   1   100   Wet   2.57 5/6   0   80   30   20   Loose   0   As Above   1   100   Wet   2.57 5/6   0   80   30   20   Loose   0   As Above   1   100   Wet   2.57 5/6   0   80   30   20   Loose   0   As Above   0   As Abo	₹			-		<u> </u>	Wet	2	÷	÷-	<del>+-</del> -	Sose	Ĭ		Ī	Lot Olive Brn Ciby	SAND search and an order of the former of th
6   60   Wed   2.5Y 5/6   0   80   20   0   Loose   As Above   2.5Y 5/6   0   80   20   0   Loose   As Above   As Above   2.5Y 5/6   0   80   20   0   Loose   As Above   2.5Y 5/6   0   80   20   Loose   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   As Above   2.5Y 5/6   0   80   30   20   Loose   As Above   As Above   2.5Y 5/6   As Above	9	-			Ξ	3	Wet	2.5Y 5/6	<del>! -</del>	<del>-</del>	<del>;</del> -	<u>.                                    </u>	0.0		Ţ	As Above	John P. Dough South, Coatse Figure
9 6.0 Wed 2.57 5/6 0 R0 20 0 Louse 0.0 R4 Above 1 80 Wed 2.57 5/6 0 R0 20 0 Louse 0.0 R4 Above 1 80 Wed 2.57 5/6 0 S0 30 20 Louse 0.0 R4 Above 1 100 Wed 2.57 5/6 0 S0 30 20 Louse 0.0 R	æ		-				Wet	2.5Y 5/6	<del>!</del>	-	<del>-</del>	1_			Ť	As Above	te de de de la company de la c
6   5   11   80   Wei   2.57 5/6   0   80   20   Louge   0.01     3   3   4   4   7   80   Wei   2.57 5/6   0   50   30   10 Louge     3   5   6   7   11   100   Wei   2.57 5/6   0   50   30   20   Louge     3   5   6   7   11   100   Wei   2.57 5/6   0   50   30   20   Louge     3   5   6   7   11   100   Wei   2.57 5/6   0   50   30   20   Louge     4   6   8   10   100   Wei   2.57 5/6   0   50   30   20   Louge     5   12   50/2   100   Wei   2.57 5/6   0   50   30   20   Ruck     5   12   50/2   100   Wei   2.57 5/6   0   50   30   20   Ruck     5   12   50/2   100   Wei   2.57 5/6   0   50   30   20   Ruck     6   10   100   100   100   100   100     7   100   100   100   100   100     7   100   100   100   100   100     8   10   100   100   100   100   100     8   10   100   100   100   100   100     9   100   100   100   100   100   100     9   100   100   100   100   100   100     9   100   100   100   100   100   100   100     9   100   100   100   100   100   100   100     9   100   100   100   100   100   100   100     9   100   100   100   100   100   100   100   100     9   100   100   100   100   100   100   100   100     9   100   100   100   100   100   100   100   100   100     9   100	ᆜ		_			_	Wct	2.5Y 5/6	<del></del>	<del></del>	<del>! -</del>	Sec			Ĺ	As Above	albei tekstellebelle broude verser westen makele iparaparapapapapaten istapere zur zur zur zustelsbeiser.
1 80   Wet   2.57 6/8   0 50   10   10   10   10   10   10	<del>-</del>	9	S		=	-	¥œ	2.5Y 5/6	-	_		<u>.                                    </u>	0.0		Ĺ	As Above	***************************************
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100   Wed   2.5 Sty 5/6   0   50   20   Ruck	2	+			-		₩œ	2.5Y 5/6		g	_	_	0.0		ľ	As Above	***************************************
Auger Reinsal @ 22ft on Bedrock  Auger Reinsal @ 22ft on Bedrock  (g. m.g.c. g.: Rite. Medium; and Coarse-graft) size	-	-+		7		3	¥¤	2.5Y 5/6	-	8	<u>.                                    </u>	<u> </u>				As Above	errererer ern ein im ein jereiseren eine ein ein ein bestelle ein ein ein ernerererereren ein ein ein ein ein e
Auger Refusal @ 22ft on Bodrock	122	-	4	_	_	_	Day	10YR 7/6			2	¥ 8				Weathered carbonate	. Terminated horing at 22 flus
(§. mig.e.g.; Rite: Noclium; and Coarse-grain 51%		-			er temperatura.				Aug	r Refu	sal @ 2	2n on	Bedrock	1			
(E. m.g. e.g. : Rite: Neclum; sed Coase-graft) 31X		-	-	_							L	-		-		termedatarad as in this plantes and the same	***************************************
(E. m.g. e.g. : Rite: Neclum; sed Coase-graft) 31X			-	_	_							-		<u></u>		***************************************	terenesia bir de describerasi in personali propries de constante propries propries de constante de constante d
(£. ng. cg. * Rite. Noclum; and Course-graft) 31%		+	-	- 1	4								<del></del>	<u> </u>	-		Harden and American and American telephone of the control of the c
(E. n.g., e.g.: Rite: Noclum; and Course-graft) 31%	1	+	-	-	-	1								<u>!</u>		***************************************	PPROPRIATE CONTRACTOR OF THE PROPRIATE OF THE PROPRIATE CONTRACTOR OF THE PROPRIATE OF THE
(E. nig.e.g.; Rite. Noclus, and Coase-graft) six	1	+	-	1	1	1			+		-	-	Ī	Li			***************************************
(E. Dig. e.g. : Rice. Noclius, sed Coase-graft) 372		-	+	-	-	1			-	1	***************************************	-	1	i_	THE STREET	Managara propert 20 34 fel (1979) pagarana managara	***************************************
(§. m.g.v.c.; Fitter. Medium; and Course-grain 312									+	T		-	-		İ	***************************************	er menen est est elementen en emenen en elementen del set elementen des des elementes establisation en establis
(g. m.g. c.g.: Hre-, Mediun, and Couss-graft size	-												***************************************	<u> </u>	-	***************************************	
	1	+	-	$\parallel$	4				-				. 8	B. E. C. S. Fit	nc-, Medin	um., and Coarse grain size	bes: below ground surface

rom investigation Soltage Grove, Minnesot

## OVERBURDEN BORING LOG

Completion Table   Completion						Cortage G	10 Grove	rove MN Facility					AND VALUE	1		rage 1 of 1 DA 3 E: 26 May 05
Tructor:	CT NO.:	***************************************				0218	1.002.010	1000		1.			NORTHING	1 1		
Table   Participal   Particip	Contractor:	***************************************				Amei	3 3	neering & Testing				9	EASTING: tepth to Water (ft bgs)		NM	Location Type: ( ) GeoProbe ( ) Well ( X ) Soll Boring ( ) Other:
Sample   S	r.quipment: By:		Partition in			Etha	3					ភ្ន ភ័	tal Boring Depth (it by epth to Refusal (it bgs)	a .	23.5 23.5	Completion Zone: (X.) Overburden ( ) Bedrock Completion Type: ( ) Monitoring Well
Sample   Sign Count   Page Co		Add microsom	***************************************									<b>.</b>	rlug Diameter (inches		9	(X) Abandoned by Grout ( ) Other (Provide Comments)
Sample (Charles)					l	-										
Columbia   Columbia					evis	<del></del>	arute	ijot.	rie z		កវាម្ចាក	W		alu-		
O   O   D   D   D   D   D   D   D   D		80	OW Co	Ę	A-U		ioM	°2		<u> </u>	втС	10				
1						3		Munsell	Н	$\vdash$		Linita	L	1		Lithic Description
2       4       3       2       4       2       6       60       Mst       5YR 3/3       10       60       20       10       Loose       0.0         6       8       5       7       4       6       5       50       Mst       25Y 5/6       0       80       20       10       Loose       0.0         10       10       5       6       7       7       13       70       Mst       25Y 5/6       0       80       20       1       Loose       0.0         11       14       16       6       6       10       14       10       10       Loose       0       1 </td <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>┝</td> <td>Mst</td> <td>SYR 3/3</td> <td>-</td> <td>-</td> <td></td> <td>₽-</td> <td></td> <td>Ľ</td> <td>Rettlish Rm Si</td> <td>In CAMP sometimed and a series</td>		-	-	-	-	┝	Mst	SYR 3/3	-	-		₽-		Ľ	Rettlish Rm Si	In CAMP sometimed and a series
4   6   3   3   2   4   5   50   Mist   SYR 3/3   10   60   20   10   Loose   0.0   SYR 3/3   10   60   20   10   Loose   0.0   SYR 3/3   10   60   Loose   0.0   SYR 3/3   10   10   Loose   0.0   SYR 3/3   10   10   Loose   0.0   SYR 3/3   10   10   Loose   0.0   SYR 3/3   10	-	3	-		-	-	Mst	SYR 3/3	<u> </u>			12		Ì	Above	Western Charles Source, contact from
6         8         5         7         8         9         15         25         Mst         2.5Y 5/6         0         80         20         0         Loose         0           10         12         4         6         8         10         14         80         Mst         2.5Y 5/6         0         80         20         0         Loose         0           12         14         6         6         6         7         11         13         70         Mst         2.5Y 5/6         0         80         20         0         Loose         0           14         16         6         6         7         11         13         70         Mst         2.5Y 5/6         0         80         20         0         Loose         0           16         18         9         11         17         504         28         70         Mst         2.5Y 5/6         0         80         20         0         Loose         0         10         10         10         10         10         10         10         10         14         10         10         10         10         11         10         10		3	-	-	-	<u> </u>	H	5YR 3/3	+-	<del></del>		_		15	Above	
10   12   4   6   8   10   14   80   Mst   2.5Y \$66   0   80   20   0   Loose   0.0	_	5	_	-	<u> </u>	<u> </u>	-	2.5Y 5/6	<del>-</del>	<del>-</del>	┺	4-		Ť	Oliva Den Ciber	CAND
10   12   4   6   8   10   14   80   Mss   2.57 \$56   0   80   20   0   Loose     12   14   6   6   7   11   13   70   Mss   2.57 \$56   0   80   20   0   Loose     14   16   6   6   7   11   13   70   Mss   2.57 \$56   0   80   20   0   Loose     15   18   9   11   7   504   28   70   Mss   2.57 \$56   0   80   20   0   Loose     18   20   33   23   27   27   27   27   27   27	Н	2	-	H	┝	⊢		2.5Y 5/6	<u>-</u>	+-	÷	<u>i</u>		Į.	Above	AAND, HOUGHLY SOURY, CORISE PIRIT
12   14   6   6   6   10   12   70   Mst   2.5Y \$66   0   80   20   0   Loose     14   16   6   6   7   11   13   70   Mst   2.5Y \$66   0   80   20   0   Loose     16   18   9   11   17   504   28   70   Mst   2.5Y \$66   0   80   20   0   Loose     18   20   33   23   27   27   52   70   Mst   2.5Y \$66   50   30   20   0   Dense     20   21   20   16   41   50   Mst   2.5Y \$66   50   30   20   0   Dense     21   22   235   15   17   502		4	_	-		-	L	2.5Y 5/6	28	<u>i</u>	+	<u>:</u>		Ì	Above	
14   16   6   6   7   11   13   70   Mst   2.5Y 56   0   80   20   0   Loose   0 0   Cooke   1   1   1   1   1   1   1   1   1		9	_	_	┡-	<b>!</b>	Mst	2.5Y S/6	2	+	<del>+</del>			ľ	Above	· · · · · · · · · · · · · · · · · · ·
16   18   9   11   17   504   28   70   Mst   2.5Y 5/6   0   80   20   0   Loose	-	9	. 9	7	_			2.5Y 5/6	2	<del></del>	<del></del>			Ý	Ahwe	
18     20     33     25     27     27     52     70     Mst     2.5Y566     50     30     20     0     Dense     0.0       20     22     53     21     20     16     41     50     Mst     2.5Y566     50     30     20     0     Dense       22     23.5     15     17     50/2     2     41     50     Mst     2.5Y566     50     30     20     0     Dense       3     22     23.5     15     17     50/2     2     2     2.5Y566     50     30     20     0     Dense       4     50     2     2     2.5Y566     50     30     20     0     Dense       5     2     2     30     20     0     Dense     5       6     2     30     30     20     0     Dense       7     4     4     4     4     4     4		0	=			L	L	2.5Y 5/6	8	-	┿	<u>.</u>		F	Office Des Ciles	CAND A
18 20 33 25 27 27 52 70 Mst 2.54 56 6 10 Dense 0.0				H				***************************************	Ĺ	<del>!</del>	+-			I E	gt. Onve prin, only mite on base	SAIND, INOUCEATIS SOITCO, COAISE grain, with weathere
20     22     50     21     20     16     41     50     Mst     2.5Y 5:6     50     30     20     0     Dense     \$\limits{300}{200}\$       22     23.5     15     17     50.2     2.5Y 5:6     50     30     20     0     Dense     \$\limits{300}{200}\$       Auger Relusal @ 23.5     15     10     Bestrock	-		_	-	-		Mst	2.5Y 5/6	2	<u>.                                    </u>	<del>;</del>	_		6	Olive D.	THE AND THE PROPERTY OF THE PR
20 22 50 21 20 16 41 50 Mst 2.5Y 56 50 30 20 0 Dense 2 2 2 2 3.5 15 17 50.2		⊢		Н	⊢	H				+-	+-			J :=	gt. Oilve bril. sand restone, gramite, si	y UKAVEL, very poorly sorted, rounded gravel, mixo Itstone, dolomite
22 23.5 15 17 50.2 Dense 2.5	_	ဒ္	:		_		Mst	2.5Y S/6	8		•	6		Ž	Above	fedfreiste 1:0112.000.000.000.000.000.000.000.000.000
Auger Refusal (i) 23.5 ft on Bedirox k		2		72	_			2.5Y 5/6	30		_	0		ř	Above Refused of	1 Westherned transferred of the contract of th
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enter and the second of the se			H	Н	H	Ļ				+	1	_		1	***************************************	
	-		1	Total Balance											***************************************	
(B. mg., c.g., Fine, Medium, and Coarse-guilt size bits, below ground sailbac	Control Suday		$\frac{1}{2}$	+	1				-	+			-	Medius	. and Course grain size	bys: below ground surface

20070015

#### APPENDIX C ANNUAL REPORT FOR COLLECTIONS UNDER SPECIAL PERMIT NO. 13031



Weston Solutions, Inc. 1400 Weston Way P.O. Box 2653 West Chester, Pennsylvania 19380 610-701-3000 • Fax 610-701-3186 www.westonsolutions.com

January 30, 2006

Paul J. Wingate
Fisheries Research Manager
Minnesota Department of Natural Resources
Fish Management Section
Division of Fish and Wildlife
500 Lafayette Road
St. Paul, MN 55155

Re: Annual Report for 2005 Collections under Special Permit No. 13031

#### Dear Mr. Wingate:

an employee 554/12d comparied data SCP\_13031\_annual\_rat final.doc

This annual report has been prepared on collections of fish performed in the Mississippi River in the vicinity of Cottage Grove, Minnesota under the scientific collection permit (SCP) Special Permit No. 13031. Prior to the collection effort, the Area Fisheries Manager, Dave Zappetillo, and the Regional Fisheries Manager, Dirk Peterson, were notified of the pending sampling activities. No threatened or endangered species were encountered and all collections were performed in accordance with the SCP conditions.

Fish collections were performed between August 8, 2005 and August 12, 2005 at three reaches adjacent to the 3M Cottage Grove facility. Specimens were collected of smallmouth bass (Micropterus dolomieu), channel catfish (Ictalurus punctatus) and bluegill sunfish (Lepomis macrochirus). Gear types included electrofishing for smallmouth bass and bluegill sunfish and trotlining for catfish. Non-target species were released. A total of 62 fish were collected including 11 smallmouth bass, 30 channel catfish and 21 bluegill sunfish. Whole body or filet tissue samples were prepared from the collected specimens for chemical analyses. A figure showing the collection locations and sample IDs is provided in Attachment 1. Tabulated morphometric data on the fish samples are provided in Attachment 2.

WESTON appreciates the assistance provided by the Department of Natural Resources Division of Fish and Wildlife in providing the SCP for this program. There are no immediate plans for additional collections of aquatic biota. Consequently, there is no present need to renew the SCP





DNR

Division of Fish and Wildlife

-2-

January 30, 2006

for this program. Please feel free to contact me at (610) 701-3787 in the event that you need additional information on the collection activities described above and in the attachments to this letter report.

Very truly yours,

WESTON SOLUTIONS, INC.

Charles T. Young

Senior Technical Manager

#### Attachments

cc: M. Santoro (3M)

R. Paschke (3M)

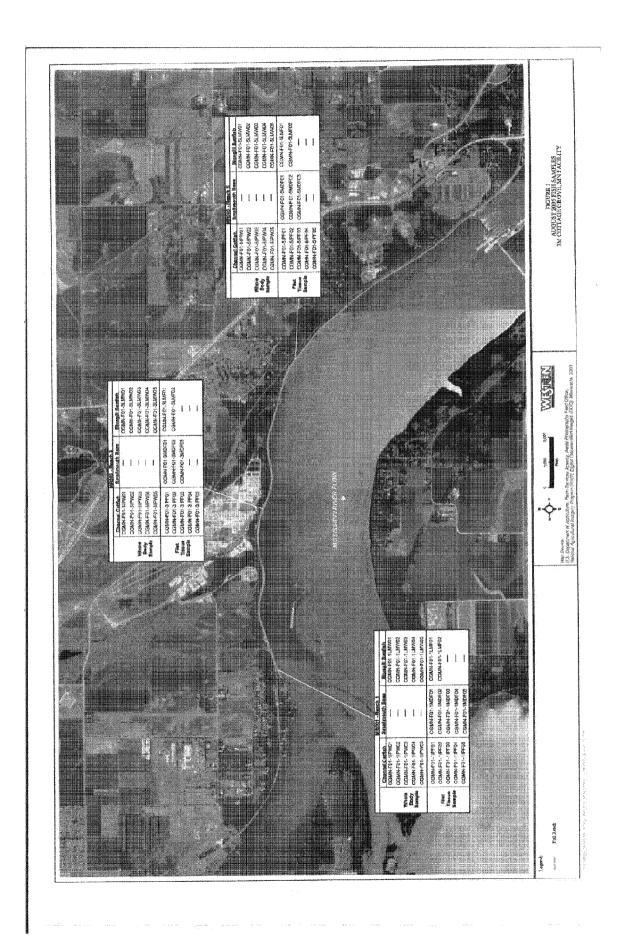
G. Hohenstein (3M)

J. Kesari (WESTON)

E. POLDERS.0-9/3m-cottage: grove/Fld\_data/SCP\_13001\_ammal\_rpt final.doc



#### **ATTACHMENT 1**





# **ATTACHMENT 2**

Table 1 Fish Whole Body Tissue Samples

	Total Weight (g)	54	265	909	296	1617	4	20	37	44	35		Total Weight (g)		252	250	626	1630	29	. 4	62	575	45		Total Weinht (a)	1548	481	1643	1440	1100	<u></u>	<b>2</b>	? ₹		5 8	1
	Fork Length (mm) Total Weight (g)	174	295	375	395	485	120	129	112	120	113		Fork Lenath (mm)	191	278	279	439	491	134	121	133	125	120		Fork Lenath (mm)	512	350	515	491	450	76	118	92	109	32	
Reach 1 - Whole Body Samples	Total Length (mm)	195	343	445	443	550	124	135	120	129	120	Reach 3 - Whole Body Samples	Total Length (mm)	222	335	330	505	552	142	128	140	132	125	Reach 5 - Whole Body Samples	Total Length (mm)	295	397	268	552	483	86	122	100	114	100	
Reach 1 - Wh	Common Name	Channel catfish	Bluegill sunfish	Reach 3 - Wh	Common Name	Channel catfish	Bluegill sunfish	Reach 5 - Wh	Common Name	Channel catfish	Channel catfish	Channel catfish	Channel catfish	Channel catfish	Bluegill sunfish	Bluegill sunfish	Bluegill sunfish	Bluegill sunfish	Bluegill sunfish																	
	Sample ID	CGMN-F01-11PW01-0-050812	CGMN-F01-1IPW02-0-050812	CGMN-F01-1IPW03-0-050812	CGMN-F01-1IPW04-0-050812	CGMN-F01-1IPW05-0-050812	CGMN-F01-1LMW01-0-050812	CGMN-F01-1LMW02-0-050812	CGMN-F01-1LMW03-0-050812	CGMN-F01-1LMW04-0-050812	CGMN-F01-1LMW05-0-050812		Sample ID	CGMN-F01-3IPW01-0-050812	CGMN-F01-3IPW02-0-050812	CGMN-F01-3IPW03-0-050812	CGMN-F01-3IPW04-0-050812	CGIMN-F01-3IPW05-0-050812	CGMN-F01-3LMW01-0-050812	CGMN-F01-3LMW02-0-050812	CGMN-FU1-3LMW03-0-050812	CGMN-F01-3LMW04-0-050812	CGMIN-F01-3LMW05-0-050812		Sample ID	CGMN-F01-5IPW01-0-050812	CGMN-F01-5 PW02-0-050812	CGIMIN-F 01-51PW03-0-050812	CGMN-F01-5IPW04-0-050812	COMIN-FU1-51PW05-0-050812	CGMN-F01-5LMW01-0-050812	CGIMIN-F01-5LMW02-0-050812	CGIMIN-FUI-5LMW03-0-050812	CGMN-F01-5LMW04-0-050812	CGMN-F01-5LMW05-0-050812	

Table 2 Fish Filet Tissue Samples

Sample Weight (g) 137 97 36 39 34 19	Sample Weight (g) 26* 39 37 24*	Sample Weight (g) 34 59 46 29* 29*	Sample Weight (g) 861 538 285 428 357
Total Weight (g) 692 454 178 162 166 155	Total Weight (g) 63 175 175 65 75	Total Weight (g) 158 274 214 72 69	<b>Total Weight (g)</b> 4500 2800 1750 2500 1750
Reach 1 - Filet Tissue Samples - Bass/Sunfish           on Name         Total Length (mm)         Fork Length (mm)           buth bass         387         367           buth bass         231         220           buth bass         226         215           buth bass         230         220           buth bass         180         172           sunfish         155         148	Reach 3 - Filet Tissue Samples - Bass/Sunfish on Name Total Length (mm) Fork Length (mm) outh bass 227 218 outh bass 222 213 isunfish 150 140	Reach 5 - Filet Tissue Samples - Bass/Sunfish on Name Total Length (mm) Fork Length (mm) buth bass 250 239 240 228 Isunfish 140 135 131	Reach 1 - Filet Tissue Samples - Channel Catfish non Name Total Length (mm) Fork Length (mm) rel catfish 750 630 rel catfish 540 495 rel catfish 660 600 rel catfish 562
Filet Tissue Sam Total Length (m 387 320 231 228 230 180	Filet Tissue Sam Total Length (m) 160 227 222 145 150	Filet Tissue Sam Total Length (m 220 250 240 140 139	ilet Tissue Samples Total Length (mm) 750 700 540 660 562
Common Name Smallmouth bass Smallmouth bass Smallmouth bass Smallmouth bass Smallmouth bass Smallmouth bass Bluegill sunfish Bluegill sunfish	Common Name Smallmouth bass Smallmouth bass Smallmouth bass Bluegill sunfish Bluegill sunfish	Reach 5 - Common Name Smallmouth bass Smallmouth bass Smallmouth bass Bluegill sunfish Bluegill sunfish	Reach 1 - F Common Name Channel catish Channel catish Channel catish Channel catish Channel catish
Sample ID CGMN-F01-1MDF01-0-050812 CGMN-F01-1MDF02-0-050812 CGMN-F01-1MDF03-0-050812 CGMN-F01-1MDF05-0-050812 CGMN-F01-1MDF05-0-050812 CGMN-F01-1LMF01-0-050812 CGMN-F01-1LMF01-0-050812	Sample ID CGMN-F01-3MDF01-0-050812 CGMN-F01-3MDF02-0-050812 CGMN-F01-3MDF03-0-050812 CGMN-F01-3LMF01-0-050812 CGMN-F01-3LMF02-0-050812	Sample ID CGMN-F01-5MDF01-0-050812 CGMN-F01-5MDF02-0-050812 CGMN-F01-5MDF03-0-050812 CGMN-F01-5LMF01-0-050812 CGMN-F01-5LMF02-0-050812	Sample ID CGMN-F01-1 PF01-0-050812 CGMN-F01-1 PF02-0-050812 CGMN-F01-1 PF03-0-050812 CGMN-F01-1 PF04-0-050812 CGMN-F01-1 PF05-0-050812

\* Both right and left side filets included in sample to provide adequate sample mass for analyses.

Table 2 Fish Filet Tissue Samples

Sample Weight (g) 317 479 528 540 603	Sample Weight (g) 392 355 646 406 319
Total Weight (g) 2250 2500 3250 3500 3000	Total Weight (g) 2000 2500 3250 3250 2000
Reach 3 - Filet Tissue Samples - Channel Caffish           non Name         Total Length (mm)         Fork Length (mm)         Total Weight (g)           nel catfish         625         570         2250           nel catfish         640         573         2500           nel catfish         700         645         3250           nel catfish         760         710         3500           nel catfish         640         580         3000	Reach 5 - Filet Tissue Samples - Channel Catfish           non Name         Total Length (mm)         Fork Length (mm)         Total Weight (g)           nel catfish         560         2000           nel catfish         670         600         2500           nel catfish         680         630         3250           nel catfish         620         560         2000
Reach 3 - F Common Name Channel catfish Channel catfish Channel catfish Channel catfish Channel catfish	Reach 5 - F Common Name Channel caffsh Channel caffsh Channel caffsh Channel caffsh Channel caffsh
Sample ID# CGMN-F01-3IPF01-0-050812 CGMN-F01-3IPF02-0-050812 CGMN-F01-3IPF04-0-050812 CGMN-F01-3IPF05-0-050812	Sample ID# CGMN-F01-5IPF01-0-050812 CGMN-F01-5IPF02-0-050812 CGMN-F01-5IPF03-0-050812 CGMN-F01-5IPF04-0-050812 CGMN-F01-5IPF05-0-050812

\* Both right and left side filets included in sample to provide adequate sample mass for analyses.

# APPENDIX D ANALYTICAL DATA PACKAGES

#### INTERIM REPORT #2 Analysis of Cottage Grove and Woodbury Water Samples

#### STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

#### **DATA REQUIREMENTS**

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

#### STUDY DIRECTOR

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380 Phone: 610-701-3761

#### INTERIM REPORT COMPLETION DATE

September 09, 2005

#### PERFORMING LABORATORY

Exygen Research 3058 Research Drive State College, PA 16801 Phone: 814-272-1039

#### STUDY SPONSOR

3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144 Phone: 651-733-6374

#### **PROJECT**

Protocol Number: P0001400 Exygen Study Number: P0001400

Total Pages: 115

Exygen Study No.: P0001400

#### GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluoroctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

John Flaherty

Principal Investigator

Exygen Research

Jaisimha Kesari P.E., DEE

Study Director

Weston Solutions, Inc.

9/13/05

Sponsor Representative

3M Company

Robert A. Paschke

Exygen Research

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Exygen Study No.: P0001400

#### **OUALITY ASSURANCE STATEMENT**

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

	Date	Date Reported to Principal	Date Reported to Exygen	Date Reported to
<u>Phase</u>	Inspected	Investigator	Management	Study Director
4. Raw Data Review	05/23-24/05	08/30/05	09/02/05	09/09/05
5. Interim Analytical Report Review	05/25-26/05	08/30/05	09/02/05	09/09/05
8. Interim Analytical Report Review	08/31-09/01/05	09/08/05	09/08/05	09/09/05

Technical Lead, Quality Assurance Unit

09/09/25

<sup>1</sup>Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

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9/9/05

#### **CERTIFICATION OF AUTHENTICITY**

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by:

Exygen Research 3058 Research Drive State College, PA 16801

(814) 272-1039

Principal Investigator, Exygen:

John Flaherty

Vice President Exygen Research

Exygen Research Facility Management:

Richard A. Grazzini

President /

Exygen Research

Date

Study Director Weston Solutions, Inc.

Jaisimha Kesari P.E., DEE

Weston Solutions, Inc.

Sponsor Representative, 3M Company:

Robert A. Paschke

Manager, 3M Corporate Environmental Programs

9113/05

Date

Exygen Research

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Exygen Study No.: P0001400

#### STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:

P0001400

**EXYGEN STUDY NUMBER:** 

P0001400

TYPE OF STUDY:

Residue

SAMPLE MATRIX:

Water

TEST SUBSTANCE:

Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS)

SPONSOR:

3M Company

3M Building 0236-01-B-10

St. Paul, MN 55144

STUDY DIRECTOR:

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380

STUDY MONITOR:

Robert A. Paschke

3M Company

3M Building 42-02-E-27 St. Paul, MN 55144

PERFORMING LABORATORY:

Exygen Research 3058 Research Drive State College, PA 16801

ANALYTICAL PHASE

Study Initiation Date:

03/03/05

TIMETABLE:

Interim Analytical Start Date:

03/28/05

Interim Analytical Termination Date: 08/22/05

Interim Report Completion Date:

09/09/05

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#### PROJECT PERSONNEL

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

Name

Title

John Flaherty

Vice President

Karen Risha

Scientist

Paul Connolly

Technical Lead - LC/MS

Chrissy Edwards

Technician

**Brittany Kravets** 

Technician

Mark Ammerman

Sample Custodian

Amy Sheehan

**Associate Scientist** 

Eric Edwards

Sample Custodian

Shawn Robb

Technical Lead - Facilities

Edward Kaiser

Scientist

Exygen Research

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#### 1.0 SUMMARY

Exygen Research extracted and analyzed water samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Method V0001780 (Appendix A).

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in water was 50 ng/L and the limit of detection for PFOA, PFBS, PFHS and PFOS in water was 25 ng/L.

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS and PFOS in water samples are summarized in **Table I**. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in water samples were  $116\% \pm 30$ ,  $137\% \pm 37$ ,  $113\% \pm 20$  and  $110\% \pm 31$ , respectively. The average percent recoveries  $\pm$  standard deviations for  $^{13}\text{C-PFOA}$  in water samples were  $99\% \pm 18$ .

#### 2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in water according to Protocol P0001400 (Appendix A).

#### 3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in water using the analytical method entitled, "V0001780: Method of Analysis for the Determination of Perfluorocctanoic Acid (PFOA) in Water by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was March 28, 2005, and the analytical termination date for this interim report was May 03, 2005.

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#### 4.0 ANALYTICAL TEST SAMPLES

One hundred and thirty-eight water samples, which correspond to thirty-three sample sites, (Exygen ID C0065432-C0065506, C0065973-C0065996, C0065930-C0065945, C0065947-C0065969) were received at ambient temperature on March 18, 2005 from Pat Ferretti at 3M Environmental Lab. Twenty-seven water samples, which correspond to six sample sites (Exygen ID C0067856-C0067882) were received at ambient temperature on April 07, 2005 from Pat Ferretti at 3M Environmental Lab. All together, these samples represent thirty-nine sample sites and associated field QC samples. The samples were logged in by Exygen personnel and placed in refrigerated storage.

Sample log-in and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

#### 5.0 REFERENCE MATERIAL

The analytical standard, PFOA, was purchased from Sigma Aldrich and was received at Exygen on December 08, 2003. The surrogate spiking standard, <sup>13</sup>C labeled perfluorooctanoic acid (<sup>13</sup>C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on July, 06, 2000. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and <sup>13</sup>C PFOA were stored frozen and PFOS was stored refrigerated.

Compound	Exygen Inventory No	<u>Lot #</u>	Purity (%)	<b>Expiration Date</b>
PFOA	SP0003800	23116HB	97.64	12/08/05
<sup>13</sup> C PFOA	SP0004184	3507-195	97	03/29/09
<b>PFBS</b>	\$P0000252	1 <b>01</b>	96.7	12/04/06
PFHS	SP0002401	SE036	98.6	10/18/06
PFOS	SP0002694	430180-1	101.2	04/23/06

The molecular structures of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS are given on the following pages:

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#### **PFOA**

Chemical Name: Perfluorooctanoic acid

Molecular Weight: 414

Transitions Monitored:  $413 \rightarrow 369$  (for quantification) and

 $413 \rightarrow 219$  (for confirmation)

Structure:

$$F \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{O} OH$$

#### <sup>13</sup>C PFOA

Chemical Name: 1,2-13C perfluorooctanoic acid

Molecular Weight: 416

Transition Monitored:  $415 \rightarrow 370$ 

Structure:

$$F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{13} C \xrightarrow{13} C \xrightarrow{OH}$$

#### **PFBS**

Chemical Name: Perfluorobutanesulfonate

Molecular Weight: 338 supplied as the potassium salt (C<sub>4</sub>F<sub>9</sub>SO<sub>3</sub>K<sup>+</sup>)

Transitions Monitored: 299 → 99

Structure:

$$F = F = F = SO_3$$

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#### **PFHS**

Chemical Name: Perfluorohexanesulfonate

Molecular Weight: 438 supplied as the potassium salt (C<sub>6</sub>F<sub>13</sub>SO<sub>3</sub>K<sup>†</sup>)

Transitions Monitored: 399 → 80

Structure:

$$F = F = F = F = 503^{-1}$$

#### **PFOS**

Chemical Name: Perfluorooctanesulfonate

Molecular Weight: 538 supplied as the potassium salt (C<sub>8</sub>F<sub>17</sub>SO<sub>3</sub>K<sup>+</sup>)

Transitions Monitored:  $499 \rightarrow 80$ 

Structure:

### 6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical method "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS" was used for this study.

#### 6.1. Extraction Procedure

A 40 mL aliquot of the water sample was used for the extraction procedure. After fortification of appropriate samples, the samples were loaded onto a C<sub>18</sub> SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The eluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of eluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

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#### 6.2 Preparation of Standards and Fortification Solutions

Individual stock standard solutions of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS were prepared as specified in Exygen method V0001780. The stock standard solutions were prepared at a concentration of 100 µg/mL by dissolving 10 mg of each of the standard (corrected for purity and salt content, if necessary) in methanol. From these solutions, 1.0 µg/mL fortification standard solutions were prepared by taking 1 mL of the appropriate stock and bringing the volume up to 100 mL with methanol. By taking 10 mL of the appropriate 1.0 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, 0.1 µg/mL fortification standards were prepared. By taking 10 mL of the appropriate 0.1 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, 0.01 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, 0.01 µg/mL fortification standards were prepared.

Several sets of standards containing PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS were prepared in water and processed through the extraction procedure, identical to samples. The following concentrations were prepared:

Conc. of Fort	Fort	Volume of	Final Conc. of
Solution	Volume	Fortified Sample	Calibration Std.
$(ng/mL)^1$	(μL)	(mL)	(ng/L)
0	0	40	0
10	100	40	25
10	200	40	50
10	400	40	100
100	100	40	250
100	200	40	500
100	400	40	1000
- cpro + 13g :		DELLE I DECC	

of PFOA, C PFOA, PFBS, PFHS and PFOS

An additional mixed stock solution of PFOA,  $^{13}$ C PFOA, PFBS, PFHS, and PFOS was prepared at 1000  $\mu$ g/mL and diluted to 100 and 10  $\mu$ g/mL for bottle spiking purposes. Complete details can be found in the raw data package associated with this study.

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator ( $4^{\circ} \pm 2^{\circ}$ C) when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

#### 6.3 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~12 min, ~3 mins, ~10 mins, and ~13 mins, respectively. Peaks above the LOD were not detected in any of the reagent blank samples corresponding to the analyte retention time.

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#### 6.4 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 25 ng/L of PFOA, PFBS, PFHS and PFOS.

#### 6.5 Description of LC/MS/MS Instrument and Operating Conditions

Instrument: API 4000 Biomolecular Mass Analyzer

Interface: Turbo Ion Spray Liquid Introduction Interface

Computer: DELL OptiPlex GX400

Software: Windows NT, Analyst 1.4.1

HPLC: Hewlett Packard (HP) Series 1100

HP Quat Pump
HP Vacuum Degasser
HP Autosampler
HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm

Column Temp.: 30° C Injection Vol.: 15 µL

Mobile Phase (A): 2 mM Ammonium Acetate in water

Mobile Phase (B): Methanol

Time (min)	<u>% A</u>	<u>% B</u>
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min Flow Rate: 0.3 mL/min Ions monitored:

<u>Analyte</u>	Mode	Transition Monitored	Approximate Retention Time (min)
PFOA	negative	$413 \rightarrow 369$	~12 min.
PFOA Confirm Ion	negative	$413 \rightarrow 219$	~12 min.
<sup>13</sup> C PFOA	negative	$415 \rightarrow 370$	~12 min.
PFBS	negative	$299 \rightarrow 99$	~3 min.
PFHS	negative	$399 \rightarrow 80$	~10 min.
PFOS	negative	$499 \rightarrow 80$	~13 min.

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#### 6.6 Quantitation and Example Calculation

Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using six concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/L, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

#### Equation 1:

Analyte found 
$$(ng/L) = (Peak area - intercept) \times DF$$
  
slope

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

For samples fortified with known amounts of PFOA, PFBS, PFHS, PFOS and <sup>13</sup>C PFOA prior to extraction, Equation 2 was used to calculate the percent recovery.

#### Equation 2:

Recovery (%) =

(analyte found (ng/L) - analyte in control (ng/L)) ×100% amount added (ng/L)

An example of a calculation using an actual sample and results from the PFOA analysis follows (values may differ slightly from the raw data due to rounding differences):

Water sample Exygen ID C0065436 Spk F (Set: 032805C), fortified at 10000 ng/L with PFOA where:

 peak area
 =
 161009

 intercept
 =
 0.0153

 slope
 =
 1530

 dilution factor
 =
 100

 ng/L PFOA added (fort level)
 =
 10000

amt in corresponding sample  $(ng/L)^* = 0$  (\*The primary sample result was used for all calculations)

#### From equation 1:

Analyte found (ng/L) = 
$$[161009 - 0.0153] \times 100$$
  
1530

= 10523 ng/L

From equation 2:

% Recovery = 
$$(10523 \text{ ng/L} - 0 \text{ ng/L}) \times 100\%$$
  
10000 ng/L

= 105%

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0 (Not Detected)

Exygen Study No.: P0001400

#### 7.0 EXPERIMENTAL DESIGN

<sup>13</sup>C PFOA was used as a surrogate for all the samples. <sup>13</sup>C PFOA was added to the sample collection bottles in the laboratory before being shipped to the field for sampling. For samples designated as field matrix spikes PFOA, PFBS, PFHS, and PFOS were also added at a known concentration to the bottles in the laboratory before being shipped to the field. The samples were filled to a 200 mL volumetric fill line in the field.

The samples were extracted in eight sets. Each set included one reagent blank and two reagent spikes fortified at known concentrations. The first three sets contained six sample sites each. The fourth and fifth sets contained five sample sites each, along with a trip blank and two trip blank spikes in each set. The sixth set contained five sample sites, while the seventh set contained three sample sites. The eighth set contained three sample sites, along with a trip blank and two trip blank spikes. For each site, a sample, a field duplicate and two-matrix field spikes were collected. For each site, a laboratory duplicate of the primary sample was extracted and two laboratory matrix spikes were also extracted. For the two laboratory matrix spikes, two 40 mL portions of the primary sample collected for the site were poured from the bottle and fortified. Not only were PFBS, PFHS, PFOS and PFOA added in the laboratory prior to extraction, but also <sup>13</sup>C PFOA was added. The additional <sup>13</sup>C PFOA was added to the laboratory matrix spikes because the levels of PFBS, PFHS, PFOS and PFOA spiked into the samples were known to exceed the calibration ranges and were not analyzed without dilution; therefore, <sup>13</sup>C PFOA levels were adjusted to require the same dilution as the other analytes.

Accuracies were assessed for each sample by reviewing the individual QC results obtained for each sample site. In most cases, there were two laboratory and two field spike recovery results available for each sample site that were used to assess the accuracy. There were seven individual <sup>13</sup>C PFOA recovery results per site that were also used to assess the accuracy. In the cases where the lab and field QC could not be calculated, the <sup>13</sup>C PFOA recoveries alone were used to access accuracy.

#### 8.0 RESULTS

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in water samples are summarized in Table I.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the water samples are detailed in **Tables II** and **III**. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in water samples were  $116\% \pm 30$ ,  $137\% \pm 37$ ,  $113\% \pm 20$  and  $110\% \pm 31$ , respectively. Fortification recoveries for <sup>13</sup>C PFOA in the water samples are detailed in **Table IV**. The average percent recoveries  $\pm$  standard deviations for <sup>13</sup>C-PFOA in water samples were  $99\% \pm 18$ .

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For each primary sample collected, between the field and lab, seven individual QC results were reported for <sup>13</sup>C PFOA. Some samples gave recoveries for <sup>13</sup>C PFOA outside of the normal acceptance range of 70-130%. Because laboratory control spikes for <sup>13</sup>C PFOA were acceptable in every set, instrument washes were free of <sup>13</sup>C PFOA, at least one <sup>13</sup>C PFOA recovery per the seven done for the sample was acceptable and no evident errors in spiking or extracting could be found, no re-extractions were performed, except for the low lab spike of WBMN-GW-R1-O-050314 and the low field spike of CGMN-GW-MW5-LS-050316. <sup>13</sup>C PFOA recoveries outside of 70-130% are deemed indicative of matrix effects.

#### 9.0 CONCLUSIONS

The water samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical method V0001780. There were no circumstances that may have affected the data quality or integrity.

#### 10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the sponsor. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

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# **TABLES**

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Table I. Summary of PFBS, PFHS, PFOS and PFOA in Water **Samples** 

Exygen ID   Client Sample ID	i Accuracy
Exgen ID Client Sample ID (ppt, ag/L) (+%1-%) (ppt, ng/L) (+%1-%)	
C0065432	NL) (*%/-%)
C0065432 Rep   WBMN-GW-R1-D-050314   3510   100/50   2630   30/30   88.5   30/30   2224   2240   2240   2244   2240   2244   2	
C0085438 WBMN-GW-R1-DP-050314 ND 100/50 PD 30/30 ND 30/30	
C0085438 WBMN-GW-R2-C-050314 ND 100/50 ND 30/30 ND 30/30 ND C0085438 Rep C0085437 WBMN-GW-R2-D-050314 ND 100/50 ND 30/30	
C0085438 Rep C0085437 WBMN-GW-R2-O-958314 ND 100/50 ND 30/30 ND 30/30 ND 30/30 ND 50/30 ND 50/50 ND 50/50 ND 50/50 ND 50/50 ND 50/50 ND 50	30/30
C9085449 WBMN-GW-R2-O-950314 482 100/50 1170 30/30 118 30/30 159 C9085440 Rep WBMN-GW-R3-O-950314 477 100/50 1180 30/30 110 30/30 159 C9085441 WBMN-GW-R3-O-950314 478 100/50 1170 30/30 199.5 30/30 144  C9085444 WBMN-GW-R4-O-950314 10900 100/50 19700 60/60 2480 40/40 2860 C9085444 Rep WBMN-GW-R4-O-950314 11100 100/50 19700 60/60 2240 40/40 2840 C9085444 WBMN-GW-R4-O-950314 11000 100/50 19700 60/60 2160 40/40 2770 C9085448 WBMN-GW-R4-O-950314 6020 100/50 19700 60/60 2160 40/40 2770 C9085448 WBMN-GW-CWM-C-050314 6020 100/50 100/60 30/30 1150 30/30 1870 C9085448 WBMN-GW-CWM-C-050314 6020 100/50 11000 30/30 1150 30/30 1870 C9085448 WBMN-GW-CWM-C-050314 6020 100/50 11000 30/30 1210 30/30 20/40	30/30
C0065448	30/30
C0085444 WBMN-GW-R3-C-80314* 477 100/50 1180 30/30 110 30/30 158 C0085444 WBMN-GW-R3-DP-850314 10900 100/50 1170 30/30 99.5 30/30 144 C0085444 Rep C0085444 WBMN-GW-R4-C-050314* 11100 100/50 19700 60/60 2480 40/40 2860 C0085445 WBMN-GW-R4-DP-850314* 11100 100/50 19700 60/60 2160 40/40 2840 C0085448 WBMN-GW-R4-DP-850314* 11000 100/50 19700 60/60 2160 40/40 2770 C0085448 WBMN-GW-CWM-C-050314* 6020 100/50 100/60 30/30 1150 30/30 1870 C0085448 Rep WBMN-GW-CWM-C-050314* 6020 100/50 11000 30/30 1210 30/30 20/40	30/30
C0085444 WBMN-GW-R3-C-850314* 477 100/50 1180 30/30 110 30/30 158 C0085444 WBMN-GW-R3-DP-850314 478 100/50 1170 30/30 99.5 30/30 144 C0085444 Rep C0085444 WBMN-GW-R4-C-050314* 11100 100/50 19700 60/60 2480 40/40 2860 C0085445 WBMN-GW-R4-DP-850314* 11100 100/50 19700 60/60 2160 40/40 2840 C0085445 WBMN-GW-R4-DP-850314 11000 100/50 19700 60/60 2160 40/40 2770 C0085448 WBMN-GW-CWM-C-050314* 6020 100/50 100/60 30/30 1150 30/30 1870 C0085448 Rep WBMN-GW-CWM-C-656314* 6130 100/50 11000 30/30 1210 30/30 20/40	30/30
C0085444 WBMN-GW-R3-DP-850314 478 100/50 1170 30/30 99.5 30/30 144  C0085444 WBMN-GW-R4-0-850314 10900 100/50 19700 60/60 2480 40/40 2860  C0085444 Rep C0085444 Rep WBMN-GW-R4-D-950314 11100 100/50 19700 60/60 2160 40/40 2240  C0085448 WBMN-GW-CWM-C-050314 6020 100/50 19700 60/60 2160 40/40 2770  C0085448 WBMN-GW-CWM-C-050314 6020 100/50 10000 30/30 1150 30/30 1870  C0085448 Rep WBMN-GW-CWM-C-050314 6130 100/50 11000 30/30 1210 30/30 20/40	30/30
C0085444 Rep C0085445 WBMN-GW-R4-DP-050314* 11100 100/50 19700 60/80 2140 40/40 28/40 2770	30/30
C0085444 Rep C0085445 WBMN-GW-R4-DP-050314* 11100 100/50 19700 60/80 2140 40/40 28/40 2770	30/30
C0888448 WBMN-GW-R4-DP-950314 11000 100/50 19700 60/80 2160 40/40 2770  C0885448 WBMN-GW-CWM-C-050314 6020 100/50 10000 30/30 1150 30/30 1870  C0885448 Rep WBMN-GW-CWM-C-056314* 6130 100/50 11000 30/30 1210 30/30 20/40	
C0885448 WBMN-GW-CWM-O-650314 6020 100/50 10000 30/30 1150 30/30 1870 C085448 Rep WBMN-GW-GWM-O-654314* 6130 100/50 11000 30/30 12:10 30/30 2040	
C0065448 Rep WBMN-GW-GWM-O-654314* 6130 100/50 11000 30/30 1210 30/30 2040	40.00
100000000000000000000000000000000000000	
C0085440 WEMIN-GW-CWM-OP-050314   R117 107/50   9880 30/30   1340 30/30   1980	
	30/30
C0863452 CGMN-GW-ARW14-O-850318 599000 100/50 28900 30/30 74800 30/30 86700	
C0865452 Rep CGMN-GW-NW14-C-650316* 844000 100/50 31500 30/30 80500 30/30 99000	
C0065453 CGMN-GW-MR/14-DP-050316 567000 100/50 28800 30/30 82500 30/30 94400	0 50/50
C0005456 CGMN-GW-MW10-O-050316 16100 100/90 386 30/30 2240 50/50 2220	50/50
C0065498 Rep CGMN-GW-MW10-O-656316* 17200 100/50 400 30/30 2050 50/50 2260	50/50
C0085457 CGMN-GW-MW18-DP-050018 16100 100/50 372 30/30 2160 50/50 2190	50/50
CO085480 CGNN-GW-MW4-D-050316 16100 100/50 2220 30/30 179 30/30 10700	30/30
C9965440 Rep CGMN-GW-WW4-O-080316* 15800 100/50 2110 30/30 154 30/30 9470	30/30
C0005481 CGMAI-GW-MW4-DP-050316 14500 100/50 2070 30/30 170 30/30 9310	30/30
C0085484 CGMN-GW-MW3-C-450316 389 100/50 362 30/30 184 30/30 8140	30/30
C0005444 Rep CGMN-GW-MW3-Q-056318° 404 100/50 349 30/30 205 30/30 8150	30/30
COORS465 CQMN-GW-RIW3-DP-059315 379 100/50 344 30/30 208 30/30 8430	30/30
CO085488 CQMN-GW-AFW1-Q-950318 78.4 100/50 58.7 30/30 667 40/40 1130	30/30
C0085488 C0MN-GW-MW1-O-050318 78.4 100/50 58.7 30/30 667 40/40 1130 C0065448 Rep CGMN-GW-MW1-O-050318* 75.0 100/50 58.9 30/30 557 40/40 1110	30/30
COORS469 CGARN-GYV-EDV-1-DP-050218 73.5 100/50 58.6 30/30 733 40/40 1190	30/30
70.0 100.0 00.0 100.0	
C0085472 CGMN-GW-WW5-Q-050318 NQ 100/50 ND 30/30 142 30/30 746	30/30
C0065472 Rep CGMN-CW-MWs-O-080318* NQ 100/50 ND 30/30 139 30/30 724	30/30
C0088473 CGMN-GW-4FW5-DP-458316 NQ 100/50 NQ 30/30 170 30/30 776	30/30
C0085476 CGMH-GW-MW7-D-058316 NQ 100/50 ND 30/30 101 30/30 237	30/30
C0065476 Rep CGMN-GW-MW7-C-050316* 51.6 100/50 ND 30/30 135 30/30 294	30/30
C0005477 CGMN-GW-MW7-DP-050316 50.5 100/50 ND 30/30 150 30/30 314	30/30
CO085480 CGMN-GW-MW2-Q-650315 NQ 100/50 NQ 30/30 ND 30/30 1500	30/30
C8085486 Rep CGMM-GW-MW2-C-850318" NQ 100/50 53.9 30/30 ND 30/30 1630	30/30
C8085481 CGMN-GW-8FW2-DF-458315 50.2 100/50 52.4 30/30 ND 30/30 1680	30/30
C0085484 CGMN-GW-MW9-C-650315 124 100/50 353 30/30 237 30/50 935	50/50
C0065414 Rep CGMN-GW-MW9-C-850315" 139 100/50 361 30/30 248 30/30 957	50/50
C0085485 CGMN-GW-MW9-DP-058315 124 100/50 359 30/30 312 30/30 998	50/50

<sup>&</sup>quot;Laboratory Duplicate

ND = Not detected at or above 25 ng/L. ,

NQ = Not quantifiable = Measured concentration between 25 ng/L and the Limit of Quantitation (LOQ) which is 50 ng/L.

Summary of PFBS, PFHS, PFOS and PFOA in Water Table I. **Samples Continued** 

		C4 Sulfon	ate PFBS	C4 Sulfor	tate PFHS	C4 Sulfor	ate PFOS	CB Acid PFOA		
		Analyte	Assessed	Analyte	Assessed	Analyte	Assessed	Analyte	Assessed	
		Found	Accuracy	Found	Accuracy	Found	Accuracy	Found	Accuracy	
Exygen ID	Cilent Sample ID	(ppt, ng/L)	(+%/-%)	(ppt, ng/L)	(+%/-%)	(ppt, ng/L)	(+%/-%)	(ppt, ng/L)	(+% ( - %)	
C0085488	CGMN-GW-WW12-O-050315	194000	100/50	49400	30/30	219000	40/40	2140000	40/40	
C0065488 Rep	CGMN-GW-MW12-Q-050315*	211000	100/50	49700	30/30	224000	40/40	2240000	40/4D	
C0065489	CGMN-GW-MW12-DP-050315	135000	100/50	32300	30/30	151000	40/40	1210000	40/40	
C0085492	CGNN-GW-PZ14-O-860315	350	100/50	496	3D/3D	543	50/50	2710	80/60	
C0065482 Rap	CGMN-GW-PZ14-O-050315"	375	100/50	501	30/30	554	50/50	2020	60/60	
C0085493	CGMN-GW-PZ14-DP-050315	381	100/50	556	30/30	801	50/50	2400	90/90	
C0085496	CGMN-GW-NW17-O-050315	393	100/50	488	3D/3D	595	40/40	1760	30/30	
C0065496 Rep	CGMN-GW-MW17-O-050315*	414	100/50	495	30/30	577	40/40	1810	30/30	
C0085497	CGMN-GW-MW17-DP-050315	400	100/50	479	30/30	649	40/40	1820	30/30	
C0065500	CGMN-GW-MW18-O-050315	348	100/50	902	40/40	7777	40/40	2140	50/50	
C0065500 Rep	CGMN-GW-MW18-O-050315*	349	100/50	948	40/40	879	40/40	3200	50/50	
C0065501	CGMN-GW-MW18-DP-650316	388	100/50	1090	40/40	975	40/40	2370	50/50	
C0065504	CGMN-GW-TRIP2-O-050315	ND	100/50	ND	30/30	ND	30/30	ND	30/30	
C0045973	CGMN-GW-MW11-C-050312	12800	100/50	1990	30/30	10900	30/30	69500	30/30	
C0065973 Rep	CGMN-GW-MW11-O-050312*	13400	100/50	1910	30/30	10800	30/30	70200	30/30	
C0065874	CGMN-GW-MW11-DP-050312	12800	100/50	1990	30/30	11700	30/30	72400	30/30	
C0065977	CGMN-GW-MW101-0-050312	28400	100/50	1690000	30/30	341000	80/80	157000	50/50	
C0065877 Rep	CGMN-GW-MW101-O-050312"	26200	100/50	1500000	30/30	299000	80/80	147000	50/50	
C0065978	CGMN-GW-MW101-DP-050312	25700	100/50	1560000	30/30	333000	80/80	145000	50/50	
C0065981	CGMN-GW-MW182-O-050312	38400	100/50	92400	100/50	45900	70/70	175000	80/80	
C0065081 Rep	CGMN-GW-MW102-D-050312"	36500	100/50	56200	100/50	50200	70/70	150000	80/80	
C0065962	CGMN-GW-HW102-DP-050312	38500	100/50	82200	100/50	53200	70/70	156000	80/80	
C0065985	CGMN-GW-MW13-O-050312	1240	100/50	1570	100/50	13400	50/50	15500	60/60	
C0065985 Rep	CGMN-GW-MW13-O-050312°	1260	100/50	1600	100/50	14000	50/50	15500	60/60	
C0045946	GGMN-GW-MW13-DP-050312	1840	100/50	2430	100/50	22000	50/50	26000	60/60	
Ç0065 <del>009</del>	CGMN-GW-MW16-Q-050312	14000	100/50	1990	100/50	41100	50/50	24000	50/50	
C0045989 Rep	CGMN-GW-MW18-O-050312*	14000	100/50	1830	100/50	32000	50/50	22300	50/50	
C8065990	CGMN-GW-MW16-DP-050312	12200	100/50	1670	100/50	2B40C	50/60	18100	50/50	
C0065093	CGMN-GW-MW15-O-050312	1920	100/50	535	30/30	11300	100/50	6390	30/30	
C8065993 Rep	CGMN-GW-MW15-Q-0503121	2020	100/50	539	30/30	10700	100/50	6440	30/30	
C0065094	CGMN-GW-MW15-DP-050312	1890	100/60	536	30/30	13200	100/50	6620	30/30	
C0045930	CGMN-GW-TRIP1-0-850314	NO	100/50	ND	30/30	ND	30/30	ND	30/30	
C0045933	CGMN-GW-PW1-C-050314	516	100/50	170	30/30	457	30/30	3320	30/30	
C0065633 Rep	CGMN-GW-PW1-O-050314*	533	100/50	163	30/30	444	30/30	3330	30/30	
C0045934	CGMN-GW-PW1-DP-050314	524	100/50	167	30/30	486	30/30	3380	30/30	
C9965937	CGNH-GW-PWZ-C-050314	255	100/50	167	30/30	573	30/30	3880	30/30	
C0065937 Rep	CGMN-GW-PW2-O-050314"	238	100/50	170	30/30	656	30/30	3850	30/30	
C0065938	CGMN-GW-PW2-DP-050314	252	100/50	180	30/30	756	30/30	4310	30/30	
C0965941	CGMN-GW-PW3-O-056314	ND	100/50	ND	30/30	ND	50/50	523	30/30	
C0065941 Rep	CGNN-GW-PW3-O-050314"	NQ	100/50	ND	30/30	ND	50/50	603	30/30	
C0065942	CGMN-GW-PW3-DP-050314	NQ	100/50	NB	30/30	ND	50/50	650	30/30	

<sup>&</sup>quot;Laboratory Duplicate

ND = Not detected at or above 25 rg/L.

NQ = Not quantifiable = Measured concentration between 25 rg/L and the Limit of Quantifiation (LOQ) which is 50 rg/L.

Summary of PFBS, PFHS, PFOS and PFOA in Water Table I. **Samples Continued** 

		C4 Sulfonate PFES		C6 Sulfonate PFHS		CB Sulfon	nte PFOS	CS Acid PFOA	
		Analyta	Assessed	Analyta	Assessed	Analyte	Assessed	Analyta	Assessed
		Found	Accuracy	Found	Accuracy	Found	Accuracy	Found	Accuracy
Exyges ID	Client Sample ID	(ppt, ng/L)	(4%/-%)	(ppt, ng/L)	(+%/-%)	(ppt, ng/L)	(+%/-%)	(pgst, ng/L)	(+%/-%)
C0065945	CGUN-GW-PW4-C-450314	114	100/50	158	30/30	ND	30/30	1190	40/40
C0065045 Rep	CGMN-GW-PW4-O-050314*	123	100/50	148	30/30	ND	30/30	1210	40/40
C0485947	CGMN-GW-PW4-DP-050314	118	100/50	165	30/30	ND	30/30	1270	40/40
C0965950	CGMN-GW-PWS-0-050314	2240	100/50	1910	30/30	4340	30/36	14800	30/30
C0065950 Rep	CGMN-GW-PW5-O-868314*	2160	100/50	1930	30/30	4460	30/30	14500	30/30
C0065951	CGMN-GW-PWS-DP-050314	2270	100/50	1800	30/30	4200	30/30	14500	30/30
C0005954	CGMN-GW-PW6-O-050314	48500	100/50	4820	30/30	33300	30/30	158000	30/30
C0065054 Rep	CGMN-GW-PW8-D-050314*	47400	100/50	4730	30/30	32400	30/30	151000	30/30
C0005955	CGMN-GW-PW4-DP-050314	47800	100/50	4780	30/30	33000	30/30	157000	30/30
C0065958	CGMN-GW-PW8-O-050314	NO.	100/60	NO.	30/30	ND	30/30	570	30/30
C0005058 Rep	CGMN-GW-PW8-O-050314"	NQ	100/50	ND	30/30	ND	30/30	846	30/30
C0085959	CGMN-GW-FW8-DP-050314	NG	100/50	NO	30/30	ND	30/30	523	30/30
C0085062	CGMN-GW-B116-O-050314	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065962 Rep	CGMN-GW-8118-O-050314"	NO	100/50	NO.	30/30	ND	30/30	ND	30/30
C0005983	CGMN-GW-B116-DP-050314	ND	100/50	NO	30/30	NO	30/30	ND	33/30
C0465966	CGMN-PW-CWD-O-050314	5750	100/50	8410	30/30	1150	30/30	3030	30/30
C0065066 Rep	CGMN-PW-CWD-O-050314*	5650	100/50	8430	30/30	1320	30/30	3200	30/30
C0465967	CGMN-PW-CWD-DP-850314	5450	100/50	8570	30/30	1560	30/30	3320	30/30
C0467858	CGMN-GW-CWD-C-050405	7290	100/50	9910	30/30	1430	30/30	2720	30/50
C0067856 Rep	CGMN-GW-CWD-O-050405"	7350	100/50	9510	30/30	1260	30/30	2590	30/30
C0967657	CGMN-GW-CWD-DP-050405	7390	100/50	9400	30/30	1140	30/30	2520	30/30
C0967860	WBMN-GW-CWM-O-050405	7350	190/50	11800	30/30	1260	30/30	2230	30/90
C0067869 Rep	WBMN-GW-CWM-O-050405*	6880	100/50	10500	30/30	1080	30/30	2010	30/30
C0967901	WBMN-GW-CWM-DP-050405	7550	100/50	12500	30/30	1260	30/30	2310	30/30
C0967864	WBMH-GW-R-2-0-050405	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0067884 Rep	WBMN-GW-R-2-O-050405*	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0457965	WBMH-GW-R-2-DP-050405	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0467966	WBMN-GW-R-3-Q-050405	360	100/50	1290	30/30	143	36/30	191	30/30
C0067888 Rep	WBMN-GW-R-3-Q-050405*	364	100/50	1160	30/30	137	30/30	182	30/30
G0967969	WBMN-GW-R-J-DP-050405	375	100/50	1150	30/30	153	30/30	188	30/30
C0667872	WBMN-GW-R-1-0-050405	1580	100/50	2310	30/30	NQ	30/30	2060	60/60
C0667872 Rep	WBMN-GW-R-1-O-050405*	1950	100/50	2410	30/50	57.3	30/30	2330	80/80
C0967873	WBMN-GW-R-1-DP-050405	1880	100/50	2620	30/30	67.2	30/30	2610	60/60
C0067878	WBMN-GW-R-4-O-050405	6050	100/50	20100	30/30	2340	30/30	3120	30/30
C0057575 Rep	WBMN-GW-R-4-0-850495*	6420	100/50	20800	30/30	2080	30/30	3070	30/30
C0087877	WBMN-GW-R-4-DP-050405	5250	100/50	20400	30/30	2180	30/30	3180	30/30
C0+67662	WBMN-GW-Fleid-Blank-050405	ND	100/50	ND	30/30	ND	30/30	ND	30/30

<sup>&</sup>quot;Laboratory Duplicate

ND = Not detected at or above 25 rg/L.

NQ = Not quantificitie = Measured concentration between 25 rg/L and the Limit of Quantificition (LOQ) which is 50 rg/L.

Exygen Study No.: P0001400

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples

			& Sufforate PFBS		,		Sulforate PFHS	
Sample Description	Amount Spiked (ng/L)	Amt Found in Sample {ng/L}	Amount Recovered (ng/L)	Recovery (%)	Amount Splited (ng/L)	Amt Found in Sample (ngfL)	Areount Recovered (ng/L)	Plactorery (%)
WBMH-GW-R1-DP-050314	7							
(C0006413 Sph C, 1800 mp/L (Lab Spho)	1000	3700	3130		1000	2480	3680	120
WB001-GW-R1-0-050214 (C008422 8pt: II, 18000 mpli. Lub (kpilm)	10000	3700	15000	113	10608	2480	12900	104
WBAIN-GW-R1-L5-050314 Low Spike 1 ppb (C000414, 1000 mgl. Fluid lipitur )	1000	3700	4170		1905	2480	3650	120
WBMN-GW-R1-HS-050314 High Spike 10 ppb (C0081434, 19000 agr. Field Spike	10080	3700	15400	117	10000	2480	13500	110
WELEN < W-R2 < ○-050114 (C0000000 Apr. 6, 1000 mg/s. Len 15pm.e)	1000	ND	1350	135	1995	NID	1090	109
WBMN-GW-R2-O-050314		145	1000		1550		1080	100
(C0000430 Opt. F, 10000 mg/L Lab Spites)	10000	NEO	13400	134	10000	ND	10:800	108
WEMM-GW-R2-LS-050314 Low Spiles 1 ppb (2008434, 1000 agr., Fluid 6981) 1	1000	ND	1280	125	1080			
WBAIN-GW-R2-H8-050214 High Splin 10 ppb	1960	N.C.	1200	120	7000	· ND	1210	121
(CROSSASS, 10000 mg/L Pluid Spiles)	19800	ND	13300	153	10000	ND	11400	114
W65064-GW-403-O-050314 (C2005446 Suit 0, 1006 mpl., Leit Spille)	1000	452	1820	134	1000	1170	2480	131
WBRIN-GW-R3-C-050314 (C000046 Spb N, 19000 ngC, Lub Spbu)	10050	482	14300	136	10000	1170	12000	108
WEMN-GW-R3-L8-050314 Low Splins 1 ppb (C0005442, 1000 ng/L Floki Splins )	1008	482	1790	131	1000	1170	2390	122
WRMAGW-R3-HS-058314 High Spike 10 pph (0000641), 10000 nph. Floid Shile; )	10000	482	13700	132	10000	1170	12400	112
975MN-GW-R4-O-056314 (C596644 Spit I, 9000 npl. Lab Spito)	1800	10900	8820		1000	19700	23300	
WBMN-GW-R4-O-0503)4 (0808044 Spit J. 10000 mg/L Let Spille)	10000	10900	21600	107	10000	19700	31300	116
WBM N-GW-R4-L8-958314 Low Spike 1 ppb (C0001446, 1091 mg/L Plate Spike )	1900	10900	9010		1009	19700	23500	
WSMM-GW-R4-MS-050314 High Spike 10 ppb (comment, 1989) hgfL Field Spike )	10000	10900	24000	131	10000	18700	36700	180
WB00N-GW-CW04-C-050314 (C000044) Spirit (1000 mpl. Lub Spirit)	1900	6020	5880		1000	10000	11200	•
WENN-GW-CWN-O-050214 (C008449 Spit L, 14000 opt. Leb Spito)	19000	6020	15600	108	19960	10000	21700	117
WIBMEN-GW-CWIN-LS-050354 Low Spike 1 ppb (00006480, 1000 mg/t, Field Spike )	1000	6020	5740		1900	10000	11200	-
WISHIN-GW-CWNE-H8-050214 High Spiles 18 ppb (Constitut, 10000 mpf. Pield Spile )	10000	6020	18300	123	10000	10000	22 <b>5</b> 00	125
CG1001-GW-NW14-Q-050218 (C1008402 Spix N., 180000 mg/L Lub Applie)	100000	599000	810000	.	100000	28900	138000	109
CGMA-GW-MW14-C-060318  CCM4452 8gsh N. 1988889 ng/L Lata Spillat)	1800000	599000	1820000	122	1000000	28900	1110000	108
CGMN-GWF-MW14-LS-050916 Low Spike 100 ppb (C0001464, 50000 ng/L First Spike )	10000	588000	624000		190000	28900	156000	127
GMN-GW-689/14-H3-050314 Fligh Spike 1900 ppb (2004448, 100404 mpt. Floid Spike )	1500000	500000	1600000	130	1999000	28900	1200000	117

<sup>&</sup>quot;Sample resided sectacts the spiting level significantly; therefore, an accurate recovery value cannot be calculated

Note: Since this extremely table shows rounded results, recovery values may vary slight

to = Not retained at or above 25 ng/L (pps). (Q = Not quantitable = Measured concentration between 25 ng/L (pps) and

Quantization (I,OQ) which is 58 kg/L (ggQ).

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Matrix Spike Recovery of PFBS and PFHS in Water Table II. **Samples Continued** 

		C	Sulfonete PFBS		C4 Sulfonate PFHS				
Sample Description	Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ngfL)	Recovery (%)	Amount Spacer (ng/L)	Arnt Found In Sample (ng/l.)	Arrount Recovered (ng/L)	Recovery (%)	
CGMN-GW-MW10-0-050316 (C0065-06 Spk 0, 1006 regt, Lab Splin)	1008	16100	19000	•	1000	386	1490	110	
CGMM-GW-MM10-Q-650274 (COMMAN Spk I), 1880 ng/L Lub Ephul	10009	16100	23600	75	10000	386	9760	94	
CGMN-GW-MW10-LS-050314 Law Spiles 1 ppb (C0005458, 1480 agr. Plul Bulls )	1000	16100	17300		1000	386	1520	113	
CGMN-GW-MW16-HS-858316 High Spike 10 ppb (CB06546, 16006 npf. Field Spike )	18000	16100	25300	92	10000	366	11100	107	
CGNN-GW-ARWO-O-080218 (C000000 Spir 6, 1000 ngl. Lub Spilo)	1900	16100	17400	•	1000	2220	3200	96	
CGMN-GPN-MW4-C-080218 (C0008400 Spit F, 8000 npt. (ash Spike)	5900	16100	18500	•	5000	2220	7430	104	
CGMM-GW-46W4-LS-056316 Low Spike 1 ppb: (00045m1, 4m20 egit Field Spike )	1800	16100	18600		1000	2220	3500	128	
CGMH-GW-MW4445-060316 High Spike 5 ppb (C006663, 8008 ngt. Pint Spike 5)	5000	16100	31900		5000	2220	7460	105	
CGBAN-GW-MW3-C-856316 (C6664668)sh 0, 506 mg/L Lub Syllin)	500	300	1030	126	560	362	998	101	
CGBNN-GW-87973-O-850316 (C000444 Spt. H, 5000 ng/L, Lab Splite)	5000	399	6770	127	5000	362	5790	109	
CGMH-GW-BrWS-LS-080318 Low Spiles 0.5 ppb (Cossists, 600 egt. Field Spile)	500	399	1030	126	500	362	990	106	
CGMH-GW-MW3-HS-050318 High Spilos 5 ppb (C0000467, 5000 hyr. Pint Spilos )	5000	390	8440	121	5000	362	5090	95	
CGBBN-GW-MW1-C-450314 (CGBBN-B April , 100 mg/l, Lab April )	100	7B.4	215	137	100	56.7	180	101	
COMM-GW-MW-1-0-050090 (00000400 lipis -1, 1000 righ, (am 0-phir) '	1900	78.4	1330	125	1000	58.7	1140	108	
CGNN-GW-MAY1-LS-050316 Low Spiles 8.1 ppb (0446476, 146 mg/L Fint-Spiles )	100	78.4	216	198	180	58.7	184	106	
CGMN-GW-MW1-HS-650316 High Spike 1 ppb (CORRECT, 1988 mg/L Fluid Spike )	1000	78.4	1430	135	100C	58.7	1400	134	
CCIMIN-GW-44W5-C-058318 (CCOSSATZ Spit K, 100 ngs. Lab Spilos)	180	NQ	172	172	100	ND	131	131	
COMIN-GW-84945-C3-090316 (C0000472 Spit L, 1000 mpL Lad Spitus)	1890	NQ	1330	133	1000	ND	1040	104	
CGRM-GW-ArW5-LS-058218 Low Spike 9.1 ppb (0006874, 100 ng/L Field Spike )	180	NO	151	161	100	ND	148	148	
CGMN-GW-46W5-MS-050316 High Spike 1 ppb (CRAMATH, 1000 mpt Fluid Spike )	1886	NO	1490	149	1000	ND	1230	123	
CGRIN-GW-MW7-CI-050215 (CRRS-RTS Spin III, 100 ng/l, Lub Spilm)	100	NQ	171	171	100	NO	124	124	
CGMN-GW-MW7-C-050016 (C0000475 Spik N, 1000 mg/L Spih Spiho)	1000	NQ	1390	135	1000	ND	1070	107	
CGNN-GW-NW7-LS-050318 Low Spike 0.1 ppb (C000507), 100 mpl. Fixed Spike )	100	NQ	177	177	100	ND	142	142	
CG/RH-GW-RW77-HS-050316 High Spike 1 ppb (C008478, 1008 agf, Floid Spike )	1950	NQ	2010	201	1940	ND	1230	123	

<sup>&</sup>quot;Sample recidue exceeds the opting level significantly, therefore, an accurate recovery value cannot be calculated ND = Not extended at or above 25 rgd. (ppt).
NO = Not quantificate = Necessard concentration between 25 rgd. (ppt) and the Limit of Quantification (LOC) which is 60 rgd. (ppt).
Note: Stream this auremany table shows rounded results, recovery values may vary sightly from the values is the new date.

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Matrix Spike Recovery of PFBS and PFHS in Water Table II. **Samples Continued** 

	C4 Sulforrate PFBS					Cf Sulfonate PFHS					
	Amount	Anni Found	Amount		Amount	Amt Found	Amount				
Semple	Spliced	in Semple	Recovered	Recovery	3plked	In Sample	Recovered	Recovery			
Description	(ng/L)	(ng/L)	(ng/L)	[%]	(ng/L)	(ng/L)	(ng/L)	(%)			
CGMM-GW-MW2-O-050315					1						
(C000E466 Spic C, 960 agr)_ Lab Spille)	506	NQ	823	125	500	NQ	594	119			
CGMN-GW-MW2-O-850315	1				<b>!</b>						
(C0005400 Upk D, \$500 agil, i.e. Spita)	5090	NO	5630	113	1000	NC)	6000	120			
CGMN-GW-MW2-L8-050315 Law Spike 0.5 ppb											
(C0001422, \$60 agrit, Fluid Spile )	500	NQ	577	115	500	NQ.	556	171			
CGMN-GW-MW2-HS-050315 High Spiles 5 pph											
(C6066-813, 8608 ag/L Field Spiles	5006	NQ	5040	101	5000	NQ	5840	113			
CGNN-GW-88W8-O-860315	1 1										
(C0006484 Spit E, 600 ng/L Lab Spito)	500	124	664	112	500	353	674	104			
CGMN-GW-68W8-O-050315	]				1		- 7				
(C0000414 Spit 7, 8000 ng/L Lab Spillo)	5000	124	5030	98	5000	353	5380	101			
CGMH-GW-MWB-LS-050315 Law Spile 0.5 pph					1111						
(CONSISS, 840 mpt, Flats Splits )	500	124	619	99	500	353	857	101			
CGMN-GW-MW1-HS-080315 High Spike 5 ppb	l i				ì						
(C4086487, 5000 mg/L. Fluid Spille )	5000	124	5760	113	5000	353	5870	110			
	1 1										
CGMH-GW-MW12-O-080916	l l	404000	105004								
(COCOLATE Spit Q, 1900 ng/L Lab Spitus)	1900	194000	185000	• 1	1000	49400	50400	-			
CGIM-GW-MW12-O-059315	10000	194000	210000		19095	49400	58500				
(CONSISSE Spit N, 18000 ng/L Lab Spito)	10000	IBAULA	210000	_	19000	49400	30000				
CGMH-GW-MW12-LS-050315 Low Spike 1 ppb	1000	194000	129000		1800	49400	36900	•			
(C00004000, 1000 mg/L Fluid Splike }	1,000	10000	128000			45400	JAMAA				
CGMN-GW-40N12-HS-050315 High Spilm 10 ppb	10000	194000	204000		10000	49480	59600				
(C0005491, 10000 mg/L Floid Epitro )	10000	199000	224000			10100	48000				
CGMN-GW-PZ14-0-050319											
(C0006402 Spk I, 1000 ng/L Lab Spille)	1996	350	1370	101	1000	496	1620	112			
CGMN-GW-PZ14-Q-050315					·						
(constant plu 1 tones will the playe)	10000	359	13500	134	10000	495	13500	130			
CGMN-GW-PZ14-LB-050318 Low Spiles 1 ppb					1	400	1710	121			
(C0000454, 1000 ng/L Field Splits )	1000	350	1280	<b>82</b>	1980	496	ากบ	121			
CGMN-GW-P214-H8-050315 High Spike 10 ppb	10000	250		1	10000	496	12500	120			
(COUNTING, 19000 mg/L Flots Spike )	10000	359	; 1900	115	10000	490	12300	120			
CGBRK-GW-BRW17-C-050315	1 1				- 1						
(CONSESS Syst IC. 600 sgrl. Lab Sylke)	500	393	992	120	500	455	1030	108			
CGMH-GW-MHH17-O-050316	1										
(COORSES SAN L. GOOD MAYL Lab Styling)	5000	303	5490	102	6000	488	5690	102			
CGMN-GW-MW17-LS-050915 Low Spike 0.5 ppb	l I				!						
(500mletts, 800 mg/s. Florid Spline )	500	393	1080	133	500	488	970	98			
CEMN-GW-MW97-H5-050315 High Spiles 5 ppb	I										
(COORSIDE, 2000 ng/L Plate Sylbur )	5000	393	5960	511	5000	498	5080	110			
CGNIN-GW-MW14-O-088218											
(COPESSON Spit M. 500 mg/L Lab Spiles)	500	348	E30	95	500	902	1560	130			
CGMN-GW-MW18-O-650315			•		ł						
(CACADAGO Spit Nr. 1800 mg/L Lub Spillin)	5000	348	5160	98	5060	902	5960	102			
CGMN-GW-MW18-LS-050315 Low Spike 8.5 pph					ļ						
(COCOUNTS, NOW RIGHT, Floid Spiller)	500	348	917	114	500	902	1590	138			
CGMN-GW-MW18-N8-068315 High Spike 5 ppb					- 1						
(COORSES, SOM AGE, Flate Spiles )	5006	348	5690	107	5000	902	6900	1.20			

<sup>&</sup>quot;Sample residue encreads the spiting level algolificantly, therefore, an accurate recovery valve cannot be calculated ND = Not guardische 25 or algolification between 26 ng/L (ppt) and the Limit of Casestitation (LOC) which is 50 agil, topi).

Note: Since this summary labels shows sounded results, accovery valves may vary slightly from the valves in the raw data.

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Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

		04	Sulfanala PFBS		CS Stifferate PFHS			
	Amount		Amount		Amount	Am Found	Amount	•
Sample Description	Splited (ng/L)	in Sample (ng/L)	Recovered (ngA.)	Recovery (%)	Spiled (ng/L)	tr. Sample (ng/L)	Recovered (ng/L)	Recovery (%)
CGMN-GW-TRIP2-LS-880315 Low Spile 1 ppb								
(C0000001, 1000 mg/L Spiles )	1008	NID:	849	85	1000	NED	1010	101
CGMN-GW-TRIP2-413-058315 High 8 pike 10 ppb	'***	,	545	~			~.0	
(C004660, 10000 ag/L \$ples)	19000	NEC	7160	72	10000	NĎ	8170	92
CGMN-CW-MW11-0-850312								
(C000077 Spit C, 1990 ng/t, Leb Spite)	1000	12800	11500	•	100C	1990	3120	113
CGMN-GW-MW11-O-860312								
(C0000073 Spit I), 19000 rept. Lain Spite)	10000	12800	21000	88	10000	1990	12300	103
CGMN-GW-LIWI1-LS-050312 Law Splice 1 ppb								
(C0000078, 1000 mg/L, Floid Spiles )	1000	12800	11100	•	1000	1990	3160	117
CGNIN-GW-MW11-HS-650312 High Spike 10 pub	1 1							
(COOSTOTO, 10000 ng/L Floid Spilin)	10000	12800	21300	85	19990	1990	13700	117
GGMN-GW-MW191-0-080312								
(C0000077 Spin. II, 100000 mg/l. Lab Byllin)	100000	28400	143000	115	190000	1000000	1680000	•
CGMH-GW-MW101-Q-040312								
(COOCHITT Salk F. 1000000 ng/L Lab Splin)	1006000	28400	1500000	167	1000000	1690000	3820000	193
CGMH-GW-MW101-LS-858312 Low Spiler 100 ppb								
(Country), 100000 mg/L Flood Spiles )	100000	25400	144000	116	100000	1690000	1760000	•
CGMM-GW-MW101-HS-050312 High Spites 1000 ppb								
(CODESONS, 10000001 mg/C, Floid Spiles )	1000000	25400	1130000	110	1000050	1690000	2730000	104
CGMN-GW-MW162-0-650312	i I							
(Casasses Spik Q, 100000 april Lain Spike)	190000	38400	154000	118	100000	92400	218000	126
CGMH-GW-MW162-O-050312								
(C0040081 Bpk H, 1000000 mpT, Lab SpBm)	1000000	38400	1510000	147	1000000	92400	1590000	150
CGISN-GW-MW102-LB-050312 Low Spike 106 ppb								
(C00000E3, 100000 ng/L Final Spike )	190000	38400	187000	149	100000	92400	279000	178
CGMN-GW-MW102-HS-050312 High Spike 1900 ppb								
(C0000004, 4000000 ag/l. Field Splim )	1000000	38400	1350000	131	1008000	92400	1410000	132
CGMH-GW-MW13-0-490312					- 1			
(Crimina) tipit i, 1900 ng/l. Lab tipito)	1900	1240	2170	<b>#3</b>	1000	1570	2620	105
COMM-GW-MW13-D-050312								
(CA00400K Spk J, 10000 righ. Lab Spille)	10000	1240	13000	118	10000	1570	13400	118
CGMN-GW-MW13-LS-059312 Low Spike 1 ppb								
(COCCUTOTY, 1000 mg/L Fluid Splin )	1900	1240	3310	207	1080	1570	3490	192
CGMN-GW-MW13-HS-650312 High Spike 16 ppb	10000	1240	13700	125	15500	1570	14800	132
(COOLDER, 10000 ng/L Finit Spiller)	****	1240	13700	120		13/4	14000	104
CGMH-GW-MW16-D-050312				j	- 1			
(CORRECC Spin K. 1986 agril. Lab Gallin)	1880	14000	12400	٠	1000	1990	2836	84
CGMH-GW-MW18-O-050312	10000	14000	21500	75	19086	1990	12300	103
(C000000 9pt L 10000 mpt, Lab Spike) CGMN-GW-MW16-L3-050312 Low Spike 1 ppb	- IDEGE	I'UUU	21300	79	10000	1990	12300	103
(C000001, 1000 ngt, Field Spills )	1800	14000	12000	-	1000	1990	4220	223
CGMM-GW-MW14-HS-056312 High Spike 10 ppb	1			- 1			**	
(CONSTRUCT, 10000 mg/L. Finial Stylins )	10006	14000	24000	100	19006	1990	13500	115

<sup>&</sup>quot;Sample residue exceeds the seiting level significantly therefore, an accurate recovery value carried by calculable

Note: Since this summary table show

ND = Not delected at or above 25 righ. (ppt).

NCI \* Not quantifiebs - Nessured concentration between 25 ng/L (ppt) and the Limit of

Matrix Spike Recovery of PFBS and PFHS in Water Table II. **Samples Continued** 

155 165 165 196 193 161 176 183 188 172	Amount / Spined (ng/L)  1896 10000 10000 70000 70000 10000 10000 10000 10000 10000	Amt Found in Sample (ng/L)  535  535  535  535  MD  ND  170  170  170  170  170	Amunication (ngA)  1700  11000  1520  12900  523  5060  1270  11100  1250  1250  685	117 105 106 124 101 110 100 100 101
155 165 159 196 153 161 176 183 188	1000 100000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 100000 100000 10000 10000 10000 100000 10000 10000 10000 10000 100	(ng/L) 536 536 536 536 ND ND 170 170 170	(ngA) 1700 11000 1620 12900 523 5060 1270 11100 1250	117 105 108 124 103 101 110
165 159 198 163 161 176 183 168	10008 1000 10000 500 5000 10000 10000 10000	535 535 535 MD MD 170 170 170	11000 1920 12900 523 5060 1270 11100 1250	105 108 124 105 101 110 106
165 159 198 163 161 176 183 168	10008 1000 10000 500 5000 10000 10000 10000	535 535 535 MD MD 170 170 170	11000 1920 12900 523 5060 1270 11100 1250	105 108 124 105 101 110 106
165 159 198 163 161 176 183 168	10008 1000 10000 500 5000 10000 10000 10000	535 535 535 MD MD 170 170 170	11000 1920 12900 523 5060 1270 11100 1250	105 109 124 103 101 110 109
159 196 153 161 176 183 168	1000 10000 500 5000 1000 1000 1000	\$35 \$35 NID NID 170 170	1520 12900 523 5080 1270 11100 1250	198 124 105 101 110 109
159 196 153 161 176 183 168	1000 10000 500 5000 1000 1000 1000	\$35 \$35 NID NID 170 170	1520 12900 523 5080 1270 11100 1250	198 124 105 101 110 109
196 153 161 176 163 168	70800 5080 5080 1080 1080 1000	835 ND ND 170 170 170	12900 523 5060 1270 11100 1250	124 105 101 110 109
196 153 161 176 163 168	70800 5080 5080 1080 1080 1000	835 ND ND 170 170 170	12900 523 5060 1270 11100 1250	124 105 101 110 109
153 161 176 183 188	500 5080 1000 1000 1000	NID NID 170 170 170	523 5060 1270 11100 1250	105 101 110 109 108
153 161 176 183 188	500 5080 1000 1000 1000	NID NID 170 170 170	523 5060 1270 11100 1250	105 101 110 109 108
181 176 183 188	5096 1000 1000 1000 1000	ND 170 170 170 170 170	5060 1270 11100 1250	101 110 109 108
181 176 183 188	5096 1000 1000 1000 1000	ND 170 170 170 170 170	5060 1270 11100 1250	101 110 109 108
181 176 183 188	5096 1000 1000 1000 1000	ND 170 170 170 170 170	5060 1270 11100 1250	101 110 109 108
176 183 188 172	1000 1000 1000 1000	170 170 170 170	1270 11100 1250 10500	110 100 108
176 183 188 172	1000 1000 1000 1000	170 170 170 170	1270 11100 1250 10500	110 100 108
183 188 172	10460 1000 10464	170 170 170	11100 1250 10500	108
183 188 172	10460 1000 10464	170 170 170	11100 1250 10500	108
1 <b>68</b> 172	1000	170 170	1250 12500	108
1 <b>68</b> 172	1000	170 170	1250 12500	108
172	10000	170	10500	
172	10000	170	10500	
				103
				103
177	500	167	686	
177	500	167	685	
1//	300	10/	6ab	104
				104
447	Sens		C 450	
167	2000	167	5450	106
173	500	467	716	110
113	900	167	110	110
168	5000	167	5520	107
200	100	ND	115	116
	1 1			
174	1900	NID	1120	112
	1 1			
202	150	MD	191	131
	i i			
182	1906	ND	1120	112
203	509	156	650	96
	i			
174	5000	158	5290	103
	1			400
187	500	158	656	100
				445
176	5000	156	5470	106
	203 174 187 176	174 5000 187 5000 176 5000	174 5000 158 187 500 158 176 5000 158	174 5000 158 5390 187 500 158 656 176 5000 158 5470

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Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

	C4 Sulfenate PFBS					C6 Suffonde PFHS				
Sample Description	Amount Splited (ng/L)	Amil Found in Sample (ng/L)	Amount Recovered (ngl.)	Recovery (%)	Amount Spiked (ng/L)	Ami Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)		
CGWN-GW-PW5-Q-050214										
(COORDING Date C. 1000) and Lab Spiles	10000	2240	20900	187	10000	1910	12500	106		
CGMH-GW-PW5-O-050314					•					
(CONSESSED State Co., 1000000 ng/L Lafe Spillio)	180000	2240	191000	189	108660	1910	109000	107		
CCRON-GW-FWS-LS-050314 Low Spike 10 ppb (CC005002, 10000 ng/L Field Spile)	18000	2240	12800	106	12000	1910	12500	106		
CGMM-GW-PWS-HS-050314 High Splins 199 ppb (C000001, 199000 ngL Field Splins )	100000	2240	181000	179	100904	191C	116000	113		
CGMN-GW-PW9-0-450314 (cossess Syst E, 10000 myst Carb Pythan)	10000	48500	36400	• .	10000	4520	18000	112		
CGMB-GW-PWB-0-054314										
(COMMENT Suit F. 100000 mg/L Lath Refine)	100000	48500	223000	175	100000	4820	115090	110		
CGMN GW-PW64,5-050314 Low Spike 19 ppb										
(COPERSON, 10000 rugh. Platel Spiller)	19000	48500	56200	•	10909	4820	14300	96		
CGMN-GW-PW8-HS-050314 High Splice 100 ppb		40500		400	44444	4800	100000	103		
(COUNTER, 200000 mg/L Plotel Sydne )	100006	48500	216000	186	100000	4820	108000	103		
CGMN-GW-PW8-C-064314 (C006006 8gk Q, 100 ng/L Lab Rpiho)	100	NQ:	189	169	196	ND	115	115		
CGMN-GW-PWS-Q-050314	1000		1700	470	1600	ND	1120	112		
(Coccess Byth H, 1995 mg/L, Lab Syllie)	1000	NQ	1700	170	1606	140	1120	112		
CGMH-GW-PW4-LS-660314 Low Spiles 0.1 ppb (C000000, 100 ag/l, Field Spiles )	100	NG	198	198	190	NO	120	120		
CGMN-GW-PW6-HS-050314 High Spike 1 ppb (C004501, 1990 pg/L Fleid Spike )	1500	NO	1490	149	1000	NO	1060	106		
CGNN-GW-8115-0-850314 (C0000028pit (, 90000 ng/L, Lab Rpito)	19800	ND	16700	157	19990	ND	19500	105		
CGMN-GW-21 18-0-856214 (0008302 Spt. J. 10000 ogt. Lab Spillo)	100000	MD	87300	87	190066	ND	50200	50		
CGIM-GW-B116-LS-050314 Low Spike 19 ppb								107		
(C000004, 10000 ngd. Fluid Splin )	10000	NO	17100	171	10000	ND	10700	107		
CGN64-GN-22118-H3-050314 High Spiles 100 ppb (C006000, 100000 ng/L Finis Spiles)	108008	ND	160000	160	100000	MD	97700	98		
CGBMH-FWY-CWID-C-450314 (C000000 Spix K, 10000 npit, Ido Spito)	10800	5750	21900	182	18000	8410	19900	115		
CCRN PW-CWD-C-050314 (coopee spr L, 19000 eg/L Lab Spilin)	100000	5750	85700	aı	100000	8410	60 <b>6</b> 00	52		
CGMH-PW-CWD-LS-850314 Low Spike 16 ppb (cosses, 1986 agt, Field Spike)	19900	5750	22200	165	10404	8410	20200	118		
CGNN-FW-CWD-HS-050214 Migh Spites 180 ppb (CO06888), 168680 mgfl, Floid Spites }	100006	5750	183000	177	100005	8410	117000	109		
CQMIN-CYW-CYND-0-068408 (C0087888 8pt C, 1006 ngt. Lub 8ptin)	1000	7290	9420		1000	9910	11400	•		
CGMH-GW-CWD-Q-058405					ł					
(C0067866 Spit D, 10006 mg/L-Lub Spitus)	19000	7290	26000	167	18000	9910	20900	110		
CGMN-GW-CWD-LS-050405 (C0067676, 1008 mg/L Finid Spills )	1000	7290	9670	.	1006	9910	10430	•		
CGREN-GW-CWD-H\$-050405 (CRRF790), 10000 ngs. Field 8plin )	19080	7290	23700	164	10000	9910	18600	89		

<sup>&</sup>quot;Sample residue exceeds the spiling level significantly; therefore, an accurate recovery value cannot be calculate

Note: Since this summery table shows rounded results, recovery values may vary a

ND = Not detected at or above 26 ng/L (pp0.

NO - Not quantifiable - Measured concentration between 25 agril (per) and the Limit of

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Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

	14		4 Sulfonate PFBS	C6 Sulfanate PFHS				
<b>Annual</b>	Amount	Amt Found	Amount	Dana-sa.	Amount	Amt Found	Amount	D
Sample Description	Spliced (ng/L)	in Semple (ng/L)	Recovered (ng/L)	Recovery (%)	Spliced (mg/L)	in Sample (ng/L)	Recovered (ng/L)	Recover
WBMN-GW-CWM-O-050405								
(C0067980 Spt. E, 1000 ngd. Lab Splhe)	1086	7350	9260	•	1000	11800	12800	•
WBMN-GW-CWM-C-050405								
(C00017684 Spit F. 10000 mgS. Lab Spillin)	10000	7350	25000	177	10000	11600	21000	94
WISAIN-GW-CWSr-LS-050405 (C0067902, 1000 npt. Fin/s/0pite )	1000	7360	8710		1906	1180C	12700	
WEINI-GW-CWNI-HS-050405	'	, 220	0.10			71000	12700	
(C0007883, 10000 mg/L Field 8ptim )	10000	7350	21100	136	19000	11000	20000	84
WEINN-GW-R-2-O-050405								
coursel Sea G. 1000 agil. Lab Splins	1000	NĎ	2040	204	1800	ND	1090	109
WBMN-GW-R-2-O-050485	1 1				1			
20007064 Spit H, 10000 rg/L Lab Spito)	10006	ND	19000	190	10000	ND	11100	111
WENN-GW-R-2-LS-058405	1			400			4448	
(COURTING, 1995 agr., Plaid Spike )	1909	ND	1670	187	1993	ND	1110	111
WBMH -GW-R-2-HS-050405 (C0007887, 19800 ng/L Fluid Splice )	10000	ND	17700	177	10800	NB	10500	105
	,		17,00					
WBMN-GW-R-3-O-050405						4000		-
POSTIGN Byth C, 1800 aug/L Lub Spilles)	1900	360	1280	92	1000	1290	2210	22
WBMN-GW-R-3-C)-050405 2007780 Spk D, 19000 mpl. Lab Spike)	50008	360	9710	94	10060	1290	11500	102
WENN-GW-R-3-LS-860405			• 7 10	-	,	12.50		
(CHOSTATAL TORSI mg/L. Plaid Spiles )	1900	360	1130	77	1000	1290	2210	92
WBMN-GW-R-3-HS-058405	1 1				1			
(C0067571, 10000 ng/L Flotd Sylbo )	10006	360	9510	92	10000	1290	11500	102
WBMR-GW-R-1-0-050405					1			
C0057172 Spit E, 1903 mg/L Luis Spite)	1900	1 <b>68</b> D	3100	122	1000	2310	3740	143
WBMH-GW-R-1-0-060405	1	4000	44.00			***	42200	
C0007972 Spix F, 19805 mg/L Lab Spike)	10890	1860	11400	96	18000	2310	13300	110
WENN-GW-R-1-LS-450485 (20067675, 1000 mg/L Flaini Aplica )	1000	1000	2710	83	1900	2310	3430	112
WBMN-GW-R-1-HS-086405	1							
(COOSTOTA, 10000 aga. Floid Spites )	10000	1680	10600	89	10000	2310	13000	107
WBMN-GW-R-4-C-050405								
23067979 Spk Ct, 1600 mg/L Lab Spillin)	1009	6050	6760	•	1000	20100	21200	•
WEMN-GW-R-4-C-050466								
COUTET'S Baik M. 19099 mp/L Lab Splint	10086	6050	16500	105	10000	20100	30400	103
WEMM-GW-R-4-LS-059405		<b>6050</b>	7220		1006	20100	20800	
[COMPETS, 1900 ng/L Floid Spilm ]	1000	9050	7220		1906	20100	20000	-
WBMN-GW-R-4-HS-050405 (C0007879, 10000 ng/L. Floid 8pbs )	10000	6050	14600	86	18008	20100	28700	86
		•		~	]			
TIMN-GW-Fluid-Glank-LS-050405	1000	MO	762	70	1880	ND	1050	105
[COSE/180, 1000 mg/t, Flood Spiles]	1900	ND	102	76	1	RU	1076	100
VDMN-GW-Field-Blank+1\$-058405 (C0007881, 10000 agit. Field Spike)	10000	ND	6330	63	10000	NĎ	10260	102
							•	

"Sumple residue excueds the apbling level significantly; therefore, as accusts recovery value cannot be calculated

NO = Not detected at or above 25 rg/L gg/L.

NO = Not countificate in bisequired concentration between 25 not. soot and the Limit is

Communication (LCCs) which is 50 mg/L (ppt).

Nate: Since this minimum table shows munded results, recovery values may very slightly

From the values in the raw date.

Table III. Matrix Spike Recovery of PFOS and PFOA in Water **Samples** 

		C	Sulfonate PFOS				CB Acid PFGA	
Sample Description	Amount Spiled (ng/L)	Amt Found In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	Amount Splind (ng/L)	Ami Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
WB18N-GW-R1-DP-850314 (0868433 Sair G, 1860 ng/L Lais Relin)	1000	55.8	1050	99	1000	2200	3380	118
WEMMI-GWI-R1-O-058314 (C006632 bph D, 1600 mgl. Lab Sphin)	18008	85.8	10100	100	18000	2290	12200	100
WENN-GW-R1-LS-060314 Low Spiles 1 pph (0000644, 1400 npl. Fluid Spiles )	1000	55.8	1010	95	1000	2290	3200	100
WEMIN-GYF-Ft1-HS-050314 High Spike 19 ppb (CROSSIE), 18800 rg/L Field Spike )	18004	55.8	12800	125	10000	2200	13990	117
WBADL-GW-R2-C-086314 (Complete Spin II, 1040 Agin Lan Spino)	1800	MED	1029	102	1000	ND	1050	106
WEMM-GW-R2-C-060314 (CR08438 Sph. F, 1800 og/L Lab Sph.)	10000	NED	9620	96	10900	NIC	10500	105
WBMN-GW-R2-L\$-450314 Low Spilos 1 ppb						•••	1150	115
(CROSSER, 1600 ngs. Find Spins ) WENN-GW-R2-85-650314 High Spike 10 ppb	1900	NØD	1263	126	1600	NC	1130	175
(General), 19800 ngs. Fleid dyline )	19604	NID	12400	124	10500	ND	12100	121
WBANI-GW-R3-C-058314 (C0088446 Byt Ct, 1900 agr. Lin Spiles)	1000	116	1150	103	1000	159	1240	105
WISNIN-GW-R3-C-050214 (C000640 Epit H, 10000 mg/L Lud Splim)	10004	116	9680	98	10800	159	10500	103
WBMN-GW-R3-L3-850314 Law Spiles 1 ppb (C00M40, 1000 ngl. Field Rylles )	1990	116	1210	109	1000	159	1190	109
WEMM-GW-R3-455-050314 High Spike 19 ppb (C0008443, 16000 mpf. Flokt Spike )	15004	110	12900	128	10000	150	11800	116
WBMN-GW-R4-Q-000314 [D0006444 lipit t 1004 right Luib Syllin)	1900	2480	3810	113	1980	2850	3050	109
(CD005444 Spit J, 10000 ng/L Lab Spihe)	19000	2480	12100	90	10400	2850	13600	107
WBNN-GW-R4-L8-650314 Low \$piles 1 ppis (const-ris, 1960 ng/L Field Spiles )	1990	2480	3870	139	1000	2860	4010	115
WEMIN-GW-R4-R3-650314 High Spike 19 ppb (CAMB447, 18800 mgA. Field Spike )	19900	2460	16200	137	10000	2860	15800	129
WEND-GW-CWM-C-850394 (C000640 Spit X, 1000 mg/L Lub Rplin)	1000	1150	1980	83	1000	1870	2970	110
(COOLEASE Spirit, 19005 mgt, Lais Spiller)	10000	1150	10800	95	10000	1870	12900	109
WBMM-GW-CIVIS-L3-860314 Low Spike 1 ppb (C008400, 1600 agil Febri Spike )	1800	1150	2100	<b>Q</b> 5	1000	1870	3080	121
WEMN-GW-CYNA-HS-650314 High Spike 16 ppb (C000541, 16800 agr. Fiste Spike )	18000	1150	10700	95	10100	1870	13100	112
CCBMN-CW-4EW14-O-056318 (C106642 Byl: M, 100000 myll. Lab Syllm)	109030	74800	189000	114	100000	957000	1210000	•
CGMN-GW-MW14-0-050318 (C1005402 Rpk 14, 1000000 mg/L Lub Rphin)	1000000	7480C	1120000	105	1990000	967000	2080000	111
CGMN-GYV-MNY14-LS-050316 Low Spills 140 ppb (Catalida, 16000 ngl. Find Spills)	199000	74800	201000	126	190900	967000	1260000	•
(G MN-GW-MW14-HS-858396 High Spline 1000 ppb (C0001486, 100000 agif, Raid Spline)	1800000	74800	1340000	127	1000003	967000	2410000	144

simple reaches exceeds the aplicing level eigethosely; therefore, an accentate receiver — Not detected at or above 25 ng/L (ppt). I — You quarattacte is descured concentration between 23 ng/L (ppt) and the Lines Quarattaction (LOQ) which is 50 ng/L (ppt). In: Since this assembly table shows councid requite, recovery values may vary alight to the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Water **Samples Continued** 

		CE	Sulforato PPOS				CII Acid PFOA	
Sample Description	Amount Spitted (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	Amount Spiked (ng/L)	Aini Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGBEN-GW-46W10-C-050314 (C0088490 Rpt: C, 1000 mpt, Lain Apillin)	1006	2240	2960	72	1500	2220	3080	86
CGBAN-GW-67N10-O-050316 (D006668 Spd D, 18000 mgs. Lub Spdm)	19009	2240	11600	94	10000	2220	11400	92
CGNN-GW-MW18-LS-650316 Low Spike 1 ppb (C000468, 1000 nat. Field Spike )	1900	2240	2710	47	1000	2220	3020	80
CGMEN-GIVI-NAV10-HS-050216 High Spiles 10 ppb (C0005486, 19000 mg/L Fluid Spiles )	19000	2240	12800	104	10900	2220	12500	103
CGBIN-GW-MW4-C-056316 (C008649 Spit E, 1009 mpt. Last Spito)	1900	179	1120	<b>P4</b>	1000	10700	10800	-
CGMN-GW-MN44-CI-08C3-18 (C0008600 Bpit F, B000 mg/L Lub Bpitin)	5000	179	5030	97	5000	10700	14800	` <b>62</b>
CGMN-GW-MW4-LS-050316 Low Spike 1 ppb (caselest, 1980 ng/L Field Spike )	1000	179	1510	133	1000	10700	13200	•
CGMN-GW-MW4-HS-050318 High Spike 5 ppb (C00014th, 5000 npit, Floid Spike )	50GC	179	5910	115	5000	10700	15900	104
CGMN-GW-MW3-Q-456318 (2004-05-6pt Q, 000-pg/L Lish hybro) CGMN-GW-MW3-Q-050218	500	184	671	97	500	8140	8640	•
(C0005004 Spz H, 5000 ng/L, Lnb Spille)	2000	164	5080	98	5000	8140	14000	117
CGMN-GW-MW3-LS-650216 Low Spiles 6.5 ppb (C6005466, 500 ng/L Field Spiles )	500	184	697	103	500	8140	6720	•
CGMN-GW-MW3-H5-050310 High Spilm 5 ppb (C000MN7, 8000 hg/L Field Spilm )	5000	184	50 ID	97	5000	8140	12700	91
CG88N-GW-82W1-C-058218 (C008548 Byli: L 180 myll. Lab Ryths)	100	667	767	•	180	1130	1200	•
CGMH-GW-MW1-O-050216 (0000000 8pt st. 1900 mpt. Lub Rydw) CGMN-GW-86W1-LS-060216 Low Spiller 0.1 ppb	1900	667	1729	105	1800	1130	2160	103
(C0000470, 100 agr. Fluid Spins )	100	967	819	•	190	1130	1200	•
CGMM-GW-MW144S-050318 High Spike 1 ppb (C0008471, 1000 mg/L Plate Byther)	1800	667	2040	137	1000	1130	2680	156
CG8816-GW-MW9-O-050316 (C4008-672 Byt. K, 400 mg/L Lab Bythm)	180	142	255	123	160	746	642	•
CGMIN-GW-MWS-C-650316 (CMMS-F7X Spik I., 1996 ng/L Lub Spikn)	1800	142	1080	94	1890	748	1810	86
CGMN-GW-MW5-L3-050316 Low 8plite 0.1 ppb (0000474, 100 ng/L/Field 8pline)	180	142	194	52	100	748	1140	•
CGMN-GN-4FW5-HS-058216 High Spilm 1 ppb- (C046476, 1900 ng/L Finish Byllin )	1880	142	1460	132	1000	746	1940	119
CGMM-GW-MW7-Q-050318 (C000475 Spit 14, 100 ng/L Lab Spito)	190	101	208	197	160	237	341	104
CGRIN-GW-MWT-C-050316 (20085476 Spit R, 1600 mg/L Lab Spito)	1800	101	1000	98	1000	237	1270	103
CGIAN-CW-UW7-L3-650316 Low Spike 9.1 ppb (C008416, 100 mpl. Field Spike )	190	101	222	121	100	237	372	135
CGMM-GW-MW7-HS-000206 High Spiles 1 ppb (CMM478, 1800 ogl. Field Spiles )	1800	101	1250	118	1000	237	1440	120

<sup>&</sup>quot;Sample residue exceeds the spiking level significantly, the ND = Next described at or above 25 mpl. (pst). NO = Not quantifiable = Newsured concentration between Quantifiable = Newsured concentration between Quantifiable of LOQU below 50 mpl. (pst). Nose: Since the summary table shows trouded meutis, reconcern the values in the riburdate.

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Table III. Matrix Spike Recovery of PFOS and PFOA in Water **Samples Continued** 

		, CI	Suffonate PFOS				CB Acid PFOA	
Sample Description	Amount Splied (ng/L)	Ami Fourié In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
DOOR ON THE STATE OF STREET								
CGRIN-GW-MW2-C>C50315  C0005400 8ph C, 900 mpl. Link Splint	580	NO	550	110	500	1500	2200	140
CGMN-GW-MW2-O-080315			545					
(20005400 Spit D, 5000 rugh, Lath Spilm)	5000	ND	5730	115	5906	1500	7750	125
CGMN-GW-MW2-LS-050315 Law Spile 0.5 ppb								
(C0000412, 004 mg/L Flold Spline )	500	NO	538	108	500	1500	2210	142
CGMN-GW-MW2-H5-050316 High Spike 5 ppb (cs05433, 5000 ng/L Fold Spike )	5000	ND	6750	135	5004	1500	7910	128
CGMN-GW-MM8-C-658216								
(CHOSEANA Spit E, 500 mg/L Lab Spitm)	500	237	790	111	500	936	1400	93
CGMN-GW-MW8-O-058315	1							
(00000464 Bjd: F, 5000 mg/L ("nh Spille)	5000	237	5220	100	5690	935	6620	114
CGNN-GW-MWB-LS-050315 Low Spiles 0.5 ppb	1 1							
(C9005400, 000 suff, Field Spine )	500	237	806	114	500	935	1270	87
CGMN-GW-MW9-H8-090315 High Spike 5 ppb	l l							
(C0005467, 5000 mg/L Fluid Ryllin )	5000	237	6810	111	5000	935	6850	118
CG88N-GW-8WV12-O-050818	1							
(Chicalout Spit C, 1000 ngC, Lab Spills)	1900	219000	212000	•	1000	2140000	2110000	•
CGMN-GW-MW12-O-050515	l i							
(C0005406 Spit H, 10000 mg/L Lab Spitm)	19690	219000	248000	•	10000	2140000	2350000	•
CGNIN-GW-NRY12-LS-850315 Low Spike 1 ppb								
(COSSESSE, 1000 mg/L Field Syllic )	1000	219000	176000	•	1000	2140000	1330000	•
CGBIN-GW-MY12-HS-050315 High Spike 14 ppb (Constant, 10000 npt. Field Spike )	1000C	219000	231000		10000	2140000	2310000	
COMM-GW-PZ14-O-860315	<b>∤  </b>							
(COMMAND Spir I, 1800 mg/L Lab Spirin)	1000	543	1720	118	1006	2710	4140	143
CQMN-GW-#Z14-O-050315	1 I							
(CP000403 Spit J. 10000 ng/L Lab Splin)	10000	543	19600	130	18000	2710	22300	198
CGMN-GW-PZ14-LS-050315 Low Solks 1 ppb				1				
(CADABASA, 1486 agé, Flaid Sydin )	1000	543	2000	148	1608	2710	3900	119
CGMM-GRY-PZ14-HS-450315 High Spike 10 pob	l I							
[C0018405, 19800 right Floid Splice ]	10006	543	12800	123	10000	2710	18100	154
CGNH-GW-MW17-C-050315	1				ľ			
(COMMENTS Syde He SOO may'l East System)	500	506	1090	₩	500	1760	2370	122
CGMN-GW-MW17-C-050915	1							
(C0005406 Spit L., S000 mg/L Luib Spille)	5000	505	5890	106	8000	1760	7680	118
CGMN-GW-4FW17-LS-050215 Low Splice 0.5 ppb (C0001404, 200 mpt. Fleid Splice)	500	595	929	67	580	1760	2240	96
CGMN-GW-MW17-H8-096815 High Spike 5 ppb			85.40		-	4700		454
(Cososian, Seco mg/L Plate Spitus )	5000	595	6040	109	5 <b>60</b> 0	1760	7790	121
CGMN-GW-46W18-C>-050315 (COORSIO Opt. 11, 500 mg/L Lujo 11,00m)	500	m	1300	105	508	2140	2860	
CGMN-GW-MW18-C-080315				i	i			
(COOMERON Syde Nr., 1966 mg/l, Lado Sydins)	5806	777	5050	97	8000	2140	7410	105
CGNN-GW-MW18-L3-050318 Low Spike 4.5 ppb (C000840tz, 600 npl. Fisial Spike)	500	777	1450	135	506	2140	3050	
		** '	1704			2170	~~	
CGMN-GW-MW18-HS-050315 High Splins # ppb (G8000003, 3400 mpl., Fluid Splins )	5000	777	8070	148	5000	2140	9020	138

<sup>&</sup>quot;Sample residue exceeds the spiking level significantly; therefore, an accurate recovery to RD = Not detected all or above 25 rtg/L (ppt).

NO = Not quantifiable = Necessard concentration between 25 rtg/L (ppt) and the Limit of Chaestierion (L/OQ) which is 50 rtg/L (ppt).

Note: Since this purement visite alrows rounded results, recovery values may vary stightly from the values in the rian date.

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Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

		a	Selfonets PFOS				CB Acid PFQA	
Sample Description	Amount Spiled (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	Amount Spited (ng/L)	Arni Found in Semple (ng/L)	Amount Recovered (ng/L)	Resovery (%)
CGMN-GW-TRIP2-LS-058315 Low Spike 1 pab	1							
(Cossided, 1000 ngt_siplic)	1000	NO	1220	122	1006	ND	1270	127
CGMH-GW-TRIP2-HS-050315 High Spike 10 ppb	1	1						
(CONSISSE, 1988) regil. Spiles (	10000	ND	10100	101	18000	ND	11100	111
CCMN-GW/MW11-Q-850312	1							
(C0000073 Spit C, 1000 ng/L Las Spite)	1900	10900	13700	•	1000	69500	64100	•
CGMN-GW-HW11-Q-050212								_
(COMMETS Spit St, 1980) ngil. Lab Spike)	10000	10900	21400	105	16900	89500	76300	•
CGMN-GW-MW11-LS-050312 Low Spike 1 ppb	ــــ	40000	12400		1800	****	53800	
(CA000075, 1986 ag/L, Field Ephin )	1996	10900	12100		7800	69500	53800	
CGMN-GW-MW11-H5-850312 High Splim 10 ppb (C0065976, 10000 ng/L Field Splim )	10006	10900	21900	110	10000	69500	76700	
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	10220		,			70105	
CGMH-GW-MW101-Q-059312 (C008977 Spit 5, 100000 mgs. Lab Spitm)	100000	341006	528000		100000	157000	310000	153
	70000	3-100	120000		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	137300	310000	100
CGMN-GW-MW101-0-058212 (C000877 Spit F, 190000 ng/L Lab Spite)	1000004	341000	2180000	184	1000000	157000	2120000	196
CGMH-GW-MW101-LS-860312 Low Spike 160 ppb	15-45-5							
(C00020678, 100000 mg/L Fluid Spiles )	190900	341000	482000	•	190000	157000	288000	131
COMN-CW-MW191-HS-658312 High Spike 1000 pph	İ							
(Canadana, 1005000 agil, Field Spiles)	1000000	341000	2090000	175	1000000	157000	1360000	123
CGMH-GW-4/W142-O-450312								
(COOCERT Sight Co, 100000 right, Lab Spite)	100000	45900	181000	135	190000	175000	308000	133
CGMH-GW-MW102-O-650312								
(C4045611 Spix N., 1080600 mg/L Lais Spille)	1900900	45900	1680000	151	1000000	175000	1630000	100
CGMN-GW-MW102-LS-050312 Low Spile 100 ppb								
(CEONOLZ, 180000 ng/t, Plate Spline)	100000	45900	216000	170	190000	175000	349000	174
CGMN-GW-MW102-HS-050312 High Spike 1000 ppb (C000004, 100000 mg/L Ploid Spike )	1900000	45900	1380000	133	1000000	175000	1370000	120
			100000	~~		175050	1010000	
CGMH-GW-MW13-Q-650312	1900	13400	14300		1000	15500	15800	•
COMIN-OW-MAY 3-O-050312	'***		1-000	j		10000	10000	
(COCCOST Spit. J. 10000 mg/L Lab Spitus)	18000	13400	26000	126	10000	15500	31700	162
CGMN-GW-8FW13-LS-058312 Low Spike 1 ppb								
(00000007, 1000 mg/L Finld Spills )	1990	13400	23700	•	1990	15500	28900	•
CGMN-GW-MW13-HS-950312 High Spike 10 ppb								
(C0000006, 10006 right, Phild Spiles )	18604	13400	46300	329	10004	15500	47906	323
CGMN-GW-MW16-O-050312					İ			
(COORIDGO Spit IC, 1460 mg/L, Lab Syllin)	1900	41100	30600	•	1000	24000	19900	•
COMM-GW-MW16-O-050912	40000	41100	36900	. 1	10000	24000	34200	102
(COMMEN Spik L, 10000 mg/L Lab Spike) CGMN-GW-MW15-LS-050312 Low Spike 1 ppb	10000	<b>4</b> 1100	3000			24000	Jacob	, mag
(001000011, 1000 mgt, Flaid Splim.)	1000	41100	39800		1008	24000	23100	•
CGMH-GW-MW16-H8-050312 High Splim 10 ppb								
(COCOSTE), 10000 ng/L Fluid Epillo }	10000	41100	50000	٠ ا	19090	24000	39400	154

Sample residue exceeds the spitting level significantly; therefore, an accurate recovery value cannot be calculated

Quantitation (LOQ) which is 50 ngs. (cpt).

NO = Not distacted at or above 25 agr. (ppt).

NQ = Not quantifiable - Measured concentration between 25 apt. (ppt) and the Limit of

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Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

		CI	Sulfonate PFOS				CE ACIE PFOA	
_	Amount	Artit Found	Amount		Amount	Arnt Found	Amount	
Sample Description	Spliced (ng/L)	in Sample (ng/L)	Recovered (ng/L)	Recovery	Spiker	in Sample	Recovered	Resevery
	1 199	( ( ( ( ) ( ) ( ) ( ) ( )	Linge	(96)	(ng/L)	(ng/L)	(ng/L)	(%)
CGMH-GW-MW15-O-040312								
(00000000 Spir C, 1000 ng/L Lab Sylho)	1990	11300	10400	•	1600	6390	7100	•
CGMN-GW-MW15-O-480212	10000	11200	20422	***		***		
(COORTICO Spin D. 10000 mpl. Los Spins)	'****	11300	25100	148	16000	6390	10000	102
CGNIN-GW-87W15-LS-060312 Low Spike 1 ppb (C0000700, 1000 npc_rive spike )	1908	11300	13000		1000	8390	7040	
CGMH-GW-MW15-HS-080312 High Spike 10 ppb		1	13000		11000	6390	7040	
(Coossot, 10000 ng/L Flord Spine )	18006	11900	30200	189	10000	6390	19400	130
•			-					
CGMN-GW-TRIP14.5-450314 Low Splice 6.5 ppb	l	1			1			
(C0000001, 200 mg/L Flaid Spiker)	500	NED	558	112	500	NO	495	90
CGMN-GW-TRIP1-HS-650314 High Spiles 5 ppb								
(C0000032, 5000 mpil. Floid Spiles )	5900	NID	5900	116	5000	ND	5250	106
CGMN-GW-FW1-O-850514	i i							
(C0000033 date E, 1000 mg/L Lab Spiles)	1900	457	1410	95	1080	3320	4550	•
CGMN-GW-PW1-O-850314					l			
(C0000103 Sph F, 10004 ug/L Lab Spilus)	10006	457	8520	61	10000	3320	14300	110
CGNN-GW-PW1-LE-060314 Low Spite 1 ppb	1 1			]				
(C0000011, 1000 mpl. Flate 2mbs )	1900	457	1760	130	1000	3320	5230	•
CGMN-GW-PW1-H8-050314 High Spile 16 ppb				i				
(COOCHESO, 1000E eagl. Flaid Epiter)	10000	457	9790	93	19000	3320	14500	112
CGMH-GW-PW2-0-458314	! !				1			
(CONSTRATE OF SOUTH STATE OF S	500	573	712	28	500	3860	4280	•
CGMN-GW-PW2-0-050214	1			i				
(COOLORS) Style II, 5000 mg/L Lafe Spiles)	5006	573	5820	101	5008	3660	9610	115
CGMN-GW-PW2-LS-450314 Low Spike 8.5 ppb								
(C0000031, 300 mg/l. Plaid Spike )	504	573	1000	103	508	3680	6030	•
CGMH-GW-PMZ-H8-650314 High 8plin 5 ppb								
(C1001945, 6000 Agil. Field Spile )	3000	573	8800	125	5000	3560	9810	115
CGMN-GW-PW3-O-000814	l I			ŀ	- 1			
(COTOSOT Uph I, 100 agril (ab Spile)	100	ND	44.9	45	100	523	641	•
CGNN-GW-PW3-O-050314								
[C0008041 Belt J. 1000 ng/E.l.mb Spillin]	1908	NE	408	50	1960	523	1530	101
CGMH-GW-PW3-L8-080214 Law Spike 0.1 ppb								
(CMMMA), 190 agril. Field Spile )	100	ND	70.3	70	100	523	752	•
CGMN-GW-PW3-H5-050314 High Splice 1 ppb	l i			_				
(C000F044, 1000 reg/L Flaid Spiles )	1900	NEO	574	57	1960	523	1610	109
CGMH-GW-PW-LO-658314				- 1	- 1			
(COMMENT System, 500 mg/L. Last System)	500	ND	475	95	500	1190	1830	60
CGMN-GW-FW4-O-086914				ľ	Ì			
(CASSINAL Sight L., Mich angl. Lab Sigha)	5000	ND	4680	<b>94</b> ∤	5000	1190	6040	97
CGMN-GW-PW4-LS-080214 Low Spike 8.5 ppb	500	ND	600	100	500	****	1010	
[C000044, 900 ng/L Flaid Spile ]	344	NO.	602	100	300	1190	1910	144
CGMN-GW-PW4-HS-080314 High Spike # ppb (C000000, Net part, Fint Spike #	5000	ND	5690		4044	1190	4100	100
(CANADAN, SAME SEEL )		<b>70</b>	2090	114	5000	1136	6490	106

Sergels residue exceeds the soliting level storificantly: therefore, an accounts recovery value casent he culturated

Note: Since this summery table shows rounded requits, recovery values may vary slightly

NO > NOt detected at or above 25 rgA, (ppt)

NO = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of

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Table III. Matrix Spike Recovery of PFOS and PFOA in Water **Samples Continued** 

		CI	Sulfonate PFOS				CB Add PFOA	
Sample	Amount Spliced	Ami Found in Sample	Amount Recovered	Recovery	Amount Spiked	Amt Found to Sample	Amount Recovered	Recovery
Description	(ng/L)	(ng/L)	(ng/L)		[ng/L]	(ng/L)	(ng/L)	[%]
CGMN-GW-PW5-O-450314	1							
(COMMON Spir C, 16000 pp/L Lab Spirot	19900	4340	14300	100	10000	14800	25000	82
CGMN-GW-PW5-O-450314	1	'*'						
(CONCOUNT Spik C), TORROW mg/L, Lafe Rydia)	100000	4340	137000	133	100000	14800	118000	103
CGMN-GW-PWS-LS-066314 Low Splite 18 ppb	i							
(C0003002, 10000 reg/L Floid 8piles)	10960	4340	17100	128	10000	14800	24200	94
CGMN-GW-PWS-HS-050314 High Spike 100 ppb	l '							
(CONSULT, 101600 mg/L Floid Spine )	100000	4340	131000	127	100000	14800	114000	98
CQMN-QW-PWE-0-050314								
(Catalond Spin E, 10000 right Lati Spike)	10000	33300	42000		10000	158000	159000	•
CGMN-GW-PW4-0-650214	"							
(CO100064 Spit F, 100000 topft, Lab Spiller)	100000	33300	154000	121	100000	158000	277000	119
CGMN-GW-PW6-L3-050314 Law Spiles 10 ppb								
(COPERSO, 18000 mg/L Field Spline)	10080	33300	37400	•	19000	158000	158000	•
CGMN-GW-PWS-HS-050314 High Spike 100 ppb		ł			1			
(COORDEST, 101000 mg/L Platel Spiles )	100000	33300	150000	117	100000	158000	268000	108
COMMITTED CATALO								
CGMN-GW-PW8-D-050314 (C000000 Syk Q, 100 syft, Lab Byllo)	108	ND	108	106	100	570	856	•
	""	"		.40				
CGMN-GW-PWE-O-056314 (C808888 Spt. II, 1685 mp/L Lab Spilin)	1000	ND ND	1180	118	1006	570	1690	112
CGMN-GW-PW8-L3-030314 Low Spike 9.1 ppb			1.00					
(Catalogo, 160 ng/L Field Spille )	108	ND	120	120	100	570	714	•
CGMH-GW-PW8-HS-060814 High Splins 1 pob								
(C8080001, 1000 agil, Floid Spile )	1000	ND	1110	111	1900	570	1630	105
					1			
CGMM-GW-8116-O-050214	19089	ND	10400	194	19900	ND	10300	103
(CONSTRUCT Syst I, 18000 cryfi. Lath System)	10000	, NLD	10-100	114		THE STATE OF THE S	10000	
CGMH-GW-B114-O-050314 (contract tiple J, 198000 right Lab Spinis)	100000	ND	59700	60	180060	ND	51400	51
			34,00	_			<del>,</del>	
CGMN-CW-8114-LS-050314 Low Spike 10 pph (Cassass, 1990 agr. Field Spike )	10089	ND	11700	117	18000	ND	11400	114
•	1000		11140					
CCNN-QW-8116-HS-050314 High Splike 100 ppb (Cooldeed, 101000 agrl. Field bylaw)	100000	ND:	109000	109	100000	ND	92100	92
,								
C6MH-PW-CWD-0-650314	ľ							
(0000000 Spic II, 18000 mg/L Lub Spilos)	10000	1150	10400	93	18000	3030	13400	104
CGMH-FW-CWD-O-050314							55455	
(00000006 8pt L, 100000 ag/L Lab Spille)	100000	1160	68400	65	100000	3030	58100	55
CGMH-PW-CWD-L8-660314 Law Spike 10 ppb	10000	1150	13200	121	18086	3030	14800	116
(Cottons, 1970 ng/L Flatd Spite)	10000	าาอบ	13200	121	10000	3030	14000	110
CGMN-PW-CWD-HS-050314 High Spile 100 ppb	100000	1150	90200	80	100000	3090	93500	90
(CASSESSE, 100000 ag/l. Finld liphm)	10000	1130	MLM: UN	-		3000		
CGMH-GW-CWD-Q-084468							2840	449
(C0007800 Spik C, 1906 mg/L-Eust Spillos)	1006	1430	2500	107	1990	2720	3840	112
CGMH-GW-CWD-O-056408			*****			0700	45500	106
(COORTESS San D. TERRO mark Lan Spinn)	10000	1430	11800	104	18606	2720	13200	IUD
COMM-GW-CWD-LE-059406		4400	2330	90	1000	2720	3500	97
(CCOSTERS, 1000 ag/L Fleet Spike )	1000	1430	2330	¥U.	TUCA	2120	3000	•
CGMN-GW-CWD-HS-059405	10000	1430	<b>9320</b>	79	18906	2720	19803	79
(CD\$47844, 1888 ng/L Fald Spile )	1	7767	****			4744		

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Not quantitable = literatured concentration
 Quantitation (LOQ) which is 50 ng/L (ppt),
 Not Since this summary table shows sounded no
 sto values in the new data.

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Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

	Amount	Amt Found	Amount		Amount	Amt Found	Arnount	
Sample	Spiled	in Sample	Recovered	Recovery	Spiked	in Sample	Recovered	Recove
Description	(ng/L)	(ng/L)	(ng/L)	(%)	(ng/L)	(ng/L)	(ng/L)	(%)
WESTH-GW-CWM-0-050405	1							
(C0067560 Byth E, 1800 ag/L, Late Spilling)	1065	1260	2400	114	1800	2230	3360	113
WERN-GW-CWM-C-050465	1				1333		-	
(COSE7005 Salt F, 18000 mg/L Lab Sustan)	18009	1280	11200	90	10000	2230	12400	102
WBMH-GW-CWM-LS-458406	10000	,200	11200			1200	12440	104
(20067862, 1000 mg/l, Field lipike )	1006	1260	2100	84	1600	2230	3100	57
		1200	2.00	~				~
WENN-GW-CWNI-HS-050406	18000	1260	10900	96	10800	2230	10800	84
(C8067063, 10000 mg/L Fluid Spille )	19000	1200	10000	-~	10100	2230	10000	•
WENDI-GW-R-2-O-050405	1 .							
(C0067964 Spit Ct. 1000 mg/L Lab Spille)	1000	ND	1030	103	1000	ND	1060	106
WBMN-GW-R-2-O-060405								
(C0007004 Spit H, 19900 ng/L Lab Spito)	10000	ND	11300	113	10000	ND	1080C	108
WB184-GW-R-2-LS-050485	1 1							
(00057684, 1000 mg/L Field Oplice )	1800	NO.	1270	127	1008	NO	1150	115
W880N-GW-R-2-HS-058405	1 1							
(C0007867, 10000 right, Flatel Spike )	10000	NO.	12100	121	19990	ND	10900	108
WRMH-GW-R-3-Q-050485	1 1							
(Constitute that C. 1000 and L.m. Sylla)	1900	143	1140	100	1000	191	1280	109
WBMH-GW-R-3-O-950405	1 1							
(C0007500 Spb D, 10000 mg/L Lab Spiles)	10000	143	10800	107	18080	191	11700	115
WBMN-GW-R-3-L3-859485	i 1							
(C0067678, 1906 mg/t. Flotal Sylles )	1000	143	1090	96	1000	191	1200	101
WBMH-GW-R-3-H3-050406	1 1			- 1	- 1			
(COSSTET), 19800 mg/L Fluid Spills )	10080	143	9760	95	19000	191	11100	100
WB4IH-GW-R-1-O-080485	]				- 1			
(C00027072 Opt. II., 1900 mgd. Late Spilte)	1000	NQ	1150	116	1906	2060	4600	194
WBMN-GW-R-1-O-056486								
(COUNTY/A Spit F, 19000 ngs. Lab úplim)	10000	NC	11100	111	10000	2050	14200	121
WRMN-GW-R-1-L 8-050405		,,	,				,	
100007175, 1100 agt. Flaid Spile )	1000	NC	1200	120	1806	2050	3660	150
		1444	1200			2000	-	
WEINH-GW-R-1-HS-050485 (C0067874, 10000 mg/L Field Splin )	10000	NC ·	12200	122	18000	2060	1470B	125
,,				- 1				
WENN-GW-R-4-Q-060406	1 !							
(COURTETS THE CL. THE MIT. LAN SHIP)	1900	2340	3420	106	1000	3120	4170	•
WBMN-GW-R-4-Q-050405	1 1							
{C0047875-498: H, 18800 ngl. Lah Spile}	18004	2340	13000	197	10800	3120	14000	109
WEMN-GW-R-4-LS-040405	I I			_				_
(C0007373, 1000 mg/L (Field Splits )	1800	2340	3110	77	1000	3120	3900	•
WERR-GW-R-4-KS-050405	1				į			
(C0007678, 10000 ng/l, Floid Spile )	19000	2340	11600	93 .	10600	3120	11900	88
W2000-GW-Floid-Blank-LB-050405	1			- 1	ĺ			
(Contrast, 1906 ng/L Flold Spike)	1800	NID	1110	111	1000	NO	1210	121
WBMN-GW-Field-Blank-HS-050406		·- <del>-</del>	****					
(C0007681, 14000 mg/L Field Späne)	10006	NEC	10600	108	10000	ND	11700	117

<sup>&</sup>quot;Sample resides exceeds the spiking level significantly; therefore, an eccurate recovery value cannot be described

Quantification (LOQ) which is 50 ng/L (ppt).

Hoter, Singer tries seemment table shows rounded results, recovery values may vary slightly from the values in the resultable

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NQ = Not quantifiable = Measured concentration between 25 ng/L (ppl) and the Limit of

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Water Samples

			13C-PFOA	
		Amount	Amount	
Exygen	\$ample	Spiked	Recovered	Recovery
1D	Description	(ng/L)	(ng/L)	(%)
C0065433 Spk C	WBMN-GW-R1-DP-050314	1500	1290	86
C0065432 Spk D	WBMN-GW-R1-O-050314	10500	10700	102
C0065432	WBMN-GW-R1-O-050314	500	376	75
C0065432 Rep	WBMN-GW-R1-0-050314	500	383	77
C0065433	WBMN-GW-R1-DP-050314	500	395	79
C0065434	WBMN-GW-R1-LS-050314 Low Spike 1 ppb	1000	989	99
C0085435	WBMN-GW-R1-HS-050314 High Spike 10 ppb	10000	11300	113
C0065436 Sok E	WBMN-GW-R2-O-050314	1500	1540	103
C0065436 Spk F	WBI/IN-GW-R2-O-050314	10500	11100	106
C0065438	WBMN-GW-R2-O-050314	500	463	93
C0065436 Rep	WBMN-GW-R2-O-050314	500	426	85
C0065437	WBMN-GW-R2-DP-050314	500	450	90
C0065438	WBMN-GW-R2-LS-050314 Low Spike 1 ppb	1000	1130	113
C0065439	WBMN-GW-R2-HS-050314 High Spike 10 ppb	10000	12000	120
C0065440 Spk G	WBMN-GW-R3-O-050314	1500	1590	106
C0065440 Sok H	WBMN-GW-R3-O-050314	10500	10900	104
C0065440	WBMN-GW-R3-O-050314	500	422	84
C0065440 Rep	WBMN-GW-R3-O-050314	500	403	81
C0065441	WBMN-GW-R3-DP-050314	500	420	84
C0085442	WBMN-GW-R3-LS-050314 Low Spike 1 ppb	1000	1010	101
C0065443	WBMN-GW-R3-HS-050314 High Spike 10 ppb	10000	11500	115
C0065444 Spk )	WBMN-GW-R4-O-050314	<b>1500</b>	1530	102
C0065444 Spk J	WBMN-GW-R4-Q-050314	10500	11300	108
C0065444	WBMN-GW-R4-O-050314	500	435	87
C0065444 Rep	WBMN-GW-R4-O-050314	500	417	83
C0065445	WBMN-GW-R4-DP-050314	500	434	87
C0065446	WBMN-GW-R4-LS-050314 Low Spike 1 ppb	1000	1060	106
C0085447	WBMN-GW-R4-HS-050314 High Spike 10 ppb	10000	12100	121
C0065448 Spk K	WBMN-GW-CWM-0-050314	1500	1520	101
C0065448 Spk L	WBMN-GW-CWM-Q-050314	10500	10900	104
C0065448	WBMN-GW-CWM-0-050314	500	450	90
C0065448 Rep	WBMN-GW-CWM-O-050314	500	445	89
C0065449	WBMN-GW-CWM-DP-050314	500	419	84
C0065450	WBMN-GW-CWM-LS-050314 Low Spike 1 ppb	1000	989	99
C0065451	WBMN-GW-CWM-HS-050314 High Spike 10 ppb	10000	10300	103
C0065452 Spk M	CGMN-GW-MW14-O-050318	100500	107000	801
C0065452 Spk N	CGMN-GW-MW14-O-050316	1000500	979000	98
C0065452	CGMN-GW-MW14-O-050316	500	284	57
C0065452 Rep	CGMN-GW-MW14-0-050316	500	282	56
C0065453	CGMN-GW-MW14-DP-050316	500	296	59
C0065454	CGMN-GW-MW14-LS-050316 Low Spike 100 ppb	100000	107000	107
C0065455	CGMN-GW-MW14-HS-050316 High Spike 1000 ppb	1000000	962000	96

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Water Samples Continued

			12C-PFOA	
The second secon		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
<u>ID</u>	Description	(ng/L)	(ng/L)	(%)
C0065456 Spk C	CGMN-GW-MW10-O-050316	1500	1590	106
C0065456 Spk D	CGMN-GW-MW10-0-050316	10500	10800	103
C0065456	CGMN-GW-MW10-0-050316	500	444	89
C0065456 Rep	CGMN-GW-MW10-0-050316	500	429	86
C0065457	CGMN-GW-MW10-DP-050316	500	467	93
C0065458	CGMN-GW-MW10-LS-050316 Low Solke 1 pob	1000	997	100
C0065459	CGMN-GW-MW10-HS-050316 High Spike 10 ppb	10000	10400	104
C0065460 Sok E	CGMN-GW-MW4-O-050316	1500	1550	103
C0065460 Sok F	CGMN-GW-MW4-O-050316	5500	5990	109
C0065460	CGMN-GW-MW4-0-050316	500	441	88
C0065460 Rep	CGMN-GW-MW4-O-050318	500	423	85
C0055461	CGMN-GW-MW4-DP-050316	500	397	79
C0065462	CGMN-GW-MW4-LS-050316 Low Solke 1 pob	1000	1190	119
C0065463	CGMN-GW-MW4-HS-050318 High Spike 5 ppb	5000	4920	98
C0065464 Spk G	CGMN-GW-MW3-0-050316	1000	846	85
C0065464 Spk H	CGMN-GW-MW3-O-050316	5500	5620	102
C0065464	CGMN-GW-MW3-D-050316	500	417	83
C0065464 Rep	CGMN-GW-MW3-Q-050316	500	417	83
C0065465	CGMN-GW-MW3-DP-050316	500	438	88
C0065466	CGMN-GW-MW3-LS-050316 Low Spike 0.5 ppb	500	395	79
C0085467	CGMN-GW-MW3-HS-050316 High Spike 5 ppb	5000	3870	77
C0065468 Spk I	CGMN-GW-MW1-O-050316	600	593	99
C0065468 Spk J	CGMN-GW-MW1-Q-050316	1500	1560	104
C0065468	CGMN-GW-MW1-O-050318	500	492	98
C0065468 Rep	CGMN-GW-MW1-O-050316	500	493	99
C0065469	CGMN-GW-MW1-DP-060316	500	533	107
C0065470	CGMN-GW-MW1-LS-050316 Low Spike 0.1 ppb	100	96.4	96
C0065471	CGMN-GW-MW1-HS-050316 High Spike 1 ppb	1000	1300	130
C0065472 Spk K	CGMN-GW-MW5-O-050316	600	594	99
C0065472 Spk L	CGMN-GW-MW5-O-050316	1500	1450	97
C0065472	CGMN-GW-MW5-O-050316	500	471	94
C0085472 Rep	CGMN-GW-MW5-O-050316	500	468	94
C0065473	CGMN-GW-MW5-DP-050316	500	504	101
C0065474	CGMN-GW-MW5-LS-050316 Low Spike 0.1 ppb	100	90.8	91
C0065475	CGMN-GW-MW5-HS-050316 High Spike 1 ppb	1000	1170	117
00065476 Spk M	CGMN-GW-MW7-O-050316	600	598	100
C0065476 Spk N	CGMN-GW-MW7-0-050318	1500	1590	106
C0065476	CGMN-GW-MW7-O-050316	500	498	99
C0065476 Rep	CGMN-GW-MW7-O-050316	500	578	116
C0065477	CGMN-GW-MW7-DP-050316	500	532	106
C0065478	CGMN-GW-MW7-LS-050316 Low Spike 0.1 ppb	100	113	113
C0065479	CGMN-GW-MW7-HS-050316 High Spike 1 ppb	1000	1160	116

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Water Samples Continued

			13C-PFOA	
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
ÍD	Description	(ng/L)	(ng/L)	(%)
00005400 0 1 0				
C0065480 Spk C	CGMN-GW-MW2-O-050315	1000	1030	103
C0065480 Spk D	CGMN-GW-MW2-O-050315	5500	7020	128
C0065480	CGMN-GW-MW2-C-050315	500	466	93
C0065480 Rep	CGMN-GW-MW2-0-050315	500	611	122
C0065481	CGMN-GW-MW2-DP-050315	500	574	115
C0065482	CGMN-GW-MW2-LS-050315 Low Spike 0.5 ppb	500	493	99
C0065483	CGMN-GW-MW2-HS-050315 High Spike 5 ppb	5000	6390	128
C0065484 Spk E	CGMN-GW-MW9-O-050315	1000	982	98
C0065484 Spk F	CGMN-GW-MW9-O-050315	5500	6200	113
C0065484	CGMN-GW-MW9-O-050315	500	491	98
C0065484 Rep	CGMN-GW-MW9-O-050315	500	514	103
C0065485	CGMN-GW-MW9-DP-050315	500	537	107
C0065486	CGMN-GW-MW9-LS-050315 Low Spike 0.5 ppb	500	502	100
C0065487	CGMN-GW-MW9-HS-050315 High Spike 5 ppb	5000	5740	115
C0065488 Sok G	COMMON MARCO O ACOME	4500		
	CGMN-GW-MW12-O-050315	1500	1490	99
C0065488 Spk H	CGMN-GW-MW12-O-050315	10500	11100	106
C0085488	CGMN-GW-MW12-O-050315	500	345	69
C0065488 Rep	CGMN-GW-MW12-O-050315	500	336	67
C0065489	CGMN-GW-MW12-DP-050315	500	315	63
C0065490	CGMN-GW-MW12-LS-050315 Low Spike 1 ppb	1000	1160	116
C0065491	CGMN-GW-MW12-HS-050315 High Spike 10 ppb	10000	12200	122
C0065492 Spk I	CGMN-GW-PZ14-O-050315	1500	1800	120
C0065492 Spk J	CGMN-GW-PZ14-O-050315	10500	15000	143
C0085492	CGMN-GW-PZ14-O-050315	500	507	101
C0065492 Rep	CGMN-GW-PZ14-O-050315	500	513	103
C0065493	CGMN-GW-PZ14-DP-050315	500	560	112
C0065494	CGMN-GW-PZ14-LS-050315 Low Spike 1 ppb	1000	1310	131
C0065495	CGMN-GW-PZ14-HS-050315 High Spike 10 ppb	10000	14300	143
0085496 Spk K	CGMN-GW-MW17-O-050315	1000	1040	104
20065496 Spk L	CGMN-GW-MW17-0-050315		6010	
20003490 Spk L C0065498	CGMN-GW-MW17-0-050315	5500 500	5010 516	109 103
C0065496 Rep	CGMN-GW-MW17-0-050315 CGMN-GW-MW17-0-050315	500 500	516 530	103 106
C0065497	CGMN-GW-MW17-DP-050315		530 592	
C0005497 C0065498		500		118
C0065498	CGMN-GW-MW17-LS-050315 Low Spike 0.5 ppb	500	488	98
UU00499	CGMN-GW-MW17-HS-050315 High Spike 5 ppb	5000	5940	119
00065500 Spk M	CGMN-GW-MW18-O-050315	1000	994	99
20085500 Spk N	CGMN-GW-MW18-D-050315	5500	5660	107
C0065500	CGMN-GW-MW18-D-050315	500	434	87
C0065500 Rep	CGMN-GW-MW18-O-050315	500	450	90
C0065501	CGMN-GW-MW18-DP-050315	500	516	103
C0065502	CGMN-GW-MW18-LS-050315 Low Spike 0.5 ppb	500	496	99
C0065503	CGMN-GW-MW18-HS-050315 High Spike 5 ppb	5000	6160	123
C0065504	CGMN-GW-TRIP2-O-050315	500	541	108
				111
C0065505	CGMN-GW-TRIP2-LS-050315 Low Spike 1 ppb	1000	1110	

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Water Samples Continued

			13C-PFOA	
		Amount	Amount	_
Exygen	Semple	Spiked	Recovered	Recovery
<u>ID</u>	Description	(ng/L)	(ng/L)	(%)
C0065973 Sok C	CGMN-GW-MW11-0-050312	1500	1720	115
C0065973 Sok D	CGMN-GW-MW11-0-050312	10500	12800	122
C0065973	CGMN-GW-MW11-0-050312	500	415	83
C0065973 Rep	CGMN-GW-MW11-O-050312	500	418	84
C0065974	CGMN-GW-MW11-DP-050312	500	432	86
C0065975	CGMN-GW-MW11-LS-050312 Low Spike 1 ppb	1000	1230	123
C0065976	CGMN-GW-MW11-HS-050312 High Spike 10 ppb	10000	13200	132
C0065977 Sok E	CGMN-GW-MW101-O-050312	100500	139000	138
C0065977 Sok F	CGMN-GW-MW101-O-050312	1000500	1810000	181
C0065977	CGMN-GW-MW101-O-050312	500	296	59
C0065977 Rep	CGMN-GW-MW101-O-050312	500	284	57
C0065978	CGMN-GW-MW101-DP-050312	500	262	52
C0065979	CGMN-GW-MW101-LS-050312 Low Spike 100 ppb	100000	112000	112
C0065980	CGMN-GW-MW101-HS-050312 High Spike 1000 ppb	1000000	1090000	109
C0065981 Spk G	CGMN-GW-MW102-O-050312	100500	135000	134
C0065981 Sok H	CGMN-GW-MW102-O-050312	1000500	1590000	159
C0065981	CGMN-GW-MW102-O-050312	500	336	67
C0065981 Rep	CGMN-GW-MW102-0-050312	500	342	68
C0065982	CGMN-GW-MW102-DP-050312	500	348	70
C0065983	CGMN-GW-MW102-LS-050312 Low Spike 100 ppb	100000	134000	134
C0065984	CGMN-GW-MW102-HS-050312 High Spike 1000 ppb	100000	1200000	120
C0065985 Sok I	CGMN-GW-MW13-O-050312	1500	1810	121
C0065985 Spk J	CGMN-GW-MW13-O-050312	10500	13800	131
C0065985	CGMN-GW-MW13-0-050312	500	488	98
C0065985 Rep	CGMN-GW-MV13-0-050312	500	489	98
C0065986	CGMN-GW-MW13-DP-050312	500	641	128
C0065987	CGMN-GW-MW13-LS-050312 Low Spike 1 pob	1000	1250	125
C0065988	CGMN-GW-MW13-HS-050312 High Spike 10 ppb	10000	14300	143
C0065989 Spk K	CGMN-GW-MW16-O-050312	1500	1780	119
C0065989 Spk L	CGMN-GW-MW16-O-050312	10500	12900	123
C0065989	CGMN-GW-MW16-O-050312	500	506	102
C0065989 Rep	CGMN-GW-MW16-O-050312	500	510	102
CD065998	CGMN-GW-MW16-DP-050312	500	465	93
C0065991	CGMN-GW-MW16-LS-050312 Low Spike 1 ppb	1000	1770	177
C0065992	CGMN-GW-MW16-HS-050312 High Spike 10 ppb	10000	13700	137
C0065993 Spk C	CGMN-GW-MW15-O-050312	1500	1640	109
C0065993 Spk D	CGMN-GW-MW15-Q-050312	10500	11100	106
C0065993	CGMN-GW-MW15-O-050312	500	470	94
C0065993 Rep	CGMN-GW-MW15-O-050312	500	502	100
C0065994	CGMN-GW-MW15-DP-050312	500	473	95
C0065995	CGMN-GW-MW15-LS-050312 Low Spike 1 ppb	1000	978	98
C0065996	CGMN-GW-MW15-HS-050312 High Spike 10 ppb	10000	13100	131

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Water Samples Continued

			13C-PFOA	
_		Amount	Amount	_
Exygen ID	Semple Description	Spiked (ng/L)	Recovered (ng/L)	Recovery (%)
	Description	(1)	(1144-)	1/1/
C0065930	CGMN-GW-TRIP1-O-050314	500	517	103
C0065931	CGMN-GW-TRIP1-LS-050314 Low Spike 0.5 ppb	500	503	101
C0065932	CGMN-GW-TRIP1-HS-050314 High Spike 5 ppb	5000	5360	107
C0065933 Sok E	CGMN-GW-PW1-O-050314	1500	1530	102
C0065933 Spk F	CGMN-GW-PW1-O-050314	10500	11600	110
C0065933	CGMN-GW-PW1-O-050314	500	410	82
C0065933 Rap	CGMN-GW-PW1-O-050314	500	412	82
C0065934	CGMN-GW-PW1-DP-050314	500	424	85
C0065935	CGMN-GW-PW1-LS-050314 Low Spike 1 ppb	1000	1130	113
C0065936	CGMN-GW-PW1-HS-050314 High Spike 10 ppb	10000	10800	108
C0065937 Spk G	CGMN-GW-PW2-0-050314	1000	873	87
C0065937 Spk H	CGMN-GW-PW2-O-050314	5500	5580	101
C0065937	CGMN-GW-PW2-O-050314	500	401	80
C0065937 Rep	CGMN-GW-PW2-O-050314	500	419	84
C0065938	CGMN-GW-PW2-DP-050314	500	463	93
C0065939	CGMN-GW-PW2-LS-050314 Low Spike 0.5 ppb	500	481	96
C0065940	CGMN-GW-PW2-HS-050314 High Spike 5 ppb	5000	5140	103
C0065941 Suk I	CGMN-GW-PW3-O-050314	600	474	79
C0065941 Spk J	CGMN-GW-PW3-O-050314	1500	1440	96
C0065941	CGMN-GW-PW3-O-050314	500	363	73
C0065941 Reo	CGMN-GW-PW3-O-050314	500	426	85
C0065942	CGMN-GW-PW3-DP-050314	500	549	110
C0065943	CGMN-GW-PW3-LS-050314 Low Spike 0.1 ppb	100	99.2	99
C0065944	CGMN-GW-PW3-HS-050314 High Spike 1 ppb	1000	1050	105
C0065945 Sak K	CGMN-GW-PW4-O-050314	1000	881	88
C0065945 Sok L	CGMN-GW-PW4-O-050314	5500	5580	101
C0065945	CGMN-GW-PW4-O-050314	500	443	89
C0065945 Rep	CGMN-GW-PW4-O-050314	500	432	86
C0065947	CGMN-GW-PW4-O-050314 Dup	500	462	92
C0065948	CGMN-GW-PW4-LS-050314 Low Spike 0.5 ppb	500	444	89
C0065948	CGMN-GW-PW4-HS-050314 High Spike 5 ppb	5000	5160	103
C0065950 Spk C	CGMN-GW-PW5-O-050314	10500	10700	102
C0065950 Sok D	CGMN-GW-PW5-O-050314	100500	113000	112
C0065950	CGMN-GW-PW5-O-050314	500	429	86
C0065950 Rep	CGMN-GW-PW5-O-050314	500	430	86
C0065951	CGMN-GW-PW5-DP-050314	500	443	89
C0065962	CGMN-GW-PW5-LS-050314 Low Spike 10 ppb	10000	10900	109
C0065953	CGMN-GW-PW5-HS-050314 High Spike 100 ppb	100000	105000	105
C0065954 Spk E	CGMN-GW-PW6-O-050314	10500	10500	100
C0065954 Spk F	CGMN-GW-PW6-0-050314	100500	109000	108
C0065954	CGMN-GW-PW6-O-050314	500	301	60
C0065954 Rep	CGMN-GW-PW6-O-050314	500	301	60
C0065955	CGMN-GW-PW6-DP-050314	500	294	59
C0065956	CGMN-GW-PW6-LS-050314 Low Spike 10 ppb	10000	9300	93
		100000	93600 91600	93 92
C0065957	CGMN-GW-PW6-HS-050314 High Spike 100 ppb	100000	51000	JZ

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Water Samples Continued

Exygen		13C-PFOA		
	Sample	Amount	Amount	
		Spiked	Recovered	Recovery
ID .	Description	(ng/L)	(ng/L)	(%)
Annorma A.I. A	CGMN-GW-PW8-O-050314	600	542	90
C0065958 Spk G			1530	102
C0065958 Spk H	CGMN-GW-PW8-O-050314	1500 500	,	102 89
C0065958	CGMN-GW-PW8-0-050314	500 500	446 519	104
C0065958 Rep	CGMN-GW-PW8-O-050314			
C0065959	CGMN-GW-PW8-DP-050314	500	450 96.2	90 96
C0065960	CGMN-GW-PW8-LS-050314 Low Spike 0.1 ppb	100		
C0065961	CGMN-GW-PW8-HS-050314 High Spike 1 ppb	1000	942	94
C0065962 Spk I	CGMN-GW-B116-O-050314	10500	10900	104
C0065962 Spk J	CGMN-GW-B116-O-050314	100500	53400	53
C0065962	CGMN-GW-B116-O-050314	500	390	78
C0065962 Rep	CGMN-GW-B116-O-050314	500	449	90
C0065963	CGMN-GW-B116-0P-050314	500	462	92
C0065964	CGMN-GW-B116-LS-050314 Low Spike 10 ppb	10000	11400	114
C0065965	CGMN-GW-B116-HS-050314 High Spike 100 ppb	100000	91900	92
C0065966 Sak K	CGMN-PW-CWD-O-050314	10500	11500	110
C0065966 Szk L	CGMN-PW-CWD-O-050314	100500	56700	56
C0065966	CGMN-PW-CWD-0-050314	500	450	90
C0065966 Rep	CGMN-PW-CWD-O-050314	500	472	94
C0065967	CGMN-PW-CWD-DF-050314	500	473	95
C0065968	CGMN-PW-CWD-LS-050314 Low Spike 10 ppb	10000	11300	113
C0065969	CGMN-PW-CWD-HS-050314 High Spike 100 ppb	100000	92600	93
C0067856 Sok C	CGMN-GW-CWD-O-050405	1500	1430	95
C0067856 Spk D	CGMN-GW-CWD-0-050405	10500	9450	90
C0087858	CGMN-GW-CWD-O-050405	500	409	82
C0067856 Rep	CGMN-GW-CWD-O-050405	500	395	79
C0067857	CGMN-GW-CWD-DP-050405	500	473	95
C0067858	CGMN-GW-CWD-LS-050405 Low Spike 1 ppb	1000	993	98
C0067859	CGMN-GW-CWD-HS-050405 High Spike 101 ppb	10000	7420	74
	WITH MI CHILL CHAIN CO CENTOR	1500	1420	95
C0067860 Spk E	WBMN-GW-CWM-O-050405		9326	89
C0067860 Spk F	WBMN-GW-CWM-O-050405 WBMN-GW-CWM-O-050405	10500 500	9320 457	89 91
C0067860 Rep	WBMN-GW-CWM-O-050405	500 500	45/ 415	83
	WBMN-GW-CWM-DP-050405	500	429	86
C0067861 C0067862	WBMN-GW-CWM-LS-050405 Low Spike 1 ppb	1000	850	85
C0067863	WBMN-GW-CWM-HS-050405 High Spike 10 ppb	10000	7950	80
00000004 0-1- 0	WBMN-GW-R-2-O-050405	1500	1410	94
C0067864 Spk G	WBMN-GW-R-2-0-050405	1500 10500	10100	9 <del>4</del> 96
C0067864 Spk H	WBMN-GW-R-2-O-050405	10500 500	466	93
C0067864	WBMN-GW-R-2-0-050405	500 500	422	53 84
C0067864 Rep		500 500	422 488	98
C0067865	WBMN-GW-R-2-DP-050405	500 1000	488 1130	98 113
C0067866	WBMN-GW-R-2-LS-050405 Low Spike 1 ppb			
C0067867	WBMN-GW-R-2-HS-050405 High Spike 10 ppb	10000	10600	108

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Water Samples Continued

Exygen 10	Sample Description	13C-PFOA		
		Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery
C0067868 Spk C	WBMN-GW-R-3-O-050405	1500	1410	94
C0087868 Spk D	WBMN-GW-R-3-O-050405	10500	10300	98
C0067868	WBMN-GYV-R-3-O-050405	500	453	93
C0067868 Rep	WBMN-GW-R-3-O-050405	500	453	91
C0067869	WBMN-GW-R-3-DP-050405	500	492	98
C0067870	WBMN-GW-R-3-LS-050405 Low Spike 1 ppb	1000	961	96
C0067871	WBMN-GW-R-3-HS-050405 High Spike 10 ppb	10000	10000	100
C0067872 Sok E	WBMN-GW-R-1-O-050405	1500	1500	100
C0067872 Spk F	WBMN-GW-R-1-O-050405	10500	10500	100
C0067872	WBMN-GW-R-1-O-050405	500	375	75
C0067872 Rep	WBMN-GW-R-1-O-050405	500	401	80
C0067873	WBMN-GW-R-1-DP-050405	500	450	90
C0067875	WBMN-GW-R-1-LS-050405 Low Spike 1 ppb	1000	1070	107
C0067874	WBMN-GW-R-1-HS-050405 High Spike 10 ppb	10000	11300	113
C0067876 Sak G	WBMN-GW-R-4-O-050405	1500	1460	97
C0067876 Spk H	WBMN-GW-R-4-O-050405	10500	10000	95
C0067878	WBMN-GW-R-4-O-050405	500	418	84
C0067876 Rep	WBMN-GW-R-4-O-050405	500	400	80
C0067877	WBMN-GW-R-4-DP-050405	500	470	94
C0067878	WBMN-GW-R-4-LS-050405 Low Spike 1 ppb	1000	779	78
C0067879	WBMN-GW-R-4-HS-050405 High Spike 10 ppb	10000	8290	83
C0067882	WBMN-GW-Field-Blank-050405	500	547	109
C0067880	WBMN-GW-Field-Blank-LS-050405 Low Spike 1 ppb	1000	1160	116
C0067881	WBMN-GW-Field-Blank-HS-050405 High Spike 10 ppb	10000	11300	113

Average: 99 Standard Deviation: 18

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# **FIGURES**

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Figure 1. Typical Calibration Curve for PFOA in Reagent Water

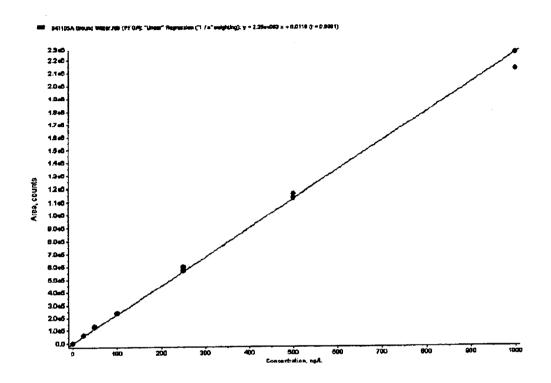


Figure 2. Extracted Standards of PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

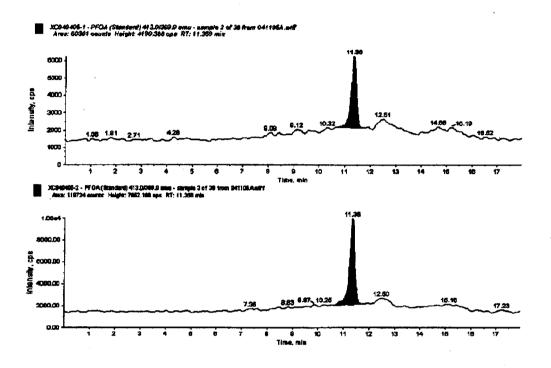


Figure 3. PFOA in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively

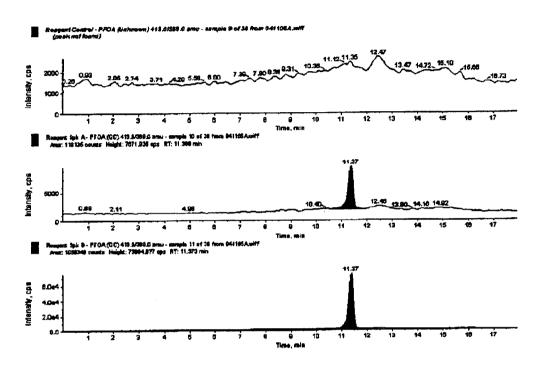


Figure 4. Chromatogram Representing a Woodbury Water Sample Analyzed for PFOA, DF=10 (Exygen ID: C0067860, Data Set: 041105AR)

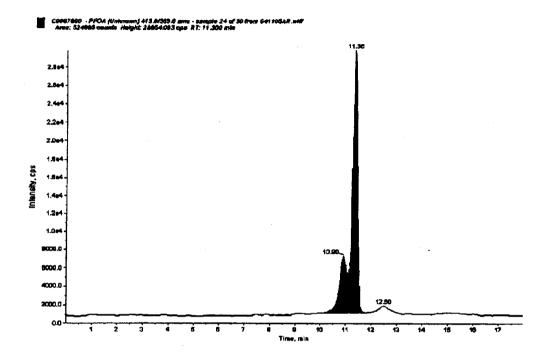


Figure 5. Typical Calibration Curve for <sup>13</sup>C PFOA in Reagent Water

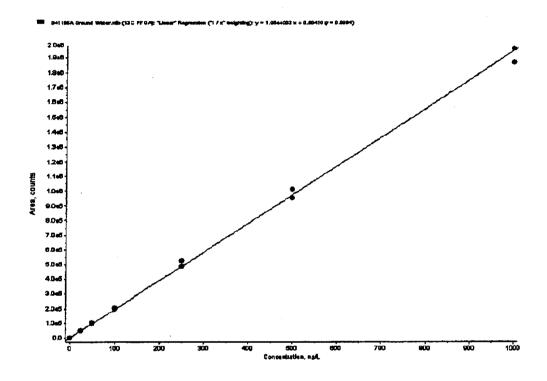


Figure 6. Extracted Standards of <sup>13</sup>C PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

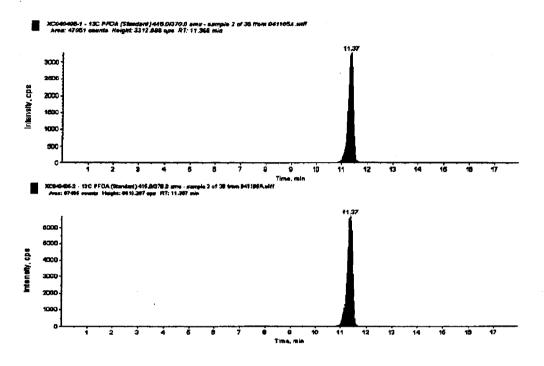


Figure 7. <sup>13</sup>C PFOA in Reagent Water, 50 ng/L Fortified Reagent Water Spk A, and 500 ng/L Fortified Reagent Water Spk B, Respectively

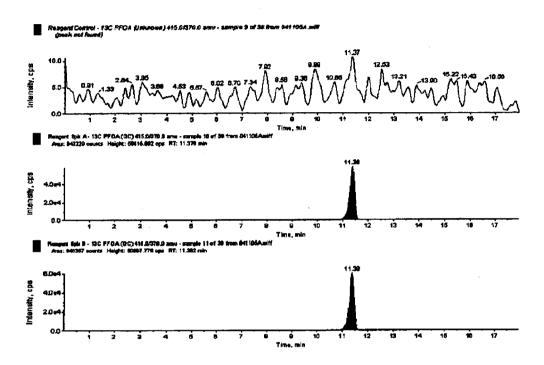


Figure 8. Chromatogram Representing a Woodbury Water Sample Analyzed for <sup>13</sup>C PFOA (Exygen ID: C0067860, Data Set: 041105A)

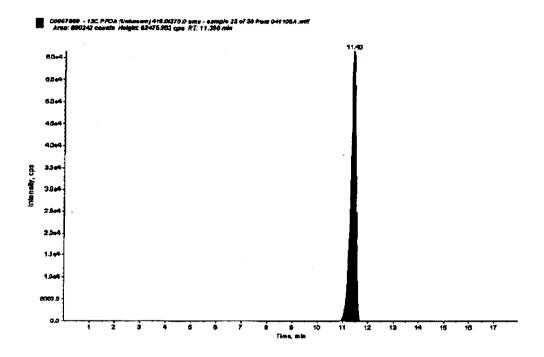


Figure 9. Typical Calibration Curve for PFBS in Reagent Water

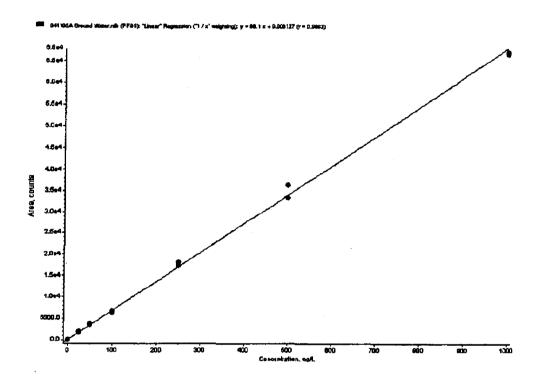


Figure 10. Extracted Standards of PFBS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

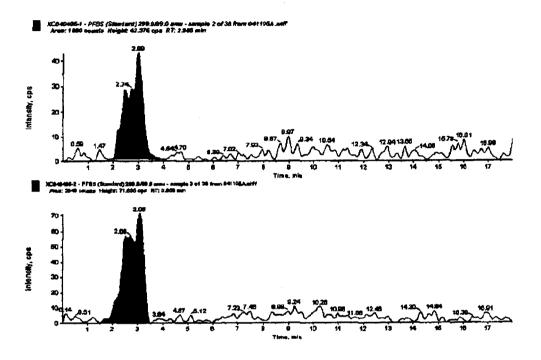


Figure 11. PFBS in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively

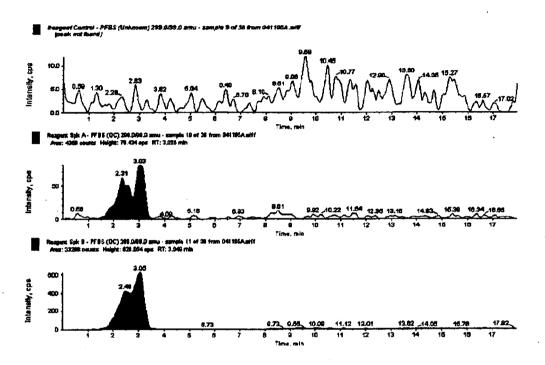


Figure 12. Chromatogram Representing a Woodbury Water Sample Analyzed for PFBS, DF=10 (Exygen ID: C0067860, Data Set: 041105AR)

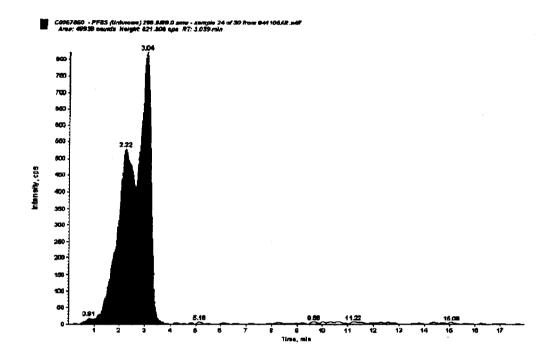


Figure 13. Typical Calibration Curve for PFHS in Reagent Water

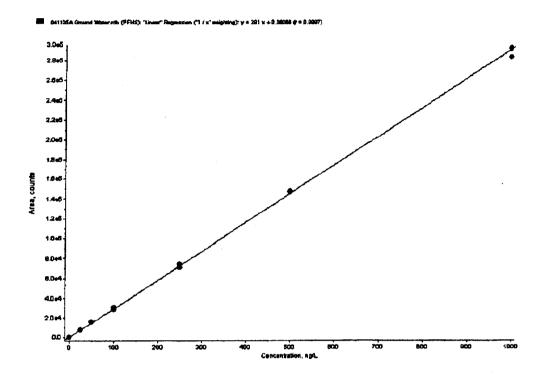


Figure 14. Extracted Standards of PFHS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

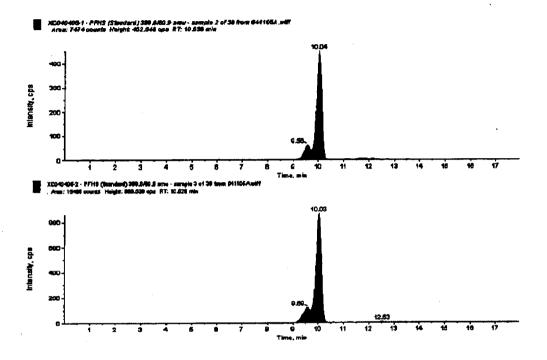


Figure 15. PFHS in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively

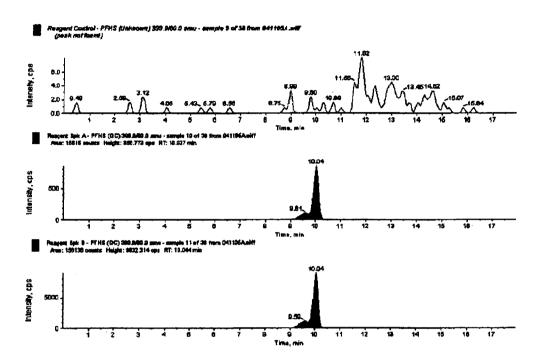


Figure 16. Chromatogram Representing a Woodbury Water Sample Analyzed for PFHS, DF=100 (Exygen ID: C0067860, Data Set: 041105AR)

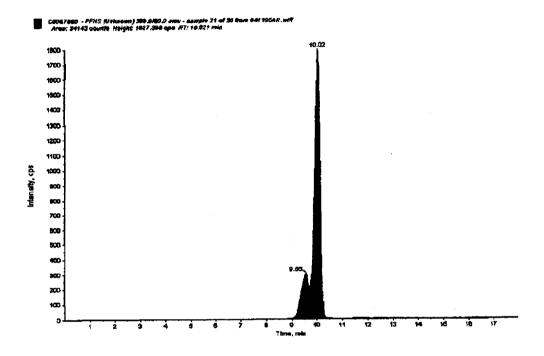


Figure 17. Typical Calibration Curve for PFOS in Reagent Water

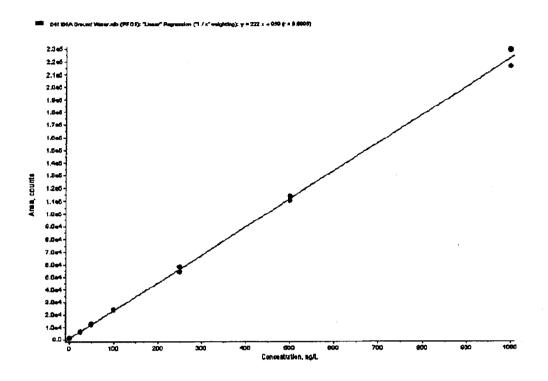


Figure 18. Extracted Standards of PFOS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

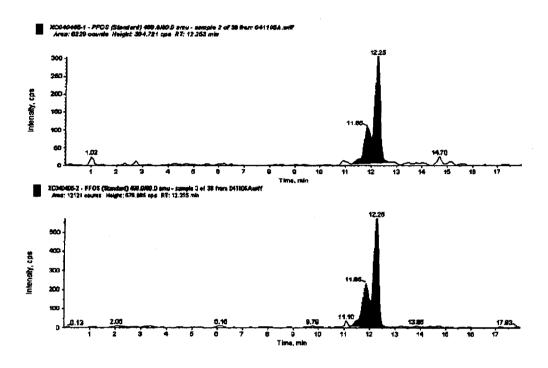


Figure 19. PFOS in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively

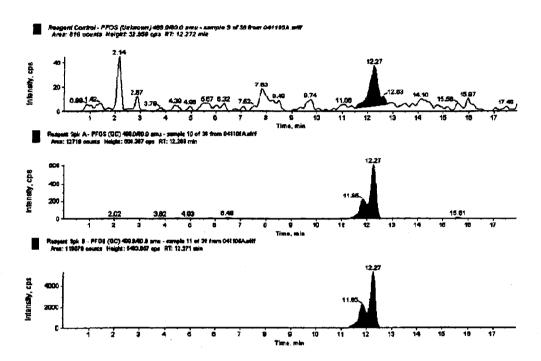
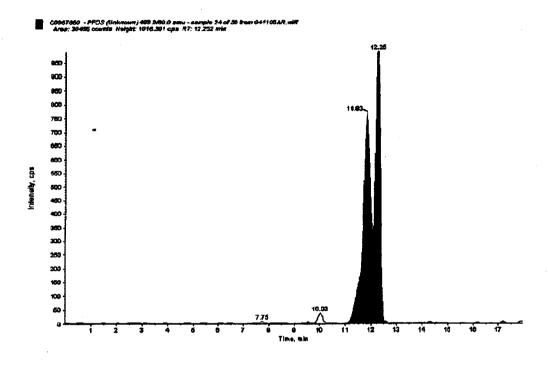


Figure 20. Chromatogram Representing a Woodbury Water Sample Analyzed for PFOS, DF=10 (Exygen ID: C0067860, Data Set: 041105AR)



# INTERIM REPORT #4 - Analysis of Cottage Grove Soll and Water Samples

#### STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS),
Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil,
Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring
Program

## **DATA REQUIREMENTS**

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

#### STUDY DIRECTOR

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380 Phone: 610-701-3761

# **INTERIM REPORT COMPLETION DATE**

December 1, 2005

## PERFORMING LABORATORY

Exygen Research 3058 Research Drive State College, PA 16801 Phone: 814-272-1039

#### STUDY SPONSOR

3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144 Phone: 651-733-6374

#### **PROJECT**

Protocol Number: P0001400 Exygen Study Number: P0001400

Total Pages: 177

Exygen Study No.: P0001400

# GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

John Flaherty

Principal Investigator Exygen Research

Jaisimha Kesari P.E., DEE

Study Director

Weston Solutions, Inc.

Robert A. Paschke Sponsor Representative

3M Company

12/2/05 Date

Exygen Research

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Exygen Study No.: P0001400

# **QUALITY ASSURANCE STATEMENT**

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

<u>Phase</u>	Date Inspected	Date Reported to Principal Investigator	Date Reported to Exygen <u>Management</u>	Date Reported to Study Director
10. Raw Data Review	11/02-07/05	11/08/05	11/09/05	11/09/05
11. Raw Data Review	11/08/05	11/08/05	11/09/05	11/09/05
12. Final Interim Raw Data and Analytical Report Review	11/09/05	11/09/05	11/09/05	11/09/05

Lydia Shaffer
Technical Lead, Quality Assurance Unit

12/01/05

<sup>1</sup>Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

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# **CERTIFICATION OF AUTHENTICITY**

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by: Exygen Research 3058 Research Drive State College, PA 16801 (814) 272-1039 Principal Investigator, Exygen: ph/as John Flaherty Date Vice President Exygen Research Exygen Research Facility Management: President Exygen Research Study Director, Weston Solutions, Inc. Jaisimha Kesari P.E., DEE Weston Solutions, Inc. Sponsor Representative, 3M Company: 12/2/05

Exygen Research

Robert A. Paschke

Manager, 3M Corporate Environmental Programs

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Exygen Study No.: P0001400

# STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:

P0001400

**EXYGEN STUDY NUMBER:** 

P0001400

TYPE OF STUDY:

Residue

SAMPLE MATRIX:

Soil and Water

TEST SUBSTANCE:

Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS). Perfluorchexanesulfonate (PFHS), and Perfluorocctanesulfonate (PFOS)

SPONSOR:

3M Company

3M Building 0236-01-B-10

St. Paul, MN 55144

STUDY DIRECTOR:

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380

STUDY MONITOR:

Robert A. Paschke

3M Company

3M Building 42-02-E-27 St. Paul, MN 55144

PERFORMING LABORATORY:

Exygen Research 3058 Research Drive State College, PA 16801

ANALYTICAL PHASE

TIMETABLE:

Study Initiation Date:

03/03/05

Interim Analytical Start Date:

08/08/05

Interim Analytical Termination Date: 10/01/05 Interim Report Completion Date:

12/01/05

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# **PROJECT PERSONNEL**

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

Name

Title

John Flaherty

Vice President

Karen Risha

Laboratory Supervisor

Chrissy Edwards

Technician

Mark Ammerman

Sample Custodian

Amy Sheehan

Associate Scientist

**Eric Edwards** 

Sample Custodian

Mindy Cressley

Technician

**Brittany Kravets** 

Technician

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## 1.0 SUMMARY

Exygen Research extracted and analyzed soil and water samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Methods V0001781 and V0001780, respectively (Appendix A).

Several of the analyzed samples were not reported due to quality control failure. Samples failed because the PFOA and <sup>13</sup>C PFOA surrogate spikes were too low relative to the endogenous level in the sample to allow assessment of matrix interference or failed the eligibility criteria for reporting (see Section 8.0). Assessed accuracies for the remaining soil samples can be found in Table I.

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in soil was 0.4 ng/g (wet weight) and the limit of detection for PFOA, PFBS, PFHS and PFOS in soil was 0.2 ng/g (wet weight). The limit of quantitation for PFOA, PFBS, PFHS and PFOS in water was 50 ng/L and the limit of detection for PFOA, PFBS, PFHS and PFOS in water was 25 ng/L.

Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in soil samples are summarized in Table I. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in ground water samples are summarized in Table II. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in rinse blank samples are summarized in Table III.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the soil samples are detailed in Tables IV and V. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the soil samples were  $86 \pm 17\%$ ,  $84 \pm 9\%$ ,  $88 \pm 10\%$  and  $85 \pm 16\%$ , respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the ground water samples are detailed in Tables VI and VII. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the ground water samples were  $98 \pm 17\%$ ,  $97 \pm 10\%$ ,  $103 \pm 18\%$  and  $91 \pm 17\%$ , respectively.

Fortification recoveries for  $^{13}$ C PFOA in the soil samples are detailed in Table VIII. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the soil samples were 79  $\pm$  12%. Fortification recoveries for  $^{13}$ C PFOA in the ground water samples are detailed in Table IX. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the ground water samples were  $85 \pm 30\%$ . Fortification recoveries for  $^{13}$ C PFOA in the rinse blank samples are detailed in Table X. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the rinse blank samples were  $78 \pm 5\%$ .

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## 2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorobexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in soil and ground water according to Protocol P0001400 (Appendix A).

## 3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in soil using the analytical method entitled, "V0001781: Method of Analysis for the Determination of Perfluorocctanoic Acid (PFOA) in Soil by LC/MS/MS" and in water using the analytical method entitled, "V0001780: Method of Analysis for the Determination of Perfluorocctanoic Acid (PFOA) in Water by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was August 8, 2005, and the analytical termination date for this interim report was October 1, 2005.

# 4.0 ANALYTICAL TEST SAMPLES

One hundred and seventy-nine soil samples and fifty-two water samples (Exygen ID C0081163 – C0081285, C0081329 – C0081438) were received at ambient temperature on July 23, 2005 from Pat Ferretti at 3M Environmental Lab. Thirty-six ground water samples represented nine sample sites and associated field QC samples. Four samples represented decontamination water and associated field QC samples. Three water samples represented a trip blank and two trip blank spikes, and nine samples represented field rinse blanks supplied by Weston Solutions, Inc. that did not contain the surrogate, <sup>13</sup>C PFOA. The samples were logged in by Exygen personnel and placed in refrigerated storage.

Sample log-in and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

# 5.0 REFERENCE MATERIAL

The analytical standard, PFOA, was purchased from Sigma Aldrich and was received at Exygen on December 08, 2003. The surrogate spiking standard, <sup>13</sup>C labeled

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perfluorooctanoic acid (<sup>13</sup>C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on May 13, 2005. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and <sup>13</sup>C PFOA were stored frozen and PFOS was stored refrigerated.

Compound	Exveen Inventory No.	Lot#	Purity (%)	<b>Expiration Date</b>
PFOA	SP0003800	23116HB	97.64	12/08/05
<sup>13</sup> C PFOA	SP0004184	3507-195	97	03/29/09
PFBS	SP0005726	101	96.7	12/04/06
PFHS	SP0002401	SE036	98.6	10/18/06
PFOS	SP0002694	430180/1	101.2	04/23/06

The molecular structures of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS are given on the following pages:

## **PFOA**

Chemical Name: Perfluorooctanoic acid

Molecular Weight: 414

Transitions Monitored: 413 → 369 (for quantification) and

 $413 \rightarrow 219$  (for confirmation)

Structure:

$$F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} OH$$

## <sup>13</sup>C PFOA

Chemical Name: 1,2-13C perfluorooctanoic acid

Molecular Weight: 416

Transition Monitored: 415 → 370

Structure:

$$F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{I^3C} OH$$

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PFBS

Chemical Name: Perfluorobutanesulfonate

Molecular Weight: 338 supplied as the potassium salt (C<sub>4</sub>F<sub>9</sub>SO<sub>3</sub>K<sup>+</sup>)

Transitions Monitored: 299 → 99

Structure:

**PFHS** 

Chemical Name: Perfluorohexanesulfonate

Molecular Weight: 438 supplied as the potassium salt (C<sub>6</sub>F<sub>13</sub>SO<sub>3</sub>K<sup>†</sup>)

Transitions Monitored: 399 → 80

Structure:

$$F \xrightarrow{F} F \xrightarrow{F} F F \xrightarrow{F} SO_3^-$$

**PFOS** 

Chemical Name: Perfluorooctanesulfonate

Molecular Weight: 538 supplied as the potassium salt (C<sub>8</sub>F<sub>17</sub>SO<sub>3</sub>K<sup>†</sup>)

Transitions Monitored: 499 → 80

Structure:

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# 6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical methods "V0001781: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Soil by LC/MS/MS" and "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS" were used for this study.

#### 6.1 Extraction Procedure for Soil

Before the samples were weighed for the extraction, they were placed into a new, clean Ziploc bag and mixed thoroughly. The samples were then transferred back to the sampling container. A 5 gram portion of soil was weighed into a fifty milliliter centrifuge tube for the extraction. After fortification of appropriate samples, 5 mL of methanol was added to the samples. The samples were allowed to shake on a wrist action shaker for ~15 minutes and were then sonicated in an ultrasonic bath for ~15 minutes. The volume was taken to 40 mL with water and the samples were then centrifuged for ~10 minutes at ~3000 rpm. The supernatant was then loaded onto a C<sub>18</sub> SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The chuate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of cluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

#### 6.2 Percent Solids Procedure For Soil

Percent solids were determined using the procedure indicated in Exygen method V0000427. Approximately 20 grams of sample was weighed into a pan. The weight of the sample plus the pan was recorded. The sample was then dried in an oven overnight at  $104 \pm 2$  °C. Then the sample was transferred to a dessicator and allowed to cool for ~15 minutes. Each sample was then weighed again, including the weight of the pan. The percent solid for each sample was then calculated.

## 6.3 Extraction Procedure for Water

A 40 mL aliquot of the water sample was used for the extraction procedure. After fortification of appropriate samples, the samples were loaded onto a C<sub>18</sub> SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The charte was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of cluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

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# 6.4 Preparation of Standards and Fortification Solutions

A mixed stock standard solution of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS was prepared at a concentration of 1000 µg/mL by dissolving 100 mg of each of the standards (corrected for purity and salt content, if necessary) in methanol. From this solution, a 100 µg/mL fortification standard solution was prepared by taking 10 mL of the stock and bringing the volume up to 100 mL with methanol. By taking 10 mL of the 100 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 10 µg/mL fortification standard was prepared. By taking 10 mL of the 10 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 1.0 µg/mL fortification standard were prepared. By taking 10 mL of the 1.0 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.1 µg/mL fortification standard was prepared. By taking 10 mL of the 0.1 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.01 µg/mL fortification standard bringing the volume up to 100 mL with methanol, a 0.01 µg/mL fortification standard were prepared.

A set of standards containing PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS were prepared in water and processed through the extraction procedure, identical to samples. The following concentrations were prepared:

Solution	Fort Volume	Volume of Fortified Sample	Final Conc. of Calibration Std.
(ng/mL) <sup>1</sup>	(µL)	(mL)	(ng/L)
0	0	40	0
10	100	40	25
10	200	40	50
10	400	40	100
100	100	40	250
100	200	40	500
100	400	40	1000
of PFOA, 13C F	PFOA, PFBS	, PFHS and PFOS	

An additional stock solution of  $^{13}$ C PFOA was prepared at 100 µg/mL and diluted to 1.0 and 0.1 µg/mL for bottle spiking purposes. Complete details can be found in the raw data package associated with this study.

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator  $(4^{\circ} \pm 2^{\circ}C)$  when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

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## 6.5 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~10 min, ~0.5 mins, ~8.5 mins, and ~11 mins, respectively. Peaks above the LOD were not detected in any of the reagent blank samples corresponding to the analyte retention time.

## 6.6 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 25 ng/L of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS.

# 6.7 Description of LC/MS/MS Instrument and Operating Conditions

Instrument:

API 4000 Biomolecular Mass Analyzer

Interface:

Turbo Ion Spray Liquid Introduction Interface

Computer:

DELL OptiPlex GX400

Software:

Windows NT, Analyst 1.4.1

HPLC:

Hewlett Packard (HP) Series 1100

**HP Quat Pump** 

HP Vacuum Degasser HP Autosampler

HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm

Column Temp.: 30° C Injection Vol.: 15 µL

Mobile Phase (A): 2 mM Ammonium Acetate in water

Mobile Phase (B): Methanol

Time (min)	%A	<u>% B</u>
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min Flow Rate: 0.3 mL/min

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## Ions monitored:

			Approximate
<u>Analyte</u>	<u>Mode</u>	<b>Transition</b>	Retention Time
		<b>Monitored</b>	(min)
PFOA	negative	$413 \rightarrow 369$	~12 min.
PFOA Confirm Ion	negative	$413 \rightarrow 219$	~12 min_
<sup>13</sup> C PFOA	negative	$415 \rightarrow 370$	~12 min.
PFBS	negative	$299 \rightarrow 99$	~5 min.
PFHS	negative	$399 \rightarrow 80$	~11 min.
PFOS	negative	499 → 80	~13 min.

## 6.8 Quantitation and Example Calculation

Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using seven concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/mL, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

## Equation 1:

--;

Analyte found  $(ng/L) = (Peak area - intercept) \times DF$ slope

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

For samples fortified with known amounts of analyte prior to extraction, Equation 2 was used to calculate the percent recovery.

Equation 2:

Recovery (%) =

(analyte found (ng/L) - analyte in control (ng/L)) ×100% amount added (ng/L)

Note: For the analyte recovery calculation, the "control" is the unspiked aliquot of the primary field sample.

Equation 3 was used to convert the amount of analyte found in ng/mL to ng/g (ppb).

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Travel Carage

## Equation 3:

analyte found (ppb) = [analyte found (ppt)  $\times$  volume extracted (L)] sample weight (g)

Equation 4 was then used to calculate the amount of analyte found in ppb based on dry weight.

## Equation 4:

Analyte found (ppb) dry weight = Analyte found (ppb) x [100% / total solids(%)]

An example of a calculation using an actual sample follows:

Soil sample Exygen ID C0081358 Spk D (Set: 080905A), fortified at 50000 ng/L with PFOA where:

peak area 1208128 91300 intercept slope 2430 100 dilution factor 50000 ng/L analyte added (fort level) amt in corresponding sample (ng/L)\* 131 volume extracted (L) 0.04sample weight (g) 5 86.88 total solids (%)

## From equation 1:

Analyte found (ng/L) =  $[1208128 - 91300] \times 100$ 2430

= 45960 ng/L

From equation 2:

% Recovery =  $(45960 \text{ ng/L} - 131 \text{ ng/L}) \times 100\%$ 

50000 ng/L

= 92 %

From equation 3:

Analyte found (ppb) =  $(45960 \text{ ng/L} \times 0.04 \text{ L})$ 

5 g

= 368 ppb

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<sup>\*</sup>The primary sample result was used for all calculations

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From equation 4:

Analyte found (ppb) dry weight = 368 ppb x (100% / 86.88%)

= 423 ppb

NOTE: This value may be slightly different than that of the raw data due to rounding.

# 7.0 EXPERIMENTAL DESIGN

<sup>13</sup>C PFOA was used as a surrogate for all the samples except the rinse blanks. <sup>13</sup>C PFOA was added to the soil samples and sample replicates in the laboratory after collection. <sup>13</sup>C PFOA was added to the ground water sample collection bottles in the laboratory before being shipped to the field for sampling. For water samples designated as field matrix spikes, PFOA, PFBS, PFHS and PFOS were also added at a known concentration to the bottles in the laboratory before being shipped to the field. The water sample bottles were filled to a 200 mL volumetric fill line in the field.

The soil samples were extracted in forty-one sets, five of which contained re-extractions. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The first thirty-five soil sets contained five samples each. The thirty-sixth soil set contained four samples. The thirty-seventh soil set contained re-extractions of four samples. The thirty-eighth soil set contained re-extractions for three samples. The thirty-ninth and fortieth soil sets each contained re-extractions for five samples. The forty-first soil set contained a re-extraction for one sample. For each sample, a laboratory duplicate of the sample and two laboratory matrix spikes were also extracted. The laboratory spikes were fortified with known concentrations of PFBS, PFHS, PFOS, PFOA and <sup>13</sup>C PFOA.

The ground water samples were extracted in four sets and the rinse blanks were extracted in one set. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The rinse blank set contained samples from eight sample sites. The first ground water set contained three sample sites. The second ground water set contained one sample site and the decontamination water. The third ground water set contained three sample sites. The fourth ground water set contained two sample sites, along with a trip blank and trip blank spikes collected for the ground water samples. For each site, a sample, a field duplicate and two matrix field spikes were collected. For each site, a laboratory duplicate of the primary sample was extracted and two laboratory matrix spikes were also extracted. For the two laboratory matrix spikes, two 40 mL portions of the primary sample collected for the site was poured from the bottle and fortified. Not only were PFBS, PFHS, PFOS and PFOA added in the laboratory prior to extraction, but also 13C PFOA was added. The additional 12C PFOA was added because the levels of PFBS, PFHS, PFOS and PFOA spiked into the samples were known to exceed the calibration ranges and were not analyzed without dilution; therefore, <sup>13</sup>C PFOA levels were adjusted to require the same dilution as the other analytes.

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## 8.0 RESULTS

Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in soil samples are summarized in Table I. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in ground water samples are summarized in Table II. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in rinse blank samples are summarized in Table III.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the soil samples are detailed in Tables IV and V. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the soil samples were  $86 \pm 17\%$ ,  $84 \pm 9\%$ ,  $88 \pm 10\%$  and  $85 \pm 16\%$ , respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the ground water samples are detailed in Tables VI and VII. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the ground water samples were  $98 \pm 17\%$ ,  $97 \pm 10\%$ ,  $103 \pm 18\%$  and  $91 \pm 17\%$ , respectively.

Fortification recoveries for  $^{13}$ C PFOA in the soil samples are detailed in Table VIII. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the soil samples were 79  $\pm$  12%. Fortification recoveries for  $^{13}$ C PFOA in the ground water samples are detailed in Table IX. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the ground water samples were 85  $\pm$  30%. Fortification recoveries for  $^{13}$ C PFOA in the rinse blank samples are detailed in Table X. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the rinse blank samples were 78  $\pm$  5%.

In cases where both the low and the high matrix spikes were not reportable due to high levels of endogenous analyte, the <sup>13</sup>C PFOA results were used to calculate assessed accuracy. It appears that an inverse correlation may exist between the recoveries of the <sup>13</sup>C PFOA and the measured level of PFOA in some samples. Careful assessments of the QC results were made to ensure that the data is of known quality and the analytical concentrations were not under-reported. Several of the analyzed soil samples were not reported due to quality control failure. The samples failed because the PFOA and <sup>13</sup>C PFOA surrogate spikes were too low relative to the endogenous level in the sample to allow assessment of matrix interference or because they failed the eligibility criteria for reporting (explained below).

The following approach was used for the assessment of the accuracy for the individual samples. First, the result of PFOA spikes, where the endogenous amount is not greater than three times the spiked amount, was evaluated. For samples where the endogenous analyte was measured at levels greater than three times the spike amount, the <sup>13</sup>C PFOA was evaluated. Most samples were fortified with <sup>13</sup>C PFOA at 4 ppb. The low and high spikes included <sup>13</sup>C PFOA at 40 ppb and 400 ppb respectively. Based on conversations

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with the Study Director and 3M laboratory management, the <sup>13</sup>C PFOA result was only used to assess accuracy for samples that had analyte concentrations below 400 ppb so that the <sup>13</sup>C PFOA concentration was at a minimum of 10% of the highest analyte concentration. Sample results over 400 ppb (wet weight) are not reported using QC data at the 40 ppb spike level.

# 9.0 CONCLUSIONS

The soil and ground water samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical methods V0001781 and V0001780, respectively. There were no circumstances that may have affected the data quality or integrity.

# 10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the study director. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

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# **TABLES**

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Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples

		G4 Selfon	ada PF®®	C# derifon	ata P7118	C& Setten	eta PFOS	CB Actio	PPQA
		Analyte	Accepted	Amelyte		Antika		Amelyte	
		Found Dry Wt.	Acoustics	Pound Dry Wi.	Assurance	Doy Wt.	Accountry	Found DryWL	ACCURACY
Exygen ID	Client Sample ID	COURT HOUSE	(+%/-%)	graph, notal	(151-50	ingle, notice	14%/-16	dogate, market	(+%.7.9S
							1.2		1.77
C0061356	CGMN-SS-D101-0-0005	ND	30	NO.	30	19.4	30	1.21	30
C0081358 Rap	CGMH-SS-D101-0-0005*	ND	30	NID	30	20.5	30	Ø. <b>85</b> 6	30
C0081350	CGMN-\$5-0101-08-0005	NO	30	, NO	90	19.4	30	0.613	30
C0081359 Rep	CGMN-38-D101-D5-0006*	ND	30	ND	30	21.0	30	NQ	30
C0081250	CGMN-SS-D201-0-0000	ND	30	1.57	30	82.8	40	4.51	30
C0081360 Rep	CGMN-S9-D201-0-0000*	ND	30	1.66	30	<b>67.9</b>	40	4.79	30
C0081381	CGL84-85-D201-0-0005	NB	30	1.35	30	68.1	30	9.19	30
O0081201 Plep	CGMN-98-D201-0-0005*	NO	30	0.828	30	66.7	30	3.97	30
Q0081382	CGMN-33-D202-0-0000	NQ	30	4.48	30	1140	30	23.8	30
C0081582 Res	CGMN-\$\$-0202-0-0000*	NQ	30	5.06	30	1250	50	23.5	30
CD081383	CGMN-88-0202-0-0005	MD	30	7.14	30	1590	30	56.5	30
C0081383 Rep	CGMH-35-0202-0-0006*	NQ	30	6.21	30	1800	30	48.5	30
C0081374	CGMN-35-D101-0-0000	MĐ	30	ND	30	12.7	30	3.90	30
C0081374 Rep	CGMN-85-D101-0-0000*	ND	30	CM	30	15.3	30	5.33	30
C0061388	CGMH-SS-81802-0-0000	1.34	40	0.451	30	18.0	.50	4.35	30
C0081386 Rep.	CGMN-SS-81802-0-0000*	1.34	40	0.547	30	13.2	30	9.22	30
C0061389	CGMN-89-81502-0-0005	ND	50	NO	30	81.4	30	7.84	30
C0081389 Rep	CGMN-SS-81502-6-0005*	ND	50	ND	90	52.0	30	7.69	30
C0081390	CGMN-SS-B1501-0-0000	8.40	30	NQ	30	13.2	30	3 <b>5.</b> 4	30
C0081390 Rep	CGMN-SS-81801-0-0000°	5.55	30	NQ	30	14.0	30	20.5	30
C0051391	CGMM-63-B1501-0-0005	MQ	30	NC	30	45.5	30	18.0	40
C0061301 Rep	CGMN-SS-81601-0-0006*	NO	30	NQ	30	48.4	30	10.6	40
C0081163	CGMN-SBC-0203-0-0000	1.02	30	35.3	30	3830	40	250	40
C0081165 Ftep	CGMN-SBC-D203-0-0000*	<b>9.84</b>	30	30.0	30	4010	40	230	40
C0061164	CCMN-SBC-D203-0-0060	5.61	30	259	30	9560	80	1940	80
20381164 Rep	CCWN 88C-D303-0-0060.	4,52	30	368	30	9680	60	2330	80
C0081165	CGMN-89C-D203-0-0100	6.10	30	361	30	7280	86	4550	60
20081165 Rup	CGMN-SBC-0203-0-0100*	8.85	30	377	30	7360	80	5220	60
C0021186	CGMN-SBC-D283-0-0150	22.5	30	1880	50	11300	58	11600	56
20061166 Rep	CGMN-SSC-D203-0-0150*	19.6	30	1420	50	9440	50	10200	50
C0081187	CGMN-SBC-D203-0-0200	16.2	30	935	30	10800	50	9100	50
20081187 Rep	CGMN-S8C-0203-0-0200*	17.3	30	971	50	9243	50	8730	50
C0061166	CGMN-SBC-D203-4-0250	4.86	30	51.3	30	786	30	487	30
20081 les Rep	CGMI-98C-0203-0-0250*	4.96	30	49.2	30	730	30	444	30
C0061106	CGMN-SBC-D203-0-0800	6.67	30	61.0	30	49.8	40	813	50
20081189 Rep	CGMN-SBC-D203-0-0300*	7.A2	30	56.5	30	43.3	40	549	50
C0081170	CGMW-58C-D203-DB-0308	11.2	30	38.8	30	44.9	3C	322	30
-	CGMR-SBC-D203-D8-4500*	7.40	30	58.5	30	42.3	30	525	30
C0081171	CGN#1-SBC-D203-0-0380	1.84	30	75.0	30	12.7	30	855	30
20081171 Rep	CGMH-88C-D203-0-0350*	1.60	30	72.4	30	12.4	30	599	30
C0081172	CGMN-SBC-D203-0-0400	2.14	30	31.9	30	7.67	30	170	30
2063172 Rep	CG764-88C-0302-0-0400,	2.23	30	31.P	30	11.0	30	107	30
C0081173	CGMN-5BC-D205-0-0450	4.56	30	25.4	30	19.7	30	62.8	50
20681 173 Rep	CGL#H-95C-D203-0-0450*	4.32	30	25.5	30	19.9	30	81.1	30
C0081174	CGMN-88C-D202-0-0000	NQ	30	30.8	30	5410	30	283	60
0681174 Rup	CGMN-88C-D202-0-0000*	0.818	30	37.3	30	5860	30	361	<b>80</b>
C0061175	CGNN-5BC-D202-0-0050	3.79	30	258	30	6580	50	5820	30
20081176 Rep	CGIAH-68C-D202-0-0050*	3.68	30	295	30	7090	50	5800	30

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<sup>© =</sup> Not descript at or above 0.2 raying from weight).

NC) = Not quantifiable = Measured concentration between 0.2 rg/g (wet weight) and the Limit of Cauntitation 8.00) which is 0.4 rg/g (wet weight)

HR = Not reported due to quality control result failures.

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Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Table I. Continued

Englan   D	Annesed
Engige RD   Cillent Sample ID   Dry Wi.   Assumpt   Dry Wi.   Assumpt   Cillent Sample ID   Dry Wi.   Cillent Sample ID   Dry Wi.   Cillent Sample ID   Color   Cillent Sample ID   Color   Cillent Sample ID   Color   Cillent Sample ID   Cillent	Annound
CODE1178	_
C0061178 CGMM-SBC-D202-0-0100 0.885 30 32.0 30 1500 30 570 CO061178 Rap CGMM-SBC-D202-0-0100 0.875 30 32.2 30 1460 30 578 CO061178 Rap CGMM-SBC-D202-0-0150 3.2 30 188 30 12000 60 2250 CO061177 Rap CGMM-SBC-D202-0-0200 1.28 30 188 30 12000 60 2750 CO061178 Rap CGMM-SBC-D202-0-0200 1.83 30 81.7 30 7460 50 762 CO061178 Rap CGMM-SBC-D202-0-0200 1.83 30 81.7 30 7460 50 762 CO061179 Rap CGMM-SBC-D202-0-0200 1.83 30 81.7 30 7460 50 762 CO061179 Rap CGMM-SBC-D202-0-0200 1.97 30 82.0 30 776 30 248 CO061180 Rap CGMM-SBC-D202-0-0300 2.15 30 80.0 30 776 30 246 CO061180 Rap CGMM-SBC-D202-0-0300 2.15 30 80.0 30 776 30 84.2 CO061180 Rap CGMM-SBC-D202-0-0350 2.77 30 31.0 30 80.4 30 80.4 30 80.4 50 477 CO061181 Rap CGMM-SBC-D202-0-0350 2.77 30 31.0 30 80.4 50 454 CO061182 Rap CGMM-SBC-D202-0-0400 2.66 30 80.4 30 80.4 50 469 CO061183 Rap CGMM-SBC-D202-0-0400 2.66 30 87.3 40 188 80 50 80.4 50 469 CO061183 Rap CGMM-SBC-D202-0-0400 2.66 30 87.3 40 188 30 1010 CO061184 Rap CGMM-SBC-D202-0-0400 2.66 30 87.3 40 188 30 1010 CO061184 Rap CGMM-SBC-D202-0-0400 2.66 30 87.3 40 188 30 1010 CO061184 Rap CGMM-SBC-D202-0-0400 2.66 30 87.3 40 188 30 1010 CO061184 Rap CGMM-SBC-D202-0-0400 2.66 30 87.3 40 188 30 1010 CO061184 Rap CGMM-SBC-D202-0-0400 2.66 30 87.3 40 188 30 1010 CO061184 Rap CGMM-SBC-D202-0-0400 8.0 30 87.3 40 188 30 1010 CO061184 Rap CGMM-SBC-D202-0-0400 8.0 30 80.3 30 8	Accuracy
CO061176 Rap  CGMR-SBC-D202-0-0160  CGMR-SBC-D202-0-0160  CGMR-SBC-D202-0-0160  CGMR-SBC-D202-0-0160  CGMR-SBC-D202-0-0160  CGMR-SBC-D202-0-0160  CGMR-SBC-D202-0-0160  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0200  CGMR-SBC-D202-0-0300  CGMR-SBC-D202-0-0400  CGMR-SBC	<u> (+%/+%)</u>
CO081178 Rep CGMM-SBC-D202-0-0160	30
CODE1177 CORN-SBC-D202-0-0150	30 30
COB81177 Rep	
CDB1178 CGBMN-SBC-D202-0-0200 1.28 30 80.1 30 6680 80 518 CGBMN-SBC-D202-0-0200 1.83 30 81.7 30 7490 30 762 CDB1179 Rep CGBMN-SBC-D202-0-0200 1.87 30 20.2 30 775 39 248 CDB1179 Rep CGBMN-SBC-D202-0-0200 1.79 30 10.9 30 7768 30 247 CDB1179 Rep CGBMN-SBC-D202-0-0200 1.79 30 10.9 30 776 30 248 CDB1180 Rep CGBMN-SBC-D202-0-0300 2.15 30 30.0 30 779 30 842 CDB1180 Rep CGBMN-SBC-D202-0-0300 2.15 30 30.0 30 779 30 842 CDB1181 Rep CGBMN-SBC-D202-0-0300 2.77 30 30.9 30 908 30 908 30 908 CDB1181 Rep CGBMN-SBC-D202-0-0300 2.77 30 30.9 30 908 30 908 30 908 CDB1181 Rep CGBMN-SBC-D202-0-0300 2.77 30 30.9 30 908	30
CO081178 Rep	30
C0081179 Rep CGAIN-SBC-D202-0-0250 1.17 30 20.2 30 775 39 246 C0081179 Rep CGAIN-SBC-D202-0-0250 1.19 30 19.9 30 788 30 247 C0081180 Rep CCAIN-SBC-D202-0-0300 2.15 30 89.0 30 779 30 842 C0081181 CGAIN-SBC-D202-0-0350 2.73 30 89.0 30 779 30 863 30 863 C0081181 CGAIN-SBC-D202-0-0350 2.73 30 39.9 30 88.4 50 477 C0081181 Rep CGAIN-SBC-D202-0-0350 2.77 30 31.0 30 88.4 50 477 C0081182 Rep CGAIN-SBC-D202-0-0350 3.32 30 34.4 30 89.4 30 543 C0081182 Rep CGAIN-SBC-D202-0-0400 2.89 30 83.2 30 62.8 30 498 C0081183 Rep CGAIN-SBC-D202-0-0400 2.89 30 83.7 40 198 30 908 C0081184 C0081184 Rep CGAIN-SBC-D202-0-0400 2.89 30 85.7 40 198 30 1010 C0081184 Rep CGAIN-SBC-D202-0-0400 2.89 30 85.7 40 198 30 1010 C0081184 Rep CGAIN-SBC-D202-0-0400 10.3 90 822 30 177 30 1170 C0081185 Rep CGAIN-SBC-D202-0-0400 10.3 90 822 30 177 90 32.3 C0081185 Rep CGAIN-SBC-D201-0-0000 ND 30 3.28 30 711 50 32.7 C0081185 Rep CGAIN-SBC-D201-0-0000 ND 30 3.0 2.89 30 717 90 32.3 C0081186 CGAIN-SBC-D201-0-0000 ND 30 3.0 2.89 30 717 90 32.3 C0081186 Rep CGAIN-SBC-D201-0-0000 ND 30 2.89 30 717 90 32.3 C0081186 Rep CGAIN-SBC-D201-0-0000 ND 30 2.89 30 717 90 32.3 C0081186 Rep CGAIN-SBC-D201-0-0000 ND 30 2.89 30 717 90 32.3 C0081186 Rep CGAIN-SBC-D201-0-0000 ND 30 5.31 30 288 30 48.5 C0081187 Rep CGAIN-SBC-D201-0-0000 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0100 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0100 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0100 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0100 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0100 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0100 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0100 ND 30 5.31 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0200 ND 30 5.33 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0200 ND 30 5.33 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0200 ND 30 5.33 30 288 30 48.5 C0081188 Rep CGAIN-SBC-D201-0-0200 ND 30 5.33 30 5.33 30 5.33 30 5.33 30 5.33 30 5.33 30 5.33 30 5.33 30 5.33 30 5.33 30 5.3	60
CO081179 Rep	60
C0081180	30
COMBITIST CGANN-SBC-D202-0-0300* 2.35 30 38.9 30 808 30 803	36
C0081181 CGMN-SBC-0202-0-0350 2.73 30 31.0 30 86.4 50 477  C0081182 Rep CGMN-SBC-0202-0-0350 2.77 30 31.0 30 86.4 50 477  C0081182 Rep CGMN-SBC-0202-0-0350 4.07 30 31.0 30 86.4 50 477  C0081182 Rep CGMN-SBC-0202-0-0400 2.99 30 87.3 40 198 30 908  C0081183 Rep CGMN-SBC-0202-0-0400 2.99 30 87.3 40 198 30 1010  C0081184 Rep CGMN-SBC-0202-0-0400 2.99 30 87.3 40 198 30 1010  C0081186 CGMN-SBC-0202-0-0400 2.99 30 117 50 104 30 1100  C0081186 CGMN-SBC-0202-0-0450 10.3 90 122 30 107 30 1170  C0081186 CGMN-SBC-0202-0-0450 10.3 90 122 30 107 30 1170  C0081185 Rep CGMN-SBC-0202-0-0450 10.3 90 122 30 107 30 1170  C0081186 CGMN-SBC-0201-0-0000 ND 30 3.06 30 737 50 32.3  C0081186 CGMN-SBC-0201-0-0000 ND 30 2.89 30 737 50 32.3  C0081187 CGMN-SBC-0201-0-0000 ND 30 2.89 30 133 30 30 737 50 32.3  C0081186 CGMN-SBC-0201-0-0000 ND 30 2.94 30 2.520 50 413 30 32.3  C0081186 CGMN-SBC-0201-0-0000 ND 30 2.94 30 2.520 50 413 30 30 30 30 30 30 30 30 30 30 30 30 30	30
CO081181 Rep CGMN-SBC-D202-D0500* 2.77 30 31.0 30 86.4 50 477  CD081182 CGMN-SBC-D202-D8-0350 3.32 30 34.4 30 80.4 30 543  CD081183 Rep CGMN-SBC-D202-D8-0350* 4.07 30 33.2 30 62.6 30 469  CD081183 Rep CGMN-SBC-D202-D400* 2.69 30 87.3 40 198 30 908  CD081184 CGMN-SBC-D202-D400* 2.51 30 85.7 40 198 30 1010  CD081184 CGMN-SBC-D202-D-0450* 10.3 90 82.2 30 107 30 1170  CD081184 CGMN-SBC-D202-D-0460* 10.3 90 822 30 107 30 1170  CD081185 Rep CGMN-SBC-D201-D-0000* ND 30 3.06 30 711 50 32.7  CD081185 Rep CGMN-SBC-D201-D-0000* ND 30 2.89 30 737 90 32.3  CD081186 CGMN-SBC-D201-D-0000* ND 30 2.89 30 737 90 32.3  CD081187 CGMN-SBC-D201-D-0000* ND 30 2.89 30 737 90 32.3  CD081187 CGMN-SBC-D201-D-0000* ND 30 2.89 30 737 90 32.3  CD081187 CGMN-SBC-D201-D-0000* ND 30 2.9.4 30 2.520 50 443  CD081187 CGMN-SBC-D201-D-0100* ND 30 2.9.4 30 2.520 50 443  CD081187 CGMN-SBC-D201-D-0100* ND 30 5.31 30 270 30 56.0  CD081188 Rep CGMN-SBC-D201-D-0100* ND 30 5.31 30 270 30 56.0  CD081189 CGMN-SBC-D201-D-0100* ND 30 5.31 30 270 30 56.0  CD081189 CGMN-SBC-D201-D-0100* ND 30 6.85 30 410 30 67.9  CD081189 CGMN-SBC-D201-D-0150* 3.04 30 292 40 12400 50 4810  CD081189 CGMN-SBC-D201-D-0150* 3.04 30 292 40 12400 50 4810  CD081189 CGMN-SBC-D201-D-0150* 3.04 30 292 40 12400 50 4810  CD081189 CGMN-SBC-D201-D-0200* 1.50 30 50.0 30 2500 60 702  CD081189 CGMN-SBC-D201-D-0200* 1.47 30 47.2 20 1980 60 869  CD081189 Rep CGMN-SBC-D201-D-0200* 1.47 30 47.2 20 1980 60 869  CD081181 Rep CGMN-SBC-D201-D-0200* 1.47 30 47.2 20 1980 60 869  CD081181 Rep CGMN-SBC-D201-D-0200* 1.97 30 50.8 30 313 30 88  CD081182 Rep CGMN-SBC-D201-D-0200* 1.97 30 50.8 30 313 30 88  CD081181 Rep CGMN-SBC-D201-D-0200* 1.97 30 50.8 30 313 30 30 50.0 30 30 30 30 30 30 30 30 30 30 30 30 30	30
CO081182 Rep CGAMN-SBC-D202-04000 2.99 30 31.0 30 88.4 50 477  C0081182 Rep CGAMN-SBC-D202-05050 3.32 30 34.4 30 62.6 30 498  C0081182 Rep CGAMN-SBC-D202-04000 2.99 30 87.3 40 198 30 1010  C0081183 Rep CGAMN-SBC-D202-0-0400 2.99 30 87.3 40 198 30 1010  C0081184 CGAMN-SBC-D202-0-0400 2.99 30 87.3 40 198 30 1010  C0081184 Rep CGAMN-SBC-D202-0-0400 10.3 90 172 30 104 30 1100  C0081184 Rep CGAMN-SBC-D202-0-0450 10.3 90 172 30 107 30 1170  C0081185 Rep CGAMN-SBC-D202-0-0500 ND 30 3.08 30 711 50 32.7  C0081186 CGAMN-SBC-D201-0-0000 ND 30 3.08 30 711 50 32.7  C0081186 CGAMN-SBC-D201-0-0000 ND 30 2.89 30 717 50 32.3  C0081186 CGAMN-SBC-D201-0-0000 ND 30 2.89 30 737 50 32.3  C0081186 CGAMN-SBC-D201-0-0000 ND 30 2.89 30 737 50 32.3  C0081186 CGAMN-SBC-D201-0-0000 ND 30 2.89 30 2520 50 413  C0081187 Rep CGAMN-SBC-D201-0-0000 ND 30 2.9 4 30 2520 50 413  C0081188 Rep CGAMN-SBC-D201-0-0000 ND 30 5.31 30 288 30 40.5  C0081188 Rep CGAMN-SBC-D201-0-0000 ND 30 5.31 30 288 30 40.5  C0081188 Rep CGAMN-SBC-D201-0-0000 ND 30 5.31 30 288 30 40.5  C0081188 Rep CGAMN-SBC-D201-0-0100 ND 30 5.31 30 288 30 66.8  C0081188 Rep CGAMN-SBC-D201-0-0100 ND 30 5.31 30 270 30 56.0  C0081188 Rep CGAMN-SBC-D201-0-0100 ND 30 5.31 30 288 30 66.8  C0081188 Rep CGAMN-SBC-D201-0-0100 ND 30 5.31 30 280 30 66.8  C0081188 Rep CGAMN-SBC-D201-0-0100 ND 30 6.85 30 410 30 67.9  C0081188 Rep CGAMN-SBC-D201-0-0150 3.94 30 334 40 11500 50 4810  C0081189 Rep CGAMN-SBC-D201-0-0150 3.94 30 334 40 11500 50 4810  C0081189 Rep CGAMN-SBC-D201-0-0150 3.94 30 334 30 280 60 752  C0081189 Rep CGAMN-SBC-D201-0-0200 1.50 30 50.0 30 2500 60 752  C0081182 Rep CGAMN-SBC-D201-0-0200 1.97 30 69.8 30 343 30 613  C0081182 Rep CGAMN-SBC-D201-0-0300 1.97 30 69.8 30 31.8 30 51.3 30 320  C0081182 Rep CGAMN-SBC-D201-0-0300 0.987 30 38.8 30 57.4 30 4.40 30 4.40 30 320  C0081182 Rep CGAMN-SBC-D201-0-0300 0.987 30 38.8 30 57.4 30 4.40 30 4.40 30 320  C0081184 CGAMN-SBC-D201-0-0300 0.987 30 38.8 30 57.4 30 4.40 30 4.40 30 320	30
C0081182 CGMN-S8C-D202-D8-0360 3.32 30 34.4 30 80.4 30 489  C0081183 Rep CGMN-S8C-D202-D8-0360 4.07 30 33.2 30 62.8 30 489  C0081183 Rep CGMN-S8C-D202-D400 269 30 87.3 40 198 30 908  C0081183 Rep CGMN-S8C-D202-D400 269 30 87.3 40 198 30 1010  C0081184 CGMN-S8C-D202-D400 8.99 30 117 30 104 30 1100  C0081184 CGMN-S8C-D201-D600 10.3 90 122 30 107 30 1170  C0081185 Rep CGMN-S8C-D201-D6000 ND 30 3.08 30 711 50 32.7  C0081185 Rep CGMN-S8C-D201-D6000 ND 30 2.89 30 737 50 32.3  C0081186 CGMN-S8C-D201-D6000 ND 30 2.89 30 737 50 32.3  C0081187 CGMN-S8C-D201-D6000 ND 30 2.89 30 737 50 32.3  C0081187 CGMN-S8C-D201-D6000 ND 30 2.9 30 2520 30 44.3  C0081187 CGMN-S8C-D201-D6000 ND 30 2.9 30 2520 30 46.5  C0081188 Rep CGMN-S8C-D201-D6000 ND 30 5.31 30 270 30 56.0  C0081188 CGMN-S8C-D201-D6000 ND 30 5.31 30 270 30 56.0  C0081188 CGMN-S8C-D201-D6000 ND 30 5.33 30 288 30 57.9  C0081189 CGMN-S8C-D201-D6000 ND 30 5.33 30 280 30 57.9  C0081189 CGMN-S8C-D201-D6000 ND 30 5.33 30 280 30 56.0  C0081189 CGMN-S8C-D201-D6000 ND 30 6.85 30 410 30 56.6  C0081189 CGMN-S8C-D201-D6000 ND 30 6.85 30 410 30 57.9  C0081189 CGMN-S8C-D201-D6000 ND 30 6.85 30 410 30 50 4810  C0081189 CGMN-S8C-D201-D6000 1.50 30 50.0 30 2500 40 702  C0081189 CGMN-S8C-D201-D6000 1.50 30 50.0 30 2500 40 702  C0081181 CGMN-S8C-D201-D6200 1.57 30 50 60.8 30 343 30 613  C0081181 CGMN-S8C-D201-D6200 1.97 30 50.8 30 343 30 613  C0081182 Rep CGMN-S8C-D201-D6250 3.90 30 63.3 30 51.3 30 508  C0081181 CGMN-S8C-D201-D6250 1.97 30 58.8 30 51.3 30 508  C0081181 CGMN-S8C-D201-D6250 0.937 30 58.8 30 51.3 30 508  C0081182 CGMN-S8C-D201-D6250 0.937 30 58.8 30 57.4 30 4.40 30 508  C0081183 CGMN-S8C-D201-D6250 0.937 30 38.8 30 51.3 30 350  C0081183 CGMN-S8C-D201-D6250 0.937 30 38.8 30 51.3 30 350  C0081183 CGMN-S8C-D201-D6250 0.937 30 38.8 30 51.3 30 350  C0081183 CGMN-S8C-D201-D6250 0.937 30 38.8 30 51.3 30 350  C0081183 CGMN-S8C-D201-D6250 0.937 30 38.8 30 51.3 30 350	30
CO081182 Rep	50
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CO081183 Rep CGMM-S8C-D202-D-000" 251 S0 83.7 40 788 30 1010 CO081184 Rep CGMM-S8C-D202-D-0400 9.89 30 1177 30 104 30 1100 CO081184 Rep CGMM-S8C-D202-D-0400 10.3 90 122 30 107 30 1170 CO081185 Rep CGMM-S8C-D201-D-0000 ND 30 3.08 30 711 50 32.7 CO081185 Rep CGMM-S8C-D201-D-0000 ND 30 2.89 30 713 50 32.3 CO081186 CGMM-S8C-D201-D-0000 ND 30 2.89 30 737 50 32.3 CO081186 CGMM-S8C-D201-D-0000 ND 30 2.89 30 737 50 32.3 CO081186 CGMM-S8C-D201-D-0000 ND 30 2.89 30 2610 50 413 CO081187 Rep CGMM-S8C-D201-D-0000 ND 30 22.9 30 2510 50 313 CO081187 Rep CGMM-S8C-D201-D-0100 ND 30 5.31 30 270 30 56.0 CGMM-S8C-D201-D-0100 ND 30 5.31 30 270 30 56.0 CGMM-S8C-D201-D-0100 ND 30 5.31 30 270 30 56.0 CGMM-S8C-D201-D-0100 ND 30 5.31 30 270 30 56.0 CGMM-S8C-D201-D-0100 ND 30 5.31 30 270 30 56.0 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 67.9 CGMM-S8C-D201-D-0100 ND 30 6.85 30 410 30 60 60 60 60 60 60 60 60 60 60 60 60 60	
C0861184 CGMN-S8C-D203-0-0450 9.89 30 117 30 104 30 1100 C0861184 Rep CGMN-S8C-D203-0-0460 10.3 90 122 30 107 30 1170 C0861185 CGMN-S8C-D201-0-0000 ND 30 3.98 30 737 50 32.3 C0861185 Rep CGMN-S8C-D201-0-0000 ND 30 2.89 30 737 50 32.3 C0861185 Rep CGMN-S8C-D201-0-0000 ND 30 2.89 30 737 50 32.3 C0861186 CGMN-S8C-D201-0-0000 ND 30 2.89 30 737 50 32.3 C0861186 CGMN-S8C-D201-0-0000 ND 30 2.94 30 2620 50 413 C0861187 CGMN-S8C-D201-0-0100 ND 30 2.94 30 2620 50 313 C0861187 CGMN-S8C-D201-0-0100 ND 30 4.89 30 288 30 46.5 C0861187 Rep CGMN-S8C-D201-0-0100 ND 30 5.31 30 270 30 56.0 C0861188 CGMN-S8C-D201-0-0100 ND 30 5.31 30 270 30 56.0 C0861188 CGMN-S8C-D201-0-0100 ND 30 5.33 30 288 30 56.5 C0861188 CGMN-S8C-D201-0-0100 ND 30 6.85 30 410 30 57.9 C0861189 CGMN-S8C-D201-0-0150 ND 30 6.85 30 410 30 57.9 C0861189 Rep CGMN-S8C-D201-0-0150 3.94 30 334 40 11500 50 4810 C0861189 Rep CGMN-S8C-D201-0-0150 3.94 30 292 40 12400 50 4810 C0861189 Rep CGMN-S8C-D201-0-0200 1.50 30 50.0 30 250 40 702 C0861190 Rep CGMN-S8C-D201-0-0200 1.57 30 30 50.0 30 250 40 702 C0861190 Rep CGMN-S8C-D201-0-0200 1.57 30 30 50.0 30 250 40 702 C0861190 Rep CGMN-S8C-D201-0-0200 1.57 30 30 50.0 30 250 40 702 C0861190 Rep CGMN-S8C-D201-0-0200 1.57 30 30 50.0 30 30 30 30 80 60 60 60 60 60 60 60 60 60 60 60 60 60	30
C0081186 CGAM-SBC-D201-0-0000 ND 30 3.08 30 711 50 32.7 C0081185 Rap CGAM-SBC-D201-0-0000 ND 30 2.89 30 737 50 32.3 C0081185 Rap CGAM-SBC-D201-0-0000 ND 30 2.89 30 737 50 32.3 C0081185 Rap CGAM-SBC-D201-0-0000 ND 30 2.89 30 737 50 32.3 C0081186 Rap CGAM-SBC-D201-0-0000 ND 30 2.9.4 30 2500 50 413 C0081187 CGAM-SBC-D201-0-0100 ND 30 2.9.4 30 2510 50 313 C0081187 CGAM-SBC-D201-0-0100 ND 30 4.89 30 288 30 46.5 C0081187 CGAM-SBC-D201-0-0100 ND 30 5.31 30 270 30 56.0 C0081187 Rap CGAM-SBC-D201-0-0100 ND 30 5.31 30 270 30 56.0 C0081188 Rap CGAM-SBC-D201-0-0100 ND 30 5.33 30 288 30 56.8 C0081188 Rap CGAM-SBC-D201-0-0150 ND 30 5.83 30 286 30 56.8 C0081189 Rap CGAM-SBC-D201-0-0150 ND 30 5.85 30 410 30 57.9 C0081189 CGAM-SBC-D201-0-0150 3.94 30 334 40 11500 50 4610 C0081189 CGAM-SBC-D201-0-0150 3.94 30 292 40 12400 50 4610 C0081180 Rap CGAM-SBC-D201-0-0200 1.50 30 50.0 30 2500 40 702 C0081190 Rap CGAM-SBC-D201-0-0200 1.57 30 50 50.0 30 2500 40 702 C0081190 Rap CGAM-SBC-D201-0-0200 1.57 30 30 50.0 30 2500 40 702 C0081190 Rap CGAM-SBC-D201-0-0200 1.57 30 30 50.0 30 2500 40 702 C0081190 Rap CGAM-SBC-D201-0-0200 1.57 30 30 50.0 30 2500 40 702 C0081190 Rap CGAM-SBC-D201-0-0250 3.90 30 93.3 90 93	<b>30</b>
C0081185 CGMN-SBC-D201-0-0000° ND 30 3.08 30 711 50 32.7 C0081185 Rap CGMN-SBC-D201-0-0000° ND 30 2.89 30 757 50 32.3 C0081185 Rap CGMN-SBC-D201-0-0000° ND 30 2.89 30 757 50 32.3 C0081186 Rap CGMN-SBC-D201-0-0000° ND 30 2.89 30 2820 50 413 C0081186 Rap CGMN-SBC-D201-0-0100° ND 30 2.89 30 283 30 48.5 C0081187 CGMN-SBC-D201-0-0100° ND 30 5.31 30 270 30 55.0 C0081188 Rap CGMN-SBC-D201-D8-0100° ND 30 5.31 30 270 30 55.0 C0081188 Rap CGMN-SBC-D201-D8-0100° ND 30 5.31 30 288 30 66.8 C0081188 Rap CGMN-SBC-D201-D8-0100° ND 30 5.33 30 288 30 66.8 C0081188 Rap CGMN-SBC-D201-D8-0100° ND 30 6.85 30 410 30 67.9 C0081189 CGMN-SBC-D201-D8-0100° ND 30 5.35 30 410 30 67.9 C0081189 CCMN-SBC-D201-D8-0100° ND 30 8.85 30 410 30 67.9 C0081189 Rap CGMN-SBC-D201-0-0150° 3.04 30 242 40 11500 50 5180 C0081189 Rap CGMN-SBC-D201-0-0150° 3.04 30 242 40 12400 50 4610 C0081189 Rap CGMN-SBC-D201-0-0200° 1.50 30 50.0 30 2500 60 752 C0081190 Rap CGMN-SBC-D201-0-0200° 1.47 30 47.2 20 1880 80 868 C0081191 Rap CGMN-SBC-D201-0-0200° 1.47 30 47.2 20 1880 80 868 C0081191 Rap CGMN-SBC-D201-0-0200° 1.97 30 59.5 30 30 35 30 59.6 C0081192 CGMN-SBC-D201-0-0200° 1.97 30 59.6 59.5 343 30 613 C0081192 CGMN-SBC-D201-0-0300° 2.00 30 57.7 30 335 30 598 C0081193 Rap CGMN-SBC-D201-0-0300° 2.00 30 35.8 30 51.3 30 320 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 35.8 30 51.3 30 320 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 35.8 30 51.3 30 320 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 35.8 30 51.3 30 320 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 35.8 30 51.3 30 320 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0300° 2.00 37.7 30 335 30 30 320 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0300° 2.00 30 37.4 30 48.7 30	30
C0081185   Pape   CGMN-SBC-D201-0-0000*   ND   30   2.88   30   737   50   32.3	<b>30</b>
C0081186	50
C0081196 Rep	60
C0081187 C0NN-S8C-D201-0-0100* ND 30 4.88 30 288 30 48.5  C0081187 Rep CGMN-S8C-D201-0-0100* ND 30 4.88 30 288 30 48.5  C0081188 CGMN-S8C-D201-0-0100* ND 30 5.31 30 270 30 55.0  C0081188 CGMN-S8C-D201-D8-0100* ND 30 5.31 30 270 30 55.0  C0081188 CGMN-S8C-D201-D8-0100* ND 30 5.31 30 288 30 66.8  C0081188 CGMN-S8C-D201-D8-0100* ND 30 8.85 30 410 30 67.9  C0081188 CGMN-S8C-D201-0-0150* 3.94 30 334 40 11300 50 5180  C0081189 CGMN-S8C-D201-0-0150* 3.04 30 282 40 12400 50 4810  C0081190 CGMN-S8C-D201-0-0200* 1.50 30 50.0 30 2500 60 752  C0081191 CGMN-S8C-D201-0-0200* 1.47 30 47.2 30 1880 60 869  C0081191 CGMN-S8C-D201-0-0200* 1.47 30 47.2 30 1880 60 869  C0081191 CGMN-S8C-D201-0-0250* 3.90 30 63.3 60 613 80 518  C0081192 Rep CGMN-S8C-D201-0-0250* 3.90 30 63.3 60 613 80 518  C0081192 Rep CGMN-S8C-D201-0-0250* 2.00 30 57.7 30 335 30 588  C0081192 Rep CGMN-S8C-D201-0-0250* 2.00 30 33.8 30 613  C0081192 Rep CGMN-S8C-D201-0-0250* 2.00 30 33.8 30 51.3 30 588  C0081192 Rep CGMN-S8C-D201-0-0250* 0.552 30 33.8 30 51.3 30 320  C0081193 CGMN-S8C-D201-0-0250* 0.552 30 33.8 30 51.3 30 320  C0081194 CGMN-S8C-D201-0-0350* 0.552 30 33.8 30 51.3 30 320  C0081194 CGMN-S8C-D201-0-0350* 0.552 30 33.8 30 44.7 30 310	80
C0081197 Rep CGMM-S8C-D231-0-9100* ND 30 5.31 30 270 30 55.0 C0081198 Rep CGMM-S8C-D231-0-9100* ND 30 5.33 30 288 30 56.8 C0081198 Rep CGMM-S8C-D231-D8-0100* ND 30 6.85 30 410 30 67.9 C0081198 Rep CGMM-S8C-D231-0-9150 3.94 30 3.94 40 11500 50 5180 C0081199 Rep CGMM-S8C-D231-0-0150* 3.94 30 242 40 12400 50 4610 C0081199 Rep CGMM-S8C-D231-0-0200* 1.50 30 50.0 30 2500 60 752 C0081190 Rep CGMM-S8C-D231-0-0200* 1.47 30 47.2 20 1880 90 869 C0081191 Rep CGMM-S8C-D231-0-0200* 1.47 30 47.2 20 1880 90 869 C0081191 Rep CGMM-S8C-D201-0-0200* 3.90 30 83.3 0	80
C0081197 Rep CGMM-S8C-D231-0-9100* ND 30 5.31 30 270 30 55.0 C0081198 Rep CGMM-S8C-D231-0-9100* ND 30 5.33 30 288 30 56.8 C0081198 Rep CGMM-S8C-D231-D8-0100* ND 30 6.85 30 410 30 67.9 C0081198 Rep CGMM-S8C-D231-0-9150 3.94 30 3.94 40 11500 50 5180 C0081199 Rep CGMM-S8C-D231-0-0150* 3.94 30 242 40 12400 50 4610 C0081199 Rep CGMM-S8C-D231-0-0200* 1.50 30 50.0 30 2500 60 752 C0081190 Rep CGMM-S8C-D231-0-0200* 1.47 30 47.2 20 1880 90 869 C0081191 Rep CGMM-S8C-D231-0-0200* 1.47 30 47.2 20 1880 90 869 C0081191 Rep CGMM-S8C-D201-0-0200* 3.90 30 83.3 0	30
C0081188 CGMN-SBC-D201-DB-0100 ND 30 5.33 30 288 30 56.8 C0081188 Rep CGMN-SBC-D201-DB-0100* ND 30 6.85 30 410 30 67.9 C0081188 Rep CGMN-SBC-D201-D-0150* ND 30 6.85 30 410 30 67.9 C0081189 Rep CGMN-SBC-D201-D-0150* 3.94 30 334 40 11500 50 5180 C0081199 Rep CGMN-SBC-D201-D-0200* 1.50 30 282 40 12400 50 4610 C0081199 CGMN-SBC-D201-D-0200* 1.47 30 47.2 20 1880 40 869 C0081191 Rep CGMN-SBC-D201-D-0200* 1.47 30 47.2 20 1880 40 869 C0081191 Rep CGMN-SBC-D201-D-0200* 3.90 30 83.3 60 613 90 518 C0081191 Rep CGMN-SBC-D201-D-0200* 3.90 30 83.3 60 613 90 518 C0081192 CGMN-SBC-D201-D-0200* 2.06 30 57.7 30 335 30 598 C0081193 Rep CGMN-SBC-D201-D-0300* 2.06 30 33.8 30 343 30 613 C0081193 Rep CGMN-SBC-D201-D-0300* 2.06 30 57.7 30 335 30 598 C0081193 Rep CGMN-SBC-D201-D-0350* 0.562 30 33.8 30 51.3 30 320 C0081193 Rep CGMN-SBC-D201-D-0350* 0.562 30 33.8 30 51.3 30 320 C0081194 CGMN-SBC-D201-D-0350* 0.562 30 33.8 30 51.3 30 320 C0081194 CGMN-SBC-D201-D-0350* 0.562 30 33.8 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0350* 0.562 30 33.8 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0350* 0.562 30 33.8 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0350* 0.562 30 33.8 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0350* 0.987 30 33.8 30 440 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0360* 0.987 30 33.8 30 440 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0360* 0.987 30 33.8 30 440 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0360* 0.987 30 33.8 30 440 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0360* 0.987 30 33.8 30 440 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0360* 0.987 30 33.8 30 440 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0360* 0.987 30 33.8 30 440 30 48.7 30 310 C0081194 CGMN-SBC-D201-D-0360* 0.988 30 37.4 30 440 30 239	30
C0081188 Rep CGAM-SBC-D201-D8-0100* ND 90 8.85 30 410 30 07.0  C008118R C CGAM-SBC-D201-D-0130 3.94 30 334 40 11350 50 5180  C008118R Rep CGAM-SBC-D201-D-0130* 3.04 30 242 40 12400 50 4610  C008119R Rep CGAM-SBC-D201-D-0200* 1.50 30 50.0 30 250 60 762  C008119R Rep CGAM-SBC-D201-D-0200* 1.47 30 47.2 20 1880 40 869  C008119R Rep CGAM-SBC-D201-D-0250* 3.90 30 63.3 60 613 80 518  C008119R Rep CGAM-SBC-D201-D-0250* 3.90 30 63.3 60 613 80 518  C008119R Rep CGAM-SBC-D201-D-0300* 2.06 30 57.7 30 335 30 598  C008119S Rep CGAM-SBC-D201-D-0300* 2.06 30 57.7 30 335 30 598  C008119S Rep CGAM-SBC-D201-D-0350* 0.552 30 33.8 30 51.3 30 320  C008119S Rep CGAM-SBC-D201-D-0350* 0.552 30 33.8 30 51.3 30 320  C008119S Rep CGAM-SBC-D201-D-0350* 0.552 30 33.8 30 44.7 30 310  C008119S CGAM-SBC-D201-D-0350* 0.552 30 33.8 30 44.7 30 310	
C0081189	46 46
C0081199 Rep	-
CO081190 CGAMN-SSC-D201-0-0200 1.50 30 50.0 30 2500 60 702 C0081190 Rep CGAMN-SSC-D201-0-0200* 1.47 30 47.2 30 1880 80 869 C0081191 Rep CGAMN-SSC-D201-0-0250* 3.90 30 83.3 60 813 80 818 C0081191 Rep CGAMN-SSC-D201-0-0250* 3.90 30 83.3 60 813 80 818 C0081192 Rep CGAMN-SSC-D201-0-0500 1.97 30 50.8 30 343 30 613 C0081192 Rep CGAMN-SSC-D201-0-0500 2.06 30 57.7 30 335 30 568 C0081193 Rep CGAMN-SSC-D201-0-0350* 0.562 30 33.8 30 51.3 30 520 C0081193 Rep CGAMN-SSC-D201-0-0350* 0.562 30 33.8 30 51.3 30 320 C0081193 Rep CGAMN-SSC-D201-0-0350* 0.877 30 33.4 30 48.7 30 310 C0081194 CGAMN-SSC-D201-0-0350* 0.887 30 33.4 30 48.7 30 310 C0081194 CGAMN-SSC-D201-0-0460* 0.688 30 37.4 30 4.40 30 239	50
C0081190 Rep CGMM-SBC-D201-0-0200* 1.47 30 47.2 20 1880 80 869  C0081191 CGMM-SBC-D201-0-0250 8.43 30 78.1 80 780 80 888  C0081191 Rep CGMM-SBC-D201-0-0250 3.90 30 83.3 80 813 80 818  C0081192 Rep CGMM-SBC-D201-0-0300 1.97 30 568.8 30 343 30 613  C0081192 Rep CGMM-SBC-D201-0-0300 2.06 30 57.7 30 335 30 568  C0081193 CGMM-SBC-D201-0-0350 0.562 30 33.8 30 51.3 30 320  C0081193 Rep CGMM-SBC-D201-0-0350 0.987 30 38.4 30 48.7 30 310  C0081194 CGMM-SBC-D201-0-0350 0.988 30 37.4 30 4.40 30 239	50
C0081191 CGAM-SBC-D201-0-0250 8.43 30 78.1 80 730 80 868 C0081191 Rep CGAM-SBC-D201-0-0250 3.90 30 83.3 80 813 80 818 C0081191 Rep CGAM-SBC-D201-0-0250 3.90 30 83.3 80 813 80 813 C0081192 Rep CGAM-SBC-D201-0-0500 2.00 30 57.7 30 335 30 588 C0081192 Rep CGAM-SBC-D201-0-0350 0.562 30 33.8 30 51.3 30 320 C0081193 CGAM-SBC-D201-0-0350 0.937 20 33.4 30 48.7 30 310 C0081194 CGAM-SBC-D201-0-0400 0.988 50 37.4 30 4.40 36 239	30
C0081191 Rep CGAM-S8C-D201-0-0250* 3.90 30 63.5 60 613 80 518  C0081192 Rep CGAM-S8C-D201-0-0300* 2.06 30 568.8 30 343 30 613  C0081192 Rep CGAM-S8C-D201-0-0300* 2.06 30 57.7 30 335 30 568  C0081193 C96M-S8C-D201-0-0350 0.562 30 33.8 30 51.3 30 320  C0081193 Pep CGAM-S8C-D201-0-0350* 0.937 20 38.4 30 48.7 30 310  C0081194 CGMM-S8C-D201-0-0400 0.688 30 37.4 30 4.40 30 239	30
C0081192 C034AL-S8C-D201-0-0900 1.97 30 59.8 30 343 30 613 C0081192 Rep CGMN-SBC-D201-0-0900* 2.06 30 57.7 30 335 30 598 C0081193 C094N-SBC-D201-0-0980 0.562 30 33.8 30 51.3 30 320 C0941193 Rep CGMN-SBC-D201-0-0980* 0.697 30 33.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0400 0.688 30 37.4 30 4.40 30 238	50
C0081192 Rep	50
C0081193 CGMN-SBC-D201-0-0350 0.552 30 33.8 30 51.3 30 320 C0081193 Rep CGMN-SBC-D201-0-0350 0.937 30 38.4 30 48.7 30 310 C0081194 CGMN-SBC-D201-0-0400 0.988 30 37.4 30 4.40 30 239	.30
C0981193 Rep CGMN-SBC-D201-0-0380* 0.837 30 38.4 30 48.7 30 39.0 C0081194 CGMN-SBC-D201-0-0400 0.988 30 37.4 30 4.40 30 239	30
C0081193 Rep CGMN-SSC-D201-0-0350* 0.897 20 38.4 30 46.7 30 310 C0081194 CGMN-SSC-D201-0-0400 0.988 30 37.4 30 4.40 30 239	30
C0001194 CGMM-SSC-0201-0-0400 0.988 30 37.4 30 4.60 30 239	30
	30 30
C0081196 CGMN-58C-0104-0-0000 4.77 30 8.85 90 MR MR MR MR C0081195 Rep CGMN-58C-0104-0-0000* 4.64 90 7.60 50 MR MR MR MR	MR
	NR
C0001196 CGMN-SBC-D104-0-0060 ND 30 15.1 30 893 30 284	50
C0081196 Rep. CGMN-58C-D104-0-0050* ND 30 9.45 30 916 30 348	50
C0081197 CGAN-S8C-D194-D8-8050 ND 30 14.8 30 820 80 246	30
20061197 Rep C3MN-SBC-D104-D8-0060* ND 30 9.40 30 562 80 202	30
C0061198 CGNN-SBC-D104-0-0100 NC 30 23.0 30 381 30 1300	AC .
	60
	60 60
	~

NO = Not descared at or above 0.2 rigity (was weight).

NO = Not descared at or above 0.2 rigity (was weight).

NO = Not quantifiable = Measured concentration between 0.2 rigity (was weight) and the Limit of Cuantifiable in (LOC) which is 0.4 rigity (was weight).

NR = Not reported due to quality content result fellures.

Exygen Study No.: P0001400

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples
Continued

		C4 Sullen	sia PFBS	CS Bullon	ete PFHS	CI Sulfon	als PFOS	CB Ack	PFDA
		Aradyte		Analyte		Armijo		Acetyte	
		Provide Dry Wt.	Anne	Found thy ML	Account	Found Dry Mr.	Annotation	Pound Dry VR.	Accuracy
Exygen 10	Client Sample 10	grots, nove)	(+%/-%)	STA TOTAL	(4%/-%)	OPA, NGIGO	(+% / - %)	(pata, ray/g)	(+%/-%)
00074004	dOM: 000 DAM DAM		**						
C0081200 Rep	CGMN-SBC-D104-0-0200 CGMN-SBC-D104-0-0200*	NQ 0.574	30 30	61.7 54.5	30 30	73.1 64.1	30 30	2500 2490	60 60
C0081201	CGMN-SBC-D104-0-0250	0.634	30	35.8	30	112	40	2080	80
C008 1201 Rep	CGMN-88C-D104-0-0250*	0.524	30	37.5	30	93.4	40	2000	50
C0081202	CGMN-6BC-0104-0-0300	6.506	30	32.6	30	262	30	361	30
C00#1202 Rep	CGMN-58C-D104-0-6300*	0.558	30	39.0	30	337	30	396	30
C0081203	CGMN-SBC-D104-0-0350	0.815	30	8.90	30	184	30	190	300
C008 1203 Rep	CGMN-88C-D104-0-0350*	0.507	30	58,1	30	161	30	185	30
C0051205	CGMN-SBC-D104-0-0400	NQ	30	38,1	50	125	30	52.2	30
C0081205 Rep	CGMN-S8C-D104-0-0400*	NO	30	36.4	30	148	30	623	30
C0061206 Red	CGMH-SBC-D104-0-0450 CGMH-SBC-D104-0-0450*	ND NO	30 36	23.5 24.4	30 36	120	30	185 182	30
C0061207		NG:				125	30		<b>30</b>
C0081207 Ren	CGMN-98C-0104-08-0450 CGMN-SBC-0104-08-0450*	NO.	30 30	25.3 23.7	30 30	128 118	30 30	180 183	50 50
C0081298	CGMN-SBC-D104-0-0500	NC	30	8.08	30	90.2	40	371	30
C0061206 Rep	CGMN-55C-D104-0-0500*	NO	30	8.25	30	20.0	**	340	30
C0081209	CGMN-38C-D104-0-0550	NC	30	6.24	30	<b>82.6</b>	40	3.23	30
C0081209 Rep	CGMN-88C-D104-0-0550*	NQ	30	5.87	30	79.6	46	313	30
C0081210	CGMH-SBC-0104-0-0800	ND	30	8.10	30	131	30	143	30
C0061210 Rep	CGMN-SBC-D104-0-0900*	HD	30	8.07	30	139	36	176	30
C0381211	CGMN-S9C-D104-0-0550	NO	30	3.61	30	134	30	146	39
C0081211 Rep	CGMN-SBC-D104-0-06501	ND	30	362	30	131	30	142	30
C0081212	CGMN-98C-D103-0-0000	MD	30	ND	30	63.3	50	13.6	40
C0981212 Pep	CGMN-S8C-D103-0-0000*	MD	30	HD	30	85.1	30	11.8	40
C0061213 C0061213 Rea	CGMN-SBC-D103-0-0060 CGMN-SBC-D103-0-0060*	ND NO	30 30	0.780 0.884	30 80	913 675	30 30	181 143	30 30
C0041214	CGMN-S8C-D103-0-0100	ND	30	0.91A	30	940	30	632	30
C0081214 Rep	CGMH-98C-D103-0-0100*	NO	30	0.772	30	906	30	491	30
C0081215	CGMN-SBC-D183-0-8150	MD	30	2.78	30	229	30	2480	30
C0061215 Rep	CGMN-SBC-D103-0-0150*	ND	30	2.50	30	209	30	2190	30
C0061216	CGMN-SBC-0103-0B-0150	NO	30	2.81	30	220	30	2470	30
C0081216 Rep	CGMP1-88C-D193-O8-0180*	NO	30	2.72	30	225	30	2360	30
C0081217 C0081217 Rep	CGMN-SBC-D103-0-0200 CGMN-SBC-D103-0-0200*	0,744 0.888	30 30	10.8 10.8	30 30	592 556	30 30	1450 1570	30 30
C0081219 C0081219 Rep	CGMN-88C-D103-0-0250 CGMN-88C-D103-0-0250*	1.42 1.39	30 36	12.8 13.0	30 30	350 418	30 30	NR NR	MR MR
C0081220	CGMN-SBC-D103-0-0300	NG	30	8.21	30	223	30	152	60
C0081220 Rep	CGMH-88C-D103-0-0300*	NO	30	6.84	36	228	30	156	ã
00081221	CGMN-98C-D103-p-0366	0.570	30	13.9	30	336	30	64.0	40
C0081221 Rep	CGMN SBC-D103-0-0350*	0.771	30	15.2	30	368	30	66.7	40
C0081222	CGMN-SBC-D103-0-0400	0.771	30	35.6	30	381	40	114	30
C0081222 Rep	QGMR1-SBC-0193-0-0490*	0.775	30	34.2	36	340	40	102	30
C0081236	CGMN-68C-0183-0-0450	NR	NR	8.78	30	197	30	84.6	50
C0061256 Rep	CGMN-S8C-0103-0-0450*	NR	NR	9.29	36	207	30	85.4	30
C0081258 C0081238 Reo	CGMN-SBC-D103-0-0500 CGMN-58C-D103-0-0600*	NC NC	30 30	4.09 4.24	30 30	178 184	30 30	53.5 54.3	30 30
		•							
C0061236 C3061236 Red	CGMN-SBC-D103-0-0000 CGMN-SBC-D103-0-0650*	NQ NO	30 30	3.70 3.97	30 30	11 <b>6</b> 121	30 30	156 168	30 30
m									

<sup>\*</sup>Laboratory Duplicate

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NO = Not detacted at or above 0.2 rg/g (wet weight).

NC = Not quantifiable = Misseured concentration between 0.2 right (wet weight) and the Limit of Quantifiation (LCQ) which is 0.4 right (wat weight)

Exygen Study No.: P0001400

Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Table I. Continued

		C4 Sulfon	PFRS	C# Sulfor	ale PFHS	CB Sulfon	uto PFOS	CB Acts	PPOA
		Acmiyin	h	Armiyee		Armigin		Analyse	
		Feetal	Actoresis	Found	Account	Found		Pound	Annang
Exygen ID	Client Semple ID	Day We.	Accessor 1934 1-34	Dry Mt.	Accuracy (+%/-%)	Say Wit.	19% ( - %)	Dry Mt.	Acouracy (V% I - %)
C0081240	CGMN-SBC-D103-0-0400	ND	30	4.50	30	189	36	162	30
C0081240 Rec		ND	30	4.50	30	189	3C	174	36
C0081241	CGMN-SBC-D103-0-0650	NO	30	7.51	30	250	30	164	30
C0081241 Rec		NO.	30	8.28	30	267	30	177	30 30
C0081244	CGMN-SBC-D801-0-0000	0.573	30	2.81	30	563	80	159	30
C0061248 Ran		0.525	30	2.82	30	830	60	150 151	3C
C0061248	CGMN-SBC-D801-0-0050	1.40	30	5.17	30	526	36	356	
C0081249 Rec		4.22	30	5.17 4.58	30 30	9457	30 30	330 313	30 30
C0081250	CGMN-SBC-D601-0-0100		30	5.74	30				
C0061250 Rec		1.74 1.77	30 30	5./4 6.20	30	567 821	50 50	470 615	50 50
C00\$1251 C00\$1251 Res	CGMN-SBC-D601-0-0150 CGMN-SBC-D601-0-0150*	0.710 6.788	30 30	2.81 2.71	30 30	281 346	30 36	88.0 95.8	40 40
	• • • • • • • • • • • • • • • • • • • •								
C0081252 C0081262 Res	CGMN-SBC-D801-0-0200	1.19	30	4.75	30	394	30	204	30
•	CGMH-98C-D601-0-0200*	1.17	30	4.45	30	345	80	190	30
C0061274	CGMN-SBC-D101-0-0000	NC	30	1.46	30	46.6	30	5.78	30
C0081274 Rup	CGMN-88C-D101-0-0000*	NC	30	1,50	30	45.8	30	5.00	30
C0081275	CGMN-88C-D101-0-0060	5.92	30	7. 13	- 30	45.4	30	57.9	30
C0081275 Rep	CGMN-SBC-D101-0-0060*	5.79	30	7.34	30	47.4	30	60.5	30
C0081277	CGMN-SSC-0101-0-0100	2.03	30	31.4	30	84.2	30	178	30
C0081277 Rep	CGMN-58C-D101-8-0100*	1.97	30	31.9	30	64.8	30	184	30
C0081278	CGMN-SBC-D101-D8-0100	2.11	80	30.2	30	67.9	40	189	30
C0081275 Rep	CGMN-SBC-D101-D8-0100*	1.83	30	30.6	30	66.0	40	180	30
C0081279	CGMN-89C-D191-0-0160	1.17	30	6.75	30	67.6	30	25.2	30
C0051279 Rep	CGMN-58C-C101-0-0160*	1.20	30	6.82	30	67.6	30	25.5	30
C0081280	CCMN-\$BC-D101-B-0203	0.800	36	2.70	30	36.1	30	16.3	30
C0081280 Rep	CGMH-8BC-D101-0-0200*	0.753	30	3.11	30	33.8	30	16,9	30
C0081261	CGMN-88C-D192-0-0000	1.94	30	8.82	30	NR	NR	NR	NR
C00812061 Rep	CGMN-SBC-D162-0-0000*	2.04	30	7.78	30	NR	NR	NR	NR
C0081282	CGMN-88C-0102-0-0050	2.83	30	35.0	30	391	36	772	50
C0981282 Rep	CGMN-\$8C-D102-0-0050*	2.51	30	36.1	30	401	30	764	30
C0081283	CGMN-8BC-D102-0-0100	0.514	30	21.8	30	134	30	973	30
C0051283 Rep	CGMN-SEC-D102-0-0100*	0.451	30	21.5	30	133	30	661	30
C3081284	CGMN-SBC-D102-0-0150	NQ	30	5.20	30	34.7	30	117	40
C0081284 Rep	CGMN-58C-D102-0-0160*	NQ	30	6.46	30	36.9	30	122	40
C3061265	CGMN-SBC-D102-0-0206	NO	30	5.82	30	254	30	129	30
C0081295 Rep	CGMH-69C-0102-0-0200*	NQ	300	7.30	30	250	30	138	30
C0081342	CGMN-SBC-81501-0-0008	1.72	30	2.77	30	590	30	56.7	80
C3081342 Rep	CGMH-SBC-B1501-0-0000"	1.80	30	2.95	30	647	30	67.1	<del>00</del>
C0081343	CGMN-3BC-81901-0-0050	1.62	30	2.88	30	170	30	173	30
C0081343 Rep	CGLMI-SBC-B1501-0-0050*	1.48	30	2.67	30	162	30	150	30
C0081344	CGMN-88C-81501-0-0100	0.727	30	2.09	30	104	40	190	30
C0081344 Rep	CGMN-65C-61501-0-0100*	0.614	30	2.14	30	102	40	192	30
C0091346	CGMN-SBC-81501-0-0150	9.484	30	0.832	30	NIR	NR	40.3	30
C0081345 Rep	CGMN-S8C-81501-0-0150*	0.485	30	0.784	30	NR	NR	88.3	30
C0081346	CGMN-SBC-81501-0-0200	4.736	30	NO	30	1840	30	80.9	50
C0081346 Ren	CGMN-88C-81501-0-0200*	1.00	30	NG	30	1890	30 30	82.3	50 50
C0081242	CGMN-88C-0501-0-0000	1.42	30 30	17.5 19.8	30 30	2340 2280	30 30	NR NR	MR MR
C0081242 Rap	CGMN-9BC-D501-0-0000*	1.49	au.	18.0	30	2200	24	MES	Like.

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<sup>&</sup>quot;Leborstory Duplicate
NO = Not detected at or stone 0.2 right; (well weight).
NO = Not quantifiable > Measured concentration below
NR = Not reported due to quality control result failures. on 0.2 mg/g (wat weight) and the Limit of Quantitation (LCC) which is 0.4 mg/g (wat weight).

Exygen Study No.: P0001400

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples
Continued

		C4 Bullon	et PFE	CA Sulfer	rts   77   18	CB Suffee Analyte	PPOS	CS Acid	PTOA
		Apalyto		Analyto		Found		Found	Assessed
		Do WL	Ancerete	Dry Mt.	Accuracy	Dry Wit.	Acresion	DIT W.	ADDLIVE
Exygen (6	Client Sample ID	1994, 1998	(e% 1-%)	(apt), nefti	(4%) - %)	(dept., regist)	(ME1-29)	(pyth, note)	(+%/-%)
C8081243	CGMN-SBC-0501-0-0090	1.67	30	62.7	30	781	30	1350	60
C0081243 Rep	CGMN-SBC-D601-0-0050"	1.76	30	67.2	36	872	30	1400	60
C0081244	CGMN-88C-0501-08-0050	1.88	90	68.C	30	886	50	1290 1200	80 80
C0081244 Rep	CGMN-88C-0501-DB-0050*	1.58	30	81.1	30	793	50		
C0081245	CGMN-SBC-D501-0-0100	1.64	30	27.6	30	743 642	30 30	3,25 288	30 30
C0081245 Rep	CGMH-SBC-D501-0-0100*	1.30	30	23.8	30	46.8	40	41.3	36
C0081246	CGMN-SSC-D501-0-0150 CGMN-SSC-D501-0-0150*	ND ND	30 30	8.452 0.436	30 30	46.0	40	43.7	30
C0081246 Rap			30	1.743	30	25.1	30	26.3	30
C0081247 C0081247 Res	CGMN-SBC-D501-0-9200 CGMN-SBC-D501-0-0200*	NO NO	30	1.18	30	38.9	30	23.3	30
·	COMIN-SEC-FYA02-0-0000	NO	30	26.5	30	367	50	9.18	30
C0081253 C0081253 Rep	CGMN-SBC-FTAU2-0-0000"	ND	30	28.7	30	389	50	9.40	30
C0061284	COMN-SEC-FYAD2-0-0050	NIB	30	8.11	30	46.4	30	2.00	30
C9061254 Rep	CGMH-38C-FTA02-0-0050*	ND	36	0.52	30	51.0	30	2.16	36
C0061255	COMM-SEC-FTAG2-DE-0100	NO	30	6.61	30	11.4	30	1.91	30
C0081255 Rep		ND	30	5.72	30	13.1	30	2.07	30
C0081 258	CGMH-SBC-FTAIZ-0-0100	NO	30	5.31	30	12.5	30	1.84	30
C0081256 Rep	CGMN-SBC-FTA02-0-0100"	NO	30	5.43	30	13.0	36	1.63	30
C0081257	CGMH-SBC-FTAIZ-0-0150	MD	30	19.6	30	17.6	30	3.81	30
C0081257 Rep	CGMH-88C-FTM02-0-0150*	MD	30	20.0	30	18.8	30	4.07	30
C0081258	CGMN-SBC-FYA02-0-0200	HO	30	21.1	30	15.6	30 30	5.00 5.18	30 30
C0061254 Rep	COMM-SEC-FTADZ-0-0200°	ND	30	23.2	30	16.3			
C0081259	CGMN-SBC-FTA03-0-0000	24.7	30	331	30	902 824	40 40	440 365	30 30
C0081259 Rep	CGMN-SBC-FTM03-3-0000*	19.3	36	278	30		30	58.4	30
C0081280	CGMH-SBC-FTANS-0-0100	7,01	30 30	11.1 10.1	30 30	12.6 11.9	30	56.2	30
C0081280 Rep	CGMN-SBC-FTA03-0-0100*	1.11		2.03	30	1.51	<b>3</b> 5	15.0	36
C0081282	COMN-SBC-FTA03-0-0100 COMN-SBC-FTA03-0-0100*	NQ NQ	30 30	1.89	30	1.58	30	15.2	30
C0001282 Rep	••	AED	36	0.698	30	1.24	30	4.61	36
C0081263 Rep	CGMN-SBC-FTA03-0-0150 CGMN-SBC-FTA03-0-0150*	ND ND	30	0.806	30	1.40	30	5.62	30
	COMIN-EBC-FTA03-0-0200	0.994	30	7.42	36	1.50	30	142	34
C0081284 C0081264 Res	CGMN-SBC-FTAC3-0-0200*	0.959	30	7.00	30	1.84	30	154	30
C0081289	COMM-SEC-FTAN-0-0000	0.56	30	345	50	MR	NR	197	40
C0081289 Rep	COMMISSIC-FTACI-0-0000"	10.4	20	376	50	MP	NR	224	40
C0081270	COMM-SEC-FTAM-D-0050	2.06	30	99.1	48	75.6	30	45.2	3Ĝ 30
C0061270 Rep	CGMN-SBC-FTA01-8-0050*	2.12	. 30	88.3	40	75.8	30	45.4	-
C0061271	COMIN-SEC-FTAS1-0-0100	2.00	30	33.7	30	21.3	30	16.7 17.2	30 30
C8081271 Rep	COMM-SEC-FTACT-0-0100"	2.10	30	33.4	36	22.1	30		
C00812/2	CGMN-SBC-FTA01-0-0150	1.43	30	50.8 57.9	50 50	23.2 26.5	30 30	34.5 38.4	30 30
C0081272 Flap	CGMN-88C-FTA01-8-0150	1.52	30			•	50	NIK	SUR.
C0061273	COMN-88C-FTA01-0-0200	1.60	30 30	196	30 30	52.8 81.6	50 50	MR	HR
C0081273 Rep	COMM-SBC-FTA01-0-0200	1.70		NG:	30	120	40	32.5	40
C0081329	CGMH-SBC-WPA01-0-0000 CGMN-SBC-WPA01-0-0000	NO NO	30 30	NG NG	30	133	40	31.6	40
C0081329 Rep	<del></del>	NO	30	NO	35	40.5	50	18.6	36
C0081330	COMN-SBC-WPA01-0-0069 COMN-SBC-WPA01-0-0050	NED NED	30	NQ.	30	44.6	50	19.8	30
C0081330 Rep		ND	36	NG.	30	66.3	50	22.6	30
C0081331 Rep	CGMN-SBC-WPA01-0-0100 CGMN-SBC-WPA01-0-0100	NO	30	NQ.	30	49.7	50	20.0	30
COURT 33 7 F489		-							

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NO = Not detected at or above 0.2 ng/g (net weight)

<sup>10 =</sup> Not quantifiable - Measured concentration between 6.2 raping (not weight) and the Limit of Quantifiable (LOQ) writing to 0.4 raping (not weight)

NR - Not reported due to quality control mous failures.

Exygen Study No.: P0001400

Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Table L Continued

			ens PFRS	CS Sulfor	ata PFI4E	Cit Sulfor	ein PPDS	CR ALL	FFOA.
		Aretyle		4		Amalyin		Analyte	
		Found	Amend	Found	Account	Femd	Accessed	Found	Assessed
Exygen ID	Client Sample ID	Dry WŁ	Acouracy	Dry Wi.	Accessory	Dry set,	Accuminy	Dry W.	Atturney
		PPA APPE	(M.I-W	Day value	1-21-21	(sph, ngh)	1481-81	inets repro-	44-144
C0081332	CGMN-SBC-WPA01-DB-0100	NEO	30	NC:	30	50.7			
	CGNN-SBC-WPA01-DB-0100	NO	34	NO	30	81.4	30 36	14.8	30
•							30	17.6	30
C0081333 C0081333 Res	CGMN-SBC-WPA01-0-0150	1.82	30	7.21	30	408	46	27.8	30
		1.86	30	5.65	30	804	40	27.5	30
C0081334	CGMN-SBC-WPA01-0-0200	6,18	30	NR	MR	NR	- NR	NR	MR
C0081534 Rep	CGMN-88C-WPA01-0-0200*	5.74	30	NR	NR	NR	NR	NR	NR
C0081335	CGMN-SBC-BKQ01-0-0000	ND	60	ND	30	0.607	30	0.521	30
C0061535 Rap	CGMN-88C-8KQ61-0-0000*	ND	00	ND	30	0.016	34	0.560	30
C0081336	CGMN-SBC-MCC01-0-0060	MD	48	ND	30	NO			
C0081536 Reg		ND	40	ND	30	NQ:	30 30	0.765	30
C0081338	CGNN-SBC-BKQ01-0-0100	AND.		-		-	_	0.687	30
C0081536 Reg	CGMN-S8C-8K301-0-0100*	ND ND	30	ND	30	ND	30	0.529	30
			30	ND	30	ND	30	0.500	30
C0061339	CGMN-89C-8KG01-98-0100	NO	30	ND	30	ND	36	0.678	30
C0061339 Rep	CGMN-85C-BKG01-D6-0160*	ND	30	ND	30	ND	30	8.730	30
C0061340	CGMN-88C-8K601-0-0150	NO	36	ND	30	ND	30	NQ	30
C0061340 Rep	CGMN-SBC-BKG01-0-0150*	ND	30	ND	30	ND	36	NO	30
C0061341	CGMN-35C-8(G01-0-0200	ND	50	ND	30				
C0081341 Rep	CGMN-SBC-BKQ01-0-0200*	NEO .	30 30	NO NO	30 30	NO	30	0.913	30
•						0.486	30	1.04	30
C0081347 C0081347 Rep	CGMN-SBC-5KG02-0-0000	ND	30	ND	30	2.01	30	NQ	30
	CCYN 88C-8KG05-0-0000.	NO	30	ND	30	1.87	30	NQ	30
C0081348	CGMN-SBC-BKQ02-0-0050	NO	30	ND	30	NO	30	NQ	30
C0681348 Rep	CGMN-88C-BK@02-0-0050*	NO	30	ND	30	ND	30	NC	30
C0081349	CGMN-88C-8KG02-0B-0100	ND	30	ND	30	NO	30	NO	30
C0061349 Rep	CGMH-SBC-BKG02-DB-0190*	ND	30	ND	30	ND	50	NO	36
C0081350	CGMN-SBC-BKG02-0-0100	NiD	30	ND	30	ND	30	NO.	36
C0081350 Rep	CGMM-SBC-BKG02-0-0100*	ND	30	NO	30	NO	30 30	NO.	30 30
C0081351	CGMN-98C-8KG02-0-0150	NE	30	ND					•
C0081351 Rap	CGMH-SBC-BKG02-0-0150*	ND	30 30	ND .	30 30	ND ND	30	0.613	30
							36	60B.D	30
C0061352 C0061352 Rep	CGMN-SBC-BKG02-0-0200	ND	40	NO	30	ND	30	0.941	30
	CGMN-SBC-BKG02-0-0200°	ND	40	ND	30	ND	30	0.975	30
C0081553	CGAN-SS-8KG01-0-0000	ND	30	ND	30	15.6	30	3.32	30
20081958 Rep	CGMN-SS-BIGG01-0-0000*	ND	30	NO	30	15.1	30	3.32	30
C0081364	CGAIN-5B-BKG01-6-0005	ND	30	ND	30	4.08	30	3.38	30
20081354 Rep	CGMN-SS-8KG01-0-0006*	ND	30	ND	30	8.15	30	3.43	30
C0081388	CQ1/81-85-De01-0-0000	NO	30	0.956	30	53.2	40	400	
20061355 Rap	CGMN-8S-D801-G-0000*	NO		0.861	30	49.5	40	18.2 15.9	40 40
C0061356	CGMN-33-0601-0-0006								
20081356 Res	CGM+SS-D801-0-0008*	ND ND	30	NO	30	39.9	30	25.9	40
			30	NQ	30	41.7	30	28.4	40
C0081357	CGMH-SS-D601-O8-0005	ND	30	NQ	30	41.0	40	30.2	30
20061367 Rep	CGMN-SS-D601-DB-0005*	NO	30	NG	30	40.8	48	31.8	36
C0001305	CGMRV-SS-8 10201-0-0000	ND	30	0.400	30	29.8	40	1.00	30
20061365 Rap	CGAMI-SS-810201-0-0000*	ND	30	NQ	30	25.4	40	1.86	30
C0081366	CGMN-95-B10201-8-0005	ND	30	ND	30	77.4	40	1.35	30
0001306 Rep	CGMH-68-810201-0-0008"	ND	30	NQ.	30	74.6	40		30 30
C0001387	CGMN-88-82201-0-0000	NO	30	MO					
0081367 Res	CGNN-88-82201-0-0000"	NC:	30	CIN CIN	50 30	243			30
SASSAGE LAND			لاد		••	1.85		0. <b>97</b> 0	30
C0081368 -	CGMH-\$\$-82201-0-0008 CGMN-\$8-82201-0-0005*	ND ND	30 30		30 30	18.0	30	1.85	30

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ND = Not detected at or above 0.2 ng/g (wet weight).
NO = Not quantifietife = Meneured concentration betw NR = Not reported due to quality control neath failures.

Exygen Study No.: P0001400

Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Table I. Continued

		Amelyte		Analyte		Analyse		Analyte	
		Founded		Proceeding		Found		Found	Accessed
		Dry ML	Accumen	Dry WL	Acouncy	Dry Mt.	Acousin	Dry Mc	Attuney
Exygen ID	Client Sample ID	toph, ne/et	[-16.7.44]	(pris, ng/g)	(+K/-1G)	ippis, ng/gi	(+K(-K)	(pph, og/gr	(4K1-K)
			1 32 39	CP	X	7,			(10. 10
C0081359	CGMN-SS-B2201-DB-0005	ND	30	ND	320	17.2	30	1.98	30
C0061369 Rep	CGMN-68-82201-DB-0005*	ND	340	NO	30	17.9	30	2.10	30
C0081370	CGMN-SS-82501-0-0000	0.910	30	1.80	30	512	30	54.0	30
C0081370 Rep	CGMN-35-82501-0-0000°	0.856	30	1.44	30	488	30	61.4	30
C0081371	CGMN-88-12501-0-0005	ND	30	2.53	30	97.9	30	30.8	30
C0081371 Rep	CGMN-SS-B2501-0-0005*	ND	30	2.17	30	104	30	37.7	30
C0081372	CGMRI-SS-B2601-0-0000	1.10	30	1.18	36	71.5	30	10.0	30
C0061372 Rep	CGMN-SS-B2601-0-0000*	1.38	30	1.22	30	82.3	30	15.7	30
C0081373	CGMN-85-B2601-9-0005	NQ	30	2,59	30	463	30	18.5	30
C0081373 Rep	CGMN-SS-82801-0-0005*	NO	30	2.08	30	372	30	16.7	30
C0081375	CGMN-8S-81602-0-0000	2.73	38	181	30	185	30	5.00	30
C0081375 Rep	CGMN-85-81602-0-0000*	2.58	30	1.61	30	149	30	5.10	30
C00#1376	CGMN-SS-B1602-0-0005	0.753	30	6.02	30	282	30	78.1	30
C006 1376 Res	CGMN-85-81802-0-0005*	0.753	30	5.51	30	284	30	73.6	30
C0081377	CGMN-93-811201-0-0000	NO	30	1.02	30	83.0	40	7.74	30
C0061377 Rep	CGMN-55-811201-0-0000*	NG	30	0.994	30	62.6	40	7.51	30
C0081378	CGMN-SS-#11201-0-0006	ND	30	NO	30	14.4	30	3.10	30
C0081378 Red	CGMM-SS-E11201-0-0000"	ND	30 30	NG	30	12.3	30	3,10 3.21	30
•		KD.	30	5.27	20		40	4.33	30
C0081379 C0081379 Red	CGMN-58-F7A01-0-0000 CGMN-SS-F7A01-0-0000°	ND CK	30	5.27 5.28	30 30	42.4 42.8	40	4.44	30
	*								
C0081380 C0081380 Reg	CGMN-SS-FTA01-0-0005 CGMN-SS-FTA01-0-0005*	ND DN	40 40	1.55 1.51	30 30	35.0 46.3	30 30	2.46 2.00	30 30
C0081381 C0061381 Rep	CGMN-SS-FTA01-D8-0006*	ND ND	40 40	1.75 1.90	30 30	34.0 35.0	30 30	2.58 2.86	30 30
C0061382 C0061382 Res	CGMN-83-FTA02-0-0000 CGMN-89-FTA82-0-0000*	4.76 4.81	30 30	295 286	40 40	1920 1720	40 40	92.4 85.7	30 30
C0041383	CGMN-SS-FTA02-0-0005 CGMN-SS-FTA02-0-0005*	1.76 1.43	30 30	49.8 38.6	30 30	449 461	40 40	24.4 18.0	30 30
C0081385 Rep	••		•						
C0081585	CGMM-SS-86801-0-0000	5.48	30	15.7	30	952	30	179	30
C0061385 Rep	CGMN-58-86601-0-0000*	4.52	30	11.6	30	713	30	122	30
Q0061385	CGMN-55-56801-05-0000 CGMN-58-56601-05-0000*	4.78 4.98	30 30	13.8 18.0	30 80	860 962	30 30	144 183	30 30
C0081387	CG18N-SS-88801-D-0005	1.88	36	5.00	30	560 534	30	326 329	30
C0081367 Rep	CGNIN-55-86601-0-0006*	2.52	30	8.54	36		30		30
C0061392	CGMN-SS-81601-0-0000	3.82	80	ND	30	2.61	30	1.68	30
C0081392 Rep	CGMN-65-81801-0-0000°	4.08	80	ND	30	2.78	30	1.75	30
C0081393	CGMN-SS-B1801-0-0005	10.7	30	9.726	30	195	30	11.6	30
C0081393 Rep	CGMN-95-81801-6-0006"	12.8	300	0.7 <b>68</b>	30	178	30	13.4	30
C0081395	CGMN-88-IC04-0-0000	ND	30	NO	30	8.20	30	1.27	30
C0081395 Rep	CGMN-SS-IC04-0-0000°	ND	30	ND	30	5.81	30	1.18	30
C0081398	CGMN-85-1C04-0-0006	ND	30	ND	30	21.0	30	2.22	30
C0081396 Rep	CGMH-SS-IC04-0-0005*	ND	30	NO	30	18.4	30	2.19	30
C0081397	CGMN-55-IC03-0-0000	ND	30	ND	30	1.31	30	1.65	30
20081397 Rep	CGMN-88-IC03-0-0000*	ND	30	NO	30	1.07	30	1.17	30
C0081398	CGMN-88-IC08-0-0006	NO	30	NO.	30	1.53	30	5.1B	30
****	CGMN-SS-IC03-0-0005*	ND	30	NO	30	1.40	30	5.64	50
20061396 Rep									
C0081399	CGMN-85-IC01-0-0000	ND	30	1.06	36	31.4	30	1,28	30

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<sup>&</sup>quot;Laboratory Duplicate

ND = Not detected to or above 0.2 ng/g (set weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (vet weight) and the Limit of Quantifiable (LOC) which is 0.4 ng/g (set weight).

NR = Not reported the to quality control result britans.

Exygen Study No.: P0001400

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Continued

		C4 Sulfon	oto PFBR	C# Suffer	ate PFHB	CB Bulfor	ete PFOS	CI Acid	PFOA
		Analysis		Analyte		Analyte		Analyte	
		Found	Assessed	Found	Appropried	Found	Assessed	Found	/0000000
		Dry WL	Accuracy	Day Wt.	Accuracy	Dry Wt.	Accuracy	Dry Wit	Accuracy
Exygen ID	Clieni Sempio (D	(ppb, ng/g)	(+%/-%)	(ppb, eg/g)	(+%/-%)	(Dyle, ne/s)	(+% 1-10)	(mpth, mg/pt)	(+%1·%)
C0081400	CGMN-SS-IC01-0-0005	ND	30	1.57	30	51.3	40	2.10	30
C0061400 Rep	CGMN-SS-IC01-G-0005*	ND	30	1.23	30	39.0	40	1.80	30
C0081401	CGMN-SS-IC02-0-0000	ND	30	ND	30	9.41	30	1.94	30
C0081401 Rep	CGMN-SS-IC02-0-0000*	ND	30	NQ	30	9.56	30	2.02	30
C0061402	CGMN-85-IC02-0-0006	ND	30	ND	30	8.52	30	0.875	30
C0081402 Rep	CGMN-SS-IC02-0-0005°	ND	30	ND	30	8.11	30	0.873	30
C0081403	CGMN-SS-D503-6-0000	ND	30	1.20	30	49.3	30	10.8	30
C0081403 Rep	CGMN-SS-D503-C-0000*	ND	30	1.08	30	48.4	30	11.5	30
C0081404	CGMN-SS-D503-9-0000	ND	30	NQ	30	18.Đ	30	2.00	30
C0081404 Rep	CGMN-88-D603-0-0006*	ND	30	NQ	30	22.5	30	3.02	30
C0081405	CGMN-S8-E501-0-0000	NO	30	1.30	30	136	40	10.8	30
C0061405 Rep	CGMN-SS-D501-0-0000°	NC	30	2.04	30	157	40	11.8	30
C0081406	CGMN-SS-D501-0-0006	0.737	30	1.32	30	82.8	30	7.05	30
C0081406 Rep	CGMN-SS-D501-0-0005*	0.510	30	1.35	30	86.7	30	6.42	30
C0061407	CGMN-6S-6801-0-0000	NO	30	0.924	30	541	30	8.29	30
C0081407 Rep	CGMN-6S-8801-0-0000*	NO	30	0.851	30	509	30	7.31	30
C0081406	CGMN-SS-5801-0-0005	ND	30	1.28	30	1670	60	42.7	50
C0081498 Rep	CGMN-SS-8801-C-0005*	ND	30	1.25	30	096	50	34,0	50
C0081499	CGMN-SS-D502-0-0000	ND	30	0.717	30	72.7	30	4.60	30
C0081409 Rep	CGMN-SS-0502-0-0000*	סא	30	0.886	30	103	30	4.25	30
C0051410	CGMN-S8-D502-0-0005	ND	30	7.52	30	444	30	13.8	30
C0061410 Rep	CGMN-SS-D502-0-D005"	NQ	30	8.72	30	383	30	12.6	30

ND = Not detacted at or above 0.2 ng/g (wet weight).
NO = Not quantifiable = Measured concentration betw.
NR = Not reported due to qualify control result billures.

Exygen Study No.: P0001400

Table II. Summary of PFBS, PFHS, PFOS and PFOA in Ground Water Samples

		C4 bullone	e PFES	Ci dultoni	PF16	ÇS Sufficien	17O\$	CR Addit	PPQA
		T	Appeared		Assessed		Assessed		Assessed
		Acuthor Found	Accuracy	Analyse Found					Accumicy
Exygen ID	Citent Sample ID	IAN HOLL	(+%/-10	(PSL 19/L)	[+% 1-%]	test negth	(49.1-9)	(pet, eqt.)	(491.) - 94
C0061224	COMM-GW-FA7-0-060518	NO.	30	ЖD	30	ND	30	332	30
C0061224 Rep	CGMN-GW-PWT-0-080516"	NO	30	NO	96	NED	30	277	30
C0081225	COMPONENT-DP-050616	NO	30	ND	30	ND	30	341	30
C0061228	COLON CAN MANS D 850516	80.2	30	186	30	393	30	959	30
C0081228 Rec	COMMICHANIS GOODS TO	53.2	30	157	30	454	30	766	30
C0081229	CGMN-GW-MWS-DP-050516	NC	30	171	30	689	30	605	30
C0081232	C23AR1-GW-MW18-0-068617	NR	HFR	NR	NR	69.7	50	NR	NR
C0051232 Fee	COMPN-GW-MW 19-3-050517"	MR	NR	NR	MR	NQ.	<b>80</b>	NR	HR
(20061235	CGMN+GW-MW10-DIP-030517	MR	NP	MIR	HR	NC	<b>80</b>	NR	HR
00051265	CGMN-GW-DECON-0-060524	ND	30	NED	30	NED)	30	ND	30
CODE1265 Rep	COMM-GW-DECCN-0-080824*	ND	30	NE	30	NED	30	ND	30
(20051266	COMM-GW-DECON-DP-650524	ND	30	NID	30	NO	30	ND	30
CD087411	WENN-GW-R1-G-060812	1890	30	2073	40	58.9	30	209D	40
C0081411 Rep	WBINI-QW-R1-0-050512"	1980	30	2610	40	53.5	30	2375	40
C0081412	WBMH-GW-R1-DP-050812	1860	30	2340	40	58.3	30	2310	40
C0051415	MBMN-GM-R3-0-060613	ND	30	ND	30	NO	30	ND	30
C0081416 Rep	WBMN-GW-R2-0-050812*	ND	30	ЖĐ	30	NO	30	ND	30
C0081417	WISHIN-GW-PQ-DP-080512	ND	30	HD	30	, MD	30	NO	30
CD053423	W9MN-GW-R3-0-060612	366	30	1040	30	91.4	30	150	30
C0081420 Rep	WBMN-GW-R3-0-060812*	325	30	1010	30	<b>87.0</b>	30	151	30
C00B1421	WBLIN-CW-R3-DF-050512	331	30	1040	30	106	30	166	30
GD081424	WENT-CHY-RH-0-000012	5410	36	22100	36	1880	30	2580	30
C0081424 Rep	WBMRI-GW-R4-0-000612"	6510	30	22500	30	1780	30 30	2980 2830	30 30
CD081425	MRMH-GM-SH-DP-050513	5230	30	26190	30	2960	30	2000	30
C0081428	WELLIN-CHI-CHINI-S-060512	3540	50	16260	30	957	30	1940	30
C0081245 Rep	WBMN-GNY-CWM-0-050512"	3450	30	9930	30	770	30 30	1890 2140	30 30
C0081429	WELFLOW-CWILL DP-000512	3690	30	10900	30	1020	30	214U	30
C006145R	WBMN-GW-CW001-0-080812	3380	30	7420	40	1220	80	5080	40
C0081432 Rep	WBMN-GW-CWD01-0-000012"	3560	30	7290	<b>40</b>	1120	50 50	2970 3648	40 40
C0881433	WBMH-GW-CW001-DP-000012	3400	30	8670	40	1790	en.	3040	70
CD081498	WENN GW TRIP 0-050511	ND	30	NES-	30	NO	30	ND	30

<sup>&</sup>quot;Luboratory Duplicate
NO = Not riotested at or obsess 28 A

MR = Not reported also to quality control result 1984/46

NO = Not countilable = Measured concentration believes 25 rgs, and the Linit of Quantilation (LOQ) which is 20 rgs.

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Table III. Summary of PFBS, PFHS, PFOS and PFOA in Rinse Blank Samples

Exygen ID	Client Sample ID	C4 Suffortate PFBS	Analyte Four C# Sulforeste PFH3	nd (ppt, ng/L) CB Sulfoness PFOS	CE AGIO PFOA
C0081204	CGMN-SBC-D104-RB-0400	ND	ND	ND	NID
C0081218	CGMN-SBC-0103-RB-0250	ND	NID	NO	ND
C0061297	CGMN-SBC-D103-RB-0500	NO	NID	ND	ND
C0061337	CGMN-SBC-DBKG01-RB-0200	MO	ND	ND	ND
C0061364	CGMN-SS-D101-RB-0005	NC	ND	NO	ND
C0081384	COMN-SS-FTAM-RB-0005	ND	ND	ND	NO
C0061394	CGMIN-SS-B6801-RB-0000	ND	ND	ND	ND
C0061261	CGMA-SBC-FTA03-RB-0100	ND	ND	ND	ND
C0081276	CGMN-SBC-D101-RB-01500	NO	ND	ND	NO

ND = Not detected at or above 25 ng/L.
NQ = Not quantifiable = Measured concentration bets

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples

1			C4	Sulforate PFB	<b>s</b>			Sulfonate PFH	i <b>s</b>
	Sample Description	Amount Spiked (no/g)	Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/p)	Amt Found in Sample (ng/p)	Amount Recovered (ng/g)	Recovery (%)
	OLIN CO DIA 0 0000								
-	GMN-SS-D101-0-0000 ISM Spik C, 40 mg/L Lab Spike)	40	ND	35.8	90	40	ND	37.7	94
•	CMN-SS-D101-0-0005								
_	366 Bjd. D. 496 ng/L Lab Spille)	400	NEO	334	84	459	ND	354	89
EG	MN-SS-0101-DB-0005								
C0081	1388 Bph E, 49 mpt. Lab Spilm)	44	NID	35.8	92	44	ND	35.2	96
CQ	MN-35-0101-08-0005	1							
(COSES	390 Sak F. 480 ngA. Lats Saline)	400	NO	346	87	400	ND	354	89
C	GMN-SS-D201-0-000G							07.4	
(C0001	300 Spir G. 40 mg/L Lats Spilling	44	ND	29.9	75	- 44	1.15	37.4	94
	3MH-85-D201-0-0000	1						343	86
{C0001	ten Spic H, 400 right Lab Spino)	400	NO	281	70	480	1.18	343	86
	GMN-85-D201-0-0005			A4 <b>T</b>	87	44	1.02	35.8	90
C0001	1381 Bpitt, 44 mg/L Lait Bpite)	44	NO	34.7	•′	-	1 304	30.0	~
	SMN-55-0201-0-0005	488	ND	317	79	484	1.02	334	84
(CDBE)	101 Spk J, 490 ng/L Lab Syllo)	1		211		-			
CC	GMN-88-D202-0-0000				1	1			
(C0001	342 Byk K, 46 mgd, Lub Spihe)	44	NO	37.5	94	40	3.67	42.8	97
C	SMIN-65-D202-0-0000					1			
Cosa	SEZ Bak L, 400 mg/L Lab Spille)	106	NQ	330	83	484	3.87	334	83
α	3MN-88-D202-0-0005								**
Cooks	368 Spk C, 49 mg/L, Lob Splint	40	NO	37.7	94	40	6.48	42.3	90
CC	SMN-SS-D202-0-0005	1				1		336	83
(C8081)	165 Spi. O, 400 ngil. Lab Spike)	400	ND	354	89	408	8.48	338	843
C	3MN-88-D101-0-0000	1 .				48	ND	35.1	48
(Coost	274 Spk E, 40 mg/L Lab Spila)	40	ND	34.2	86		AU	30.1	
	3MN-55-0101-0-0000			302	76	400	ND	307	77
{C0001	174 Spx F, 400 sqfL into Spiker	400	ND	352	70		140		•••
EG	MEN-\$5-81502-0-0000					_		AT A	01
(C0081)	HAE Spir Cl., 46 mg/L Lab Spira )	40	1.22	20.2	62	40	0.410	37.0	₩1
	MRI-\$5-81502-0-0000			250	64	400	0.410	334	84
(C04013	66 Aut H, 486 Agri. Lab Spiles)	400	1.22	231	~		5.474	•	
CG	MEN-55-61502-0-0005	1 . 1						48.4	66
COURT	1300 Sphil, 40 rig/L Lab Spfin)	40	NO	23.0	68	40	NO	35.6	80
CG	MN-33-81602-0-0006					400	ND	312	78
(CD001	100 Spit J, 409 regit, Lub Spites)	484	ND	212	53		NAL/	314	76
CG	MN-SS-81501-0-0000								aa.
(Câtel	100 Spit K, 48 ng/L Lab Spika )	40	5.97	40.0	55	40	NQ	35.3	35
CG	MIN-SS-81501-0-0000				_			204	75
(C08013	100 Spit L, 406 mg/L £aft Spite }	400	5.97	264	71	406	NQ	298	13

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<sup>&</sup>quot;Sample residue exceeds the spiking level significantly (bit spiking level): therefore, an accurate recovery visite cannot be obligated ND = hot detected at or shows 0.2 right; (vert weight), and the Limit of Quantitative = Necessing concentration between 0.2 right; (vert weight), and the Limit of Quantitative = Necessing concentration of the concentration of the result of the selected due to Quality control result features.

Note: Since this substancy table shows rounded results, recovery values may very slightly from the values in the raw data.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		C	Sulfenate PFC	13		CI	Sulfonate PFI	is.
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Arecunt Recovered (ng/s)	Recovery (%)
CGN/N-SS-B 1501-0-0005 (C8881381 Spk C, 49 mg/L Lak Spille)	40	NO	30.3	7 <b>a</b>	40	NO	33.4	85
CGMN-SS-B1501-0-0005 (C8091891 Style D, 499 rgs. Lai-Spille)	400	NC)	302	76	406	NQ.	345	86
CGMN-88C-D203-0-0000 (C000103 She E, 40 repl. Lab Spile)		0.832	38.9	96	48	28.8	59.4	π
CGMN-SEC-D209-0-0000 (C0001163 Spit F, 460 npf. Lat Spite)	400	0.832	326	62	400	28.6	351	81
CGMN-SBC-D203-0-0080 (C0081100 Spt G, 49 Agril Lab System) CGMN-SBC-D203-0-0080	**	2.66	37.5	87	40	1\$1	295	•
(CS681 184 Spk H, 408 agil. Lab Spike)	440	2.66	:538	84	400	181	564	83
CGN/N-SBC-D203-0-0100 (C1001108 Spk i, 40 rp/L Lab Splin)	40	4.94	30.9	87	40	220	234	•
CGMN-SBC-D203-G-0100 (C0001146 Spk.1, 400 ag/l. Lab Splin)	490	4.94	335	83	400	220	522	75
CGREN-SBC-D203-0-0180 (C0001100 Spk II, 40 cg/L Lab Splins)	40	9.36	45.0	89	#	698	457	•
CGMN-SBC-D263-G-0150 (C8691166 Spit L, 460 mg/L Lab Spitus	400	9.38	599	97	444	868	928	53.
CGANI-SBC-D203-0-0200 (Cooktraf Spit C, 40 ug/L Link Spitus)	**	9.38	43.3	85	48	480	517	•
CGANN-98C-0203-0-0200 (C0001167 Balk 0,400 npR. Lab Spilint)	400	9.36	330	80	***	480	848	92
CGARN-SB.C-D203-0-0250 (C0081169 Spit R, 46 right. Lab Spitin)	•	4.47	37.2	82	40 ,	47.3	79.6	61
CGMN-68C-D203-0-0250 (C0001166 Spit F, 400 ag/L Lab Spitza)	400	4,47	352	87	400	47.3	392	88
CGAM-GBC-D203-0-0300 (CBMH-GBC-D203-0-0300		8.17	42.2	••	40	56.4	87.2	77
CGN64-SBC-D203-0-0300 (C9461146 Spik H, 400 light, Lab Spillin )	400	<del>6</del> .17	340	-83	400	58.4	401	86
CGB/RI-SBC-D203-DB-0300 (C8881776 Spk I <sub>2</sub> 49 ng/L Lab Splin)	**	10.2	43.6	84	*	35.4	85.4	128
CGMP4-88/C-D203-DB-0300 (C808/1179 Bjd. J., 409 agrt. Lab Spilet)	400	10.2	386	æ	400	35.4	350	87
CGMN-SBC-D203-0-0350 (C8881171 Spit K, 49 ng/L Lab Spito )	40	1.60	34.4	82	40	73.0	106	63
CGARI-SBC-D203-0-0950 (C0091171 Spk. L, 400 rg/L Lab Spille )	400	1.60	334	.83	400	73.0	426	88
	1							

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<sup>&</sup>quot;Sample residue exceeds the spiking level algorificantly (5x apilong level); therefore, an accurate recovery value cannot be calculated ND = Not detected at or above 0.2 rigit (net weight).

Not a Not quantifiable = Measured concentration between 9.2 rigit (well weight) and the Limit of Quantifiation (LOQ) which is 0.4 rigit NR = Not reported due to quality control result failures.
Note: Since this summary table alrows resended results, recovery values may very aligntity from the values is the resendant. on 0.2 ng/g (wat weight) and the Limit of Quantitation (LDQ) which is 0.4 ng/g (wat weight).

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		Ce	Sulformie PFB	\$		Cŧ	Salforata PFH	*
Sample Description	Arequist Spiked (ng/g)	Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)		Ant Found in Sample (ng/g)	Amount Recovered (ng/s)	Recovery (%)
CGNN-SBC-D203-0-0400 (C0081172 Syst C, 46 mg/L, Leib Systes)	44	2.10	36.9	87	40	31.3	64.4	85
CGNN-SBC-D203-0-0400 (C0001172 Spit D. 401 repl. Lab Spite)	408	2.10	336	83	400	31.3	384	88
CGNIN-SBC-D203-0-0450 (CRR81978 Spb. E. 44 rept. Lab Spike)	40	4.43	35.0	76	40	24.7	53.3	72
CGMN-85C-9263-0-0450 (C668173 Spk F, 400 apt. Lab Spike)	409	4.43	337	83	400	24.7	386	90
CCNN-SBC-0202-0-0000 (C0001174 Sph G, 44 ng/L Lati Splin)	40	NO	35.4	88	44	22.3	54.8	51
CGAIN-SBC-D202-0-0000 [C0001174 Spit H, 489 mg/L Lafe Spitins]	400	NQ	300	77	400	22.3	314	73
CGNR4-SBC-D202-0-0050 (C0001175 Split 1, 40 mg/L Lutu Splits)	40	1.98	40.0	96	*	150	187	93
CGMN-SBC-D202-0-0050 (CBMN178 Byt. J. 400 og/L Lab Bylling	400	1.98	317	79	488	150	455	78
CGMM-SBC-D202-D-D100 (C0081178 Spt K, 44 mg/L Lab Spline)	•	0.521	34.2	84	40	25.0	65.7	102
CGMN-SBC-D202-0-4100 [C0001179 Spt. 1, 400 mg/L Lisb Spike)	400	0.521	343	85	400	25.0	367	83
CGMN-SBC-D202-0-0150 (CB091177 Spl. C, 40 mgf. Ladi Splim)	40	1.58	36.4	87	40	96.8	191	88
CGMN-SBC-D202-0-0150 (C0001177 Spk D, 489 ng/L Lab Spiles)	***	1.58	302	78	400	PE.0	405	77
CGNM-SBC-D202-0-0200 (C8001176 Spin K, 40 mg/L Lain Spilm)	44	1.02	38.7	94	40	39.6	79.5	99
CGMN-69C-D202-0-0200 (C6001179 Spt. F. 400 right. Liab Spilins)	404	1.02	342	85	400	39.8	347	82
CGM/N-SBC-D202-0-0250 (C0001179 Sph G, 40 mpt. Lab Solin )	40	1.00	39.8	97	40	18,4	55.4	99
CGMP4-SBC-D202-0-0250  C1061179 Spk H. 444 noft. Lish Spike	404	1.06	351	87	406	18.4	362	85
CGL(N-SBC-D202-0-0300 (C0001539 Spit I, 46 ng/L Lub Spile)	40	2.03	38.4	92	40	34.1	72.7	97
CGMN-SBC-07202-0-0900 (CB021186 Spk.J., 460 mg/L Lab Splins)	494	2.03	348	85	400	34.1	382	87
CGMN-SBC-D202-0-0350 (CBB1181 Spk K, 49 NgC, Lab Spike )	46	2.60	39.C	91		28.2	59.5	76
CGMN-SBC-D202-0-0350 (C0001191 Bjd. L, 400 ng/L Lab Spline)	404	2.80	347	86	400	28.2	374	88

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<sup>&</sup>quot;Sample maticus exceeds the episong level significantly (bx spiking level); therefore, an accurate recovery value cannot be calculated MD = Not catedred at or above 0.2 npig (wat weight).

NO = Not cannot be a Macaused concentration between 0.2 ngrg (wet weight) and the Limit of Quantization (LOQ) which is 0.4 np/g (wet weight).

NR = Not reported due to quality control result facures.

Note: Since this executory table shows rewrided results, recovery values may vary slightly from the values in the raw data.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

	C4 Selfonate PFBS					CE	Sutionate PF9				
Sample Description	Arnount Spiked (No/g)	Ami Found in Sample (naio)	Amount Recovered (ng/s)	Recevery (%)		Amt Found in Sample (ng/p)	Ansount Recovered (199/g)	Recovery (%)			
CGMN-S8C-D202-D8-6350											
(CRESTIES Bak C, 46 rg/L Lab Spike)	40	3.14	40.2	83	40	32.8	58.4	90			
CGMN-SBC-D202-D8-0350	1							•••			
(CONTINE Spk U, 400 rept. Lab Spiles)	400	3.14	349	56	494	32.8	370	84			
CGMN-SSC-D202-0-0400	1 1							*			
(C0681188 Buck E, 46 rept. Late Spilling)	40	2.62	36.7	85	48	84.6	111	86			
CGMN-SBC-D202-0-6400	1 1										
(C1041182 Spik F, 480 ng/L £ati \$200s)	400	2.62	361	90	400	64.6	429	66			
CGMN-SBC-0202-0-0450	1 1										
(C0021184 Spit G. 40 rept. Lab Spiller)	46	9.12	43,5	86		106	148	100			
CGMN-SBC-5202-0-0450				ļ							
(C00011984 Spit H, 400 mgd, 1,ph Spite)	400	9.12	367	80	400	198	452	86			
CGMN-SBC-0201-0-0000				ļ							
(CODETIAL Apic I, 40 mps, Lab Spring)	44	NØ	33.6	85	40	2.77	37.2	86			
CGMN-88C-0201-0-0000				1				**			
(C0021188 Spit J. 400 right Lab Spiles)	406	ND	329	82	400	2.77	316	79			
CGMN-SBC-0201-0-0050					- 1						
(C0001106 Spk K, 46 ogil, Late Spilet)	44	NQ	33.0	63	40	25.5	53.4	70			
CGMN-SBC-D201-0-0050	1 1			- 1	1						
(COORTSIN Spit.L., 410 right, Lab Spillin)	400	NQ	331	83	404	25.8	547	50			
CGMN-SBC-0201-0-0100					- 1						
(C808) 187 Sels C, 46 agil. Lats Spite)	40	ND	35.8	90	40	4.45	42.6	96			
CGMN-S8C-0201-0-0100											
(CD001967 Spk D, 460 ng/L Lath Spine)	404	ND	367	922	490	4.45	376	93			
CGMN-SBC-D201-DB-0100					- 1						
(C2001788 Sub E. 40 mg/L Lab Spha)	40	NO	38.4	91	40	4.82	40.2	68			
CGMN-S8C-D201-D8-0100				1							
(COORSIAN Spin F, 400 right, Lob Spins)	404	ND	386	9/2	400	4.42	355	88			
CGMN-SBC-D201-0-0150				- 1							
(CODE1149 Spit G, 46 ng/L Lab Spite)	46	2.21	34.7	<b>81</b>	40	187	207	•			
CGMN-SBC-D201-2-0150	1			ļ	- 1						
(C0001130 Spt H. 400 ngd. Lab Spiles)	404	2.21	358	80	400	187	456	67			
CGMN-SBC-0201-0-0200	1			- 1							
(CO001100 Sph I, 46 ngd, Lab Spho)	46	1.28	39.4	95	46	42.7	71.4	72			
CGMN-SBC-0201-0-0200	j										
(CSSS1166 Spx J, 466 Agrt. Lat: Spite)	408	1.28	356	<b>69</b>	406	42.7	387	96			
CGMN-SBC-D201-0-0250	i.			i							
(CODE1181 Spit IC, 48 ng/L Lub Spitin )	44	4.73	36.5	80	44	85.4	&G.&	39			
CGMN-SBC-D201-0-0256	-			ŀ	1						
(C0091191 Spit L, 400 ng/L LJA Spite )	408	4.73	324	80	404	85.4	394	82			

<sup>&</sup>quot;Sample reactive exceeds the applicing lavel signal-caselly (3x spoking for NO = Not detected at or above 0.2 ng/g (was weight).
NO = Not quantificials = Measured concentration between 0.2 ng/g (

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N/R = Not reported due to quality control result failures.

Note: Since this summary table shares rounded resu

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		C4	Sulforate PFI	15		Cal	Sulfonate PFI	15
Sangle Description	Amoust Spiked (ng/g)	Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)		Ami Found in Semple (ng/g)	Amount Recovered (ng/g)	Recevery (%)
CGMN-SBC-0201-0-0300		i						
(C0081182 Spk C, 46 ng/L Lab Splits)	40	1.83	39.4	94	44	55.4	89.6	26
CGMN-SBC-D201-0-0900	1	}						
(C0001192 Spt D. 490 4gf. Lab Spile)	400	1.53	350	87	444	55.4	411	89
CGMN-33C-0201-0-0350		i						
(C0001185 Spt E, 48 ng/L Lab Sylle)	40	0.546	3 <b>9</b> .0	96	44	34.8	71	<b>Ģ1</b>
CGAN-35C-D201-0-0350								
(C0001153 Sph F, 400 mg/L Lab Spho)	400	0.546	377	94	408	34.5	394	80
CGMN-SBC-D201-0-0400								
(C0061194 Spk G. 47 ag/L Lab Suffer)	40	0.988	37.8	92	48	36.5	74.B	95
CGMN-38C-D201-0-0400								
(COOLST& Spir II, Ald agil. Lan Spins)	400	0.968	345	86	406	38.8	390	88
CGMN-SBC-0104-0-0000								
(CROS1186 Spk I, 44 mg/L Lab Splint	40	4.80	48.0	113	44	7.24	60.7	152
CGMN-SBC-D184-0-0000								
(C0081195 Spk J. 408 agd. Lab Splint	430	4.00	329.0	81	400	7.24	399	100
CGMN-SBC-D104-0-0050					!			
(Citati 196 Spk IC, 49 ng/L Lub Bolle)	40	ND.	33.0	83	44	12.6	58.9	111
CGMN-38C-D104-0-0050	1 1			1	i			
(C0601194 Opt: L. 400 mg/L Lab Splits)	400	ND	325	81	408	12.6	327	78
CGMN-8BC-D104-DB-0050					1			
(C0901197 Spit C, 49 ng/L Lob Spite)	40	ND	35.4	<b>59</b>	**	12.4	49.6	83
CGMN-SBC-D104-DB-0050				l				
(C0061107 Spk D, 400 ng/L Lab Splin)	409	ND	338	85	490	12.4	353	85
CGMN-SBC-C104-0-0100				- 1	ļ			
(CONSTINCTION TO REAL Lab Reflet)	40	NO	35.0	90	**	21.9	62.5	101
CGMN-SBC-0194-0-0100					4			
(COGR9190 Spit F, 400 mg/L Lab Spitio)	4500	ND	354	89	400	21.9	397	94
COMN-88C-D104-0-0150				1	- 1			
(COORSIDE Spit G, 40 mg/L Lab Spite)	#0	0.471	43.5	106	**	113	170	130
CGMN-SBC-D104-0-0150				1				
(C0061100 Spk 14, 400 ngs. Lata Spitts )	4200	0.471	355	69	400	116	456	85
CGMN-SBC-D104-0-0200	1 1			1	1			
(COSS1200 Bpic I, 40 ag/L Lab Spille)	40	NQ	35.2	84	40	51.2	84.0	82
CGMN-88C-D104-0-0200	1 1						400	••
(C0001200 Spli J. 400 ng/L Lish Splind	400	NO	342	86	400	51.2	402	88
CGMN-S8C-D104-0-0250								
(CN691301 Spk K, 45 ng/L Lab Splin )	40	0.534	35.3	87	40	32.7	86.4	92
CGMN-98C-0104-0-0250	1				400	32.7	382	82 .
(C0001201 Spit L, '48 mg/L Leir Spiller)	406	0.534	334	83		32/	302	0.c )

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<sup>&</sup>quot;Sample residue exceeds the options level algorificantly (3x spring level); therefore, an accurate recovery value cannot be obtained ND = Not defined at or above 0.2 hg/g (wat veright).

NO = Not quentifields = Measured concentration between 0.2 hg/g (wat veright) and the Limit of Quantifiction (LOQ) which is 0.4 hg/g (wat veright).

NA = Not reported due to the level of concentration between 0.2 hg/g (wat veright) and the Limit of Quantifiction (LOQ) which is 0.4 hg/g (wat veright).

Nets: Since this summany suble above reunded results, recovery values may vary elightly from the values in the raw data.

Exygen Study No.: P0001400

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

	C4 Sulfonsis PFBS					C	Sulfonate PFH	
Sample Description	Amount Spiked (ne/s)	Ant Found in Sample (ng/g)	Amount Recovered (rig/g)	Recovery (%)	Amount Spiked (mg/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
COLUN COO BARA A COO	Ţ							
CGMN-SBC-D104-0-8300 (C001383 Bpt. C, 40 ng/L, Lato Sptim)	40	0,575	32.7	80	48	31.6	70.9	98
CGMN-SBC-D104-0-0300	1 "			-				
(CONS1202 Spir D, 404 ag/L Lab Spile)	444	0.575	330	82	400	31.5	403	23
CGMN-SBC-D104-0-0350 (CON1269 Set E, 49 ng/L Lab Sellin)	40	0.784	321	78	40	66,9	184	93
CGMN-SBC-D 104-0-0350 (C0001263 Spit F, 486 ngl. Lab Spille)	400	0.784	318	79	400	66.B	420	88
CGMN-SBC-D104-0-0400	4.0	NQ.	31,9	88	4	35.4	88.2	77
(COUNTY Sph C, 49 ag/L Lab Spho)	-	, AG	31.20	•0	-	33.4	00.2	**
CGMN-SBC-D104-0-0400 (C001205 Spit H; 400 ng/L Lab Spite)	400	NO	2597	74	400	35.4	370	84
CGRIN-SBC-D104-0-0450 (C001208 Spk I, 48 op/L Lab Spika)	40	ND	34.6	87	44	22.9	82.1	96
CGNRN-SBC-D104-0-0450					1			
(CR08.1502 gby 7' 408 mby frap gbypm)	400	ND	309	77	400	22.9	370	87
CQMN-SBC-D104-DB-0450 (C0081307 Spt K, 40 ng/L Lab Splins)	40	NQ	32.5	<b>8</b> 1	44	24.5	59.2	87
CGL/N-98C-D104-D8-0450 (CD081207 Spit L, 400 ng/L, Leis Spike)	400	NQ	219	80	-444	24.6	402	94
CGMN-SBC-D104-0-0500 (C0001200 Spt. C, 44 ng/L Lab Spike)	#	NQ	33.0	63	44	7.91	40.3	96
CGMN-SBC-D104-0-0500 (CHR1200 Spir D, 460 right, Link Spillin)	400	NQ	355	89	488	7.91	402	99
CGMN-38C-D104-0-0550 (C0081289 Spi. S. 49 ngd. Leb Spilin)		NQ	37.9	95	44	9.00	46.5	101
CGNN-SBC-D104-0-0550 (CRR1389 Spit F, 400 ngd, Lab Spito)	460	NQ	353	84	400	<b>5.0</b> C	422	194
CGNN-SBC-D104-Q-0800 (C8091210 800 Q, 48 mgh, Lab 8p8m-)	44	ND	33.0	63	49	5.92	48.5	101
CGMN-SBC-D104-0-0800 (00021218 8pt 14, 400 mg/L Link Spilin.)	494	NO	310	79	486	5.92	382	04
CGMN-SBC-D104-0-0650 (C6001211 Spk L, 40 rept. Lub Spitus)	40	NO	32.1	26	40	3.47	42.2	97
CGMN-SBC-D104-0-0880 (C0012211 Spit J, 400 rg/l, Lab Spita)	400	ND	3.23	81	400	3.47	372	92
CGMN-58C-D103-0-0000 (C0012Rt Spk K, 40 ng/l. Lati Spkin.)	40	NO	35.2	BS	40	ND	37.5	94
CGM/N-S8C-D103-D-0000 (C8861212 Bph L, 408 mg/L Lab Splite)	400	ND	260	88	400	ND	381	95

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<sup>&</sup>quot;Sample residue exceeds the sprking level significantly (St spiking level); therefore an accurate recovery value cannot be restoulated ND = Not detected at or above 0.2 rigig (wax weight).

NO = Not quantificials = Measured optionarization between 0.2 rigig (wax weight) and the Limit of Quantificials = Measured optionarization between 0.2 rigig (wax weight) and the Limit of Quantificials (LOQ) which is 0.4 rigig (wax weight). NR III Not reported dute to qualify control result failures.

Nete: Since this eurorizary table shows rounded results, recovery values many vary allightly those the values in the raw date.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		CA	Sufforeste PFB	\$		CE	Sulfonate PFH	8
Sample Description	Arnount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-0103-0-0050 (C001213 Spit C, 46 ng/L Lab Spilin)	4	NED	38.3	96	40	0.663	38.4	95
CGMN-SBC-0105-0-0050 (C0081212 Sph D, 400 apt. Lab Sphin)	480	ND	380	940	400	0.663	362	90
CGMN-SBC-0 103-0-0100 (C0001214 Spk E. 40 noft, Leb Solba)	40	NID	38.5	92	40	0,840	39.2	98
* CGMN-SBC-0103-0-0100 (C608214 Sph F, 466 npl. Lab Spike)	400	ND	360	88	400	0.840	380	95
CGMN-SBC-D103-0-0150 (C0081218 Spit G, 49 ogst. Lab Spito)	40	NE	32.6	82	40	2. <b>62</b>	37.8	56
CGMN-SBC-D103-0-0160 (C0001215 Spk H, 400 ng/L Lab Splin)	400	ND	343	86	400	2.62	350	89
CGMH-98C-D163-DB-6150 (C001216 Sek I, 40 npft Link SpRo)	40	NO	34.9	87	40	2.63	39.7	93
CGM94-SBC-D103-DB-0150 (C0081218 Spk J. 498 ng/L Lab Spilm)	400	NO	357	89	400	2.63	372	92
CGMN-SBC-D103-0-0200 (C0001217 Spik K, 40 og/L Laik Spike)	44	0.683	38.3	89	*	9.92	45.9	90
CGBMN-SBC-D109-0-0200 (C9081217 Sph L. 406 npfl Cab Spille)	400	Q.583	339	65	409	9.92	378	92
CGMeV-8BC-D103-0-0250 (C0081298 Stat C, 48 ng/L Lan Spling	44	1.21	38.7	59	*	19.9	49.0	95
CGMN-3.8C-D105-0-0250 (COM2218 Spk B. 400 ng/L Lab Spilia)	4200	1.21	370	92	400	10.9	397	<b>97</b>
CGRAN - 8BC-D103-0-0300 (C088) 229 Spit E, 49 Ng/L Lab Spite)	44	NQ.	37.0	93	4	5.63	48.3	101
CGMN-58C-D103-0-0300 (C0001330 Spit F, 400 Agil Liab Spito)	400	NQ	529	82	400	5.83	347	85
CGMM-SBC-D103-0-0350 (Casastast Bak 6, 46 mpl. Lab Splin )	44	0.548	34.3	84	44	13,4	52.7	ga
CGMN-SBC-D103-0-0350 (C0001221 Back H, 465 mg/L Linto Stythus )	100	0.848	906	78	400	13.4	992	<b>ac</b> )
CGREN-SBC-D103-0-0400 (C0001222 Spk I, 49 mg/L Ltd Schm)	44	9.748	33.5	83	**	34.6	71.6	93
CGMN-88C-0103-0-0400 (C0001222 Spix J, 460 mg/L Lub Sofim)	100	0.748	326	80	400	34.6	360	51
CGMP(-SSIC-D103-0-0450 (C0001238 Bylk K, 48 ng/L Lath Bolto )	44	NR	NR	NER.	40	8.48	44,4	90
CGMN-SBC-D103-0-0450 (Ceoption Spirit, 400 right Linb Seller)	100	NR	NIR	MR.	400	8.48	375	92

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<sup>&</sup>quot;Sample residue exceeds the aptiong level significantly (2x spiking level): therefore, an accurate recovery value cannot be calculated ND = Not desceed at or above 1.2 right (well weight).

NO = Not reported at or above 1.2 right (well weight).

NO = Not reported due to qualify control result failures.

Note: Since this numbersy table shows neuraled results, recovery values may vary alignity from the values in the new dista.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

			Suifores PFE	137		C# Sulfonata FFHS			
Sample Description	Amount Spiked (ng/s)	Amt Found in Sample (ng/g)	Amount Recovered (1:g/g)	Recovery (%)		Amt Found in Sample (eg/g)	Amount Recovered (ng/g)	Recevery (%)	
CGMN-5BC-D103-0-0500		1							
(CSRELENE SPEC), 49 HAVE FOR SPECIA	40	VID	\$9.1	98	49	3.98	43.4	96	
CGMN-\$BC-D103-0-0500									
(CDSS1230 Spix D, 460 ng/L Lab Selba)	400	NO	322	<b>&amp;</b> 1	400	3.98	344	85	
CGMH-8#C-D105-0-0650			***			250	20.0	90	
(CRORI ZIN Sylv. S. 40 mg/L. Lab Spfins)	40	NQ	35.8	90	40	3.58	39.6	<b>W</b>	
CGAIN-SBC-D103-0-0650 (C6081239 Spx F, 446 ng/L Lab Spillu)	400	NQ	541	85	404	3.58	380	89	
CGMN-8BC-D105-0-0600									
(C0081240 Spix G, 40 np/L Lais Spille)	40	D	33.9	85	40	4.38	41.8	62	
CGMN-SBC-D103-0-0600	400	ND	315	79	400	4.38	338	83	
(CBEST204) Sipic H, 460 ng/C. Late Spillor)	***	NU	313			4.50	•••		
CGMN-SBC-D103-0-0650			at 4	88	40	7.33	46.3	97	
(Catalizati Spix I, 44 mpl. Lab Spite)	44	NO	35.1	••	~~	7.30	70.3	•.	
CGMN-3BC-D103-0-0650 (C0001341 Rpk J, 400 rspf. Lish Spffin)	400	NQ	934	84	409	7.33	360	88	
CGMN-SBC-D801-0-0000	1				·	:			
(COMESAS Spit K, 48 mg/L Lab Spiths)	44	0.491	31.2	84	40	2.41	38.6	90	
CGMN-589C-D801-0-0000									
(COMMIZ-40 Syst. L., 100 rept. Lab System)	400	0.491	347	87	406	2.41	338	84	
CGMN-SBC-D801-0-0050					44	4.03	***	88	
(Coto1248 Spt. C, 40 npt. Lab Spille)	40	1.16	37.2	90	44	4.03	39.4	-00	
CGN/N-SBC-D801-0-0050 (C0001249 Spt ID, 400 ng/L Lab Spille)	460	1.18	347	86	408	4.03	346	88	
(Camaly and the first can alone)		1.10	•,,	-		****			
CGMN-SBC-D801-0-0100	40	1.30	30.1	87		4.30	41.1	82	
[CRAS1200 Bpic II, 40 ng/L Left Spille) CGAIN-SBC-DB01-0-0100	-	1.35	<b>G</b> . (	-					
(COST250 Spx F, 400 mg/L Lab Spike)	400	1.30	315	78	400	4.30	349	86	
CGMN-SBC-D801-0-0150				1					
(CONTROL Spin G, 49 regit Lan Spins)	40	0.538	256.6	-	•	2.18	36.1	80	
CGMN-SBC-D801-0-0150									
(CountYIN Spir H, 400 mg/L Lab Spills )	400	0.536	3(%)	87	480	2.13	356	26	
CGMN-SBC-D801-0-0200							44.5		
(C0461252 Sph. I, 49 ng/L Lab Spille)	40	0.920	37'.1	96	40	3.66	40.7	93	
CGNN-SBC-D801-0-0200 (CR01282 \$pit 1,400 hg/L Lab Spito)	480	0.920	398	84	400	3.60	354	88	
CGMN-SBC-D101-0-0000					_			**	
(Court274 Spir K, 40 ng/L Lab Spiles)	**	NQ	29.5	75	40	1.22	35.7	86	
CGNN-SBC-D101-0-0000 (C664274 Sek L 400 reft, Late Spine)	480	NO	202	73	400	1.22	341	85	
from the rank where you about									

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<sup>&</sup>quot;Sample resource accounts the spiking level significantly (5x apiling level); than NO = Not detected at or above 0.2 ng/g (wet weight).
NO = Not opartifiable = Measured concentration between 0.2 ng/g (wet weight).
NO = Not operated due to qualify control result failures.
Note: Since title exercisery table shows restricted results, recovery values. n 0.2 ng/g (wat weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wat weight).

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		Ce	Sullonata PFE	\$		CE	Sulfonate PFH	13
Semple Description	Amount Spited (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)		Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Receivery (%)
CGMN-SBC-D101-0-0050 (C0081276 Spir C, 40 mg/L Laib Spillin)	40	5.36	41.5	91	44	8.45	45.1	87
CGMN-SBC-D101-0-0050 (CBBB1275 Spb D. 400 ng/L Lab Spille)	400	5.36	379	93	460	6.45	368	90
CGMN-SBC-D101-D-0100 (C0041377 Spic E, 46 ng/L Lab Spike)	44	1.95	36.6	87	44	30.2	72.2	105
CGMN-SBC-D101-0-0100 (C0081277 Spk F, 466 ng/L Lab Syllin)	480	1.95	388	92	400	30.2	378	87
CGMN-SBC-D101-D8-0100 (C0081278 8pt G, 49 mp/L Leb Spiller)	44	2.03	35.0	82	44	29.1	83.6	86
CGNN-SBC-D101-DB-0100 (CBR1278 Bpk H, 498 npf. Lato Spile)	400	2.03	360	89	400	29.1	375	86
CGNN-SBC-D101-0-0150 (C0081278 Spir.); 46 og/L Linb Spirin)	40	1.14	33.2	80	44	6.56	40.6	85
CGMN-SBC-D101-0-0150 (C0001279 Spit J., 400 mg/L Linb Spithin)	-100	1.14	344	86	400	6.56	363	80
CGMN-88C-D101-0-0200 (C8091280 Spit R, 46 ng/l. Late Spito)	40	0.790	37.4	92	40	3,61	39.2	50
CGM/N-SBC-D101-0-0200 (C0081280 Spk L, 400 ng/L Lab Splins)	4490	0.790	357	<b>59</b>	400	3.61	364	88
CGNIN-SBC-D102-0-0000 (C0001281 Sps. C, 40 ng/L Lub Spike)	40	1.59	37.0	59	•	7.25	40.6	83
CGN/N-SBC-D102-0-0000 (C0011M1 Spt. D, 409 rgst. Lab Splint)	400	1.59	346	85	400	7.25	336	<b>8</b> 2
CGMN4-8BC-D102-0-0060 (C0061802 Spk E, 40 ngl. Lab Splin)	40	2.55	40.0	94	44	31.6	65.7	85
CGNN-SSC-D102-0-0060 (C0001202 Mpit F, 400 mpit. Lait Spitos)	400	2.55	300	<b>9</b> 7	483	31.8	399	92
CGMN-SBC-D102-0-0100 (C3003285 Spd: 01, 48 mpil: Lain Strike )	40	0.502	35.6	44	4	21.2	54.5	63
CGMN-SBC-D102-0-0100 (C0001383 Spk-H, 496 mg/L Lab Spiles)	400	0.502	342	36	400	21.3	368	87
CGMN-SBC-D102-0-015D (C0081294 Spt. I, 48 ngrt. Lati Splini)	40	NO	36.3	68	40	5.07	30.9	87
CGMN-SBC-D102-0-0150 (C0001284 Spk.J, 466 ng/L Lab Spike)	486	NQ	3:7	79	400	5 07	354	87
CGABN-\$8C-D102-0-0200 (CGGB1286 Spd: K. 46 pgr. Lab Spdie )	40	Ю	32.5	84	44	6.68	42.7	90
CGWN-SBC-D102-C-0200 (C0041365 Spk L, 460 ng/L Lab Spite )	404	NQ	350	88	400	8.68	371	91

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<sup>&</sup>quot;Dempis residue excesos the spiléng level significantly (ax spilong level); therefore, an accurate recovery value cannot be calculated ND > Not detected at or above 0.2 right (was weight).
NQ = Not quantifiable > Messured concentration between 0.2 right (was weight) and the Limit of Quantifiable > Messured concentration between 0.2 right (was weight) and the Limit of Quantifiable > Not quan

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		C4	Sulforsats PFE	18		CI	Sulforate PFHS			
Sample Description	Amount Spiked (ng/p)	Amt Found in Sample (no/s)	Amount Recovered (19/6)	Recovery (%)		Ant Found in Semple (ng/g)	Amount Recovered (ng/s)	Recovery (%)		
CGMN-S5C-B1501-0-0000										
(CROSTAGE Spir C. 40 mg/L Late Spiring	*	1.80	34.7	93	40	2.58	39.7	93		
CGMN-SBC-B1801-0-0000					l					
(C0091342 Spir. D. 400 ng/L. Lab Spile)	400	1.60	359	80	400	2.58	336	54		
CGMN-SBC-81501-0-0050	1									
(CIOPISES Spt. E., 46 ngs. Leit Spile)	46	1.53	37.5	89	40	2.71	38.5	80		
CGMN-SBC-81501-0-0050			205		400	2.71	331			
(C0001343 Spit P, 440 mgA. Lab Spitte)	405	1.53	335	83	400	2/1	331	82		
CGMN-35C-51501-0-0100						!				
(C0001344 Sat G, 40 no.i. Lab Ballin)	40	0.692	34.6	85	40	1.99	36.4	88		
CGMN-SBC-B1501-0-0100	1									
(C0001344 Spir 14,490 repl. Lab Spille)	400	0.692	356	89	400	1.90	341	85		
CGMN-58C-51501-6-0150	1									
(C0001345 Spir II, 46 mg/L Lats Spillus)	46	0.456	211.8	78	# ;	0.784	34.3	84		
CGMN-SBC-B1801-0-0150				ļ						
(C0081346 Spb J., 460 nm/L Lab Spille)	400	0.456	3 <b>41</b>	85	400	0.754	334	83		
CGMN-88C-81501-0-0200	1 1									
(COMM 340 Spin IX, 40 mp.l., Lab Spilm)	44	0.677	33.4	82	40	NQ:	35.2	68		
CGMN-SEC-81501-0-0200	1 1			1						
(C00013-45 Byt. L. 486 ag/L Lab Splint)	400	0.877	319	80	400	NQ	337	84		
CGMN-SBC-D501-0-0000										
(COUNTRIES BOA C. 44 mg/L Lab System)	44	1.31	40.9	96	40	16.2	55.1	97		
CGMN-SBC-D601-0-0000	1 1									
(C0001242 Spk D, 490 mg/L Lab Splits)	400	1.31	388	92	400	18.2	370	58		
CGMN-SBC-D501-0-0050				- 1	- 1					
(CORRESS But E, 40 rod, Lab Softer)	4	1.39	39.0	94	-40 j	52.1	92.8	102		
CGMN-S8C-0801-0-0050				1						
(C0011242 Spt F, 400 mg/L Lab Hplint)	400	1.39	375	93	400	52.1	494	54		
CGMN-SBC-0501-08-0050					- [					
(C0001244 Spt G, 45 agt. Lab Spile )	40	1.43	34.9	<b>84</b>	**	57.B	79.4	54		
CGMN-5BC-0501-08-0050				1						
(C0051566 Byd: 14, 480 mg/L Lab Epika )	406	1.43	359	84	484	57.8	373	79		
CGMN-SBC-D501-0-0100	1				1					
(COORTS IS Spir I, 40 ng/L Lab Spile)	40	1.43	30.0	94	48	24.1	81.9	95		
CGMN-SBC-D501-0-0100										
(C0011245 Sak J. 480 ng/L Lab Spike)	406	1.43	312	90	494	24.1	384	3.5		
CGMN-SBC-D501-0-0150										
(CSSP1248 Spk K, 49 mpf, Leb Splin)	48	ND	34.6	86	48	0.432	36.0	86		
CGMN-686C-D501-0-0150					ì					
(C1001246 Spirit., 400 agil. Lat Spino)	400	ND	354	89	400	0.432	357	89		
	7 1			i	1					

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<sup>&</sup>quot;Sample median societies the splking level significantly (bx splking level); therefore, an accurate recovery value cannot be calculated ND = Not detected at or above 0.2 rigig (wet weight).

NO = Not detected at or above 0.2 rigig (wet weight).

NO = Not detected at or above 0.2 rigig (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 rigig (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 rigig (wet weight).

Note: Allines the automary table atoms reminded results, recovery values anny vary slightly from the vehicle of the rigid data.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

	C4 Sulfenate PFES					C& Sulfonate PFHS				
		Amt Found	Amount			t Amt Found	Amount			
Sample	Spiked	in Sample	Recovered	Recovery		in Sample	Recevered	Recovery		
Description	(ng/p)	(ng/g)	(ng/p)	(%)	(ngin)	(ng/g)	(ng/g)	(%)		
CGMN-58C-0501-0-0200						1				
(COLDIZAT Spir C, 40 mg/L Lab Boths)	40	ND	36.2	91	40	0.713	38.1	88		
CGMN-\$BC-D501-0-0200										
(C0061247 Sph D, 400 right Lab Splins)	400	NO	336	84	490	0.713	331	83		
		ļ				1				
CGMN-58C-FTA02-0-0000										
(CDBF)263 Spk E. 46 mg/L (ab Spiles)	46	NQ	33.6	84	49	24.7	58.7	85		
CGMN-S8C-FTA02-Q-0000 (C00)1283 fpk F, 409 np/L Lab Bollah	406	NO	316	79	400					
(Constrain after P. 400 AGAL Cast Aprilla)	144	~C	376	/9	490	24.7	343	80		
CGMN-S8C-FTA02-0-0050						ĺ				
(C0691254 Spic G, 48 mg/L Lait Spilip)	46	NO	36.1	90	40	7.77	44.8	23		
CGMN-S8C-FTA02-0-0050				1		ļ				
(C0001254 Spit H, 400 ng/L Lab Spits)	480	NID .	346	87	400	7.77	356	87		
CGMN-SBC-FTA02-DB-0100	44	ND.	34.6	87	40		** *			
(COUNTESS Spir. L. 46 mg/L. Link Spirins)	<b>"</b>	Ne.	34.6	٠ ا	40	6.31	39.7	83		
CGMN-SBC-FTA02-CB-0100 (CRRTABL Solt J. 400 mgrt, Last Spilin)	480	NC	304	78	400		245			
(care one size of any mark care about		, a.J	344	/°		9.31	348	85		
CGMN-SEC-FTA02-0-0100				Į.						
(C0001236 Spit N, 49 ng/L Lab Spite)	40	ND	36.0	90	40	5.04	47.9	105		
CGMN-85C-FTA02-0-0100	1 1			1						
(C0091266 Spb L., 460 ng/L Lab Spike)	400	ND	326	81	405	6.04	360	88		
CGMN-88C-FTA02-0-0150	1 1			1	į					
(COSA1257 Spt C, 46 mg/L Lat Solie)	40	ND	36.4	91	48	18.9	53.0	85		
CGMN-SBC-FTA02-0-0180	1 1			İ						
(CSSS1267 Spt D, 496 apt. Lab Sptia)	400	ND	322	81	400	18.9	344	<b>8</b> 1		
					1	72.4		••		
CGMN-SBC-FTA02-0-0200										
(C0001254 Spt & 40 agil Lab Spile)	44	NO	36.3	91	44	20.5	53.8	83		
CGMN-SBC-FTA02-0-0200										
(C0081258 Spir F, 400 mg/L Lats Spire)	405	ND	303	76	400	20.5	342	90		
CGMN-SBC-FTA03-0-0000				1						
(COSSIZER SUR O, 40 rept. Late Spiler)	44	20.2	68.7	109	46	271	292	•		
CGMN-S8C-FTA03-0-0000	1			1						
(CHINETZSO SIN IL, 400 agil. Lim Spina )	400	26.2	378	89	404	271	561	73		
CGMN-SBC-FTA03-0-0100					ł					
(C0001200 Spit I, 40 ng/L Lab Spites)	44	9.960	35.5	88	40	10.5	47.2	92		
CGMN-SBC-FTA03-0-0100					1					
(C0681200 Spt. J. 400 ngf. Lab Spine)	400	0.960	352	88	401	10.6	343	63		
				ĺ	Ì					
CGMN-S8C-FTA03-0-0100	40	NO	37.3			- 24				
(Citolinate Spin K, 40 ngrt. Lati Spiles)	***	NQ	37.3	93	40	1.95	<b>38</b> .1	90		
CGMN-SBC-FTA03-0-0100	400	NQ	319	80	400	1.00	334	**		
(CONSTINC Set L. 400 ng/L Lob Spine )	****	WQ.	312	ou !	707	1.970	33 <del>4</del>	83		

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<sup>&</sup>quot;Semple metue excesses the spiking level algrifficantly (its spiking level); therefore, an accurate recovery value cannot be calculated ND = Not detected at or above 0.2 ng/g (vet weight).

NQ = Not quantificate = Measured concentration between 0.2 ng/g (set weight) and the Limit of Quantification (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to qualifor control near disture.

Nets: Sisse title summany table a hower rounded results, secondly values may vary slightly from the values in the resultate.

Exygen Study No.: P0001400

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples
Continued

	C4 Sulfonate PFSS						Bullonate PFH	iB
		Amt Found	Juneaunt	_		Amt Found	Amount	_
Sample Description	Spiked	in Sample	Recovered	Gecovery		in Sample	Recovered	Recovery
Lieutificos	(ng/p)	(10 <u>0/g</u> )	(ngig)	(%)	(10/0/)	ing/gt	(ng/g)	(%)
CGMN-SBC-FTA03-0-0150					l	l		
(C9001263 Spir C, 40 mg/L Luts Bythn)	40	NE)	29.7	74	40	0.678	34.0	83
CGMN-SBC-FTA03-0-0150								
(CROR1242 Spit C. 400 agd. Lat Spite)	409	NEC)	313	78	400	0.678	341	85
					ł	l		
CGMN-SBC-FTA03-0-0290	40	2.042	***		40			
(C0081384 Spit E, 49 styl) Lab Spitch)	-	0.912	31.8	77	743	6.81	41.1	86
CGMN-98C-FTA03-0-0200	400	a m/1	***		400			
(CB061264 Spit P, 480 agr. LED Spills)	-00	0.912	319	60	400	6.01	335	62
CGMN-5BC-FTA01-0-0000				Į				
(COSO1300 tiple Cl. 45 repl. Lab Spilling	40	7.48	39.5	60	40	286	265	•
CGMN-SBC-FTA01-0-0000								
(COOFEEE Sph H, and mad, Lab Bythe)	400	7.48	314	78	400	298	496	52
	1 1			- 1				
CGMN-SBC-FTA01-0-0050	40			i	40		404	
(C0001270 Sphil, 40 mg/L Lab Spile)	1 ~	1,95	34.5	51	***	95.2	121	66
CGMN-SEC-FTA01-0-0050	400		3		400	95.2	403	
(C0001370 Sph J. 400 ng/L Lab Spike)	444	1,98	341	85	***	35.2	407	78
CGMN-SBC-FTA01-0-0100				- [				
(COOR 1371 Spit IC 40 ng/L Lub Relita)	40	1.91	34.8	81	40	32.2	62.0	76
CGMN-38C-FTA01-0-0100	1 1			1				
(CRESTOTE Spice), 48th aug/L Lab Spike)	400	1.91	339	84	401	32.2	349	79
CGMN-88C-FTA01-0-8150	1			]				
(CRESTITE Set G. 46 most Lab Seines	40	1.38	34.2	82	40	49.1	108	142
CGMH-58C-FTA01-0-0150					1			
(C000) 277 Sek D, 406 mgt. Lab Selist	480	1.36	337	84	401	49.1	397	87
	1			1				
CCMN-88C-FTA01-8-0200					40			
(CHOOLSTS Spik E, 4d rept. Link Spike)	-	1.54	31.8	76	-	181	194	•
CGMN-88C-FTA01-0-0200	400		***	79	400			
(C0001273 Spin F, 408 mg/L Lub Spilm)		1.54	295	′3		101	478	72
CGMN-SBC-WPA01-0-0000				- 1	i			
(CROSS 1329 Style Ct. 48 mg/L Lab Spiller )	48	NQ	34.1	85	40	NQ.	34.8	87
CGMN-88C-WPA01-0-0000	1							
(C0101229 Spk H, 465 ag/L Lab Spile )	400	NQ	291	73	400	NQ	293	73
CGMN-58C-4VPA01-0-0050				1	- 1			
(CASSTERS Spir t, 40 mgf. Lam Station)	40	ND	12.2	81	48	HQ	33.6	84
CGMN-S8C-WPA01-0-0050					1			
(C0001330 Spt 4, 400 mpf. Lat Spite)	400	NED	333	83	400	NQ.	346	67
					- 1			
CGMH-S9C-WPA01-0-0100				_	_ 1			
(Cassillati Spk K, 40 ng/L, kan Spen)	44	NO	21.7	79	-	NG	23.5	84
CGMH-S9C-WPA01-0-0100	409	NO	352	84	446	NO	386	92
(COM 1831 Spit L, 400 mg/L Lab Syllar )	74.7	(ML)	102	04		mu.	200	#44

<sup>&</sup>quot;Sample residue exceeds the splitting level agnificantly (3x aptions level); therefore, an accurate recovery value carnot be calculated

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ND = Not estacted at or above 0.2 riging part weight).

VQ = Not quantifiable = Measured concentration between 0.7 ng/g (set weight) and that Lindt of Quantifiation (LCQ) which is 0.4 ng/g (set weight).

Note: Since this summary table shows rounded results, recovery values may vary alightly from the values in the raw date

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		C	Sulfonate PF1	16		CI	Sulfonate PFI	18
Sample Description	Amount Spiked (ng/g)	in Sample (ng/g)	Amount Recovered (ng/s)	Recovery (%)		Amt Found in Semple (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-WPA01-DB-0100 (C90813325pt C, 49 opt. Lab 8yths)	44	NEO	33.4	84	40	NQ	33.5	54
CGNR-S8C-WPA01-D8-0100 (CBR1333 Bjuk I), 466 mg/L Lab Spilin)	400	NES	353	es	496	NQ	331	83
CGMN-SBC-WPA01-G-0150 (C0001333 Balk R, 46 rg/L Lab Spital)	42	1.58	35.8	86	44	<b>9.25</b>	39.8	84
CGMN-SBC-WPA01-G-0150 (C0001533 Spit F, 400 right, Linb Spitio)	403	1.58	385	91	400	8.28	362	80
CGMN-88C-WPA01-0-0200 (CM813M 8pt Q.48 ag/L Lab Splin)	40	4.93	36.0	76	48	NR	NR	N#R
CGMN-SSC-WPA01-0-0200 (C0001334 Spk H, 404 ags. Lab Rp8sq	400	4.96	362	56	400	NR	NR	NR
CGMN-SBC-BKG01-0-0000 (C6081336 Bpk i, 4t np/L Lyb Spille)	40	ND	19.6	49	44	ND	34.1	65
CGMN-SBC-BKG01-0-0000 (C0011336 Spit. J. 400 mg/L. Lait Spit.n)	400	ND	186	47	404	N£D	354	89
CGMM-98C-EKG01-0-0050 (CRRF539 Spit K, 49 rgst. Lab Spite)	44	NO	26.8	67	40	ND	34.9	67
CGMN-SBC-BKG01-0-0060 (C0001334 Spk.L., 400 agsl. Lab Spike)	400	NO	270	70	400	ND	327	<b>62</b>
CGMPN-SBC-BKG01-0-0100 (C9091339 Spit C, 49 ng/L Lab Bollus	40	ND	33.5	84	40	MD	37.5	94
CGMN+SBC-BKG01-0-0108 (C0001338 Stpt. 0., 400 ngst. Lati Spille)	400	ND	324	81	400	NO	340	85
CGMN-SBC-BKG01-DB-0100 (C0001338 Spk E, 40 Agrt, Lub Spites)	40	ND	33.6	85	40	NO	35.2	88
CGMN-SBC-BKG01-DB-0100 (CR081338 Byt. F, 408 mg/L, Lab Spille)	400	ND	326	82	400	ND	338	85
CGMR4-SBC-BKG01-Q-0150 (C00013-00 Sprk (I), 60 ng/l. Luts Sprin )	40	ND	31.3	78	44	ND	58.3	84
CGMN-SBC-BKG01-0-0150 (C9081948-Balic H, 460 agril Lad Saltina )	400	ND	308	77	400	ND	25+	24
CGMN-SBC-BKG01-0-0200 (C0081341 Spirt, 44 ng/L Lab Spiles)	60	NO	34.4	86	40	ND	36.6	92
CGMH-SBC-BKG01-0-0200 (C8681941 Spk 1, 460 agil. Lab Sphis)	400	NO	340	85	***	NO	348	87
CGMN-98C-8KG02-0-0000 (C0001947 Spik K, 44 ng/L Laik Bpdia )	46	NC)	94.0	85	46	NO	36.4	91
CGMN-SBC-8KG02-0-0000 (C001147 Spit L, 400 rgd. Lab Spiles)	406	NO	332	83	400	ND	338	85

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<sup>&</sup>quot;Sample medius exceeds the spliding level eignificantly (thi splicing level); thorefore, an accurate recovery value censor be opticulated ND = Not destinated at or above 0.2 right (wor weight).
NQ = Not quantificable = Nessured concentration between 0.2 right (was weight) and the Limit of Quantificable = Nessured concentration between 0.2 right (was weight) and the Limit of Quantificable = Nessured concentration between 0.2 right (was weight).
NR = Not reported due to quality control nesult fishings.
Note: Stance table seammery table shows rounded results, recovery values may vary eligibility from the values in the raw date.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

	C4 Sulfonale PFES					CS Sulfenate PFHS			
Sample Description	Amount Spiked (ng/e)	Amt Found in Sample (ng/g)	Assount Recovered (Agip)	Recovery (%)		Ant Found in Sample (regig)	Amount Recovered (ng/g)	Recovery (%)	
CGLIN-SBC-BKG02-0-0050 (C0081346 Bpt C, 46 kg/L, Late Syllin)		NO	31.2	78	40	ND	34.8	87	
CGMN-SBC-BKG02-0-0050 (CMM1MM Spir D, 466 rept. Leb Spille)	499	ND	291	79	400	ND	319	<b>6</b> 0	
CGMN-SBC-BKG02-D5-0100 (C1001340 Spt. E. 40 ng/L Lab Sptis)	40	ND	30.5	76	44	NO	36.3	91	
CGNIN-SBC-BKG02-DB-0100 (C0001348 Spk F, 460 egil Late Spike)	400	ND	318	79	401	ND	356	89	
CGASN-SBC-BKQ02-0-0100 (C0001200 Spin II. 40 rpf. Lab Spins)	46	מא	32.2	81	40	NÐ	38.2	91	
CGMN-SEC-BKG02-0-0100 (C0001380 Spix H, 400 repl. Leb Spilin)	400	ND	284	71	400	МЭ	327	82	
CGMN-SBC-BKG02-0-0150 (C0001381 \$pit 1; 48 mgf. Leb \$pilo)	40	NEO	353.2	83	**	ND	36.7	92	
CGMN-SBC-BKG02-0-0150 (C0001381 Bolt J, 400 rept. Lab Salin)	400	ND	285	71	404	NO	331	83	
CGMN-SBC-BKG02-0-0200 (C0001382 Spo N, 40 ng/L Lab Spite)	40	ND	27. <b>6</b>	50	**	ND	35.8	90	
CGMN-SBC-BKG02-0-0200 (C0001362 Bjtk L, 400 ng/L Lati Spille)	400	ND	320	80	408	NO	338	65	
CGMN-SS-BKG01-0-0000 (CUUNTAR Spin C, 40 ngf. Lab Spino)	40	ND	31.2	7 <b>a</b>	40	NO	34,5	86	
CGMN-SS-BKG01-D-D000 (D9091963 Spir. D, 460 opt., Lab Spito)	408	ND	257	72	400	ND	317	79	
CGMN-55-8KG01-0-0005 (CRM1364 Bpk E, 48 ng/L Lab Splint)	•	ND	27.9	70	40	ND	37.0	93	
CGMR1-SS-BKG01-0-0006 (CRR1364 Spk F, 400 sg/L Lan Salins)	400	NO	278	70	400	ND	363	<b>9</b> 1	
CGARN-SS-D601-D-0000 (C0011365 Spit Q, 40 yept. Lash Spites ) CGARN-SS-D001-D-0000	40	NQ	34.6	87	•	0.866	32.2	æi	
(C0014365 Spk H, 100 Agit, Lat Spiles)	400	NQ	280	72	400	0.696	269	72	
CGMN-SS-D601-0-0005 (C0001350 Spit I, 40 rppf: Lish Spitio)	40	ND	29.4	71	•	NQ	33.4	84	
CGMN-SS-D001-0-0005 (C0001350 8gk: J, 400 agl. Lab Spira)	484	ND	252	63	460	NO	324	<b>8</b> 1	
CGN/N-SS-Q801-DB-0005 (C8081387 Spik N, 49 mg/L Lish Spilos )	40	ND	29.5	74	40	NO	35.3	84	
CG&NV-SS-D801-D8-0005 (C10011567 Slpik to 460 Agril: Lata Spiller)	484	ND	279	76	406	PH	333	83	

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<sup>&</sup>quot;Sample reactor exceeds the options level algorithments (as spiking level); therefore, an accurate recovery value current be calculated ND = Not detected at or above 0.2 rigig (well weight).

NO = Not quantification = Measured concentration between 0.2 rigig (well weight) and the Limit of Quantification (LOQ) which is 0.4 rigig (well weight).

NO = Not expend due to qualify control result feature.

Note: Since this outpressy table allower rounded results, recovery values easy vary alligitify from the values in the raw data.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

			4 Sulfonate PFBS			CS Bulfonnia PFHB			
Sample Departption	Amount Spiked (ng/s)	Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)		Amt Found in Sample (ng/g)	Amount Recovered (ng/y)	Recovery (%)	
CGL6U-SS-B10201-0-0000 (C0001365 Spl. C, 40 mg/L Late Spl.kus)	**	ND	33.7	84	**	0.413	34.7	36	
CGMN-SS-8 10201-0-0000 (CMN1308 Spit D, 480 mg/L Lais Spite)	400	NEO	357	Bý	400	0.413	342	85	
CGMN-3:5-610201-0-0005 (C001136 Spt. E. 4) rgt. Lab Spts)	46	ND	30.4	76	40	ND	37.1	83	
CGNAY-85-B 10201-C-0005 (C0001300 Spix F, 400 ng/L Lais Spike)	400	ND	317	70	400	N/O	386	62	
CGMN-SS-82201-0-0000 (C991197 Spl. Q. 40 ng/L Leb Splin)	40	NQ.	35.3	88	*	ND	35.9	90	
CGMN-SS-82201-0-0000 (C0001307 Sipt H, 400 righ, Lati Spiles)	450	NO	355	89	400	ND	379	95	
CGMN-98-82201-0-0005 (C001100 Spit I, 40 np/L, Leta Spitu)	40	ND	37.2	93	40	ND	36.1	80	
CGMH-55-82201-0-0005 (C0081308 Sph J, 480 ngs, Leb Spite)	400	ND	363	98	400	ND	394	99	
CGMN-88-82201-D8-0005 (C0001300 Spit K, 40 mpt. Lab Spite)	44	ND	34.7	87	44	ND	36.3	<b>8</b> 1	
CGMN-SS-B2201-DB-0005 (C0091300 Spici., 400 mg/L lab Spira)	400	ND	366	<b>82</b>	400	МD	377	94	
CGMN-85-82501-0-0000 (C8981378 Bpb. C, 44 ppl. Lab 858m) CGMN-85-822501-0-0000	44	0.840	35.8	87	40	1.48	39.3	95	
(C0081270 Spk D, 400 mpl. Lab Spite)	460	9.840	318	79	400	1.48	339	84	
CGMN-8-9-82501-0-0006 (C9167373 Spit E, 49 Rg/L Lab Spite) C46AN-8-9-82501-0-0006	64	ND	36.4	91	40	2.35	30.0	92	
(C0001071 Spit F, 400 mg/L Lish Spitch)	480	ND	322	81	400	2.35	342	85	
CGMN-88-82901-0-0000 (C0001972 Spic 4, 46 mg/L Lafe Spike ) CGMN-SS-82801-0-0000	46	1.03	29.8	72	40	1.11	37.8	91	
(C0001172 Spk H, 400 mg/L Eath Spike )	400	1.03	286	71	400	1.11	374	93	
CGNN-SS-B2601-0-G005 (C081373 Spir. I, 48 ng/L Lab Spile)	**	NO	28.0	73	40	2.34	38.0	£9	
CG3/N-8S-82601-0-0005 (C0081573 Spk. J., 406 regil. Each Spike)	400	NQ	258	656	408	2.34	367	81	
CGMN-SS-6: 802-0-0000 (C80257F 8pix K, 40 ng/L Lub Splin )	45	2.45	31.9	74	40	1.48	35.5	85	
CGMN-SS-B1692-0-0000 (C0001376 Spk L, 400 ng/L Lab Spline)	450	2.45	308	78	400	1.46	349	67	

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<sup>&</sup>quot;Sample residue excesses the apitung level eignificantly (this apitung level); therefore, an accurate recovery value cannot be calculated ND = Not detected at or above 0.2 rigit (wet weight).

NO = Not quantifiation (LOQ) which is 0.4 rigit (wet weight) and the Limit of Quantifiation (LOQ) which is 0.4 rigit (wet weight).

NR = Not accorded due to quartify comon requirement of the company to the Limit of Quantifiation (LOQ) which is 0.4 rigit (wet weight).

Note: Since this sentence is the converse of the converse of the values of the converse of the converse of the converse of the values of the converse of the converse of the values of the converse of the converse of the values of the converse of the converse of the values of the converse of the converse of the values of the converse of the converse of the values of the converse of t

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		Ç4	Sulfanets PFI	is.		CE	Sulforate PFH	18
Sample Description	Amount Spited (ng/g)	Ant Found in Sample (ng/p)	Assount Recovered (re/g)	Recovery (%)		Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B1802-0-0005 (C0001379 Spb C, 40 ng/L Lob SpRe)	40	0.710	38.5	94 ,	40	5.60	45.0	99
CGMN-SS-3 1602-0-0006 (C8881376 Spit D, 480 agif. Lati Spille)	400	0.710	364	91	400	5.80	367	90
CGNN-SS-811201-0-0000 (C0081377 8pt. E. 49 mpt. Leb 8ptio)	45	N/Q	3.5.5	89	40	0.856	37.5	92
CGAN-SS-811201-0-0000 (CBNN-SS-811201-0-0000)	406	NQ	(152	88	463	0.856	354	58
CGMN-SS-B 11201-0-0005 (CRR1375 Bak G, 40 Ag/L Lab Splint)	46	N/D	37.5	94	40	NQ.	35.5	89
CGMN-SS-B11201-0-0005 (C0091376 Spik (L 440 mp/L Lab Spike)	404	ND	378	96	400	NC.	368	90
CC3MN-58-FTA01-0-0000 [C0001379 Set i, 40 ng/L Leb Splint]	44	NEC:	32.7	82	40	4.03	57.4	83
CGMIN-SS-FT/A01-Q-0000 (C0001379 Spit J, 400 right Leb Spline)	40#	NID	326	82	400	4.03	321	79
CGNN-SS-FTA01-0-0005 (C001388 Spirit, 48 mpl. Lab Spirit)	46	ND	24.6	62	*	1.25	35.6	88
CGMN-55-FTA01-0-0005 (C0001300 Spile, 400 ng/L Lab Spile)	408	ND	235	50	45)	1.25	364	01
CGMH-SS-FTA01-DB-0006 (C0011001 Spit C, 40 mpt. Link Spitin)	40	ND	27,7	64	*	1.42	38.3	92
CGMN-SS-FTA01-D8-0005 (C001381 Spl. D, 489 ng/L Lab Splint)	408	ND	234	59	484	1.42	364	81
CGRRV-SS-FTA02-0-0000 (CBB1362 Spit E, 44 ng/L Lab Spite)		3.58	47,4	110	40	222	256	
CGMN-SS-FTA02-0-0000 (CRESTARE SIDEF, 490 HIGH Lab Suffici	404	3.56	314	B3	400	222	480	67
CGMN-S8-FTAD2-0-0006 (Creetast lipic G, 44 ngs. Lain Sytin.) CGMN-SS-FTA02-0-0005	*	1.34	33.6	81	40	37.8	87.0	75
(CANOLINE State H. 400 mg/L Last Scribe)	404	1.34	302	75	406	37.8	375	85
CGAN-SS-88801-0-0000 (C0001305 Spit 4 49 right Lab Spities)	40	4.79	427	95	40	13.8	44.7	87
CGNN-SS-86801-0-0000 (C0001306 SpbJ. 499 ng/L. Leiz Spdie)	400	4.79	396	94	400	13.8	386	93
CG34N-SS-B6801-DB-0000 (C3681366 Bjuk K, 40 ng/L Lab Bjulin )	40	4.18	39.8	89	44	12.1	<b>5</b> 0,0	96
CGANN-SS-B6801-DIS-0000 (Ceantities Bylin L. 460 mg/L Lab Syllin )	466	4.18	372	92	400	12.1	368	80

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<sup>&</sup>quot;Sample residue exceeds the spliting level eign@contry (5x splking level); therefore, an accurate recovery value cannot be estudeted NO = Not described at or above 0.2 rigig (wat weight).

NO = Not quantifiable = Measured concentration between 0.2 rigig (wat weight) and the Limit of Quantifiable = Measured concentration between 0.2 rigig (wat weight) and the Limit of Quantifiable (LDQ) which is 0.4 rigig (wat weight).

NOte: Stace this estimately table shows roun-ded results, recovery values may very alignify from the values is the raw data.

Exygen Study No.: P0001400

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

			Sulfonate PFE	<b>:\$</b>			Sulfonate PF)				
Samole	Amoun Späked	t Amt Found In Sample	Amount Recovered	Recovery		I Amt Found In Semple	Amount	<b>.</b>			
Description	(19/9)	(ng/g)	(ng/g)	(%)	(DB/B) oburier	(ng/g)	Recovered (ng/g)	Recovery (%)			
						Ī					
CGNN-SS-86801-0-0005 (CD061387 Spk C, 46 ngt, Lat Spikus		1.70	37.1	80	40	5.48	4.2	97			
CGMN-SS-55001-0-0005	-	1	<b>3</b> 1. t	De	_	3.40	94.2	93			
(C1001387 Sph D, 406 rept, Lab Spiles)	490	1.70	368	80	440	5.48	370	<b>6</b> 1			
CGMN-SS-B1801-0-0000 (CR081382 Spk IE, 48 ng/L Lub Spillin)	40	3.61	21.3	47	40	NED	40.0	100			
CGMN-SS-B1901-0-0000 (C0081382 Set F, 486 mg/L Lab Spike)	400	3.61	200	49	440	ND	371	<b>93</b>			
CGMN-SS-81601-0-6005	1	ŀ				1					
(C0001383 Bate G. 40 mg/L Lais Sather)	46	9.20	30.4	76	44	0.624	46.2	20			
CGMN-SE-B1801-0-0005		j				5.13.2.1					
(C0051303 Sph H, 410 ng/, Lab Splin)	480	9.20	339	82	440	0.624	387	92			
CGMN-SS-IC04-0-0000	1										
(Cecet 306 Spic t, 46 ng/L Lais Spiles)	40	ND	39.6	99	40	ND	36.0	95			
CGMN-9S-IC04-0-0000											
(C0061385 Set J. 405 ng/L Lab Sythe)	400	НÐ	377	94	400	ND	381	95			
CGMN-SS-IC04-0-0005				- 1	i						
(COOR1306 Spic IC, 49 mg/L, Lab Spiller)	40	ND	24.0	60	49	NO	36.8	92			
CGMH-SS-IC04-0-0006				- 1	i						
(C0001300 Spik L., 400 mg/L Lutz Syrrus)	440	ND	240	60	400	ND	374	84			
CGMN-93-IC03-0-0000					- 1						
(COORTSET Sph. C, 49 rupt. Lab Spling)	40	ND	43.3	108	40	ND	40.3	101			
CGMRI-SS-IC#3-0-0000				1	- 1						
(C9981387-5pk D, 466 mg/L Lab Sphu)	400	ND	375	94	406	NO	362	<b>81</b>			
CCMN-8.5-IC03-0-0008				į	- 1						
(COME1388 Spx E, 46 ng/L Lab Spin)	40	ND	35.7	87	40	ND	33.1	68			
CGMN-85-IC03-0-0005					ĺ						
(COOKTION Spit F, 400 mg/L, Lab Spike)	404	ND	348	56	400	ND	331	83			
CGMN-35-IC01-0-0000					- 1						
(C0051300 Spit Q. 40 ngst. Lab Spite)	46	ND	57.9	95	**	0.025	36.3	95			
CGMH-53-IC01-0-0000					1						
(C0001300 Spk H, 400 ray), Lab Spika)	405	N/O	378	96	400	0.928	342	85			
CGMN-88-(C01-0-0006					- 1						
(COUNTAGE Spir I, 45 agel. Late Spires	40	NO	33.0	83	46	1.41	35.B	88			
CGMN-98-IC01-0-0006											
(COSE1400 Spir J. 400 agril. Lisb Spike)	446	ND	293	75	400	1.41	314	78			
CGMN-S\$-IC42-0-0000				ĺ							
(C0085401 Sek K. 48 ng/L Lat \$500)	40	ND	35.0	86	44	ND	34.2	86			
CGMN-95-1C02-0-0000	444	4475									
(C0081401 Spik L, 490 ng/L Lab Spike )	408	ND	313	78	406	NO.	323	81			

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<sup>&</sup>quot;Sample readus excess the apticing level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated ND = Not detected at or above 9.2 right (wat weight).

NQ = Not quantifiable = Measured concentration between 9.2 right (wat weight) and the Limit of Quantifiable (LOQ) which is 0.4 right (wat weight).

NR = Not reprint due to qualifiable otherwise repeated in the right setting.

Nets: Since this summany table shows repeated in each setting.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

		C	Sulfonate PFN	8				
Bampie Osseription	Amoust Spiked (ng/g)	Anti Found in Sample (ng/g)	Alliburg Recovered (1949)	Recovery (%)		Amt Found in Sample (np/s)	Amount Recovered (ng/s)	Recovery (%)
CGMH-SS-IC02-0-0005 (C0081402 SalcC, 48 agil. Lab Symbol	40	NEO	35.2	91	40	NEO	40.8	192
CGMH-SS-ICU2-0-0035 [C0021402 Epit D, 400 ng/L Lab Splint]	400	NO	334	84	490	NED	426	107
CGMH-SS-D503-0-0000 (C0001003 Back E, 48 rept. Late Spites)	40	NIO	37.8	95	46	0,984	39.5	29
CGNRN-55-12503-0-0000 (C0021402 Spb F, 400 mg/L Lab Spite)	400	ND	358	100	400	0.984	378	96
CG NeN-SS-D503-0-0006 (C1001404 Sprin O. 49 mpf., Link Sprins)	46	ND	34.6	87	40	D'A	40.5	101
CGMN-SS-D503-0-0005 (C1001-04 Spb H, 400 ng/L Leb Splint)	486	ND	348	87	405	NQ	387	97
CGM(N-95-D501-0-0008 (C0011008 Spt. (, 48 ng/L, L46 Sptin)	#	NQ	18.9	97	40	1.10	38.5	98
CGMN-SS-0561-0-0000 (C0001406 Spit J, 400 ng/l, Lab Spite)	400	NQ	1132	83	408	1.10	330	82
CGAM1-SS-D501-0-0005 (C1001-100 Spit K, 40 mg/L Each Spitte)	40	0.844	38.0	63	48	1.15	40.7	90
CGMN-33-D561-0-0005 (C6067-000 Spitc.), 460 rup?. Lab Spitca)	400	0.844	348	96	400	1.15	355	89
CGN/N-SS-RRC1-0-0000 (CRRT-147 Spit C, 42 ng/L Lab Spito)	40	CN	38.5	97	4	0,748	40.6	100
CGMM-SS-B801-0-8000 (C0081487 Spit 0, 460 right, Luit Spite)	400	ND	350	85	400	9,748	351	88
CCM/N-SS-8801-0-0008 (CR081408 Spik IZ, 49 ng/L Lub Spikus)	40	NO	34.8	87	44	1.08	36.9	90
CGMN-SS-8801-0-0005 (C0081400 Epit F, 400 tipit. Lab Spitis)	400	ND	345	86	404	1.08	370	92
CGMN-85-D502-0-0000 gcme1440 8pt G, 44 righ. Lab Batto )	**	ND	31.2	•	44	0.607	36.6	90
CGMN-SS-D502-Q-0000 (C0001400 Spit H, 400 ng/L Lab Spite )	400	ND	354	<b>9</b> 1	486	0.607	383	96
CGNNV-SS-D502-0-0006 (C0081416 Spit.), 40 mg/L Linb Spit.	46	ND	37.1	\$25	40	6.48	44.2	94
CGMN-SS-D502-0-0006 (CBM1410 Bylk J, 400 ng/L Lab Spille)	400	ND	3457	89	480	6.46	362	94
			Avecase				Average:	44

"Saniple residue exceeds the Apking level Algrificantly (Sic splicing In NO = Not detected at or above 0.2 reg/g (wek-weight) NO = Not quantifiable = Messured concentration between 0.2 reg/g NR = Not provide due to quelify control result faiture.

Note: State title summarry table sewers hostinded results, recover

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples

		CI	Sulfonate PFC	<b>.</b>				
Sample Description	Amaunt Spiked (ng/g)	Amt Found in Sample (ng/g)	Amouni Recovered (ng/g)	Recovery (%)		Arat Found to Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-D101-0-0005								
(CD861358 Spk C, 46 ng/L Lab Splin)	40	16.9	53.6	92	40	1.05	41.6	101
CGMN-SS-D101-0-0005		1			1	1		
(C0001266 Spik D, 460 rg/L Lab Spike)	400	16.9	360	88	400	1.05	367	₽1
CGMN-SS-0101-DB-0005		[						
(C8081388 Spk E, 46 ng/L Lair Spiles)	44	18.9	67.8	102	48	0.538	<b>37.4</b>	92
CGMN-33-0101-08-0005								
(CORELISE Spic F; 400 ng/L Lab Spike)	408	16.9	360	86	480	0.536	329	<b>52</b>
CGMN-53-D201-0-0000								
(C0081300 Spt G, 40 ng/L Lab Sptta)	40	46.5	75.6	68	48	3.34	35.0	88
CGMN-SS-D201-0-0000				ļ				
(C0061200 Spic HL, 400 mg/L Late Spike)	400	46.5	353	77	440	3.34	294	75
CGMN-93-D201-0-0005					İ			
(C4041361 Spit L 40 mg/L Lab Spite)	40	51.6	87.2	<b>69</b>	44	6.96	36.4	<b>9</b> 1
CGMN-SS-0201-0-0005	400	<b>51</b> A		[				
(C5481301 Spk J. 460 sgrt. Lab Spite)	1475	51.6	381	52	400	6.96	316	79
CGMN-S3-D202-0-0000				ĺ	i			
(C0081302 Spk IC, 40 ng/L Lab Splin)	40	984	1120	•	40	20.5	57.D	<b>9</b> 1
CGMN-S3-0202-0-0000	l							
(COORTSAZ Spitc L., 400 mg/L Lab Spilm)	400	984	1220	59	400	20.6	353	83
CGMN-SS-D202-0-0005					- 1			
(COURTINGS Spit C, 40 agril, Last Spitte)	**	1440	1550	•	**	51.1	<b>63</b> .2	80
CGMN-S8-D202-0-0005			4.000	. !				
(COCO 1767 Spit El, 450 rigil, Lab Spite)	4070	1440	1680	•	400	51.1	351	75
CGMN-SS-D101-0-0000				1				
(C0001974 Spk E, 40 regl. Lab Splin)	40	10.0	44.7	85	40	3.35	37.7	86
CGMN-SS-D101-0-0000								
(CROSTS74 Spit F, 400 spit, Lab Spite)	404	10.6	306	74	400	3.35	282	70
CGMN-S8-B1502-0-0000				1				
(CREST NEE Spik G., 40 Agrf. Luis Spiller)	46	16.4	48.2	50	40	7.61	48.5	97
CGMN-SS-B1502-0-0000								
(CRESTANCE State H, 460 agril, Lab Spike )	-	16.4	364	87	400	7.61	362	60
CGMN-8S-B1502-0-0006	1 . 1			1	i			
(CB191300 Spic t, 44 ng/L tab Spiller)	40	87.0	37.9	77	**	7.25	44.5	83
CGMALSS-81502-0-0005 (C0001200 Spk J, 400 ng/L Lab Spille)	400	57.0	350	78	400	7.28	336	
toon the obest the war can spring	-	37.0	35#	"		1.20	330	81
CGMN-99-81501-0-0000	ا ا							
(C0001300 Spin K, 49 ng/L Lab Spills )	40	12.3	45.7	84	44	17.1	48.6	74
CGMN-SS-81501-0-0000 (C0001300 Spit L, 400 ng/L Lab Spite)	400	12.3	303	73	400	17.1	306	72
(		, 2				*7.1	3.0	16

<sup>&</sup>quot;Sample readus exceeds the spiting level algorificantly (IX apting level); therefore, an accurate recovery value cannot be calculated ND = Not detected at or above 0.2 ng/g (wet weight).

ND = Not quarafable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LDQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to qualify control result failures.

Note: Since this semmesy table shows rounded results, recovery values may vary alightly from the values in the raw data.

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Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

		CI	Sulfonate PFC	onate PFOS CE Acid P				OA AO	
Semple Description	Ameunt Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/p)	Recovery (%)		Amt Found in Sample (ng/g)	Amount Recovered (ng/q)	Recovery (%)	
			'						
CGMN-65-81601-0-0006 (C1017391 Sph C, 40 Apr. Lab Spiles)	-	42.9	75.5	82	46	15.0	41.1	66	
CGMN-SS-B1501-0-0005 (C0081991 Spt.D, 449 ngt. Lab Sptin)	404	42.9	371	82	480	15.0	333	80	
(Constitution) and the constitution of									
CGRON-SBC-D203-0-0000 (Code1162 Roke), 48 mg/L Lab Spike)	40	2970	3060	•	40	211	218	•	
CGMN-SEC-D203-0-0000 (C0801103 Back F, 400 mpt, Lab Spiller)	480	2970	2740		400	211	453	61	
forms (in alm), and all and about	""		<b>4</b>						
CGMN-35C-0203-0-0050 (C0001164 Spin G. 49 mg/L Lain Spille)	48	7060	7300	•	40	1430	1890	•	
CGMN-8BC-D203-0-0050									
(Casersal Spit H, 406 ng/L, Lub Spitin)	480	7060	8560	۰	400	1430	2230	•	
CGMN-SBC-D203-0-0100	40		3960			2780	2810	•	
(COORI 1 SE Epici, 40 mg/L Leb Sipflin)	_	4420	2801	-	-	2/60	2810		
CGMN-SBC-D203-0-0100 (C0001105 Spb 1, 400 mg/L Lab SpBus)	400	4420	4450		480	2780	3090	•	
CGMN-SBC-D203-0-0150								۵	
(C0001186 Spik K, 48 mg/L Luck Spillus)	4	4870	(29.60	•	**	48 10	3530	•	
CGMN-SBC-D203-0-0150 (C0081188 Spt. L, 404 mpt. Lab Splint	400	4870	5 <b>130</b>	-	490	4819	4740	,	
CGMN-SBC-0203-0-0200									
(Codes: es, gibt of equility (the giunt)	**	5550	1270	•	<b>4</b> 0	4670	3100	•	
CGMN-68C-D203-G-0200 (C0001107 Spit 0, 404 opt. Lisb Spike)	480	5550	4340		400	4670	3280	•	
CGMN-SBC-D203-0-0250					1				
(C3021105 Bjók č. 40 ng/L Lub Spiles)	**	724	726	•	46	449	471	•	
CGMN-SBC-D203-0-0250 (C001106 Spit P, 400 opt. Lab Spite)	480	724	1020	74	400	449	775	<b>#2</b>	
CGMN-SBC-D203-0-0300									
(CARAT 180 Spik St. 46 mg/L Luis Spike )	*	46.1	179.1	80	*	556	506	•	
CGMN-SBC-D203-0-0500 (C0191100 Sub. H. 400 cu/L. Lab Spline )	400	46.1	379	13	440	586	1180	140	
CGMN-SBC-D208-D8-6300				[					
(COOS1170 Spit L 44 ne/L Lab Spitus)	40	41.2	78.3	2-8	40	298	528	-	
CGM91-68C-1203-28-0300 (C0091179 Spit J. 488 Fgf. Lab Spike)	400	41.2	376	44	***	296	782	122	
CGMH-S8C-D203-0-0350				ļ					
(C6061171 Spir N, 49 mg/L Lab Spibe )	40	12.4	46.2	85	40	837	826	•	
CGMN-SBC-D203-0-0350 (C0081171 Spk. L. 491 rgd. Lub Spfler)	400	12.4	958	81	400	837	1110	118	
	1 1				i				

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<sup>&</sup>quot;Sample reaction exceeds the apticing level significantly (Ox option) level), therefore, an accurate recovery value cannot be calculated

NO = Not described at or above 0.2 rigity fived velight).

NO = Not quantification = Measured concentration between 0.2 rigity (wet weight) lend the Limit of Quantificition (LOQ) which is 0.4 rigity (wet weight).

NR = Not reported due to quality control result faitures.

Note: 3 leads this suremany table above rounded results, recovery values may vary alignity from the values in the rew data.

Exygen Study No.: P0001400

Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

		CI Sulforette PFOS CI Acid PFO						
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Receivery (%)		Amt Found in Sample (ng/y)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-0203-0-0400					l	ĺ		
(G8017172 Spt C, 40 ngtl. Lab Sptim)	40	7.53	41.0	84	40	167	162	•
CGMN-S8C-0203-0-0400	1							
(COORTSTE Spk D. 400 nest. Lab Spike)	400	7.53	335	81	450	157	471	78
CQMN-SBC-0203-0-0450 (C0081173 Spir E, 46 sight Liab Spiller)	49	19.1	48.8	74	46	61.0	90.4	74
CGMN-9BC-D203-0-0450 (CS081973 Spk P, 499 ng/L Lab SpRe)		19.1	349	82	400	61.0	413	50
CGARV-SBC-D202-0-0000 (C0001174 Spt Q, 40 opt. Lab Sptin)	44	3930	3660	-	44	206	230	
CGMN-SBC-D202-0-0000	1							
(C0001174 Spic 51, 466 ng/L Late Spika)	400	3930	3340	•	408	204	391	46
CGMN-58C-D202-0-0050	1 1				- 1			
(C0001176 Spix I, 46 ng/L Lats Spins)	#	3429	3570	•	44	2930	28.20	•
CGMN-SBC-C202-0-0080	1			.				
(C0081178 Spt. J. 400 agd. Lab Sptus)	400	3420	2900	•	400	2930	2810	•
CGMN-SBC-D202-0-0100				J	ĺ			
(COOK) 176 Box IC, 48 ng/L Late Spita)	44	1180	1580	•	44	448	596	•
CGMN-SBC-D202-0-0100	1				1			
(COMP1172 Spix L, 485 mpd. Lab Splins)	400	1180	1660	120	400	446	840	29
CGMN-8BC-D202-0-0150				- 1	-			
(COSE/177 Epit C, 48 ng/L kati Splin)	46	8840	5940	•	48	1600	1510	•
CGMN-SBC-0202-0-0150				1				
(C0081127 Sph D, 400 mgt. Lab Sphit)	400	6640	8200	•	400	1600	1820	•
CGMN-8BC-D202-0-0200								
(C0681178 Spit E, 40 mg/L Lato Spiline)	44	4500	4870	•	48	490	551	•
CGMN-SBC-D202-0-0200	1 1			1	1			
[C0009178 Spb F, 466 mg/L Lab Spille]	400	4500	3910	•	404	490	951	40
CGMN-SBC-D202-0-0250				1				
(Coses176 Spé G, 49 mg/L Lais Spiles)	44	705	790	•	48	224	256	•
CGLeN-SBC-D202-0-0260	1 1			j	- 1			
(C0001179 Spit H, 404 ngfL Lab Spiles)	400	705	1100	99	488	274	526	76
CGMN-SBC-D202-0-0300								
gCutters are best if 40 mars. Late Setting	40	737	824	•	40	798	984	•
CGMN-98C-D202-0-0300	1							
(C0051185 Spit J, 498 rig/L Link Spike)	400	737	1020	71	400	796	1106	78
CGMN-SBC-D202-0-0360	!				:		_	
(G9061161 Spk R, 40 ng/L Lisb Sythe )	40	77.8	99.2	54	48 ,	433	436	•
CGMN-SBC-0202-0-0360		***	400				718	74
(CREST181 Sek L., 409 mg/L Lab Spile )	400	77.6	400	81	400	433	718	71

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<sup>&</sup>quot;Sample residue socieds the soliting level significently (0x splking level); therefore, an accurate recovery value cannot be calculated NO = Not classified at or above 0.2 right (was weight).

NQ = Not quantifiable = Measured concurration between 0.2 right (was weight) and the Unit of Quantifiation (LOQ) which is 0.4 right (was weight). NR = Not reported due to qualify control result failures.

Note: Since this summary table above rounded reselts, recovery values may vary slightly from the values to the ries data.

Exygen Study No.: P0001400

Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

			Sulfonate PFC	)\$			CB Acid PFOA		
Sample Description	Amount Spiked (ng/g)	i Amt Found in Sample (ng/g)	Arnount Recovered (ng/g)	Recovery (%)		Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	
CGMN-SBC-D202-D8-0350			_					······································	
(CONSTREE Spik C, 46 ng/L Lab Spike)	44	76.0	112	90	*	514	489	•	
CGMN-38C-D202-DB-0350	1					İ			
(Chartille Suit D. 400 mpl. Lab Spille)	400	76.0	445	92	440	514	739	58	
CGMN-85C-D202-0-0400		ļ			•	1			
(CHONTERS Sight E, 48 mg/L Lab Sprint)	44	193	205	•	44	980	856	•	
CGMN-58C-D202-0-0400									
(Constins Spir F, 400 mgd. Late Spite)	400	193	554	90	400	980	1270	78	
CGMN-8BC-D202-0-0450									
(COOPES DE SPIK O, 40 ACPL Last Spille)	40	96.9	130	55	49	1020	1080		
CGMN-58C-D202-0-0450	1 1								
(C0001184 Spit H, 400 mg/L tab Spitus)	400	96.0	485	97	400	1020	1430	103	
CGMN-38C-D201-0-0000				- 1	ļ				
(COORTE 05 Spirit, 40 mg/L Lub Rector)	4	639	502	. ;	40	28.4	92.0	157	
CGMN-SBC-D201-0-0000	-			- 1	-		-2	107	
(CSSS11BS Sph. J. 400 rgpt. Lub Spiles)	400	639	840	50	400	29.4	356	82	
CGMN-38C-D2D1-0-0050					ŀ				
(C0001100 Spt. K, 49 ng/L Lab Eatha)	44	2190	2:250	. }	أعد	559	319		
CGMN-88C-D201-0-0686				1	-		2.0		
(Coop1186 Spit L. 400 agil. Lat Spital	440	2190	2440	• {	440	350	537	45	
CGMN-98C-D201-0-0100	1 1			1	i				
(CONT.187 Ref. C. 40 mg/L Lab Syline)	44	217	254		44	45.0	74.0	73	
CGMV-SBC-D201-0-0100	-			- 1		45.5	74.0	,,,	
(CRIST1ST Spit D., 400 ng/L Lab Sythe)	400	217	:ide	60	400	45.0	300	89	
CGMN-SBC-D201-DB-0100	1			1					
(COMMITTE Set E, 48 ng/L Lab Spile)	40	258	2:59	-	4	51.4	79.0	60	
CGMN-S8C-D201-D8-019D				1		•		_	
(C0001188 Spir F, 465 mg/L Lab Spike)	469	258	547	72	488	51.4	369	79	
CGMN-SBC-0201-0-0150	1 !			1	1				
(C0001130 Salt O, 40 Hgfl, Lab Syster)	**	5440	6000	.	44	2900	2940	•	
CGMN-SBC-D201-0-0150	i i			1					
(C0091189 Spit H, 409 ng/L Leb Spihe)	406	5440	7:250	.	455	2000	2480	•	
CGMN-SBC-D201-0-0200				Ì					
(COMELINA Bale I, 40 mg/L Lab Apillo)	46	2140	1906	•	40	877	566	•	
CGMN-SBC-D201-0-0200					ļ				
(Constitut Syst J. 100 mg/L Lab Spites)	400	2140	2180	-	480	077	1078	96	
CGMN-SBC-D201-0-0250									
(C0001191 Spk IC, 40 ng/L, Lab Spille)	44	635	B-19	•	40	580	546	•	
CGMN-SBC-D201-0-0250	400	635	1280	4					
(C0091191 Spit L, 400 ag/L Lat Spite )	400	430	128U	161	400	580	788	25	

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<sup>&</sup>quot;Sample residue excessés the apiking level atgriticantly (its spiking level); therefore, an accurate recovery value cannot be calculated ND = Not defected at or above 0.2 rayly (vert weight).

ND = Not querifficible = Measured concentration between 0.2 rayly (vert weight) and the Limit of Querifficible = Measured concentration between 0.2 rayly (vert weight) and the Limit of Querifficible (LOQ) which is 0.4 rayly NR = Not exported due to qualify control result failures.

Note: Elince this summary table above reunded results, receivery values may vary stightly from the values in the reun data.

Exygen Study No.: P0001400

Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

		CI	Sulfonnie PFC	15	Ci Acid PTOA				
Semple Description	Amouni Spiked (ngig)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)		Ant Found in Sample (ng/j)	Amount Recovered (ng/g)	Receivery (%)	
CGMN-8BC-D201-0-0300		İ			i				
(COORTTE2 Balk C, 44 ng/L, Luis Spille)	46	319	343	•	46	570	572	•	
CGMN-88C-D201-0-0500		l							
(CD481582 Spix B, 486 agril. Late Spite)	400	319	705	97	406	570	1020	113	
CGNN-88C-0201-0-0360 (CGNI 113 Spk S. 61 cg/L Lab Spha)	40	49.5	85.5	90	4	311	357	•	
CGNIN-SBC-D201-0-0350 (C8681182 Spx F, 409 inpl. Lab Sprint)	400	49.6	396	87	400	311	809	75	
CGMN-SBC-D201-0-0400									
(Cood:194 Spk G, 49 ng/L Lab Spite)	40	4.34	40.6	91	44	235	244	•	
CGMIN-SBC-D201-0-0400	l .	]			- 1				
(COCRETED Spit II, 400 mg/L Lab Spite)	400	4.94	356	58	481	235	520	130	
CGNN-SBC-D104-0-0000									
(COMMITTEE Spici, 40 mg/L Lab Spile)	40	NR	NR	NR	40	NR	NR	NR	
CGMN-SBC-D104-0-0000	1 (				- 1				
(Chief 1996 Spir 4, 486 ng/L Lab Syste)	400	NR	MR	NR	404	NR	NR	NR	
CGNN-SBC-0104-0-0050					- 1				
(COSS1166 Spk K, 66 ng/L Lab Splin)	48	748	1620		46	221	282	•	
CGMN-88C-0104-0-0060	1 1				i				
(C0001180 Sph. L. 400 mg/L Lab Sphirt)	400	746	1186	10:9	400	221	421	50	
CGMN-88C-D104-D8-0050	1 1				i				
(Coos1167 Spi. C. 46 ng/L. Lab Sphat	40	000	732	•	40	205	233	•	
CGMN-SBC-D104-DB-0060				Ì	(				
(C0001197 Spt. D, 400 capil. Lat) Spilos)	400	586	840	36	400	206	545	85	
CGMN-58C-D104-0-0100				1					
(Chep 1980 Spk E, 40 mg/L Lab Splint	40	364	458	•	49	1330	1520	•	
CGMN-SBC-D104-0-0100					- (				
(C0001100 Spit F, 400 mg/L Lab Spike)	400	364	796	108	400	1330	1920	•	
CGMN-SBC-D104-0-0150	1			ì					
(C0001100 Bate Q, 40 rapil. Lafe Spille )	44	99.2	158	142	40	4110	4820	•	
CGMN-SBC-D104-0-0150	1			1	- 1				
(C0001199 Spl. H, 400 ng/L Lab Spite )	420	89.2	450	88	400	4110	5010	•	
CGMN-S8C-D104-0-0200	1			i	- 1				
(Captible Spit I, 48 ng/L Lab Spite)	44	60.7	90.4	74	40	2070	2140	•	
COMN-58C-D104-0-0200					i				
(C0681209 Spt. J. 400 ng/L Lab Splin)	1400	50.7	414	58	400	2070	2580	•	
CGMN-88C-0104-0-0250									
(C0081361 Sph K, 48 mg/L Lab Splite )	-	94,4	121	57	48	1740	2020	•	
CGMN-SBC-D104-0-0250	i i				i				
(C0001301 Spit L, 406 mg/L Lab Spille )	406	94.4	436	28	400	1740	2760	•	
	ı f				1				

<sup>&</sup>quot;Sample residue accessor the spitting level algorificantly (2x spiking level): therefore, an accurate recovery value carriot be calculated NO = Not detected at or above 0.2 ng/g (wet weight).

NO = Not quantificate = Measured concentration between 0.2 ng/g (wet weight) and the Link of Calenthistion (LOO) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control nask failures.

Note: Since this summary table elever remained results, recovery values may vary alignity them the values in the raw data.

Exygen Study No.: P0001400

Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

		Ċs	Sulforate PFC	13			CS Acid PFOA	
Semple Description	Amount Spiked (ng/g)	Amt Found in Semple (ng/g)	Assount Recovered (ng/s)	Recovery (%)	Amount Spiked (ng/s)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGNN-38C-D104-0-0300 (C0001202 Spk C, 40 ngA, Lab Splin)	40	275	364	•	40	342	425	•
CGMN-SBC-D104-0-0300 (C9091212 Spik D, 490 spik Lab Spike)	400	275	710	109	400	342	717	94
CGMN-5BC-0104-0-0350 (C0081203 Selt 5, 40 egs. Lab Spilos)	40	177	214	•	40	191	237	•
CGNN-SBC-D 104-0-0350 (C0681203 Spk F, 400 ngf. Lab Spike)	400	177	fi42	91	408	191	546	86
CGA(N-SBC-I):104-0-0400 (C0001208 Balk Q, 40 mg/L Lafe Baffet)	44	122	150		44	60.9	112	128
CGNN-SBC-0104-0-0400 (C0081200 Spit N, 400 mg/L Lab Spike)	400	122	458	84	400	60.9	430	92
CGMN-SBC-D104-0-0450 (C008206 Spk I, 48 ag/L Lnb SpRm)	40	117	161	110	**	161	203	•
CGRN-SBC-D104-6-0450 (C001200 Spit J. 490 npft. Lab Spito)	400	117	467	88	480	161	498	84
CGMN-88C-0104-DB-0450 (C0001207 Bpt: K; 46 ng/L Lab Spike)	40	125	150		40	156	178	58
CGMN-SBC-D104-DB-0450 (0361207 Spit L, 486 mg/L Lab Spiles)	404	125	452	80	400	156	498	85
CCMN-SBC-D104-0-0500 (COUTING Spt C, 45 April Lab Spins)	44	86.4	114	€	44	356	360	
COMM-98C-0104-0-0500 (CHOS1206 Spl. D. 489 Agri. Lieb Spira)	404	88.4	454	92	480	355	714	90
CCMN-SBC-D104-0-0560 (C0001200 Spt. E. 40 ng/L LED Spike)	-	79.4	107	<b>59</b>	40	310	312	•
CCLINI-SBC-D104-0-0560 (CR01200 Bylk F, 400 syll-Lab Syllin)	400	79.4	474	99	400	310	633	81
CGMN-88C-0104-0-0800 (CRR1214 Spit G, 49 ngt. Lab Spite ) CGMN-SBC-0104-0-0800		127	140		-	178	784	•
(C0001216 Spk 14, 480 mgS, Lah Spike)	400	127	401	84	400	178	443	76
CGMN-SBC-D104-0-0650 (C0001211 Spk I, 48 splL Lab Splins)	40	129	1/10		40	138	167	•
(C0081211 20K 7' 406 URY 1'10 gbynd CCPNN-28C-0-104-0-0690	406	129	412	56	400	135	446	77
CGMN-SBC-0103-0-0000 (C0881212 Spk N, 48 ng/L Lub Splink)	40	73.2	105	80	40	11.9	36.4	66
CCMN1-6/8C-0-103-0-0000 (C2001212 Spik L, 400 ng/L Lab Spike )	480	73.2	3/6	81	400	11.9	318	77

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<sup>&</sup>quot;Sample residue exceeds the spliting level significantly (Sx spliting level): therefore ND = N tot detected at or above 0.2 right (well weight). NQ = N tot quantifiable = Measured concentration between 0.2 right; well weight) in NR = N tot reported due to qualify control result faitures. Note: Since this susementy table shows reported results, recovery values may

Exygen Study No.: P0001400

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

		CI	Suttonate PFC	9			CE Acid PFOA	
Sample Description	Amount Spiked (ng/p)	Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spited (ng/g)	Aret Found in Sample (ng/g)	Amount Recovered (ng/p)	Recovery (%)
CGMN-38C-D103-6-0050	i							
(C0081218 Spit C, 48 mg/L Lab Spike)	40	797	928	•	44	158	195	•
CGMN-SBC-C103-0-0050	-							
(C0011212 Spir D, 486 ng/L Lab Spire)	400	797	1110	78	409	158	488	83
CGMN-SBC-D103-0-0100	46	564	787		46	581	585	
(C0081214 Spk. E. 46 rgfl. Lab Spfler)	-	204	761			301	363	
CG&RN-SBC-D103-G-0100 (C0001814 Spit F, 400 spit, Lab Spike)	400	864	1220	59	400	581	10 <b>60</b>	125
CGMN-SSC-D103-0-0150								
(CBCB1215 Spit G, 46 ng/L Lat Spite)	#	215	242	- 1	40	2340	2210	-
CGMN-SBC-D103-0-0150 (C3081288 Siph H, 408 mg/L, Lob Spillon)	406	215	592	79	454	2340	2540	•
CGMN-SBC-D103-DB-0150				l				
4C0001216 Spk I, 40 ng/L Lab Splint	40	214	237	•	40	2310	2310	•
CGMN-SBC-D103-D8-0150								•
(C0091394 Spé.J, 400 ng/L Lah Spiles)	400	214	546	83	400	2310	2880	•
CGMN-SBC-D103-0-0200	1 1			l	ł			
(C0001217 Spit 1C, 40 ng/L Lab Spiller)	46	544	589	٠ ا	44	1340	1510	•
CGMN-SBC-D103-0-0200				[				
[C0001217 Spb. L., 400 mg/L. Lain Spillin]	400	844	518	86	400	1340	1560	•
CGMN-SBC-0108-0-0250				ļ	i			
(C1011271 Spt. C, 40 sg/L Lab Sprint	10	297	147	•	40	NR	NPL	NR
CGMN-\$8C-0103-0-0250					- 1			
(C0081219 Spk D, 480 ng4, Lab SpRe)	400	297	593	99	400	NIR	NR	NR
CGMN-SBC-D103-0-0300				1	I			
(Cott 1230 Spt E, 46 ng4, Lab Splin)	##	210	283	- [	40	142	201	•
CGMN-58C-0103-0-0300				]	Į			
(C9911229 Spk.F., 490 ng/L List Spk.e)	408	210	354	86	400	142	442	75
CGMN-SBC-D103-0-0350				ļ	-			
(CBBP1321 Spin G), 49 ng/L Lab Spile )	40	322	371	•	48	51.4	104	107
CGMN-SBC-D103-0-0350	400	322	810	72	400	81.4	362	73
(COSH1225 Spic H, 400 mg/L Lab Spiller)	-	322	810	- "		81.4	302	/3
CGMN-9BC-D103-0-0400	1							
CS9811222 Spic 1, 40 Ag/L Lab Spills	44	350	370	•	40	110	138	70
CGMN-38C-D103-0-0400	408	350	615	67	400	116	415	76
(C0001722 Spik J., 408 ag/L Lab Spike)		3531	O ID	٠,	~~		410	
CGMN-58C-D109-0-0450								
(C0001236 Stok K. 46 mpf. Lab Salin )	46	190	238	• 1	44	81.8	115	<b>8</b> 1
CGMN-SBC-D193-0-0450	488	190	527	84	400	81.6	407	â1
(C0601236 Spk.L. 400 ag/L Lab Spile )		190		· -		31.0		

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<sup>\*</sup>Sample revolve exceeds the epiding level significantly (3x epiding level); therefore, an accurate recovery value cannot be calculated NO = Not detected at or shows 9.2 rigig (wet weight).

NO = Not quantifiable = Measured concentration between 0.2 rigig (wet weight), and the Limit of Quantifiable = Measured concentration between 0.2 rigig (wet weight), ARR = Not reported due to quality control result failures.

Nete: Stace this someway table enteres rounded results, recovery values way value stightly from the veloces in the ziew deta.

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

		CI	Sulfonata PFO	46			CE Acid PFOA	
Sample Description	Arbouat Spiked (ng/g)	Aret Found in Sample (ne/s)	Assoure Recovered (Hg/g)	Recovery (%)		Amt Found In Sample (ng/g)	Arnount Recovered (ng/g)	Recovery (%)
CGMNL-SBC-D 103-0-0600 (C0001238 Spk C, 40 ng/L Lab Spile)	44	171	.221	•	44	52.1	103	127
CGMN-SBC-D103-0-0500 (C0081238 8ph D, 406 spl., Lab Splin)	400	171	495	81	400	<b>52.</b> 1	396	85
CGMIN-SSC-0183-0-0550 (C0081239 Spk E, 40 agrt. Lab Spille)	40	112	1 <b>50</b>	95	40	154	192	٠
CGMN-SBC-D103-6-0550 (C0001239 Sph F, 440 ngf. Lab Spha)	400	112	477	91	400	154	508	89
CGMN-SBC-D103-0-0800 (CB081248 State G, 48 np.). Lab Relied	40	184	209		44	158	192	*
CGAM-SBC-D105-G-0800 (C0401246 Spit 11, 440 right, Lab Spiting)	486	184	515	83	400	158	482	81
CGMN-SBC-0103-0-0850 (C688341 Spir I. 40 rept. Lab Spilos)	44	244	314		44	180	222	•
CGMN-58C-D103-0-0850 (C9861341 Spit J, 486 mg/L Lab Spites)	400	244	630	97	400	160	522	91
CGMN-58C-D601-0-0000 (C0001248 Spic K, 49 ag/L Lab Spillin)	40	482	702		#	136	169	•
CGMN-SBC-D801-0-0000 (C901249 Spit L, 495 spit Liab Spite)	400	462	1900	155	496	138	437	75
CGMN-98C-D601-0-0080 (COUTEM Spit C, 49 ng/L Lab Spille)	40	411	458	. ]	44	217	320	•
CGMN-SBC-D801-0-0080 (C9091248 Bpk D; 486 mpt. Lab Spine)	400	411	7/90	87	404	277	568	78
CGMN-SBC-D501-0-0100 (C0001200 Spt 6, 40 rept. Lati Spille)		424	410	-	40	352	330	
ĆGMN-SBĆ-D601-0-0100 (C001289 Spt F, 499 ng/L Lub Splin)	400	424	548	56	<b>100</b>	352	562	53
C/GMN-88C-D601-0-0150 (C0081281 Sph D, 48 npt. Let Spile )	-	213	Z:* <b>*</b>	.	46	65.9	122	140
CGMN-SBC-D801-0-0150 (CROMSET Byte H, 488 ngst. Leis Spales)	400	213	578	94	480	65.9	450	23
CGMN-SBC-0801-0-0200 (C0001202 bpt: I, 40 mpf. Late Epito)	40	304	2!0		44	158	130	•
CGMN-SBC-D801-0-0200 (C0001202 8pt 4, 400 mg/L Lub Sprint)	490	304	817	78	400	158	470	78
CGMN-SSC-D101-0-0000 (C6081574 Sok X, 48 ng/L Lab Salke )	49	38.9	88.4	74	4	4.82	35.2	78
CGMN-SBC-D101-0-0000 (C0001270 Spit L, 445 ng/L Lab Spitus)	200	38.5	361	81	400	4.82	326	80
	Z							

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<sup>&</sup>quot;Sample residue exceeds the spliting tevel significently (Sx apiking level); therefore, an accurate recovery virtue cannot be calculated

NO = Not detected at or above 0.2 ng/g (wat weight).

NO = Not quantifiable = Measured concentration between 0.2 ng/g (wat weight) and the Limit of Cuantifiation (LOC) which is 0.4 ng/g (wat weight).

NR = Not reported due to qualify control result faithres.

Note: Singe this summany table shows rounded results, recovery vistues may vary eligibly from the values in the saw date.

Exygen Study No.: P0001400

Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

		cı	Sulfonate PFC	18			CE Acid PFOA	
Sample Description	Amount Spiked (ag/g)	Ant Found in Sample (ng/p)	Amount Recovered (ng/s)	Recovery (%)		Aint Found in Sample (ng/s)	Amount Recovered (ng/g)	Recavely (%)
CGMN-SBC-0101-0-0050 (CHOST2TS Spit C, 49 right, Late Spiring	44	41.0	74.7	84	40	52.4	50.5	43
CGMN-SBC-D101-0-0050 (CMM1275 Spb. D. Abb ngš. 1 ab Spille)	400	<b>4</b> 1 0	404	91	400	52.4	398	86
CGMN-SSC-D101-0-0100 (C9091277 Bok E, 42 ropt, Lub Sprine)	40	61.7	104	106	40	171	209	•
CGIAN-SSC-0101-0-0100 (C6081277 Spix F, 460 ng/L, Latr Splin)	400	61.7	412	88	402	171	494	81
CGMN-SSC-D101-DS-0100 (C6661278 Spik G, 48 ng/L Lub Spille)	44	65.4	92.0	67	48	182	195	
CGN94-SBC-D101-DB-0180 (C0001279 Spit H, 400 right Lab Spite)	400	65.4	425	89	400	182	494	78
CG4/FN-385C-01D1-0-0150 (C#881279 Bpk L 44 ng/L Lab Splint)		65.7	96.0	78	44	24.5	58.1	70
CGMN-SBC-D101-0-0150 (C081279 Spk J. 499 ng/L Lub Spille)	400	65.7	406	85	459	24.5	<b>37</b> 1	87
CGMH-SBC-D101-0-0200 (C0001200 Spin N, 40 mg/L Lab Spins)	44	37.2	85.3	70	44	18.9	51.9	83
CGMN-SBC-D101-0-0200 (C0081206 Spl. L, 460 mg/L Lub Spline)	400	37.2	384	87	400	18.B	386	87
CGARN-SBC-D102-0-0000 (C0001291 Spk C, 49 ng/L Lab Splint)	44	NR	<b>N</b> IR	NPL	40	ŊR	NR	NR
CGMN-88C-D102-0-0000 (C0001281 Suit D, 469 Ag/L Lab Spille)	400	NR	NF	NR	450	NF	NR	NR
CGM/N-SBC-D102-0-0050 (C0001212 Spk E, 49 ng/L Lab Spike)	44	353	388		44	696	706	•
CGMN-SBC-D102-0-0050 (C001222 Spic F, 400 ng/L Lab Spike)	400	353	696	86	400	596	1050	56
CGMN-8BC-D102-0-0100 [C0000000 544 0, 49 Not. Link Spring ]	-	121	151		40	658	626	•
CGMN-SBC-D102-0-0100 (CHRETZBE Spt H, 400 right Lab Spine)	436	131	457	82	400	658	1040	96
CGMN-SBC-D102-0-0150 (C6081294 Spk.L 49 Apřil List Spitul)	44	33.6	66.4	80	40	114	138	<b>5</b> 0
CGMN-SBC-D102-0-0150 (C0001284 Spit J, 489 ng/L Leb Spilos)	400	33.8	383	87	400	114	461	87
CGMN-SBC-D102-9-0200 (C0001205 Spt. K, 4h ngl. Lisb Spiller)	40	248	250		44	126	153	
CGMN-SBC-D102-8-0200 (Coorces Spk L, 465 ng/L Lets Spike )	406	248	562	79	450	128	486	90
	1 1							

<sup>&</sup>quot;Sample residue exceeds the spiking level algnificantly (5k spaking level); therefore, an accurate recovery value cannot be calculated NO = Not detected at or above 0.2 roys (wat weight), NQ = Not quantifiable = Measured concentration between 0.2 roys (wat weight) and the Limit of Quantifiable = Measured concentration between 0.2 roys (wat weight) and the Limit of Quantifiable = Not reported due to qualify control result failures.

Note: Since this extension table is how a rounded results, recovery values may vary signify from the values in the new date.

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Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

	C8 Sulfonate PFOS							CB Acid PFOA			
Sample Description	Ameunt Spiked (ngip)	Amt Found in Sample (ng/g)	Junount Recovered (nois)	Recovery (%)		Ant Found in Semple (ng/g)	Amount Recovered (ng/g)	Recovery (%)			
CGMN-S5C-B15D1-0-0000 (C66B1342 Sph C, 45 ng/L Lab Sphu)	40	550	810	•	40	NR	NR	NR			
CGMN-SBC-B1501-0-0000 (CHR1342 Spk D, 460 ngs. Lab Spite)	400	550	580	83	460	NR	NIR	NR			
CGMN-SBC-B1501-0-0050 (C0081345 Spk E, 44 ng/L Lati Splin)	44	160	200	•	44	162	186				
CGMN-88C-81501-0-0050 (C001345 Spit.F, 400 ng/L Lab Spita)	400	160	471	78	401	182	487	78			
CGMN-98C-81501-0-0100 (C001344 Spix G, 40 ng/L Liph Sythin)	46	90.2	123	80	40	181	198	•			
CGMR-SBC-B1801-0-0100 (CH81304 Spk H, 400 mpf, Lat Splin)	400	99.2	428	82	494	181	486	71			
CGMN-SBC-81501-0-0150 (C0001345 Spit i, 45 mp/L Lab Spito)	40	NR	NR	NR	40	83.2	124	102			
CGMN-SBC-B1501-0-0150 (C6061845 flok J. 460 me/L Lab Sotte)	400	NR	NR	NR	400	83.2	406	81			
COMIN-SBC-B1501-0-0200 (COM1346 Spb N, 46 mg/l, Lab Spilet	46	1790	2030		40	74.4	134	149			
CGMN-86C-81501-C-0200 (C0001348 Sph L, 400 mg/L Laik Sprint)	400	1706	2040		400	74.4	418	85			
CGMN-S8C-D501-0-0008 (CRM1242 Spit C, 49 agrt. Lath Spites)	40	2160	1980		44	960	1010	•			
CGMN-SBC-D501-0-0000 (CDRFT342 Spit D, 486 Agil, Lab Spite)	403	2180	2432	-	460	960	1850	173			
CGMN-SBC-D501-0-0050 (C801243 Sph & 46 mgA, Leb Sphie)	44	549	650	.	40	1120	1030	•			
CGAN-SEC-0501-0-0050 (C801245 Spk F, 460 mg/L Lab Spillin)	400	649	1(140	98	101	1120	1350	58			
CGLIN-SBC-D501-DB-0060 (CRESTING SINE O, 40 Page Line Spring) CGLIN-SBC-D501-DB-0050	44	754	681	.	40	1080	960	•			
(C0001244 Spit H, 400 ng/L Lair Spite )	404	784	978	58	400	1060	1250	44			
CGMN-SBC-D501-0-0100 (C0001248 Spit L-40 hyrt. Lub Spikus)	44	549	630	.	46	283	298	•			
CGRIN-SBC-0501-0-0100 (C0001346 Spit J, 400 ng/L Lab Spitu)	400	549	10 <b>8</b> @	108	400	285	599	79			
CGAIN-SBC-0501-0-0150 (C0001346 Spin K, 46 mp/L Lab Spine)	40	44.7	72.0	58	40	39.5	74.6	88			
CGNN-9BC-0501-0-0150 (C0001246 Solt L, 480 April Lab Spilio )	400	44.7	360	86	400	30.5	408	92			

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<sup>&</sup>quot;Sample residue exceeds the apilong level significantly (bx spiking level); the ND = Not detected at or shows 0.2 riging (wet weight).
ND = Not quartificable = Measured concernsion between 0.2 riging (wet weight).
ND = Not reported due to quality control result features.
Note: Since this exerument table shows rounded results, recovery values.

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Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

	Amoun	CI t Ant Found	Sulfonate PF( Amount	)S	Amoun	Amt Found	CB Acid PFOA Amount	
Sample Description	Spiked (ng/g)	in Sample (ng/g)	Recovered (ng/g)	Recovery (%)		in Semple (ng/g)	Recovered (ng/p)	Recevery (%)
CGMN-S8C-0501-0-0200	1							
(COORCIAT Spik C, 40 mg/L Linb Spiting)	43	27.9	84.5	92	40	195	51.8	<b>A</b> F
CGMH-SBC-D501-0-0200	i					]		
(C9901247 Sok D, 460 mg/L 1.mh Spille)	400	27.9	338	78	400	19.5	350	83
CGMN-SBC-FTAC2-0-0000	1	i						
(CODE1252 Blok E, 44 mg/L Lab Epilin)	44	318	316	•	44	7.97	41,4	84
CGMN-SBC-FTA02-0-0000		Į.						
(C0401263 Opic F, 400 mg/L Lab Stylin)	400	318	534	54	400	7.97	312	76
CGMN-SBC-FTA02-0-0050	1	l						
(COORTZEA Saik G. 49 no/L Lab Salba)	44	44.4	80.8	91	44	1.98	39.0	93
CGMN-SBC-FTA02-0-0050	1					-10-2		-
(C8061384 Spir 14, 458 mg/L. Lab Spilos)	460	44,4	374	82	404	1.95	346	88
CGNN-SBC-FTA02-DB-0100	1			İ				
(Cast:1259 Spt. ), 40 ng/1. Lat Spttoj	1 40	10.9	44.0	83	امد	1.52	37.7	**
CGMN-SBC-FTA02-08-0100	1 "		***	~	_	1.02	34.3	90
(CDM138F Spk J. 406 ng/L Lab Spine)	496	10.9	359	87	400	1.52	363	86
CGMN-88C-FTA02-0-0100	1			ı	- 1			
(CONTERN Spirit C, 40 mg/L Lab Spirint	40	11.0	51.4	99	40	1.76	47.4	-04
CGMN-SBC-FTA02-0-0100	1 -		31.4		-	1.70	43.4	104
(Case) 280 Bpt L., 400 ng/L Lat Spine)	400	11.0	364	88	408	1.76	362	90
	`		•	~	***	1.70	302	AN)
CGMH-SBC-FTA02-0-0150	1 1			Ì				
(CHANTSAY Spit C, 40 mg/L Link Spitus)	40	16.9	52.9	90	40	3.78	41.4	94
CGMN-SBC-FTA02-0-0150	} {				j			
(C9881257 Spk D, 498 ag/L Lab Splin)	400	18.9	343	82	400	3.76	343	85
CGMN-SBC-PTAG2-0-0200	1 1			1	f			
(C8061258 Spk E, 46 ngft, Lab Spike)	40	15.4	48.7	8.3	44	4.94	40.6	89
CGMN-SBC-FTA02-0-0200				Ì				•
(C0001258 Spk.F, 486 ng/L Lub SpRu)	486	15.4	349	83	400	4.94	326	80
CGMN-SBC-FTA03-0-0000				1	- 1			
(C0001259 Spir 6, 40 rept. Lab Spite; )	-	739	004		40			
CGMN-SBC-FTA03-0-0000	-			- 1	- (	301	342	-
(C0001255 Spik H, 400 og/L Lab Spike )	406	799	968	37	400	361	662	73
CGMN-SBC-FTA03-0-0100	1			Î				
CCMM1-SSC-PTAD3-U-0100 (CMM1380 Spb L, 46 april Lab Splin)	40	12.0	54.5	106				
CGMN-SBC-FTA03-0-0100		12.0	34.5	100	40	58.5	98.4	105
(C3081289 Spk.J, 400 ng/L Lab Epike)	400	12.0	375	B1	400		***	
* · · · · · · · · · · · · · · · · · · ·		14.4	3/5	•"		56.5	300	85
CGMN-SBC-FTA03-0-0100				- 1	- 1			
(C3661282 Bpk IC, 46 ng/L Lafs Spiles)	40	1.74	40.2	<b>26</b>	**	14.4	54.0	96
CGMN-SBC-FTA03-0-0100	ĺ			i	1			
(C1661362 Spà L, 406 ng/L Lab Spiler)	408	1.74	354	86	406	14.4	364	17
				1	ł			

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<sup>&</sup>quot;Sample necture exceeds the aptiming level arginificantly (5x apixing tevel); therefore, an accurate recovery veiue cannot be calculated NO = Not detected at or accive 0.2 ng/g (wet weight).

NO = Not quantificate = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantification (LDQ) which as 0.4 ng/g (wet weight) and the Limit of Quantification (LDQ) which as 0.4 ng/g (wet weight).

NO = Not quantificate = Measured concentration tevels facilities.

Note: Since this assumestry table shows rounded results, recovery values may vary eligibily from the values in the value in the value.

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Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

		Ca	Suifosain PFC		CE ACM PFOA				
Sample Description	Amount Spiled (ng/g)	Arnt Found in Sample (ng/s)	Amount Recovered (eg/g)	Recovery (%)	Amount Spiked (Agig)	Amt Found in Sample (ngig)	Amount Recovered (ng/g)	Recovery (%)	
CCMN-SBC-FTA03-0-0150 (C0001203 Stylk C, 40 rept, Link 8 pliks)	40	1.21	\$4.7	84	46	4.50	37,8	63	
CGMN-SSC-FTA03-0-0150			****						
(C0801263 Set I), 400 agr. Lab Selbel	400	1.21	331	82	445	4.50	348	85 .	
CGMN-SBC-FTA03-0-0200									
(CANDICAL) Spit S. 46 mg/L Lain Syllin)	40	1.48	34.4	82	40	130	202	•	
CGMN-68C-FTA03-0-0200									
(C0081384 Sph. F, 466 mg/L Lab St/No.)	400	1.46	321	80	440	130	423	73	
GGMN-SBC-FTA01-0-0000	1								
(C0001200 Spk G, 40 ng/L Lab Spille)	40	NR	MR	NR	46	154	139	•	
CGMN-SBC-FTA01-0-0000						304		**	
(C0001366 Spt 14, 400 rept. Lab Spille)	400	NR	NR	N/R	400	154	414	65	
CGMH-98C-FTA01-0-0050				}	j				
(C0001270 Suit I, 48 ng/L Lab Spito)	40	72.6	101	71	**	43.4	72.5	73	
COMM-SBC-FTA01-0-0080					I				
(C0001276 Spx J, 406 hgd, Law Spide)	400	72.6	365	81	400	43.4	390	87	
CGMN-8BC-FTA01-8-0100				ĺ					
(CHOR1371 Spir IV, 48 agt. Lab Spika)	40	20.4	53.4	83	-	16.0	46.9	77	
CGMN-SBC-FTA01-0-0100	1 1								
(C0081371 Spt L, 455 agt. Lab Sptbs)	400	20.4	363	83	406	18.G	344	82	
CGMN-SBC-FTA01-0-0150	1				l				
(COCH 172 Sph. C. 46 mg/L Lab Sphro)	40	22.5	57.4	87	40	33.5	<b>\$3.2</b>	124	
CGMN-S8C-FTA01-0-0150	1 1			]	- 1				
(C0001272 Set D, 498 ng/L Lah Spille)	400	22.5	355	53	400	33.6	386	58	
CGWN-\$8C-FTA01-0-0200	1	•		i	i				
(GROSS Spin &, 40 ng/L Lob Spilin)	-80	80.0	102	56	40	MR	NR	NR	
CGMN-88C-FTA01-0-0200	1			1	- 1				
(CDB81 273 Spit F, 460 ng/L Lab Spite)	400	80.0	371	73	408	NR	NA	NR	
CGMN-SBC-V/PA01-0-0000	1 1			1					
(C0041379 Spk G, 49 ng/L Lab Spile )	40	110	115	13	+6	27.8	53.2	94	
CGAPL-99C-WPA01-0-0000	l I								
(CG081336 āpt H. 400 ngš. Lab Splin )	400	110	365	61	400	27.8	310	73	
CGMN-SBC-WPA01-6-0050									
(COOF1330 Set L 40 neft Lab Epite)	40	36.6	60.3	59	40	16.8	48.1	78	
CGMN-SBC-WPA01-0-0050					1				
(C8081308 Eak J. 400 ng/L Lab Statho)	400	36.6	370	83	400	16 8	374	89	
CSMN-88C-WPA01-0-0100	i I			- 1	- 1				
[C0081331 Spk K, 46 mpl, Lab Spice ]	40	57.8	78.2	52	40	19.0	52.2	82	
CGMN-58C-WPA01-8-8100								_	
(C0001331 Bpt. L. 410 apř. Lat: Spille )	400	<del>5</del> 7.6	418	90	400	19.5	406	97	

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NOT — Not detented at or stored 0.2 aggs host weight.

NO = Not quantifable = Measured concentration between 1
NR = Not reported due to qualify control result failures.

Note: Since this contrary table shows reunded results,

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

			CB Acid PFOA Amount					
Strepts Description	Amoun Spiked (ng/gi	t Amt Found in Sample (ng/g)	Amoset Recevered (ng/g)	Recovery (%)		in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-WPA01-DB-0100								
(C0081332 Spit C, 40 ngd. Lab Spitus	40	44.2	94.4	126	40	12.7	48.1	89
CGMN-SBC-WPA01-DB-0100	_			120	"	12.1	40.1	80
(CR061332 Spit D, 466 ngA_Lab Aprillar)	400	44.2	385	85	400	12.7	347	84
CGMN-SBC-V/PA01-0-0158 (C8801333 Spt B, 45 agd, Lab Splin)	40	702	620		40	24.2	52.7	71
CGMN-SBC-WPA01-0-0150 (C4061233 8pk F, 409 mgf. Lab Spilos)	400	702	988	67	400	24.2	123	75
CGMN-88C-WPA01-0-0200		1			İ			
(C0001334 Spix G, 40 mp/L Lab Sothe)	40	NR.	NR	NR	48	NR	NR	
CGMN-SBC-WPA61-0-0200	<b>T</b>	141	MA	nin.		NIFE	NH	NR
(C0051334 Selt H. 466 mg/L Lab Sp8in)	400	MR	NR	NR	444	NR	NR	NR
CGMN-SBC-BKG01-0-0000								
(CODELIZE Both I, 46 right Lab Spline)	41	0.576	39.3	87	40	0.494	31,4	77
CGMN-35C-8KG01-0-0000								
(CAND1216 Bot J. 400 ng/L Lato Selled	460	0.578	354	88	400	0.494	390	77
CGMN-SBC-8KG01-0-0050								
(C0001330 Spin K, 46 ngd. Lab Spilled	44	NQ	34.2	86	44	0.731	32.9	80
CGMN-88C-5KG01-0-0050								
(Cediffs36 Spk L, 460 nplL Lab Sphill)	100	NQ	340	65	401	0.731	318	79
CGMN-SBC-8KG01-0-0100				;	1			
(CONSTRUCT Spk C, 40 mgs. Lab Spins)	40	NO	35.4	88	40	9.470	35.9	89
CGMN-98C-BKG01-0-0100				1	- 1			
(CDMF133H Spit D, 404 HgH, Lata Spitus)	400	NID	310	78	***	0.470	322	80
CGMN-SBC-8KG01-DB-0100					}			
(COMITATO Spix E, 49 April Lab Spike)	<b>**</b>	ND	32.6	82	48	0.598	32.5	80
CGMN+88C-8KG01-DB-0100	1 1			ì	İ			
(CBS07330 Spit F, 480 ng/L Lais Spite)	400	ND	327	62	400	0.598	334	43
CGMH-SBC-BKG01-0-0150								
(C1091340 State Ct. 40 rept. Late Spine )	#	NED	34.3	86	48	NQ	34,1	85
CGMN-SBC-BKG01-0-0150					1			
(C0001345 Spk H, 400 ng/L Lab Spike )	400	ND:	339	85	400	NQ	348	87"
CGMN-SBC-BKG01-8-0200				ŀ				
(CSCS1541 Spit L 40 mg/L Lats Spitus	40	MO	35.4	89	40	0.648	36.0	98
CGMN-SBC-BKG01-0-0200	1 1							
(C0021541 Spt. J. 400 ng/L Lab Spilm)	403	KO	350	88	400	0.848	356	89
CGMN-59C-3XG02-0-0000	lí							
iCHICLAT Sek IC, 48 self. Lab Selie 3	44	1.90	34.7	82	40	NQ	34.8	87
CGMN-SBC-BKG02-0-0000				1	j			
(C00011947 Spic L, 400 spil. Lub Spiles )	480	1.90	340	85	400	NQ	318	80

<sup>&</sup>quot;Sample residue exceeds the splitting level algorificantly (3) apriling level); therefore, an accurate recovery value cannot be extinuted ND = Not delected et or above 0.2 rigig (wet weight).

NO = Not quantificate = Measures concentration between 0.2 rigig (wet weight) and the Limit of Quantistion (LOQ) which is 0.4 rigig (wet weight).

NR = Not reported due to qualify control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the risw data.

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Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

			CS Acid PFOA	<b>A</b>				
Sample Description	Ameun Spiked (ng/g)	Amt Found in Sample (ng/s)	Amount Rucovered (ng/s)	Recovery (%)		t Amt Found in Santple (ng/g)	Amount Recovered (ng/g)	Recovery {%}
CGMN-88C-EKG02-0-0050	1			_	[			
(CONSISSE Spik C, 40 mg/L Laty Spilling	44	NO	34.0	85	40	NG.	34.1	85
CGMN-SBC-BKG02-0-0050						ļ		
(COOS1348 Spit D, 400 mg/t. Luth Sythet	400	NO	312	78	410	NO	319	86
CGMM-SBC-BKG02-DB-0100 (CMM1340 Sph E, 40 right Lab Splint)	40	ND	34.5	86	40	NQ.	35.7	89
CGMN-SBC-BKG02-DB-0100	1 :				Í	l		
(COMP1340 Spik F, 460 mg/L, k.oto Spiko)	400	ND	334	84	480	NO.	345	86
CGMN-85C-5KG02-0-0100								
(C8081389 Sgit G, 40 agril Lab Spiles)	40	NEO	33.4	85	40	NO	34.6	27
CGMN-SBC-BKB02-0-0100						i		
(C9061255 Spit H, 405 ng/L Lab Spite)	400	ND	330	83	400	NG	330	83
CGMN-58C-8KG02-0-0150				1				
(CHIMISM Spiri, 40 rept. Lab Spilled)	40	ND	35.4	90	40	0.589	35.5	87
CGM9N-\$8C-BKG02-0-0150				į		•		•
(CORTSET Spk.), 400 mg/L Lab Spile)	400	ND	326	82	400	0.589	319	80
CGAIN-SBC-BKG02-0-0200					į			
(COSE SEE Spit St, 40 mgs. Lab Spite)	44	NO	34.0	85	40	0.888	35.9	88
CGMN-SBC-BKG02-0-0200	1 1			1	- 1			
(C0001362 Spk.L, 400 mg/L, Lab Spike)	480	ND	316	79	490	D.888	337	84
CGMN-85-8KG01-0-0000	1 1				J			
(GREET 252 Spt.C, of ngs. Lab Spite)	40	13.0	43.5	76	40	277	35.3	81
CGMN-53-8KG01-0-8000	1 1				- 1		•••	٧.
(C0081348 Sph D, 400 ng/L Lab Spile)	400	13.0	292	70	400	2.77	306	76
CGMN-88-8KG01-0-0005	1 (				Ī			
(CORF1284 Sph E, 49 ngt, Lab Sprint)	**	7.29	30.0	82	40	3.05	36.3	£3
CGMN-85-BKG01-0-0008				-	-	J.55	<b></b>	L.J
(COLE1384 Spt. F, 400 ngS. Lat: Spite)	409	7.29	130	81	608	3.05	326	81
CGMN-SS-D601-0-0000	1 1				1			
grave 1356 Spc G, 40 ngs, Lat. Spine )	44	38.2	65.4	68	44	13.0	41.0	103
CGMN-SS-D601-0-0000						-0.0	41.5	,003
(Chief 1986 Sale H. 400 mg/L Lak Spline)	100	36.2	278	60	480	13.0	266	67
CGMN-85-0601-0-0005	1 1			Į	į			
(Cellett 200 Spit i, 40 ng/l, Lab Spite)	44	33.1	67.6	85	44	21.5	48.1	62
CGMN-\$3-0801-0-0005					- !		70.7	_
(COOR1366 Spit J <sub>1</sub> 466 right Lab Spitis)	400	33.1	312	70	400	21,5	304	71
CGMN-85-D601-D8-0005				]	1			
(C001197 Spk K, 48 np/l, Lab Spike )	40	33.8	51.6	63	44	24.0	50.2	128
CGMN-SS-0801-08-0005	_			33	_	4 H	JU.2	1.00
(C0004167 Spir L, 408 ag/L Lab Stribe )	400	33.8	<b>3</b> 16	71	480	24.9	307	77
				i	1		·	

<sup>&</sup>quot;Bampie residue exceeds the apticing level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated ND = Not described at 0' shows 0.2 rigid (wat weight).

NO = Not quantification Assessment concentration between 0.2 rigid (wat weight) and the Limit of Quantification (LOO) which is 0.4 rigid NR = Not reported due to qualify control result failures.

Note: Since this summany state shows reunded results, recovery values may vary eligibily from the values in the risw data.

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Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

			Sulforate PFC		CS Acid PPOA				
Sample Description	Amous Spiked (ng/g)	in Sample (ng/a)	Amount Recovered (ng/g)	Recovery (%)		in Sample (ng/g)	Amount Recovered (ng/p)	Recovery (%)	
COMPLETE BATTOM II DODGO	T							سطفاهي ا	
CGMN-SS-810201-0-0000 (CR01365 Spit C, 46 rept. Lab Robbs)	4	25.8	51.7	85	45	1.75	34.6	82	
CGMN-SS-810201-0-0000	-		31.7	90		1.53	34.6	42	
(COORT 300 Spit II), 400 ng/L Lab Spite)	400	25.8	342	79	400	1.73	366	91	
CGMN-85-610201-0-0005 (C1981306 Bolc E. 40 rept. Leb Solite)	40	71.0	97.6	67	40	1,22	<b>35.1</b>	85	
CGMN-35-810201-0-0005	1				_		<b>55</b> . 1	•	
(C000) 206 Spic F, 400 mg/L Lab Spiling)	400	71.0	435	91	400	1.22	354	88	
CGMN-SS-82201-0-0000	1								
(CROS1367 Spit G, 46 mg/L, Lati Spine)	40	2.22	37.7	80	40	0.754	37.3	91	
CGMN-\$5-82201-0-0000				ł					
(COME 1367 State H, 400 mg/L Linto Syntheti	400	2.22	373	83	400	0.754	374	93	
CGMN-65-82201-0-0005									
(C0861396 Spix L 40 ng/L Lab Spine)	44	16.2	57.8	104	44	1.49	40.3	97	
OGMN-55-82201-0-0005									
(CD481868 Spk J, 400 mg/L, Lab Spills)	489	16.2	320	93	400	1.49	377	94	
CGMN-S\$-82201-DB-0006				ſ	- 1				
(C300/395 Spx K, 40 ngA, Lab Spine)	40	15.5	45.8	83	40	1.79	37.2	86	
CGMM-53-82201-08-0006 (C00011000 Spit L. 400 ng/L Lab Spito)	400	15.5	375	90	400	1.79	378	94	
CGMN-88-B2501-0-0000	1 1				ſ				
(C8081379 Sex C, 40 ng/L Lab Zelini)	40	473	546		40	50.6	97.6	116	
CGMN-89-B2601-0-0000				1	- 1				
(Code 2179 Spit D. 406 mg/L Lab Spike)	404	473	920	112	400	50.6	436	98	
CGMN-65-82601-0-0006									
(C0091371 Sgt E, 40 ngd, Lab Spile)	40	91.2	139	120	49	37.0	75.9	97	
CGMN-SS-82501-0-0008	1 [			ŀ	- 1				
(CROFTS71 Spk P, 400 ng/L Lab Spike)	490	91.2	458	92	400	37.0	386	67	
CGMN-SS-B2601-0-0006					- 1				
(C1001372 Spt.C), 40 ng/L Lais Byille )	40	67.3	101	54	40	10.2	48.0	95	
CGMN-SS-B2601-0-0000									
(C0561372 Spk H, 466 ng/L Lab Splin )	400	67.3	451	96	400	10.2	417	102	
CGMN-88-B2501-0-0005				- 1					
(C0001373 Spk i, 40 ng/L Lab Spila)	40	418	334	•	40	17.7	50.2	81	
CGMH-SS-B2601-0-8008									
(C0081373 Spk.J, 400 sg/L Lab Spike)	408	418	770	<b>8</b> 8	400	17.7	365	92	
CGMN-SS-81802-0-0000				1					
(COMITS/S Spk K, 49 ng/L Lab Spite )	49	169	162	•	40	4.52	36.1	79	
CGMN-SS-B1802-0-0000		445							
(C0001375 Sph L. 400 mp/L Lab Softer)	440	146	498	87	400	4.52	338	83	

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<sup>&</sup>quot;Sample review exceeds the epiting level algoritomity (its spiking level): therefore, an accurate accounty value cerved be calculated ND = Not obsected at or above 0.2 ng/g (wat weight).

NO = Not operative = Measured concentration between 0.2 ng/g (wat weight) and the Limit of Quantitation (LOQ) which as 0.4 ng/g (wat weight).

NR = Not exential due to quality control result failures.

Note: Since this summany table shows rounded results, recovery values may vary allightly from the values in the rew data.

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

		CI	Sulfonate PFC		C8 Acid PFCA			
Sample Description	Amount Spiked (ng/g)	h Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)		Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B1602-0-0005 (C6881878 Rpt C, 46 rppl. Lub Rpline)	40	262	294	•	40	72.7	112	98
CGMN-SS-B1602-0-0006 (C0081979 Spik D, 400 mg/L Lab Styllio)	480	262	568	82	440	72.7	418	86
CGMN-SS-B11201-0-0000 (C001377 Spk E, 49 ng/L Lub Spille)	44	52.7	76.8	60	40	6.48	39.0	81
CGMN-SS-B11201-0-0000 (C0081377 Spk F, 400 mg/L Lab Spille)	400	52.7	370	79	408	6.48	328	50
CGMN-SS-B   1201-0-0005 (C0001375 Rph G; 46 mg/L Lab Spiles)	40	13.1	41.3	71	40	2,82	35.5	82
CGRAN-SS-511201-0-3006 (CRRS1578 Spit H, 406 ng/L Lab Spite)	489	13.1	362	67	409	2.82	350	57
CGMN-88-FTA01-0-0000 (C8081378 Spiri, 49 ngs, Lab Spira)	481	32.4	59.4	58	40	3.31	32.8	74
CGANN-SS-FTA01-0-0000 (C8061378 Spit J. 400 ng/L Lab Spites)	400	32.4	321	72	409	3.31	266	71
CCMIN-SS-FTA01-0-0006 (C0061380 Belt R, 40 Ag/L Lab Spile)		28.2	83.0	87	*	1.98	340	80
CGMN-SS-FTA01-0-0005	400	28.2	376	87	490	1.98	331	82
CGMN-SS-FTA01-DB-0008	_		***			4.5		
(Cost:1361 Spt C, 46 ngf. Lab Sptin) CG MN-SS-FTA01-DB-0005 (C0061381 Spt. D, 496 ng/L Lab Sptin)	404	27.7 27.7	64.3	92	400	210	37.4	88
CGMN-88-FTA02-0-0000								
(C0081382 8pk E, 40 npt. Lub Spite) CGMN-SS-FTA02-0-0000	40	1440	1470		40	99.4	110	102
(C0091302 Spit F, 400 mpt. Lab Spitio) CGNN-SS-FTA02-0-0005	400	1440	1620	-	490	59.4	338	67
(C6000 365 Byt. Q. 40 mg/L Late Bythe ) CGMN-SS-FTAD2-0-0005	40	541	373	.	**	18.5	46.4	70
(C0001303 Spir.H, 4000 mptl. Lafe Spiller): CGNMS-SS-86801-0-0000	400	341	800	65	440	18.5	328	77
(C0091285 Spk I, 40 mg/L, Linb SpRe) CGM/N-SS-88801-0-0000	40	832	872	•	40	157	220	•
(CONT.184 Spt. J., 400 ag/L Lab Spring) CGNN-SS-B6501-DB-0000	400	632	1210	95	400	157	457	75
(C0001:306 Spk K, 40 ag/L Lab Spille ) (C0001:306 Spk K, 40 ag/L Lab Spille ) (CGR8N-SS-96801-DE-C000	40	749	1000	.	40	126	193	•
(COMP1306 Talk L, 406 mg/L Lab Spike )	406	749	1160	103	490	:26	560	109

<sup>&</sup>quot;Sample residue exceeds the apking level atgnificantly (bt upiking level): therefore, an accurate recovery value carnot be calculated ND = Not detected at or above 0.2 right (vest weight).

NQ = Not reported due to qualify control result faithers.

Not reported due to qualify control result faithers.

Note: Since this summers table shows mouded results, recovery values rany very alightly from the values in the raw data.

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

		a	Sulfonate PFC		Cê Acid PFOA			
Sample Description	Spiked (pp/o)	Amt Found in Sample (ng/g)	Amount Recovered (ne/s)	Recovery (%)		Amt Found in Sample (ngig)	Amount Recovered (ng/g)	Recevery (%)
CGN8N-SS-86801-0-0005							+	
(COSE1367 Spir C, 48 mg/L Leb Spite)	44	502	524	•	40	29.7	69.8	100
CGAN-SS-B6801-0-0005								
(C0081387 Bpin I), 408 ng/L Lab Spille)	400	502	912	103	480	29.7	386	80
CGMN+SS-B1601-0-0000 (C0011302 lipit E, 40 ng/L Lab 3pilor)	44	2.46	42.0	90	40	1.58	43.0	10-4
CGAIN-SS-B1501-0-0000 (C0081382 Sale F, 466 hg/L Lata Spitia)	406	2.46	397	99	400	1 58	396	90
CGMN-SS-81601-0-0005								
(COOMING Sale Co. 49 agril, Lain Spiles)	48	167	195	•	40	10.0	48.0	25
CGMN-SS-B1601-0-0006					- 1			
(C0001303 Spk H, 490 ng/L.Lab Spike)	460	167	503	84	400	10.0	356	87
CGMN-S8-IC04-0-0000	1 !							
(C1881 385 Spk L 44 mg/L Lab Splim)	44	7.10	42.6	68	48	1.10	33.6	81
CGMN-SS-IC04-0-0000	] ]			1				
(C0081306 Spk J, 498 ng/L Lab SpRe)	490	7.10	350	85	408	1.10	347	86
CGMN-33-IC04-0-0005	1			1				
(C008)386 Spt. K. 40 agrf. Lab Spike)	44	19.4	59.5	85	40	2.06	34.2	80
CGMN-53-IC04-0-0006				J				
(COORTING SUR L. 400 AUT. Lab Spike)	400	19.4	375	89	400	2.06	338	84
CGMN-SS-(C03-0-0000					ļ			
(COOFTSET Balk C, 40 right Lab Sollie)	46	1.05	38.4	93	48	1.33	40.Z	97
CGMH-5.8-IC03-0-0000				1	.			••
(COORTINE? Spit D. 466 mpt. Lab Spitist	406	1.00	344	86	400	1.33	349	57
CGMN-SS-IC03-0-6008	1 1			i	1			
(C0681386 Spt E, 40 ng/L Lab Spine)	40	1.34	31.7	76	40	4.53	36.a	81
CGMN-SS-IC69-0-0005	1 1			1	İ			
(C00011004 Spit P, 469 ngt, Lab Spika)	400	1.34	297	74	400	4.53	326	80
CCMN-SS-IC01-0-0000	1 1				1			
(Coos1900 Spit G, 40 ng/L Lot Spiller)	40	27.4	56.6	73	40	1.12	38.4	93
CGMN-5S-IC01-0-0000				- 1				
(C0881380 Spb.H, 460 ng/L Lab Spilus)	400	27.4	357	82	400	1.12	382	95
CGMN-SS-IC01-0-0005					1			
(C0081686 Spk E 45 rg/L Lab Spille)	49	46.1	70.7	62	40	1.69	34.6	82
CGMIN-SS-IC01-0-0008	ĺ							
(C0001400 Spit.J., 400 ng/L Lab Spite)	400	46.1	322	69	400	1.89	298	74
CGMN-55-1002-0-0000								
(C0061401 Suk K. 40 ng/L Lab Splin )	46	7. <b>35</b>	42.5	88	40	1.51	34.3	82
CGMN-SS-IC02-0-0000								
(CR081401 Spb.1., 400 og/l. Leb Spite )	460	7.36	334	82	480	1.51	398	84

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<sup>&</sup>quot;Semple residue exceeds the epitions level agraifountly (Sx apliting level); therefore, an accurate recovery value cannot be calculated ND = Not detected at or above 0.2 rigis (wet weight), and the Limit of Quantitation (LOQ) which is 0.4 rigis (wet weight). NQ = Not quantitation (LOQ) which is 0.4 rigis (wet weight). NR III Not reported due to quality control result failures. Note: Since this summany table abover results failures.

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Matrix Spike Recovery of PFOS and PFOA in Soil Samples Table V. Continued

		CI	Sulfonate PFC		CB Acid PFOA				
Semple Description	Amount Spliked (ng/g)	And Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/p)	Amount Receivered (nois)	Racovery (%)	
CGMN-58-IC02-0-0005			<del></del>						
(CROF1402 Sph. C. 48 mg/L Lab Spine)	40	5.98	41.3	88	40	0.800	35.8	88	
CGMN-SS-(C02-0-0005 (C0061-002 Spk D, 400 mg/L Lub Spiles)	480	5.98	415	102	400	0.800	394	98	
CGMN-35-0503-0-0000 (C001403 Spix E, 49 ng/L Lab Spika)	*	40.4	78.7	48	40	8.72	49.1	101	
CGMN-SS-D603-0-0000 (C001403 lips F, 400 ng/L Lab Spline)	444	40.4	380	88	400	8.72	354	80	
CGMN-SS-D503-0-0005 (C6611404 Set G, 6t ng/L Lab Spike)	40	17.0	56.0	96	40	1.79	38.6	93	
CGMN-SS-D503-0-0005 (CBBS1-894 Stylk H, 409 ng/L Lab Spiller)	400	17.0	390	95	400	1,79	381	95	
CGMN-55-D501-0-0000 (C1011406 Spic I, 40 rept. Lab Spins)	40	115	169	135	40	5.9 <b>6</b>	42.8	84	
CGMN-SS-D501-0-0000 (C0081466 Spix i., 486 ngfl, Lub Spille)	400	115	434	50	400	8.98	323	79	
CGMN-SS-0501-0-0005 (C0001-000 Sph %, 40 agil. Lab Spile)	40	72.2	118	115	48	6.18	48.4	106	
CGMN-S5-D501-0-0005 (CB081408 Bylk IL, 465 ng/L Lub Bylhe)	440	72.2	403	43	480	6.16	349	86	
CGMN-SS-B801-0-0000 (C0081467 Bpt C, 45 right Late Splins)		438	608	.	40	6.71	40.3	84	
CGMN-55-B601-0-0000 (CD081487 Sek D, 486 ng/L Lab Spiles)	400	438	739	75	460	6.71	205	74	
CGMN-55-8801-0-0005 (C0081408 Spit E, 46 ngil. Lab Spite)	44	888	<del>9</del> 12	.	40	35.5	58.7	53	
CCMN-SS-B801-0-0005 (C0081408 Spt. F, 480 rajit. Lab Splin)	440	868	1510	150	400	35.5	344	77	
CGMN-65-D502-0-0000 (C000100 3g/k %, 49 Ag/L L00 \$g/k-4 )	-	61.6	110	121	**	3.90	36.8	82	
CGMN-SS-D602-0-0000 (C0001400 Spit H, 400 mpt. Late Spites)	400	61.6	438	94	400	9.90	320	79	
CGMN-SS-D502-0-0005 \$C0061410 Bolk L 40 mg/L Lish Spiling		363	452		40	11.9	46.3	36	
CGMN-S8-D502-0-0005 (CR081412 Spit J. 400 ng/L Lab Spite)	400	383	796	103	404	11.9	361	85	

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<sup>\*</sup>Symple residue exceeds the splicing level algorificantly (3x splicing level); therefore, an accurate recovery value cennot be calculated NC = Not detected at or above 0.2 riging (was veright).

NO = Not quantificate = Measured concentration between 0.2 riging (was weight) and the Limit of Quantificate = Measured concentration between 0.2 riging (was weight) and the Limit of Quantification (LOQ) which is 0.4 right (was weight).

NR = Not reported due to qualify control result failures.

Note: Stock this quantifier to the efforts recorded results, recovery values may vary allightly from the values in the raw data.

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Table VI. Matrix Spike Recovery of PFBS and PFHS in Ground Water Samples

Bonyele Description	Arsount Splice (ng/L)	Ant Found in Sample (197L)	C4 Sulforists PFBS Amount Recovered (ng/L)	Recovery (%)		Amt Found in Shripto (19/L)	B Sulfenzie PTHS Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-PW7-0-050516 (C0081234 Spit C, 1909 augl. Lair Spitus)	1900	NO	928	93	1000	ND	917	92
CQMH-GW-PWT-0-050516 (C0001234 Spit I), 1000 agri, but Spita)	5000	NO	4620	92	5000	ND	4560	91
CGMN-GW-PW7-ES-030616 Low Spike 1 ppb (C0001206, 1000 mg/L Platel Spike)	1000	ND	936	94	1000	NO	1060	106
CGMN-GW-PW7-HS-050618 High Spike 5 pph (C881:237, 650 mg/l, Reid špilm)	5000	MD	5740	115	5000	NED	6690	118
CGARLGW-LIWS-0-050516 (C0001224 8pt 8, 100 upt, Lub Spito)	150	<b>80.2</b>	166	108	100	186	310	128
CGMN-GW-NAWB-D-050516 (CROST XXIII Ruh F, BAD mg/L Link Rhilling)	F00	80.2	873	103	500	186	703	104
CGMIN-GW-MW-LS-050616 Low Spike 0.1 ppb (C009386, 199 agA: Field Rethe)	100	80.2	165	106	100	185	327	142
CGMR4-GW-MWH8-H8-050618 High Spike 0.6 ppb (C801521, 800 ng/t, Plant Spite)	600	80.2	56 <del>0</del>	100	500	186	687	190
CGMN-GW-MW19-0-030617 (C001022 Sph G, 808 ng/L, Lui Spilin)	500	NFR	NR	NR	60C	NR	NR	NR
CGMN-GW-MNV19-0-050617 (C0001282 Spit N. 1960 ng/L Lab Spite)	1000	NEC	NR	NR	1090	NER	NR	NR
CCMNI-GW-ARV10-LS-050517 Low Spike 0.5 ppb (2001/274,600 hg/L Field Spike)	800	NR	NR	RSA	500	NR	NR	NR
CGMN-GW-MW19-HS-080817 High Spike 1.0 ppb (C0081238, 1000 mgt. Plate 8;58m)	1000	N/R	NR	NR	1000	NR	MR	MR
COMM-OW-DECON-0-050524 (CONTROL Dut. C. 100 mg/L Lab Sullins)	100	NO	110	110	100	NO	113	113
CEMIN-GAY-DECON-0-000624 (CHRYSHS Shak D, BORN right Lash Shakm)	5000	ND	5120	102	6000	No	5120	102
CGMN-GW-DECON-LS-050024 Low Spike 0.1 ppb (CMN1367, 140 legt. Rate Spike)	100	ND	101	101	100	MO	100	109
CGMN-GW-DECON-HS-050524 High Spike 5.0 ppb (contratt, 8000 mg/L Plute Spike)	5000	NO	5010	100	9000	CM	5060	101
WISMN-GW-R1-0-050612 (CM01411 Sale IL 1800 raph, Lad Spillin)	1000	1680	2870	110	1000	2070	3430	136
WBMN-GW-R1-0-050512 (C0001411 Spit P, 10000 upt. Let Spilot	10000	1880	12180	104	19000	2070	12780	106
W5MH-GW-R1-L5-050512 Low Spike 1.0 ppo (C0051413,1896 agr. Pletd Spine)	1000	1680	2860	117	1000	2070	3420	136
YYBARN-GWY-R1-HS-000812 (High Spiles 10 year (Coornels, 1000 ngil Find Spiles)	10000	1680	11600	99	10000	2070	13000	109
WEMN-GW-FI2-0-080612 (COVERS 14 State C, 1546 mg/L 1ult States)	1000	NO	900	a0	1000	NO	899	20
WBLRH-GW-F2-0-050312 ;C0081 F14 Tijnt II. 18008 Ng/L Lie Spillel	:0000	ND	10000	100	1000C	ND	9000	97
WSNN-GW-R2-LS-050812 Low Spike 1.0 ppb (CM81416, 1699 ng/L Field Spike)	1900	ND	947	26	1000	ND	1050	108
W BMN-C3W-P02-HS-050512 High Spike 10 ppb (C8861416, 1888) wyf. Field Spike)	10000	NID	\$790	88	10000	ДN	6300	ß

<sup>&</sup>quot;Sample readuse accessed the appling level algorithmaty (n his spiking level); therefore, an accurate recovery value cannot be calculated NO = Not descreded it or service 28 right, (ptp), NQ = Not descreded it or service 28 right, (ptp), NQ = Not quasistantice = Measured concentration between 25 right, (ptp) and the Limit of Quasitation (LOQ) which is 50 right, (ptp), NR = Not represent duties to represent a service 28 right, (ptp), NR = Not represent duties the top calculate in the case detail.

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Table VI. Matrix Spike Recovery of PFBS and PFHS in Ground Water Samples Continued

Sumple Description	Ameust Spilend (ng/L)	Amt Found in Sample (ng/L)	4 Sulfonate FFBS Amount Redovered (ng/L)	Recovery (%)		Ant Found in Sample (ng/L)	6 Sufforute PFHS Amount Recovered (right)	Recovery (%)
WBMN-GW-R3-6-050512								
(CEROR 1430 Sight E. 1600 HIGH, Each Sighted)	1000	355	1280	91	1000	1840	2000	96
WBMH-GW-PG-0-000512 (C0001420 Byk F, 10000 agrl, Lina Sylle)	10000	355	9190	88	10000	1040	2610	88
WBMN-3W-R3-L3-050612 Low Spike 1.0 ppb (C8881621, 1606 agrl, Fixed Ballin)	1000	356	1290	94	1000	1040	2290	126
WBM-GW-RS-HS-050612 High Spike 10 ppb (C0001481, 10000 mpl. Pale Bythe)	10000	386	10800	80	10000	1040	10600	95
\\'C\$M\$\\G\$W\-F\$4-Q-Q\$Q\$12 (C\$M\$\\$G\$ \$p\$ Q, 10000 apt, Lab \$piles)	19000	54 10	14600	922	10000	22100	28700	66
WBMN-GW-R4-0-060612 (C8981424 Spx C, 190000 Agil. Lab Spilin)	100000	5410	50300	81	100000	22100	100000	76
WBMN-GW-R4-ES-060512 Low Spike 1.0 ppb (CMM-GR, 1800 rg/L Myld Spike)	10000	54 1 <b>9</b>	14800	04	10000	22100	31800	97
WBANI-GW-R4-HS-050512 High Spike 100 ppb (coertezt, 190001 m/L Puld Spike)	100000	6410	99400	94	100000	22100	122000	100
WBMH-GW-CWH-0-060812 (C-0001400 Balk Q, 1000 right, Lab Spring)	1000	3540	4300	.	1000	10200	10900	•
WBARK-GW-CWR4-0-050512 (C0001439 Spk D, 19000 Ag/L, Lish Sping)	10000	3646	12900	04	10000	10200	20100	D0
WBMR-GW-CWM-LS-050512 Low Spike 1.0 ppb (C0051430, 1000 kg/L Flate Spike)	1000	3540	4390	.	1000	10200	11000	•
WBMN-GW-CWM-H6-050512 High Spike 10 ppb (0801421, 10000 Apr. Flast Spike)	10000	3540	13200	807	19900	10200	22000	118
WBMN-GW-CWD01-0-050512 (C9081492 Spk E. 1000 ng/L Lub Spfm)	1000	3560	4100		1000	7420	2070	•
WBMN-GW-CWO01-0-050512 [C0081492 Spix F, 14000 stgrt. Laib Spiker	10000	3360	11700	83	10000	7420	16000	86
/SNR-GW-CWD01-LS-060612 Low Spike 1.0 ppb (Cesetest, 1886-yel, FlateSpike)	1000	3560	3763		1000	7420	7510	
/BMN-GW-CWC01-HS-050512 High Spike 10 ppb (C001406, 10000 mg/L Finial Spike)	10000	3360	10900	74	10000	7420	13900	65
WBANN-GW-TRIP-LS-050511 Low Spike 0.1 ppb (CBMS407, Hith right Tall Spike)	100	NID	105	195	190	ND	100	100
WENNY-GW-THEP-HS-050611 High Spike 1.D ppb (CREE1438, 1886 mpt, Trip Japan)	3000	NG.	403		1000 :	MD	900	109

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Table VII. Matrix Spike Recovery of PFOS and PFOA in Ground Water Samples

	A-101	Amil Found	3 Sulformie PFOS Amount				CB Add PFOA	
Sample Committee	Spliced	in Sample	Resovered	Recover	y Spitted	Amt Found in Sample	Amount Recovered	Recovery
Description	(RQAL)	(Ing/L)	(ng/L)	(%)	(UBAT)	(ngrL)	(ngr.)	(%)
CGMA-GW-PM7-0-060516 (0008139) Spir.C, 1400 ng/t. Lab Spiring	1000	NO.	369	99	1000	332	1210	84
CGMN-GW-PW7-0-050518 CRRST234 Suit D, 5005 rapt, Lub Suplant	5060	ND	4040	81	5000	352	4700	87
CGNN-GW-PWT-LS-060618 Low Spike 1 ppb (C9081236, 1008 npl. Plaid Spike)	1000	NCO	1040	104	1200	332	1360	103
CGMN-GW-PW7-HS-D50516 High Spike 5 ppb (C0081222, 6880 agr., Field Spike)	5000	MEC	5890	118	5000	332	5050	121
CGMN-GW-RWS-C-050616 (CBM1205 Bph E. 100 mg/L Lab Spring	190	593	720		100	959	969	•
CGMN-GW-MW8-C-050518 CERRESS Sed: F, 600 rept. Luis System)	500	593	961	74	500	959	1290	64
CGN81-GW-MW8-LS-050515 Low Spike 0.1 pcb (2001230, 16f mpf., Reld Spike)	100	503	780		100	999	1120	
CGMR1-GW-MW6-HS-050016 High Spike 0.5 ppb (COVENIC), BIT byt. Flets Spike 0.5	500	593	1029	65	500	959	1370	82
CGMH-GW-MW19-0-05061? (20001251 Spit 4), 500 og/L Lub Spito)	506	59.7	412	70	500	NR	NR.	NR
CGM:N-GW-MW19-0-080517 (C0081982 Shit H, 1000 mg/L Lish Spilm)	1000	50.7	862	80	1006	NR	NR	NR
CGMR4-GW-NeW19-LS-080617 Lour Spike 0.5 ppb: {coercist_ate light_fluid Spike}	500	59.7	336	68	800	NR	NR.	NR.
CGARN-GW-MW19-H8-000617 High Spike 1.0 ppb (CR01000, 1600 ng/L Pield Spike)	1000	59.7	732	67	100c	NIR	MR	NR
CGMN-GW-DECON-0-050524 (C001200 Blok C; 100 mg/L Lub Spilos)	100	NO.	108	108	100	NØ	117	1 17
CGAAN-QW-DECON-0-0505Q4 (CR011885 Back D, 8885 eight Liab Backer)	5000	NED	4850	er	6900	NED	4840	90
CGNN-GW-DECON-LS-060624 Low Splice 8.1 ppt: (C081487, 190 mg/L Field Splin)	100	NED	110	110	1000	NED	111	111
CGMN-GW-DECONNS-080524 High Spike 5,0 ppp (Cross-200, 2004 logs, Flate Spike)	5000	ND	6290	104	5000	NIC	4630	97
WBAR4-CNV-FR1-D-0506 12 (CMM1-811 Spit E, 1888 mg/L Link Spitm)	1000	<b>54</b> .0	903	ы	1000	2090	3440	135
W5AR4-CW-R1-0-050512 (C0001415 Spit J., 13000 mg/l. Link Spilling)	10000	SE.0	9730	67	10000	2696	12500	107
WBMN-GW-R1-L3-050512 Low Spike 1.0 ppb (C0061413, 1801 hpfL Field Spile)	1000	58.9	800	74	1000	2090	3510	142
WBARN-GW-R1-HS-050512 High Spike 10 ppb (00001418, 50000 ng/L Field Spine)	10000	58.9	9420	94	10000	2090	13300	112
WBMH-GW-R2-0-050512 (CSMH-14 Bpit C, 1903 ng/L Luis Spitin)	1000	NO	880	<b>B7</b>	1990	NO	573	87
W5N81-GW-R2-0-050512 (C0001018 Bjd. B. 16000 agel. Lata Šplini)	10000	ND	9520	95	10000	MD	g260	54
WBMN-GW-R2-LS-060512 Low Spike 1,0 ppb COMMUL 1008 kgl. Raid Spike	1000	ND	1110	111	1000	ND	1000	108
YVBARY GW-P2-HS-050512 Yigh Spike 10 ppb (CRES1415, 10008 mg/L Flatd Spike)	10000	NO	9670	90	10000	MD	9270	93

<sup>&</sup>quot;Gample residus exceeds the splaing lavel significantly (PSx syllaing level); therafore, an accurate recovery visitus cannot be calculate ND = rick described at or above 25 cgrl. (ppl).
NQ = Not quantifields = Measured concentration between 25 rgrl. (ppl) and the Limit of Quantifields (LOQ) which is 50 rgrl. (ppl).
NR = Not reproded Que to qualify confort result failures.
Note: Shoots this examinary table shows recenting resolution and visities array vary affigibly from the values for the raw dute.

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Table VII. Matrix Spike Recovery of PFOS and PFOA in Ground **Water Samples Continued** 

Bemple Description	Amount Spiked (ng/L)	Ant Found in Sample (ng/L)	CE Bultoneta PPOS Amount Recovered (ng/L)	Recovery	Amount Spiked (ng/L)	Ant Found In Sample (ng/L)	C# Acid PFCA Amount Recovered (ng/L)	Recovery (%)
WBAR4-GW-R3-0450512  C0001430 light ii, 1900 mg/L Luib Jaibaj	1000	01.4	995	90	1200	150	1040	88
WSMN-GW-FC3-C-0505 12 (C0881420 Spit IF, 58880 right, Light Spiting)	10000	<b>914</b>	8900	88	10000	159	8500	83
WBMN-GW-R3-LS-050512 LOW Spike 1.0 ppb (0001/42), 1000 hgd. Fluid (lpha)	1000	Q1.4	1100	101	1000	159	1280	112
WSMN-GW-R3-HS-060512 High Spiles 10 ppb (CORM-142), 18088 Age. Files Review	19000	<b>91 4</b>	9620	\$4	10000	150	9500	94
WBMN-GW-R4-0-050512 (C0081434 3ph G. 10000 npl. Lub Spho)	10000	1660	10000	83	10006	2580	11400	52
WBAN-GIW-R4-0-0:00712 (C0014434 Bok G. 100000 mpč. Lub špilo)	1000000	1880	80800	79	100000	2560	8400C	81
WBMN-GW-R4-L5-060512 Low Spike 1.0 ppb (C000148), 10000 ng/L Flod Spilio)	10000	1560	12100	104	10000	2560	12800	100
WBIAN-GW-R4-HS-050512 High Spike 100 ppb (C100142), 10000 ng/L Field Spike)	100000	1060	196090	103	100000	2580	88400	86
WBMN-GW-CWM-0-050512 (C0001425 Spt. C. 1000 mg/L Lub Spfm)	1000	957	2060	110	1000	1940	2570	95
1V:BABH-GVV-CXVNI-0-050512 (CR001438 Sub D; 10006 HgT, Link Spring)	10000	D67	9070	<b>20</b>	10000	1940	11000	91
WBNRY-GW-CWN/LS-050612 Low Spike 1.0 ppb (C0001430, 1000 npd. Flate Spike)	1000	967	1839	<b>57</b>	1000	1940	3120	118
W BMN-GW-CWM-HS-060612 High Spike 10 ppb (C9981491, 10000 mg/L Field Spike)	10000	967	12600	126	10000	1940	13300	114
W2MAL-GW-CWID01-0-060612 (C0011432 Spir E, 1998 ng/L Lub Spiring)	1000	1220	2150	94	1980	3000	4300	
WENN-GW-CWD01-0-050512 (C001472 5yk F, 18000 ngd, Lata Spling	10000	1220	5520	73	100000	3080	11000	79
WBMR+GW-CWD01-LS-050612 Low Spike 1.0 ppb (CHR1434, 1006 mpl. Reid Spike)	1000	1220	1750		1000	3080	3660	•
WBMN-GW-CWE01-HS-050512 High Spike 10 ppb (00001438, 10000 ng/l, Fluid Spike)	10000	1220	7240	60	10000	3060	9870	88
WBMN-GW-FRSP-LS-050511 Low Spike 0.1 ppb (0001487, 149 ngt. Trip Spike)	100	NC	100	196	100	ND	111	111
WBMN-GW-TRIP-HS-050811 High Spike 1.0 ppb (CHERT-SEA, 1000 High Try Spike)	1000	NO	048	26	1900	MD	0300	<b>B</b> O
			Average:	м			Average:	H

"Sample dissidue consects the apting level algorithmetry (> 0x spiking levels; therefore, an accurate recovery value camnot be calculate. NO = Not detected at or above 25 right (apri).

NO = Not contribute = Neuroscience (april (apri).

NO = Not overefficience = Neuroscience (april

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples

		19C-PFOA					
		Amount	Amount				
Exygen	Sample	Spiked	Recovered	Recovery			
KD	Description	(ng/g)	(ng/g)	(%)			
C0081358							
C0081358 Rec	CGMN-SS-D101-0-0005	4	3.28	82			
	CGMN-SS-D101-0-0005	4	3.39	85			
C0081358 Spk C	CGMN-SS-D101-0-0005	40	36.2	91			
C0081358 Spk D	CGMN-SS-D101-0-0005	400	330	83			
C0081359	CGMN-SS-D101-DB-0005	4	3.22				
C0081359 Reg	CGMN-SS-D101-DB-0005	Ž.	3.22	81			
C0081359 Spk E	CGMN-SS-D101-DB-0005	40	3.34 34.3	84			
C0081359 Spk F	CGMN-SS-D101-DB-0005	400	34.3 327	86 82			
C0081360	50101 50 5011			•••			
C0081360 Rep	CGMN-SS-D201-0-0000	4	3.23	81			
	CGMN-SS-0201-0-0000	4	3.31	83			
C0061360 Spk G	CGMN-SS-D201-0-0000	40	31.3	78			
C0081360 Spik H	CGMN-SS-D201-0-0000	400	298	75			
C0081381	CGMN-SS-D201-0-0005	4	3.18	80			
C0081361 Rep	CGMN-SS-D201-0-0005	4	3.27	***			
C0081361 Spk	CGMN-SS-D201-0-0005	40	29.8	82			
C0081361 Spk J	CGMN-SS-D201-0-0005	400	29.0 293	74 73			
C0081382	2011 05 Dags 5 2225			•			
_	CGMN-SS-D202-0-0000	4	3.17	79			
C0081362 Rep	CGMN-SS-D202-0-0000	4	2.99	75			
C0081382 Spk K	CGMN-SS-D202-0-0000	40	33.2	83			
C0081362 Spk L	CGMIN-SS-D202-0-0000	400	302	76			
C0081363	CGMN-SS-D202-0-0005	4	3.02	76			
C0081363 Rep	CGMN-SS-D202-0-0005	i i	3.10	78			
C0061363 Spk C	CGMN-SS-D202-0-0005	48	32.1	80			
C0061363 Spk D	CGMN-SS-D202-0-0005	400	317	79			
C0081374	CGMN-SS-D101-0-0000						
C0081374 Ren		4	3.07	77			
C0081374 Spk E	CGMN-SS-D101-0-0000	4	3.18	80			
	CGMN-SS-D101-0-0000	40	30.8	77			
20081374 Spk F	CGMN-SS-D101-0-0000	400	276	59			
C0081388	CGMN-9S-B1502-0-0000	4	3.64	91			
C0081388 Rep	CGMN-SS-81502-0-0000	4	3 68	92			
0081388 Spk G	CGMN-SS-B1502-0-0000	40	38.0	90			
0061388 Splk H	CGMN-SS-B1502-0-0000	400	345	86			
C0081389	CGMN-SS-B1502-0-0005	4	0.00				
C0061369 Rep	CGMN-SS-B1502-0-0006		3.52	88			
0081389 Sok	CGMN-SS-81502-0-8005	4	3.59	96			
0081389 Spk J	CGMN-SS-B1502-0-0005	40 400	35.4 307	89 77			
		100	<i>501</i>	′′			
C0081390	CGMN-SS-B1501-0-0000	4	3.57	89			
20081390 Rep	CGMN-SS-B1501-0-0000	4	3.55	92			
0081390 Spk K	CGM#N-8S-81501-0-0000	40	34.5	88			
0081390 Spk L	CGMN-SS-81501-0-0000	<b>40</b> 0	302	76			

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		15C-PFOA					
		Amount	Amount				
Exygen	Sample	Spiked	Recovered	Recovery			
ID .	Description	(ng/g)	(ng/g)	(%)			
00004004							
C0081391	CGMN-SS-B1501-0-0005	4	3.47	87			
C0081391 Rep	CGMN-SS-B1501-0-0005	4	3.53	58			
C0081381 Spk C	CGMN-88-81501-0-0005	40	34.8	87			
C0081391 Spk D	CGMN-SS-B1501-0-0005	400	341	85			
C0081163	CGMN-S8C-D203-0-0000	4	2.56	54			
C0081163 Rep	CGMN-SBC-D203-0-0000	4	2.42	61			
C0081163 Spk E	CGMN-SBC-D203-0-0000	40	30.3	76			
C0081163 Spk F	CGMN-SBC-D203-0-0000	400	284	71			
C0081184	CGMN-SBC-D203-0-0050	4	1.96	49			
C0081164 Rep	CGMIN-SBC-D203-0-0050	4	1.75	44			
C0081164 Spk G	CGMN-SBC-D203-0-0050	40	23.5	59			
C0081164 Spk H	CGMN-S8C-D203-0-0050	400	269	67			
C0061165	CGMN-S8C-0203-0-0100	4	1.90	48			
C0081165 Rep	CGMN-SBC-D203-0-0100	7	1.90	48			
C0081165 Sok I	CGMN-SBC-D203-0-0100	•					
C0081165 Spk J		40	24.2	61			
Cotto i log apa a	CGMN-SBC-D203-0-0100	400	271	68			
C0081168	CGMN-SBC-D203-0-0150	4	2.09	52			
C0081165 Rap	CGMN-98C-D203-0-0150	4	2.00	50			
C0081166 Spk K	CGMN-SBC-D203-0-0150	40	23.3	58			
C0081166 Spk L	CGMN-SBC-D203-0-0150	400	298	76			
C0081167	CGMN-SBC-D203-0-0200	4	2.12	-			
C0081157 Rec	CGMN-S8C-D203-0-0200	4		53			
C0081167 Sak C	CGMN-SBC-D203-0-0200	•	2.02	51			
		40	23.1	58			
C0081167 Spk D	CGMN-SBC-D203-0-0200	400	262	86			
C0081168	CGMN-SBC-D203-0-0250	4	2.52	68			
C0081168 Rep	CGMN-SBC-D203-0-0260	i i	2.58	65			
C0081166 Spk E	CGMN-SBC-D203-0-0250	40	31.0	78			
C0081188 Spk F	CGMN-SBC-D203-0-0250	400	331	83			
C0081169	CGMN-S8C-D203-0-0300	4	2.80	7.00			
C0081189 Rep	CGMN-SBC-D203-D-0300	4		70			
		•	2.90	73			
C0081189 Spk G	CGMN-SBC-D203-0-0300	40	33.7	84			
C0081169 Spk H	CGMN-SBC-D203-0-0300	400	342	86			
C0081170	CGMN-SBC-D203-DB-0390	4	3.09	77			
C0081176 Rep	CGMN-SBC-D203-DB-0300	4	2.78	70			
C0081170 Spk 1	CGMN-SBC-D203-DB-0300	40	36.2	91			
C0081170 Spk J	CGMN-SBC-D203-DB-0300	400	342	88			
C0084474	COLUM BOC COMA A MOCE		2.24				
C0081171	CGMN-SBC-0203-0-0350	4	2.94	74			
C0081171 Rep	CGMN-SBC-D203-0-0350	4	2.88	72			
0081171 Spk K	CGMN-SBC-D203-0-0356	40	34.5	86			
20081171 Spk L	CGMN-8BC-D203-0-0350	400	347	87			

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		<sup>13</sup> C-PFOA						
		Amount	Amount					
Exygen	Sample	Spiked	Recovered	Recover				
ĬĎ	Description	(ng/g)	Amount	(%)				
C0081172	CGMN-58C-D203-0-0400	4		83				
C0081172 Rep	CGMN-SBC-D203-0-0400	4		80				
C0081172 Spk C	CGMN-8BC-D203-0-0400	40		90				
C0081172 Spk D	CGMN-SBC-D203-0-0408	400	349	87				
C0081173	CGMN-SBC-D203-0-0450	4	3.27	82				
C0081173 Rep	CGMN-SBC-D203-0-0450	4	3.22	81				
C0081173 Spk E	CGMN-SBC-D203-0-0450	40	30.6	77				
C0081173 Spk F	CGMN-SBC-D203-0-0450	400	338	85				
C0081174	CGMN-S8C-D202-0-0000	4	4 00	46				
C0051174 Rec	CGMN-SBC-D202-D-0000	4		41				
C0081174 Spk G	CGMN-SBC-D202-0-0000	40		41 65				
C0081174 Spk G	CGMN-SBC-D202-0-0000							
COURT 174 Spk m	CGMN-SBC-D202-0-0000	400	243	61				
C0081175	CGMM-SBC-D202-0-0050	4		49				
C0081175 Rep	CGMN-SBC-0202-0-0050	4	1.94	49				
C0081175 Spk I	CGMW-SBC-D202-0-0050	40	22.8	57				
C0081175 Spk J	CGMN-SBC-D202-0-0050	400	235	59				
C0081176	CGMN-S8C-D202-9-0100	4	2.39	60				
C0081176 Rep	CGMR-98C-D202-0-0100	4		61				
C0081176 Spk K	CGMN-S8C-D202-0-0100	40		65				
C0061176 Spk L	CGMN-S8C-D202-0-0100	400		71				
C0081177	CGMIN-SBC-D202-0-0150	4	1 93	48				
C0081177 Rep	CGMN-SBC-D202-0-0150	À		45				
20081177 Spk C	CGMN-SBC-D202-0-0150	40		67				
20081177 Spk D	CGMH-SBC-D202-0-0150	400		64				
				•				
C0051178	CGNIN-SBC-D202-0-0200	4		58				
C0081178 Rep	CGMN-8BC-D202-0-0200	4		52				
20051178 Spk E 20061178 Spk F	CGMN-8BC-D202-0-0200 CGMN-8BC-D202-0-0200	40 400		74 75				
out it a april			•••	/3				
C0081179	CGMIN-SBC-D202-0-0250	4	2.95	75				
C0081179 Rep	CGMN-SBC-D202-0-0250	4		71				
20081179 Spk G	CGMN-SBC-0202-0-0250	40	35.5	88				
20061179 Spk H	CGMN-\$8C-D202-0-0250	400	342	88				
C0081180	CGMN-SBC-D202-0-0300	4	2.42	61				
C0081180 Rep	CGMN-SBC-D202-0-0300	4	2.48	<del>5</del> 2				
00081160 Spk I	CGMN-SBC-D202-0-0300	40	33.8	85				
:0081180 Spk J	CGMN-SBC-D202-0-0300	400	<b>326</b>	82				
C0081181	CGMN-SBC-D202-0-0350	4	2 90	73				
C0081181 Rep	CGMN-3BC-D202-0-0350	7		73				
:0081181 Sok K	CGMN-SBC-D202-0-0350	40		73 88				
on to ion of the v	CGMN-SBC-D202-0-0350	400		90				

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		13C-PFOA		
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
ED .	Description	(ng/g)	(ng/g)	(%)
C0081182	CGMN-SBC-D202-DB-0350		200	
	CGMN-S8C-D202-D8-0350	4	2.90	73
C0081182 Rep C0081182 Sok C		<b>4</b> 40	2.83 35.0	71
C0081182 Spk C	CGMN-SBC-D202-DB-0350			88
CUUST TOZ SPK D	CGMN-SBC-D202-DB-0350	400	328	82
C0081183	CGMN-SBC-D202-0-0400	4	2.81	70
C0081183 Rep	CGMN-SBC-D202-0-0400	4	2.72	68
C0081183 Spk E	CGMN-SBC-D202-0-0400	40	31.5	79
C0081183 Spk F	CGMN-SBC-D202-0-0400	400	337	84
C0081184	CGMN-SBC-D202-0-0450	4	2.79	70
C0081184 Rep	CGMN-SBC-D202-0-0450	4	2.80	70
C0081184 Spk G	CGMN-SBC-D202-0-0450	40	32.7	82
C0081184 Spk H	CGMN-\$BC-D202-0-0450	400	338	85
C0081185	CGMN-SBC-0201-0-0000		200	**
C0081185 Rep	CGMN-SBC-D201-0-0008	4	2.90 2.71	73
	CGMN-S8C-D201-0-0000	4 40		68
C0081185 Spk I		• •	31.5	79
C0081185 Spk J	CGMN-SBC-D201-0-0000	400	288	72
C0081186	CGMN-SBC-D201-0-0050	4	2.06	52
C0081186 Rep	CGMN-SBC-DZ01-0-0050	4	2.06	52
C0081188 Spk K	CGMN-SBC-D201-0-0050	40	25.4	64
C0061186 Spk L	CGMN-SBC-D201-0-0050	400	266	67
C0081187	CGMN-SBC-D201-0-0100	4	3.56	39
C0081187 Rep	CGMN-SBC-D201-0-0190	4	3.46	87
C0081187 Spk C	CGMN-SBC-D201-0-0100	40	38.2	96
C0081187 Spk D	CGMN-SBC-D201-0-0100	400	374	64
C0081188	CGMN-SBC-0201-D8-9100		3.25	
C0081188 Rep	CGMN-SBC-D201-D6-0100	4	3.23 3.03	81 78
20081188 Sok E	CGMN-SBC-D201-D8-0100 CGMN-SBC-D201-D8-0100	40	33.9	/15 8/5
20081188 Spk F	CGMN-SBC-D201-DB-0100	400	346	87
	20141 202 202 2 2 2 2	4		
C0061189	CGMN-SBC-D201-0-0150	4	2.08	52
C0081189 Rep	CGMN-SBC-D201-0-0150	<b>4</b> 40	2.06	52
20051189 Spk G	CGMN-SBC-D201-0-0150	40 400	18.9 262	47
20081189 Spk H	CGMN-58C-D251-0-0150	400	202	66
C0081190	CGMR-SBC-D201-0-0200	4	1.81	40
C0081190 Rep	CGMN-88C-D201-0-0200	4	1.69	42
20081198 Spk I	CGMN-88C-D201-0-0200	40	28.5	71
00081190 Spk J	CGMN-SBC-D201-0-0200	400	317	79
C0081191	CGMN-88C-D201-0-0250	4	1.88	47
C0081191 Rep	CGMN-SBC-D201-0-0250	4	1.82	46
0081191 Spk K	CGMN-SBC-D201-0-0250	40	29.4	74
		400	312	

Note: Since this summary table shows rounded results, recovery values may vary elightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		<sup>12</sup> C-PFOA				
		Amount	Amount			
Exygen	Sample	Splked	Recovered	Recovery		
ΙD	Description	(ng/g)	(ng/g)	(%)		
C0081192	CGMN-SBC-D201-0-0300	4	1.98	50		
C0081192 Rep	CGMN-SBC-D201-0-0300	4	2.01	50		
C0081192 Spk C	CGMN-SBC-D201-0-0300	4G	2.V1 31.5	79		
C0081192 Spk D	CGMN-SBC-D201-0-0300	400	342	86		
COOR HISZ SPK D	CGMIN-SBC-120140-0300	400	342	30		
C0081193	CGMN-SBC-ID201-0-0350	4	2.45	61		
C0081193 Rep	CGMN-SBC-I)201-0-0350	4	2.56	84		
C0081193 Spk E	CGMN-SBC-I)201-0-0350	40	35.6	89		
C0081193 Spk F	CGMN-SBC-I)201-0-0350	400	384	96		
C0081194	CGMN-SBC-D201-0-0400	4	2.70	68		
C0081194 Rec	CGMN-SBC-D201-0-0400	Ă	2.82	71		
C0081194 Spk G	CGMN-SBC-D201-0-0400	40	35.3	88		
		400				
C0981184 Spk H	CGMN-SBC-D201-0-0400	400	354	89		
C0981185	CGMN-SBC-D104-0-0000	4	NR	NR		
C8081195 Rep	CGMN-SBC-D104-0-0000	4	NR	NR		
C0081195 Spk1	CGMN-SBC-0104-0-0000	40	MR	MR		
C0081195 Spk J	CGMN-SBC-D104-0-0000	400	NR	NR		
C0081196	CGMN-SBC-D104-0-0050	4	1.96	49		
C0081196 Rep	CGMN-SBC-D104-0-0050	4	1.81	45		
C0081196 Spk K	CGMN-SBC-D104-0-0050	40	23.0	60		
C0081198 Spk L	CGMN-SBC-D104-0-0050	400	275	69		
C0061197	CGMN-SBC-D104-DB-0050	4	2.18	55		
	CGMN-SBC-D104-DB-0050	4	2.42	81		
C0081197 Rep		•				
C0081197 Spk C	CGMN-88C-D104-D8-0050	40	33.5	84		
C0081197 Spk D	CGMN-SBC-D104-DB-0050	400	336	84		
C0081196	CGMN-SBC-D184-0-0100	4	1.75	44		
C0081198 Rep	CGMN-SBC-D104-0-0100	4	1,81	45		
20081198 Stak E	CGMN-SBC-D104-0-0100	40	30.2	78		
C0081196 Spk F	CGMN-SBC-D104-0-0100	400	366	92		
C0061199	CGMN-SBC-D104-0-0150	4	1.76	45		
C0081199 Rep	CGMN-SBC-D104-0-0150	4	1.78	44		
C0081199 Sok G	CGMN-SBC-D104-0-0150	46	33.9	85		
20081199 Spk H	CGMN-SBC-D104-0-0150	400	341	85		
	001010000000000000000000000000000000000	_	2.24	7-		
C0081200	CGMN-SBC-D104-0-0200	4	2.01	50		
C0081200 Rap	CGHN-SBC-D104-0-0200	4	1.79	45		
C0081200 Spk	CGMN-SBC-D104-0-0200	40	28.6	72		
00081200 3pk J	CGMN-SBC-D104-0-6200	400	362	91		
C0081201	CGMN-SBC-D104-0-0250	4	1.74	44		
C0081201 Rep	CGMN-SBC-D104-0-0250	4	1.79	45		
20081201 Sok K	CGMN-SBC-D104-0-0250	40	28.0	70		

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		12C-PFOA					
		Amount	Amount Amount				
Exygen	Sample	Spiked	Recovered	Recover			
ID .	Description	(ng/g)	(ng/g)	(%)			
Anneanna	CO. 1. 000 Date 1 0000	_					
C0081202	CGMN-SBC-D104-0-0300	•	2.67	87			
C0081202 Rep	CGMN-SBC-D104-0-0300	4	2.74	69			
C0081192 Spk C	CGMN-SBC-D104-0-0300	40	35.1	88			
C0081192 Spk D	CGMN-SBC-D104-0-0300	400	374	94			
C0081203	CGMN-SEC-D184-0-0350	4	2.52	56			
C0081203 Rep	CGMN-SBC-D104-0-0350	4	2.63	56			
C0061203 Spk E	CGMN-SBC-D104-0-0350	40	34.8	87			
C0081203 Spk F	CGMN-SBC-D104-0-0350	400	365	91			
C0081205	CGMN-SEC-D104-0-0400	4	2.97	74			
C0081205 Rec	CGMN-SBC-D104-0-0400	4	2.98	75			
C0081205 Spk G	CGMN-SBC-D104-0-0400	40	35.2	88			
C0081205 Spk H	CGMN-SBC-D104-0-0400	400	352	88			
C0081208	CCMM CDC D404 A 04F0		3.12	70			
	CGMN-SBC-D104-0-0450	4		78			
C0081206 Rep	CGMN-SBC-D104-0-0450	4	3.07	77			
C0061206 Spk I	CGMN-SBC-D104-0-0450	40	36.8	92			
C0081206 Spx J	CGMN-SBC-D104-0-0450	490	381	90			
C0081207	CGMN+SBC-D104-DB-0450	4	3.09	77			
C0081207 Rep	CGMN-SBC-D104-DB-0450	4	3.0t	75			
C0081207 Spk K	CGMN-SBC-D104-DB-0450	40	35.8	90			
C0081207 Spk L	CGMN-SBC-D104-DB-0450	400	375	94			
C0081208	CGMN-SBC-D104-0-0500	4	2.48	62			
C0081206 Rep	CGMN-SBC-D104-0-0500	4	2.59	65			
C0081208 Spk C	CGMN-SBC-D104-0-0500	40	32.7	82			
C0081197 Spk D	CGMN-SBC-D104-0-0500	400	365	91			
	00th 400			**			
C0081209	CGMN-SBC-D104-0-0550	4	2.59	65			
C0061209 Rep	CGMN-SBC-D104-0-0550	4	2.50	63			
00081209 Spk E 00081209 Spk F	CGMN-SBC-D104-0-0550 CGMN-SBC-D104-0-0550	49 400	36.7 363	92 91			
C0081210	CGMN-SBC-D104-0-0600	4	2.74	69			
C0081210 Rep	CGMN-SBC-D104-0-0600	4	2.72	68			
00081216 Spk G	CGMN-SBC-D104-0-0600	40	35.7	89			
C0081210 Spk H	CGMN-SBC-D104-C-0600	400	330	83			
C0081211	CGMN-SBC-D104-0-0650	4	2.56	64			
C0081211 Rep	CGMN-SBC-D104-D-0650	4	2.48	62			
C0081211 Spk i	CGMN-SBC-D104-0-0650	40	33.7	84			
C0081211 Spk J	CGMN-SBC-D104-0-0650	400	338	85			
C0081212	CGMN-SBC-D103-0-0000	4	3.03	76			
C0081212 Rep	CGMN-SBC-D103-C-0000	ĭ	3.20	80			
0081212 Sok K	CGMN-SBC-D103-0-0000	40	30.5	76			
/UVU 14 14 UMA IN	~~W. 4. 000. C. 100. C. 100. C.	70	<b>~~.</b> ₩				

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		"C-PFCA	C-PFOA		
		Amount	Amount	<del></del>	
Exygen	Sample	Spiked	Recovered	Recovery	
10	Description	(ng/g)	(ng/g)	(%)	
C0081213	CGMN-SBC-D103-0-0050				
C0081213 Rep	CGMN-SBC-D103-0-0050	4	2.67	67	
		•	2.75	69	
C0081213 Spk C	CGMN-SBC-D103-0-0050	40	35.7	89	
C0081213 Spk D	CGMN-SBC-D103-0-0050	400	367	92	
C0081214	CGMN-SBC-D103-0-0100	4	2.66	87	
C0081214 Rep	CGMN-SBC-D103-0-0100	4	2.88	72	
C0081214 Spk E	CGM/N-SBC-D103-0-0100	40	34.9	87	
C0081214 Spk F	CGMN-SBC-C103-0-0100	400	366	92	
C0081215	CGMN-SBC-D103-0-0150	4	2.89	72	
C0081215 Rep	CGMN-SBC-D103-0-0150	4	2.83	71	
C0081215 Spk G	CGMN-SBC-D103-0-0150	40	32.2		
G0081215 Spk H	CGMN-SBC-D103-0-0150	400		81	
GUUG 1210 SPK III	CGMM-SBC-D103-0-0150	400	354	89	
C0081216	CGMN-SBC-D103-DB-0150	4	3.03	76	
C0081216 Rep	CGMN-SBC-D103-DB-0150	4	2.98	75	
C0081216 Spk I	CGMN-S8C-D103-D8-0150	40	33.7	84	
C0081216 Spk J	CGMN-SBC-D103-DB-0150	400	363	91	
C0081217	CGMN-SBC-D103-0-0200	4	2.58	67	
C0081217 Rep	CGMN-SBC-D103-0-0200	4	2.56	67	
C0081217 Spk K	CGMN-S8C-D103-0-0200	40	33.8	85	
C0081217 Spk L	CGMN-SBC-D103-0-0200	400	35.0 350	58 88	
OWO IETT OPICE	5 dimit-05C-0125-0200	700	300	90	
C0081219	CGMN-SBC-D103-0-0250	4	NR	NR	
C0081219 Rep	CGMN-SBC-D103-0-0250	4	NR	NF	
C0981219 Spk C	CGMN-SBC-D103-0-0250	40	NR	NR	
C0081219 Spk D	CGMN-SBC-D103-0-0250	400	NR	NR	
C0081220	CGMN-SBC-D103-0-0300	4	2.58	65	
C0081220 Rep	CGMN-6BC-D103-0-0300	4	2.55	64	
C0081220 Sak E	CGMN-SBC-D103-0-0300	40	37.2	93	
C0081220 Spk F	CGMN-SBC-D103-0-0300	400	333	53 53	
C0081221	CGMN-SBC-D103-0-0350			-	
		4	2.77	59	
C0081221 Rep	CGMN-SBC-D183-0-8350	4	2.88	72	
C0081221 Spk G	CGMN-SBC-D103-0-0350	40	36.1	90	
C0081221 Spk H	CGMN-SBC-D103-0-0350	460	313	78	
C0061222	CGMN-SBC-D103-0-0400	4	2.70	68	
C0081222 Rep	CGMN-SBC-D103-0-0400	4	2.50	53	
C0061222 Spk I	CGMN-SBC-D103-0-0400	40	38.0	90	
C0081222 Spk J	CGMN-SBC-D103-0-0400	400	345	86	
C0081238	CGMN-SBC-D103-0-0450	4	2.83	71	
C0081236 Rep	CGMN-8BC-D103-0-0450	Ĭ	2.88	72	
C0081236 Sak K	CGMN-SBC-D103-0-0460	40	2.86 35.8	72 90	
	CGMN-8BC-D103-0-0450	400	35.6 368	90 92	
C0081236 Spk L	COMPOSITE INSTITUTE	<b>QUU</b>	200	14.2	

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples
Continued

		13C-PFOA				
		Amount Amount				
Exygen	Sample	Spiled	Recovered	Recover		
ID D	Description	(ng/g)	(ng/g)	(%)		
				X-7		
C0081238	CGMN-SBC-D103-0-0500	4	3.12	78		
C0081238 Rep	CGMN-SEC-D103-0-0500	4	3.30	83		
C0081238 Spk C	CGMN-SBC-D103-0-0500	40	37.8	95		
C0081238 Spk D	CGMN-SBC-D103-0-0500	400	342	85		
C0081239	COMMINDO DADO A SERA					
	CGMN-SBC-D103-0-0550	4	2.80	70		
C0081239 Rep	CGMN-SBC-D103-0-0550	4	2.78	70		
C0081239 Spk E	CGMN-SBC-D103-0-0550	40	36.4	91		
C0081239 Spk F	CGMN-SBC-D103-0-0550	400	366	92		
C0081240	CGMH-SBC-D103-8-0600	4	2.69	67		
C0081240 Rep	CGMN-SEC-D103-0-0600	4	2.68			
C0081240 Spk G	CGMN-SBC-D103-0-0500	40		67		
			35.6	89		
C0081240 Spk H	CGMN-S8C-D103-0-0800	400	357	<b>6</b> 9		
C0081241	CGMN-SBC-D103-0-0650	4	2.72	88		
C0081241 Rep	CGMN-SBC-D103-0-0850	4	2.71	68		
C0081241 Spk (	CGMN-SBC-D103-0-0850	40	37.8	94		
C0081241 Spk J	CGMN-SBC-D103-0-0650	400	358	90		
C0081248	CGMN-SBC-D801-0-0000	4	200	•		
C0081248 Rep	CGMN-SBC-D801-0-0000		2.55	67		
		4	2.68	67		
C0081248 Spk K	CGMN-SBC-D801-0-0000	40	37.4	94		
C0081248 Spk L	CGMN-SBC-D801-0-0000	400	338	85		
C0081249	CGMN-SBC-D801-0-0050	4	2.43	61		
C0081249 Rea	CGMN-SBC-D801-0-0050	4	2.59	65		
C0051249 Sok C	CGMN-SBC-D801-0-0050	40	34.2			
C0081249 Sok D	CGMN-SBC-D801-0-0050	400		86		
0000 1248 Spk D	CG1994-3612-12601-4-4030	400	370	93		
C0081250	CGMN-SBC-D801-0-0100	4	2.56	64		
C0081250 Rop	CGMN-SBC-D801-0-0100	4	2.38	60		
C0081250 Spk E	CGMN-SBC-D801-0-0100	40	38.1	95		
C0081250 8pk F	CGMN-SBC-D801-0-0100	400	347	87		
C0081251	CGMN-SBC-D801-0-0150	4	3.18	80		
C0081251 Rep	CGMN-SBC-D801-0-0150	4	3.33			
00081251 Sok G	CGMN-SBC-D801-0-0150	40		83		
			37.0	93		
C0081251 Spk H	CGMN-SBC-D801-0-0150	400	372	83		
C0081252	CGMN-SBC-D801-0-0200	4	2.90	73		
CD081252 Rap	CGMN-S8C-D801-0-0200	4	2.98	75		
C0081252 Spk I	CGMN-SBC-D801-0-0200	40	38.1	95		
00081252 Spk J	CGMN-S8C-D801-0-0200	400	344	85		
C0081274	CGMN-SBC-D101-0-0000	4	2.54			
		4	3.51	88		
C0081274 Rep	CGMN-SBC-D101-0-0000	4	3.41	88		
0081274 Spk K	CGMN-SBC-D101-0-0000	40	34.5	85		
00812074 Spk L	CGMN-SBC-D101-0-0000	400	327	82		

Note: Since this summary table shows rounded results, recovery values may vary alignity from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

	14C-PFOA						
		Amount	Amount				
Exygen	Sample	Spiked	Recovered	Recovery			
10	Description	(ng/g)	(ng/g)	(%)			
C0081275	CGMN-SBC-D101-0-0050	_	2.42				
C0081275 Rep	CGMN-SBC-D101-0-0050	4	3.19	80 79			
			3.16				
C0081275 Spk C	CGMN-SBC-D101-0-0050	40	33.2	83			
C0081275 Spk D	CGMN-SBC-D181-0-6050	400	354	89			
C0081277	CGMN-SBC-D101-0-0100	4	2.74	69			
C0081277 Rep	CGMN-SBC-D101-0-0100	4	2.80	70			
C0081277 Spk E	CGMN-SBC-D101-0-0100	40	37.3	93			
C0081277 Spk F	CGMN-SBC-D101-0-0100	400	354	89			
CD081278	CGMN-SBC-D101-DB-0100	4	2.71	68			
C0081278 Rep	CGMN-S8C-D101-D8-0100	4	2.66	67			
C0081278 Sok G	CGMN-S8C-D101-DB-0100	4D		85			
			33.8				
C0081278 Spk H	CGMN-SBC-D101-DB-0100	400	362	91			
C0081279	CGMN-SBC-D101-0-0150	4	3.38	85			
C0081279 Rep	CGMN-SBC-D101-0-0150	4	3.36	84			
C0081279 Spk I	CGMN-SBC-D101-0-0150	40	35.6	90			
C0081279 Spk J	CGMN-SBC-D101-0-0150	400	338	85			
C0081280	CGMN-SBC-D101-0-0200	4	3.29	82			
C0081280 Rep	CGMN-SBC-D101-0-0200	4	3.64	91			
C0081280 Spk K	CGMN-SBC-D101-0-0200	40	37.8	96			
C0081280 Spk L	CGMN-SBC-D101-0-0200	400	353	88			
C0081281	CGMN-SBC-D102-0-0000	4	NR	NR			
C0081281 Rep	CGMN-S8C-D102-0-0000	3	NR.	NR.			
C0081281 Spk C	CGMN-SBC-D102-0-0000	40	NR.	NR.			
C0081281 Spk D	CGMN-SBC-D102-0-0000	400	NR	NIR NIR			
COURTER SPREE	CG##1-3BC-D 102-0-0000	400	NE	NUK			
Q0081282	CGMN-SBC-D102-0-0050	4	2.82	71			
C0081282 Rep	CGMN-SBC-D102-0-0050	4	2.74	<b>5</b> 9			
C0081282 Spk E	CGMN-SBC-D102-0-0050	40	33.4	84			
CD081282 Spk F	CGMN-88C-0102-0-0050	400	362	91			
C0061283	CGMN-SBC-D102-0-0100	4	2.89	72			
C0081283 Rec	CGMN-SBC-D102-0-0100	4	2.87	72			
C0061283 Spk G	CGMN-SBC-D102-0-0100	40	33.9	85			
C0081283 Spk H	CGMN-SBC-D102-0-0106	400	349	87			
C0081284	CGMN-SBC-D102-0-0150	4	3.39	85			
C0081284 Rep	CGMN-SBC-D102-0-0150	4	3. <b>39</b> 3. <b>20</b>	∞⊃ 80			
C0081284 Spk I	CGMN-SBC-D102-0-0150	40	3.20 35.5	96 86			
	CGMN-SBC-D102-0-0150	400 400	35.6 347				
C0081284 Spk J	CGMN-3BC-D1U2-G-0130	400	347	87			
C0081285	CGMN-SBC-D102-0-0200	4	3.02	76			
C0081285 Rep	CGMN-SBC-D102-0-0200	4	3.14	79			
C0081285 Spk K	CGMN-SBC-0192-0-0290	40	35.8	90			

NR = Not reported due to quality control result fallures.

Note: Since this auminary table shows rounded results, recovery values may very slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		15C-PFOA			
_		Amount	Amount		
Exygen	Sample	Spiked	Recovered	Recovery	
iD	Description	(ng/g)	(ngig)	(%)	
C0081342	CGMN-SBC-81501-0-0000	_			
C0081342 Rep	CGMN-SBC-B1501-0-0000	4	3.57	89	
•	- · · · · · · · · · · · · · · · · · · ·	4	3.26	82	
C0061342 Spk C	CGMN-SBC-B1501-0-000()	40	36.9	92	
C0081342 Splk D	CGMN-SBC-B1501-0-0000	400	360	90	
C0051343	CGMN-S8C-81501-0-0050	4	2.91	73	
C0081343 Rep	CGMIN-SBC-81501-0-0050	4	2.80	70	
C0081343 Spk E	CGMN-SBC-B1501-0-0050	40	35.8	90	
C0081343 Spk F	CGMN-SBC-B1501-0-0050	400	350	50 58	
C0081344	20181 580 B454 4 444	_			
	CGMN-SBC-81501-0-0100	4	2.74	69	
C0081344 Rep	CGMN-S8C-B1501-0-0100	4	2.82	71	
C0081344 Spit G	CGMN-SBC-B1501-0-0100	40	35.0	88	
C6081344 Spk H	CGMN-SBC-B1501-0-0100	400	332	83	
C0081345	CGMN-SBC-B1501-0-0150	4	2.96	74	
C0081345 Rep	CGMN-SBC-B1501-0-0150	À	3.00	75	
C0061345 3pk (	CGMN-SBC-B1501-0-0150	40	34.2	86	
C0081345 Sak J	CGMN-SBC-B1501-0-0150	400			
DODO 1243 CAPE D	COM(4-200-21301-0-0130	400	338	85	
C0081346	CGMN-SBC-B1501-0-0200	4	2.55	54	
C0081346 Rap	CGMN-SBC-B1501-0-0200	4	2.60	65	
C0081348 Spk K	CGMN-SBC-B1501-0-0200	40	34.2	86	
C0081348 Spk L	CGMN-SBC-B1501-0-0200	400	332	83	
C0081242	CGMN-SBC-D501-0-0000	4	NR	NR	
C0081242 Rep	CGMN-SBC-D501-0-0000	à	NIR	NR	
C0081242 Spk C	CGMN-SBC-D501-0-0000	40	NR	NR	
C0081242 Spk D	CGMN-SBC-D501-0-0000	400			
2000 : 242 OJA U	CGW84-35C-230 1-0-0000	400	NR	NR	
C0081243	CGMN-S8C-D501-0-0050	4	2.84	71	
C0081243 Rep	CGMN-SBC-D501-0-0050	4	2.93	73	
20081243 Spk E	CGMN-8BC-D501-0-0050	40	32.8	82	
20081243 Spk F	CGMN-98C-D501-0-0050	400	342	56	
C0081244	CGMN-SBC-D501-DB-0050	4	2.98	75	
C0081244 Rec	CGMN-SBC-D501-D8-0050	4	2.82	71	
0081244 Spk G	CGMN-SBC-D501-D8-0050	40	30.7	77	
20081244 Spk H	CGMN-SBC-D501-DB-0050	400	30.7 318	<b>\$0</b>	
C0081245	COMMINENCE DEDA A MARE				
*****	CGMN-88C-D501-0-0100	4	2.86	72	
C0081245 Rep	CGMN-SBC-D501-0-0100	4	2.94	74	
20081245 Spk I	CGMN-88C-D501-0-0100	40	33.8	85	
20081245 Spk J	CGMN-SBC-D501-0-0100	400	341	85	
C0081246	CGMN-S8C-D501-0-0150	4	3.58	90	
C0081246 Rep	CGMN-SBC-D501-0-0150	4	3.39	85	
0081246 Sak K	CGMN-SBC-D501-0-0150	40	35.6	89	
20081246 Spk L	CGMN-SBC-D501-0-0150	400			
AUGUSTANO CIPA EL	CGMM-30C-0301-0-0130	400	360	90	

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

_		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recover
ID .	Description	(ng/g)		(%)
0000000				···
C0081247	CGMN-SBC-D501-0-0200	4		71
C0081247 Rep	CGMN-SBC-D501-0-0200	4		58
C0081247 Spk C	CGMN-98C-D501-0-0200	40	33.5	84
C0081247 Spk D	CGMN-SBC-D501-0-0200	400	329	82
C0081253	CGMN-SBC-FTA02-0-0000	4	3 23	81
C0081253 Rep	CGMN-SBC-FTA02-0-0000	4		78
C0081253 Spk E	CGMN-SBC-FTA02-0-0000	40		80
C0081253 Spk F	CGMN-SBC-FTA02-0-0000	400		75
		-		
C0081254	CGMN-SBC-FTA02-0-0050	4	3.29	82
C0081254 Rep	CGMN-SBC-FTA02-0-0050	4	3.42	88
C0061254 Spk G	CGMN-SBC-FTA02-0-0050	40	35.8	90
C0081254 Spk H	CGMN-SBC-FTA02-0-0050	400	343	86
C0981255	CGMN-S8C-FTA02-D8-0100	4	3 50	<b>9</b> 0
C0081255 Rep	CGMN-SBC-FTA02-DB-0100	4		94
C0061255 Spk I	CGMN-SBC-FTA02-DB-0100	40		
C0081255 Spk J	CGMN-SBC-FTA02-DB-0100	400		87 90
•		400	402	<b>3</b> 0
C0081256	CGMN-SBC-FTA02-0-0100	4	3.84	91
C0081256 Rep	CGMN-SBC-FTA02-0-0100	4	3.50	88
C0081258 Spk K	CGMN-SBC-FTA02-0-0100	40	40.4	101
C0081258 Spk L	CGMN-SBC-FTA02-0-0100	400	358	90
C0081257	CGMN-SBC-FTA02-0-0150	4	2 26	0.5
C0081257 Rep	CGMN-SBC-FTA02-0-0150	7		85
C0081257 Spk C	CGMN-SBC-FTA02-0-0150	40		85
C0061257 Spk D	CGMN-SBC-FTA02-0-0150			93
0000 1201 Opk D	COMM-386 [A02-0-0 100	400	338	85
C0081256	CGMN-S8C-FTA02-0-0200	4	3.44	86
C0081258 Rep	CGMN-99C-FTA02-0-0200	4	3.50	86
C0081258 Spk E	CGMN-SBC-FTA02-0-0200	40		89
20081258 Spk F	CGMN-SBC-FTA02-0-0200	400		85
C0081259	CGMN-SBC-FTA03-0-0000	4		
C0081259 Rep	CGMN-SBC-FTA03-0-0000	7		63
0081259 Spk G	CGMN-SBC-FTA03-0-0000	40		65
20081259 Spk H	CGMN-SBC-FTA03-0-0000	. •		84
Journ 208 Spk Fi	COMPOSC: AUG-U-DOD	400	342	86
C0081260	CGMN-SBC-FTA03-0-0100	4	3.14	79
C0081260 Rep	CGMN-SBC-FTA03-0-0100	4	3.25	81
C0081280 Spk I	CGMN-SBC-FTA03-6-0100	40		90
00081250 Spk J	CGMIN-SBC-FTA03-0-0100	40G		86
C0081262	CGMN-68C-FTA03-6-0100		224	••
C0081282 Rev		4		83
	CGMN-SBC-FTA03-0-0100	4		85
0081262 Spk K	CGMN-SBC-FTA03-0-0100	40	37.4	94
20081262 Spk L	CGMN-SBC-FTA03-0-0100	400	348	87

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples
Continued

		<sup>G</sup> C-PFOA		
_		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
Ю	Description	(ng/g)	(np/g)	(%)
C0081283	CGMN-SBC-FTA03-0-0150			
C0081263 Rep	CGMN-SBC-FTA03-0-0150	4	3.44	86
C0081283 Spk C		4	3.58	90
	CGMN-SBC-FTA03-0-0150	40	34,1	85
C0081263 Spk D	CGMN-9BC-FTA03-0-015/0	400	346	87
C0081264	CGMN-SBC-FTA03-0-0200	4	2.90	. 73
C0081264 Rep	CGMN-SBC-FTA03-0-0200	4	2.86	72
C0081264 Spk E	CGMN-SBC-FTA03-0-0200	40	32.4	81
G0061264 Spk F	CGMN-SBC-FTAC3-0-0200	400	332	83
C0061269	CGMN-SBC-FTA01-0-0000			
C0081269 Rep		4	2.61	65
	CGMN-SBC-FTA01-0-0000	4	2.58	65
C0081269 Spk G	CGMN-SBC-FTA01-0-0000	40	31.7	79
C0081269 Spk H	CGMIN-SBC-FTA01-0-0000	400	305	75
C0081270	CGMIN-SBC-FTA01-0-005()	4	3.16	79
C0081270 Rep	CGMN-SBC-FTA01-0-0050	4	3.22	81
C0061270 Spk I	CGMN-SBC-FTA01-0-005()	40	33.1	83
C0061270 Spk J	CGMN-SBC-FTA01-0-0050	400	348	87
C0081271	CGMN-SBC-FTA01-0-0100	4	3.46	87
C0061271 Rep	CGMN-SBC-FTA01-0-0100		3.57	
C0081271 Spk K	CGMN-SBC-FTA01-0-0100	40		59
C0081271 Spk L	CGMN-SSC-FTA01-0-0100	400	34.1 334	96 84
20044070	20111 0nd man			
C0081272	CGMN-SBC-FTA01-0-0150	4	3.01	75
C0081272 Rep	CGMN-S9C-FTA01-0-0150	4	3.10	78
C0081272 Spk C	CGMN-SBC-FTA01-0-0150	40	31.7	79
C0081272 Spk D	CGMN-S8C-FTA01-0-0150	400	341	85
C0081273	CGMN-S9C-FTA01-0-0200	4	NR	NR
C0081273 Rep	CGMN-S8C-FTA01-0-0200	4	NR	NR .
00081273 Spk €	CGMN-SBC-FTA01-0-0200	40	NR	NR .
C0061273 Spk F	CGMN-SBC-FTA01-0-0200	400	NR	NR
C0081329	CGMN-SBC-WPA01-0-0000	4	3.33	
C0081329 Rep	CGMN-SBC-WPA01-0-0000	7	2.83	83
20081329 Spk G	CGMN-SBC-WPA01-0-0000	40		71
C0061329 Spk H	CGMN-SBC-WPA01-0-0000		32.7	82
2000 1022 Spn 11	COMIN-05C-11FAU1-0-0000	400	284	71
C0081330	CGMN-SBC-WPA01-0-0050	4	3.40	85
C0081330 Rep	CGMN-SBC-WPA01-0-0050	4	3.36	84
C0081330 Spk !	CGMN-SBC-WPA01-0-0050	40	33.8	85
C0081330 Spk J	CGMN-SBC-WPA01-0-0050	400	344	86
C0081331	CGMN-SBC-WPA01-0-0100	4	3.51	88
C0081331 Rep	CGMN-SBC-WPA01-0-0100	4	3.43	86
00081331 Spk K	COMN-SBC-WPA01-0-0100	40	34.2	
0081331 Sek L	CGMN-SBC-WPA01-0-0100	400		86
	TOWNS TO THE PROPERTY OF THE P	400	380	<b>95</b>

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		12C-PFOA					11C-PFOA	
		Amount	Amount					
Exygen	Sample	Spiked	Recovered	Recover				
ID .	Description	(ng/g)	(ng/g)	(%)				
C0081332	CGMN-SBC-WPA01-DB-0100	4	3.20	60				
C0081332 Rep	CGMN-SBC-WPA01-D8-0100	4	3.32	83				
C0061332 Spk C	CGMN-SBC-WPA01-DB-0100	40	33.3	83				
C0081332 Spk D	CGMN-SBC-WPA01-DB-0100	400	325	81				
C0081333	CGMN-SBC-WPA01-0-0150	4	3.22	51				
C0081333 Rep	CGMN-SBC-WPA01-0-0150	4	3.07	77				
C0081333 Sak E	CGMN-SBC-WPA01-0-0150	40	28.2	71				
C0081333 Sak F	CGMN-SBC-WPA01-0-0150	400	298	75				
C0081334	0010100010010010	_						
	CGMN-SBC-WPA01-0-0200	4	NR	NR				
C0081334 Rep	CGMN-SBC-WPA01-0-0200	4	NR	NR				
C0081334 Spk G	CGMN-SBC-WPA01-0-0200	40	NR	NR				
C0081334 Spk H	CGMN-SBC-WPA01-0-0200	400	NR	NIR				
C0081335	CGMN-SBC-8KG01-0-0000	4	3.31	83				
C0081335 Rep	CGMN-SBC-BKG01-0-0000	4	3.28	82				
C0081335 Spk I	CGMN-SBC-BKG01-0-0000	40	30.0	75				
C0061335 Spk J	CGMN-SBC-BKG01-0-0000	400	305	76				
C0061336	CGMN-S8C-BKG01-0-0050	4	3.53	88				
C0081336 Rep	CGMN-SBC-BKG01-0-0050	ì	3.38	85				
C0081336 Splt K	CGMN-SBC-BKG01-0-0050	40	32.3	81				
C0081336 Spk L	CGMN-SBC-BKG01-0-0050	400	318	80				
~^^^	2010 202 Direct 4 0440							
C0081338	CGMN-SBC-BKG01-0-0100	4	3.29	82				
C0081338 Rep	CGMN-SBC-BKG01-0-0100	4	3.50	88				
C0081338 Spk C	CGMN-S8C-BKG01-0-0100	40	35.4	89				
C0081338 Spk D	CGMN-SBC-BKG01-0-0100	400	328	82				
C0081339	CGMN-SBC-8KG01-DB-0100	4	3,41	85				
C0081339 Rep	CGMN-SBC-BKG01-D8-0100	4	3.32	83				
C0081339 Spk E	CGMN-SBC-BKG01-DB-0100	40	32.4	81				
C0081339 Spk F	CGMN-8BC-BKG01-DB-0100	400	322	81				
C0061340	CGMN-SBC-BKG01-0-0150	4	3.59	90				
C0081340 Rep	CGMN-SBC-BKG01-0-0150	4	3.65	91				
0081340 Spk G	CGMN-\$8C-8KG01-0-0150	40	34.4	85				
20081340 Spk H	CGMN-SBC-BKG01-0-0150	400	346	87				
C0081341	CGMN-SBC-8KG01-0-0200	4	7.40	0.7				
		4	3,49	87				
C0081341 Rep	CGMN-SBC-BKG01-0-0200	4	3.49	<b>8</b> 7				
C0081341 Spk I	CGMN-\$8C-8KG01-0-0200	40	35.0	88				
00081341 Spk J	CGMN-SBC-BKG01-0-0200	400	346	87				
C0081547	OGMN+SBC-BK302-0-0000	4	3.85	96				
C0081347 Rep	CGMN-SBC-BKG02-0-0000	4	3.64	91				
00081347 Spk K	CGMN-SBC-BKG02-0-0000	40	33.9	85				
00061347 Spk L	CGMN-SBC-BKG02-0-0000	400	326	82				

NR = Not reported due to quality commol result faitures.

Note: Since this summany table shows rounded results, recovery values may vary alightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		*C-PFOA				
		Amount	Amount			
Exygen	Sample	Spiked	Recovered	Recovery		
ID.	Description	(ng/g)	(ng/p)	(%)		
C0081348	COLMI SEC DIVOSO O COSO					
C0081348 Rep	CGMN-SBC-BKG02-0-0050	4	3.61	90		
C0081348 Stak C	CGMN-SBC-BKG02-0-0060	4	3.47	87		
	CGMN-SBC-BKG02-0-0050	40	35.0	67		
C0081348 Spk D	CGMN-SBC-BKG02-0-0050	400	323	81		
C0081349	CGMN-SBC-8KG02-08-0100	4	3.54	89		
C0081349 Rep	CGMN-SBC-BKG02-DB-0100	Ä	3.45	86		
C0081349 Spk E	CGMN-SBC-BKG02-DB-0100	40	35.7			
C0061349 Spk F	CGMN-SBC-BKG02-DB-010(I	400	33.7 33 <del>9</del>	89 85		
				65		
C0081350	CGMN-SBC-BKG02-0-0100	4	3.46	86		
C0081350 Rep	CGMN-SBC-BKG02-0-0100	4	3.45	86		
C0081350 Spk G	CGMN-SBC-BKG02-0-0100	40	35.5	88		
C0081350 Spk H	CGMN-88C-BKG02-0-0100	400	338	85		
C0081351	CGMN-SBC-BKG02-0-0150					
C0081351 Rag	CGMN-SBC-BKG02-0-0150	4	3.50	87		
C0081351 Spk !		4	3.42	85		
C0081351 Spk J	CGMN-SBC-BKG02-0-0150	40	36.3	91		
Chine instruction	CGMN-SBC-BKG02-0-0150	400	332	83		
C0061352	CGMN-SBC-BKG02-0-0200	4	3.46	87		
C0081352 Rep	CGMN-SBC-BKG02-0-0200	i i	3.45	86		
C0081352 Spk K	CGMN-SBC-BKG02-0-0200	40	35.1	88		
C0081352 Spk L	CGMN-SBC-BKG02-0-0200	430	321	55 80		
C0081353	66111 45 Budas 5			•		
	CGMN-SS-8KG01-0-0000	4	3.14	79		
C0081353 Rep	CGMN-SS-BKG01-0-0000	4	3.02	76		
C0081353 Spk C	CGMN-SS-BKG01-0-0000	40	30.6	77		
C0081353 Spk D	CGMN-SS-BKG01-0-0000	400	283	71		
C0081354	CGMN-SS-BKG01-0-0004	4	3.19			
C0081354 Rep	CGMN-SS-8KG01-0-0005	7	4	80		
00081354 Sok F	CGMN-SS-BKG01-0-0005	40	3.26	82		
20081354 Spk F	CGMN-SS-BKG01-0-0005	40 403	32.0 306	80 78		
0000.000				••		
C0081355	CGMN-SS-D601-0-0000	4	2.72	58		
C0081355 Rep	CGMN-SS-D601-0-0000	4	2.91	73		
0081355 Spk G	CGMN-SS-D801-0-0000	40	27.8	70		
20081355 Spk H	CGMN-SS-D601-0-0000	400	248	52		
C0081356	CGMN-SS-D601-0-0006	4	5.74			
C0081358 Rep	CGMN-SS-D801-0-0005		2.74	69		
20081356 Spk i	CGMN-SS-D601-0-0005	4	2.87	72		
0081356 Sck J	CGMN-SS-D601-0-0005	40 400	27.7 273	6 <b>9</b>		
		700	213	88		
C0081357	CGMN-SS-D601-DB-0005	4	2.74	69		
C0081357 Rep	CGMN-SS-D601-DB-0005	4	2.65	66		
9081357 Spk K	CGMN-SS-D601-DB-0005	40	26.9	67		
0081357 Spk L	CGMN-SS-D601-D8-0005	400	278	70		

Note: Since this summary table shows rounded results, recovery values may yary stightly from the values in the rounded

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		12C-PFOA		
		Amount	Amount Amount	
Exygen	Sample	Spiked	Recovered	Recovery
Ð	Description	(ng/g)	(ng/g)	(%)
C0081365	COLDI CO DICERIO A CARR			
C0081365 Rap	CGMN-SS-B10201-0-0000	4	3.28	82
	CGMN-SS-B10201-0-0000	4	3.35	84
C0081365 Spk C	CGMN-SS-B10201-0-0000	40	30. <del>6</del>	77
C0081365 Spk D	CGMN-SS-810201-0-0000	400	320	80
C0081366	CGMW-SS-B10201-0-0005	4	3.32	
C0081356 Rep	CGMN-SS-B10201-0-0005	7	3.32 3.34	83
C0081356 Spk E	CGMN-SS-B10201-0-0005	40		84
C0081388 Spk F	CGMN-SS-B10201-0-0006	40 460	32.7 347	82 87
			341	0.7
C0081367	CGMN-SS-B2201-0-0000	4	4.02	101
C0081357 Rep	CGMN-SS-B2201-0-0000	4	3.98	99
C0081367 Spk 3	CGMN-SS-B2201-0-0000	40	35.5	89
C0081367 Spk H	CGMN-SS-B2201-0-0000	400	371	93
C0081368	COMM OF PAGGA & AREA			_
C0081368 Rep	CGMN-SS-B2201-6-0005	4	3.50	88
C0081368 Spk i	CGMN-SS-82201-0-0005	4	3.67	92
C0081368 Spk J	CGMIN-SS-82201-0-0005	40	37.6	94
Cuda (30a Spik )	CGMN-SS-82201-0-0005	400	369	92
C0081369	CGMN-SS-B2201-D8-0905	4	3.61	90
C0081359 Rep	CGMN-SS-B2201-DB-0005	4	3.66	92
C0081389 Spk K	CGMN-SS-B2201-DB-0005	40	35.8	
C0081369 Spk L	CGMN-SS-B2201-DB-0005	400	368	90 92
C0081370	CGMN-SS-B2501-0-0000	_		
C0081370 Rep		4	3.42	66
	CGMN-SS-B2501-0-0000	4	3.44	86
C0081370 Spk C	CGMN-SS-B2501-0-0000	40	37.5	95
C0081370 Spk D	CGMN-SS-B2501-0-0000	400	355	89
C0081371	CGMN-SS-B2501-0-0005	4	3.27	
C0081371 Rep	CGMN-SS-B2501-0-0005	7		82
C0081371 Spk E	CGMN-SS-B2501-0-0005	40	3.14	79
20061371 Spk F	CGMN-SS-B2601-0-0005	40 400	33.8 324	85
•		400	324	81
C0081372	CGMN-SS-B2801-0-0000	4	3.50	88
C0081372 Rep	CGMN-SS-B2601-0-0000	4	3.51	88
00081372 Spk G	CGMN-SS-B2601-0-0000	40	36.7	92
20081372 Spk H	CGMN-SS-B2601-0-0000	400	358	90
C0081373	CGMN-SS-B2801-0-0005	4		
C0061373 Rao		4	3.61	90
C0061373 Rep C0081373 Spk i	CGMN-SS-B2601-0-0005	4	3.53	88
•	CGMN-SS-B2801-0-0005	40	30.2	91
20081373 Spk J	CGMN-SS-B2801-0-0005	400	361	90
C0081375	CGMN-SS-B1802-0-0000	4	3.26	D-0
C0081375 Rep	CGMN-S9-81802-0-0000	4	3.42	82
0081375 Spk K	CGMN-SS-B1802-0-0000	40		86
0081375 Sak L	CGMN+SS-B1802-0-0000	400	31.3	78
	SCHOOL OF LANCE	400	<b>3</b> 27	82

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples
Continued

		<sup>11</sup> C-PFOA					
		Amount	Amount				
Exygen	Sample	Spiked	Recovered	Recovery			
10	Description	(ng/g)	(ng/g)	(%)			
C0081376	COMMING BASES A TARE						
C0081376 Rep	CGMN-SS-B1602-0-0005	4	3.08	Π			
C0081376 Sak C	CGMN-SS-B1802-0-0005	4	3.00	75			
	CGMN-SS-81602-0-0005	40	36.6	85			
C0081376 Spk D	CGMN-SS-B1602-0-0005	400	339	85			
C0061377	CGMN-SS-B11201-G-0000	4	3.22	81			
C0081377 Rep	CGMN-SS-811201-0-0000	4	3.15	79			
C0081377 Sok E	CGMN-SS-B11201-0-0000	40	32.3	81			
C0081377 Spk F	CGMN-SS-B11201-0-0000	400	322	81			
C0081378	CC111 00 74404 1 0447			•			
	CGMN-SS-B11201-0-0005	4	3.05	76			
C0081378 Rap	CGMN-SS-B11201-0-0005	4	3.16	79			
C0081378 Spk G	CGMN-SS-B11201-0-0005	40	33.8	84			
C0081378 Spk H	CGMN-SS-B11201-0-0005	400	357	89			
C0081379	CGMN-SS-FTA01-0-0000	4	2.86	72			
C0081379 Rep	CGMN-SS-FTA01-0-0000	i	3.01	75			
C0061379 Spk I	CGMN-SS-FTA01-0-0000	40	27.8	70 70			
C9081379 Spk J	CGMN-SS-FTA01-0-0000	400	278	70			
C0081380	COLMI DO FT 104 D 200-						
C0081380 Rep	CGMN-SS-FTA01-0-0005	•	3.14	79			
C0081380 Spk K	CGMN-SS-FTAD1-0-0005	4	3.03	76			
	CGMN-SS-FTA01-0-0005	40	29.8	75			
C0081380 Spk L	CGMN-SS-FTA01-D-0005	400	314	79			
C0051381	CGMN-SS-FTA01-DB-0005	4	3.23	81			
C0081381 Rep	CGMN-SS-FTA01-D8-0005	4	3.26	82			
C0081381 Spk C	CGMN-SS-FTA01-DB-0005	40	33.8	85			
C0081381 Spk D	CGMN-SS-FTA01-DB-0005	400	335	84			
C0081382	CCMM OF FTARA A AGOO						
*****	CGMN-SS-FTA02-0-0000	4	2.57	64			
C0081382 Rep	CGMN-SS-FTA02-0-0000	4	2.66	87			
C0081382 Spk E C0081382 Spk F	CGMN-SS-FTA02-0-0000	40	30.4	76			
COOD ISBE OFFICE	CGMN-SS-FTA02-0-2000	400	272	68			
C0051383	CGMN-SS-FTA02-0-0006	4	3.02	78			
C0061383 Rep	CGMN-SS-FTA02-0-0005	4	3.08	77			
C0081383 Spk G	CGMN-SS-FTA02-0-0006	40	30.2	75			
20081383 Spik H	CGMN-SS-FTA02-0-0005	400	314	79			
C0081385	CGMN-SS-B6801-0-0000	4	0.50	24			
C0081385 Rep	CGMN-SS-86801-0-0000	•	2.52	63			
C0081385 Sok I	CGMN-SS-86801-C-0000	4	2.71	58			
20061365 Spk J	CGMN-SS-B8801-0-0000 CGMN-SS-B6801-0-0000	40 400	34.6 342	87 86			
•			V74.	90			
C0081386	CGMN-88-B6801-DB-0000	4	2.67	67			
C0081386 Rep	CGMN-SS-86801-DB-0000	4	2.46	62			
0081386 Spk K	CGMN-SS-65801-DB-0000	40	32.6	82			
0061386 Spk L	CGMN-SS-86801-DB-0000	400	328	82			

Note: Since this summary table shows rounded results, recovery values may vary alightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

		15C-PFOA		
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
ID D	Description	(ng/s)	(ng/a)	(%)
C0081387	CONT. OC OCODA A SODA		5.00	
C0081387 Red	CGMN-SS-86801-0-0005 CGMN-SS-86801-0-0005	4	2.89	72
		4	2.82	71
C0081387 Spk C	CGMN-SS-86801-0-0005	40	36.2	91
C0081387 Spk D	CGMN-SS-86801-0-0006	400	342	86
C0081392	CGMN-SS-81601-0-0000	4	3.50	88
C0081392 Rep	CGMN-SS-B1601-0-0000	4	3.58	90
C0061392 Spk E	CGMN-SS-81601-0-0000	40	38.9	97
C0061392 Spk F	CGMN-SS-B1601-0-0000	400	365	91
C0081393	CGMN-SS-B1601-0-0005	4	3.20	80
C0081393 Rep	CGMN-SS-B1601-0-0005	7	3.30	83
C0081393 Spk G	CGMN-SS-B1601-0-0005	40	35.8	90
C0081393 Spk G	CGMN-SS-B1601-0-0005	400 400	35.8 353	90 88
Concusso obiru	C-34114-35-5 (00) 1-0-0005	400	323	ac
C0081396	CGMN-SS-IC04-0-0000	4	3.12	78
C0081395 Rep	CGMN-SS-IC04-0-0000	4	3.42	86
C0061395 Spk	CGMN-99-1004-0-0000	40	34.0	85
C0081395 Spk J	CGMN-SS-IC04-0-0000	400	324	81
C0081396	CGMN-S9-IC04-0-0005	4	2.99	75
C0081396 Reo	CGMN-SS-IC04-0-0005	4	3.10	78
C0081398 Spk K	CGMN-SS-IC04-0-0005	40	31.0	78
C0081395 Spk L	CGMN-SS-IC04-0-0005	400	320	80
C0081397	CGMN-SS-IC03-0-0000	4	3.70	93
C0081397 Rep	CGMN-SS-IC03-0-0000	7	3.38	
		40		85
C0081397 Spk C	CGMN-SS-IC03-0-0000 CGMN-SS-IC03-0-0000		39.0	98
C0081397 Spk D	CGMN-55-RU3-0-0000	400	335	84
C0081398	CGMN-SS-IC03-0-0005	4	3.52	88
C0061398 Rep	CGMN-SS-IC03-0-0005	4	3.09	77
C0081398 Spk E	CGMN-SS-IC03-0-0005	40	31.5	79
C0081398 Spk F	CGMN-\$5-IC03-0-0005	400	290	73
C0081399	CGMN-9S-IC01-0-0000	4	3.90	98
C0081399 Reo	CGMN-SS-IC01-0-0000	4	3.60	90
00081399 Spk G	CGMN-SS-IC01-0-0000	40	37.7	94
C0081399 Spk H	CGMIN-35-IC01-0-0000	400	342	86
C0081400	CGMN-SS-IC01-0-0005	4	3.25	81
C0081400 Rmo	CGMN-SS-IC01-0-0005	•	3.25 3.33	83
	CGMN-SS-IC01-0-0005 CGMN-SS-IC01-0-0005	•		
C0081400 Spk I		40	33.3	83
C0081400 Spk J	CGMN-SS-IC01-0-0005	400	293	73
C0081401	CGMN-SS-ICC2-0-0000	4	3.22	81
C0081401 Rep	CGMN-S8-ICC2-0-0000	4	3.42	86
0081401 Spk K	CGMN-SS-IC02-0-0000	40	30.5	76
C0081401 Spk L	CGMN-SS-IC02-0-0000	400	268	67

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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## Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Soil Samples Continued

			12C-PFOA	
F		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
ID ID	Description	(pg/g)	(ng/g)	(%)
C0081402	CGMN-65-1002-0-0005	4		
C0081402 Rep	CGMN-SS-IC02-0-0005	4	3.79	85
C0081402 Spk C	CGMN-68-IC02-0-0006	4	3.58	90
C0081402 Spk D	CGMN-SS-IC02-0-0005	40	34.2	88
COLD 1402 SPK D	CBM/4-35-ICU2-0-0005	400	390	96
C0081403	CGMN-SS-D503-0-0000	4	3.98	100
C0081403 Rep	CGMN-SS-D503-0-0000	4	3.43	86
C0081403 Spk E	CGMN-SS-D503-0-0000	40	37.2	93
C0061403 Spk F	CGMN-SS-0503-0-0000	400	334	84
C0081404	CGMN-SS-0603-0-0005			
C0081404 Rep	CGMN-SS-D503-0-0005	4	3.71	93
C0081404 Spk G	CGMN-SS-D503-0-0005	4	3.51	55
C0081404 Spk H	CGMN-SS-D503-0-0805	40	37.4	94
COVERTOR SIGN II	CGMI4-55-1503-0-0003	400	374	94
C0081405	CGMN-S8-D501-0-0000	4	3.30	83
C0081405 Rep	CGMN-SS-D501-0-0000	4	3.07	77
C0081405 Spk i	CGMN-SS-D501-0-0000	40	35.9	90
C0081405 Spk J	CGMN-SS-D501-0-0000	400	314	79
C0061406	CGMN-SS-D501-0-0005	4	2.07	52
C0081406 Rep	CGMN-SS-D501-0-0005	i	1.98	52 50
C0081406 Splc K	CGMN-SS-D501-0-0005	40	36.2	91
C0081406 Spk L	CGMN-SS-D501-0-0005	400	330	81 63
C0081407	CGMN-SS-B801-0-0000			
C0081407 Rep	CGMN-SS-8801-0-0000	4	3.23	81
		4	3.03	78
C0061407 Spk C	CGMN-SS-B801-0-0000	40	32.1	80
C0081407 Spfr D	CGMN-SS-B801-0-0000	400	274	69
C0081408	CGMN-SS-B801-0-0005	4	2.83	71
C0081408 Rep	CGMM-SS-3801-0-0005	4	2.84	71
20081408 Spk E	CGMN-SS-8801-0-0005	40	27.5	59
00081408 Spk F	CGMN-9S-8801-0-0005	400	305	76
C0081409	CGMN-S\$-D502-0-0000	4	2.77	69
C0081409 Ran	CGMN-SS-D502-0-0000	7	3.07	77
00081409 Spk G	CGMN-SS-D502-0-0000	40	3.07 28.3	71
0081408 Spk H	CGMN-SS-0502-0-0000	490	28.3 310	/1 78
C0081410	CCMM-69-DED2-0-AGGE			
C0081410 Rep	CGMN-SS-D502-0-0005	•	3.27	82
· · · · · · · · · · · · · · · · · · ·	CGMN-SS-D502-0-0005	4	3.81	90
C0061410 Spk I	CGMN-93-D502-0-0005	40	32.2	81
20081410 Spk J	CGMN-SS-D502-0-0005	400	326	82

Average: 78 Standard Deviation: 12

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IX. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Ground Water Samples

			13C-PFOA	
Exygen	<b>**</b>	Amount	Amount	
	Sample	Spiked	Recovered	Recovery
	Description	(ng/L)	(ng/L)	(%)
C0081224 Spk C	CGMN-GW-PW7-0-050516	1500	4888	
C0081224 Spk D	CGMN-GW-PW7-0-050516		1300	87
C0081224	CGMN-GW-PW7-0-050516	5500	4840	88
C0081224 Rep	CGMN-GW-PW7-0-050516	500	418	84
C0081225	CGMN-GW-PW7-DP-050518	500	342	68
C0061226	CGMN-GW-PW7-LS-050516	500	125	25
C0081227	CGMN-GW-PW7-HS-050518	1000	1120	112
	COM14-G14-T147-NS-050518	5000	5390	106
C0081228 Spk E	CGMN-GW-MW8-0-050516	600	287	48
C0081228 Spk F	CGMN-GW-MW8-0-050518	1000	647	65
C0081228	CGMN-GW-MW8-0-050518	500	164	33
C0081228 Rep	CGMN-GW-MW8-0-050516	500	134	
C0081229	CGMN-GW-MW8-DP-050516	500	230	27
C0081230	CGMN-GW-MW8-LS-050516	100	230 274	46
C0081231	CGMH-GW-MW8-HS-050518	500	628	274
		550	020	126
C0081232 Spk G	CGMN-GW-MW19-0-050517	1000	NR	NIR
C0081232 Spk H	CGMN-GW-MW19-0-050517	1500	NR	NR
C0081232	CGMN-GW-MW19-0-050517	500	NR	NR
C0061232 Rep	CGMN-GW-MW19-0-050517	500	NR	NIR
C0081233	CGMN-GW-MW19-DP-050517	500	NR	NR
C0081234	CGMN-GW-MW19-LS-050517	500	NR	NR
C0061235	CGMN-GW-MW18-HS-050517	1000	NR	NR
C0081265 Sek C	CGMN-GW-DECON-0-050524	600		
C0081285 Spk D	CGMN-GW-DECON-0-050524		575	96
C0081265	CGMN-GW-DECON-0-050524	5500 500	5200	95
C0081265 Rep	CGMN-GW-DECON-0-050524	500 500	424	85
C0081266	CGMN-GW-DECON-DP-050524		382	72
C0081267	CGMN-GW-DECON-LS-050524	500	409	82
C0081268	CGMN-GW-DECON-HS-050524	100 5000	102 45 <b>2</b> 0	102
20004444 0 1 0		3000	4520	90
20081411 Spk E	WBMN-GW-R1-0-050512	1500	1360	91
00081411 Spk F	WBMN-GW-R1-0-050512	10500	10600	101
C0081411	WBMN-GW-R1-0-050512	500	401	50
C0081411 Rep	WBMN-GW-R1-0-050512	530	393	79
C0081412	WBMN-GW-R1-DP-050512	500	395	79
C0081413	WBMN-GW-R1-LS-050512	1000	833	83
C0081415	WBMN-GW-R1-HS-050512	10000	9520	95
0081416 Spk C	WBMN-GW-R2-0-050612	4EDR	4700	
0081418 Spk D	WBMN-GW-R2-0-050512	1500	1380	91
C0081416	WBMN-GW-R2-0-050512	10500	9710	92
00081416 Rep	WBMN-GW-R2-0-050512	500	447	<b>69</b>
C0081417	WBMN-GW-R2-DP-050512	500	401	80
C0081418	WBMN-GW-R2-LS-050512	500	503	101
C0081419		1000	1020	102
VVVV 17 13	W8MN-GW-R2-HS-050512	10000	8660	87

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IX. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Ground Water Samples Continued

			13C-PFOA	
		Amount	Amount	
Exygen	Sample	3plkad	Recovered	Recovery
<u> </u>	Description	(ng/L)	(ng/L)	(%)
C0061420 Spk E	WBMN-GW-R3-0-050512:	1500	1230	82
C0081420 Spk F	WBMN-GW-R3-0-050512	10500	8850	82
C0081420	WBMN-GW-R3-0-050512	500	381	76
C0081420 Rep	WBMN-GW-R3-0-050512	500	356	71
C0081421	WEMN-GW-R3-DP-050512	500	411	82
C0081422	WBMN-GW-R3-LS-05051:2	1000	1000	100
C0081423	WBMN-GW-R3-HS-050512	10000	8920	89
C0081424 Spk G	WBMN-GW-R4-0-050512	10500	8760	83
C0081424 Spk H	WBMN-GW-R4-0-050512	100500	80700	80
C0081424	WBMN-GW-R4-0-050512	500	359	72
C0081424 Rep	WBMN-GW-R4-0-050512	500	332	68
C0081425	WBMN-GW-R4-DP-050512	500	366	73
C0081426	WBMN-GW-R4-LS-050512	10000	9090	91
C0081427	WBMN-GW-R4-HS-050512	100000	82300	82
C0081428 Spk C	WBMN-GW-CWM-0-050512	1500	1330	89
C0081428 Spk D	WBMN-GW-CWM-0-050512	10500	9440	90
C0081428	WBMN-GW-CWM-0-050512	500	443	88
C0081428 Rep	WBMN-GW-CWM-0-050512	.500	364	73
C0081429	W8MN-GW-CWM-DP-050512	500	405	81
C0081430	WBMN-GW-CWM-LS-050512	1000	959	96
C0081431	WBMN-GW-CWM-HS-050512	19000	10500	105
00081432 Spk E	WBMN-GW-CWD01-0-050512	1500	1280	85
00081432 Spk F	WBMN-GW-CWD01-0-050512	10500	8370	80
C0081432	WBMN-GW-CWD01-0-050512	500	354	71
C0061432 Rep	WBMN-GW-CWD01-0-050512	500	330	66
C0081433	WBMN-GW-CWDQ1-DP-050512	500	408	82
C0061434	WBMN-GW-CWD01-LS-050812	1000	787	79
C0061435	WBMN-GW-CWD01-HS-050512	10000	6680	67
C0081436	WBMN-GW-TRIP-0-050511	500	434	87
C0081437	WBMN-GW-TRIP-LS-050511	100	104	104
C0081438	WBMN-GW-TRIP-HS-050511	1000	899	90

Average: 83 Standard Deviation; 38

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table X. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Rinse Blank Samples

			13C-PFOA	
Exygen ID	Sample Description	Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0081204	CGMN-SBC-D104-RB-0400	500	372	74
C0081218	CGMN-SBC-D103-RB-0250	500	382	76
C0081237	CGMN-SBC-D103-RB-0500	500	421	84
C0081337	CGMN-SBC-BKG01-RB-0200	500	414	83
C0081364	CGMN-SS-D101-RB-0005	500	418	84
C0081384	CGMN-SS-FTA01-RB-0005	500	361	72
C0081394	CGMN-SS-B6801-RB-0000	500	368	74
C0061261	CGMN-SBC-FTA03-RB-0100	500	373	75
C0081276	CGMN-S8C-D101-RB-0150	500	415	83
			Average:	78

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table XI. Total Percent Solids for Soil Samples

Exygen ID	Client Sample ID	Total Solids (%)
C0081163	CGMN-SBC-D203-0-0000	81.70
C0081164	CGMN-SBC-D203-0-0050	73.84
C0081165	CGMN-SBC-D203-0-0100	80.97
C0081166	CGMN-SBC-D203-0-0150	41.52
C0081167	CGMN-SBC-D203-0-0200	51.35
C0081168	CGMN-SBC-D203-0-0250	92.22
C0081169	CGMN-SBC-D203-0-0300	92.46
C0081170	CGMN-SBC-D203-DB-0300	91.81
C0081171	CGMN-SBC-D203-0-0350	97.29
C0081172	CGMN-SBC-D203-0-0400	98.10
C0081173	CGMN-SBC-D203-0-0450	97.14
C0081174	CGMN-S8C-D202-0-0000	72.55
C0081175	CGMN-SBC-D202-0-0050	52.15
C0081176	CGMN-SBC-D202-0-0100	78.26
C0081177	CGMN-SBC-D202-0-0150	54.16
C0081178	CGMN-SBC-D202-0-0200	79.50
C0081179	CGMN-SBC-D202-0-0250	90.93
C0081180	CGMN-SBC-D202-0-0300	94.54
C0081181	CGMN-SBC-D202-0-0350	95.34
C0081182	CGMN-SBC-D202-D8-0350	94.57
C0081183	CGMN-SBC-D202-0-0400	97.10
C0081184	CGMN-SBC-D202-0-0450	92.20
C0081185	CGMN-SBC-D201-0-0000	89.84

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Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081186	CGMN-SBC-D201-0-0050	86.87
C0081187	CGMN-SBC-D201-0-0100	90.92
C0081188	CGMN-SBC-D201-DB-0100	90.37
C0081189	CGMN-SBC-D201-0-0150	56.09
C0081190	CGMN-SBC-D201-0-0200	85.46
C9081191	CGMN-SBC-D201-0-0250	87.06
C0081192	CGMN-SBC-D201-0-0300	92.97
C0081193	CGMN-SBC-D201-0-0350	97.14
C0081194	CGMN-SBC-D201-0-0400	98.46
C0081195	CGMN-SBC-D104-0-0000	83.93
C0081196	CGMN-SBC-D104-0-0050	63.50
C0081197	CGMN-SBC-D104-DB-0050	83.68
C0081198	CGMN-SBC-D104-0-0100	95.51
C0081199	CGMN-SBC-D104-0-0150	90.98
C0081200	CGMN-SBC-D104-0-0200	83.04
C0081201	CGMN-SBC-D104-0-0250	84.27
C0081202	CGMN-SBC-D104-0-0300	97.45
C0081203	CGMN-SBC-D104-0-0350	96.15
C0081205	CGMN-SBC-D104-0-0400	97.83
Ç0081206	CGMN-SBC-D104-0-0450	97.55
C0081207	CGMN-SBC-D104-DB-0450	97.42
C0081208	CGMN-SBC-D104-0-0500	95.80
C0081209	CGMN-SBC-D104-0-0550	96.12

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Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081210	CGMN-SBC-D104-0-0600	97.11
C0081211	CGMN-SBC-D104-0-0650	96.19
C0081212	CGMN-SBC-D103-0-0000	87.89
C0081213	CGMN-SBC-D103-0-0050	87.26
C0081214	CGMN-SBC-D103-0-0100	91.87
C0081215	CGMN-SBC-D103-0-0150	93.94
C0081216	CGMN-SBC-D103-DB-0150	93.76
C0081217	CGMN-SBC-D103-0-0200	91.87
C0081219	CGMN-SBC-D103-0-0250	84.92
C0081220	CGMIN-SBC-D103-0-0300	93.88
C0081221	CGMN-SBC-D103-0-0350	95.89
C0081222	CGMN-SBC-D103-0-0400	96.84
C0081236	CGMN-SBC-D103-0-0450	96.46
C0081238	CGMIN-SBC-D103-0-0500	97.27
C0081239	CGMN-SBC-D103-0-0550	96.92
C0081240	CGMN-SBC-D103-0-0600	97.47
C0081241	CGMN-SBC-D103-0-0650	97.59
C0081242	CGMN-SBC-D501-0-0000	92.45
C0081243	CGMN-SBC-D501-0-0050	83.12
C0081244	CGMN-SBC-[3501-DB-0050	85.04
C0081245	CGMN-SBC-D501-0-0100	87.27
C0081248	CGMN-SBC-D501-0-0150	95.64
C0081247	CGMN-SBC-D501-0-0200	95.9 <del>9</del>

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Table XI. Total Percent Solids for Soil Samples Continued

Client Sample ID	Total Solids (%)
CGMN-SBC-D801-0-0000	85.66
CGMN-SBC-D801-0-0050	77.94
CGMN-SBC-D801-0-0100	74.82
CGMN-SBC-D801-0-0150	75.84
CGMN-SBC-D801-0-0200	77.16
CGMN-SBC-FTA02-0-0000	86.80
CGMN-SBC-FTA02-0-0050	95.75
CGMN-SBC-FTA02-DB-0100	95.54
CGMN-SBC-FTA02-0-0100	95.66
CGMN-SBC-FTA02-0-0150	96.12
CGMN-SBC-FTA02-0-0200	97.02
CGMN-SBC-FTA03-0-0000	81.97
CGMN-SBC-FTA03-0-0100	95.05
CGMN-S8C-FTA03-0-0100	96.30
CGMN-SBC-FTA03-0-0150	97.64
CGMN-SBC-FTA03-0-0200	91.72
CGMN-SBC-FTA01-0-0000	78.28
CGMN-SBC-FTA01-0-0050	96.03
CGMN-SBC-FTA01-0-0100	95.77
CGMN-SBC-FTA02-0-0150	97.07
CGMN-SBC-FTA02-0-0200	96.64
CGMN-SBC-D101-0-0000	83.44
CGMN-SBC-D101-0-0050	90.49
	CGMN-SBC-D801-0-0000 CGMN-SBC-D801-0-0100 CGMN-SBC-D801-0-0150 CGMN-SBC-D801-0-0150 CGMN-SBC-D801-0-0200 CGMN-SBC-FTA02-0-0000 CGMN-SBC-FTA02-0-0050 CGMN-SBC-FTA02-0-0100 CGMN-SBC-FTA02-0-0100 CGMN-SBC-FTA02-0-0100 CGMN-SBC-FTA02-0-0150 CGMN-SBC-FTA03-0-0000 CGMN-SBC-FTA03-0-0000 CGMN-SBC-FTA03-0-0100 CGMN-SBC-FTA03-0-0100 CGMN-SBC-FTA03-0-0150 CGMN-SBC-FTA03-0-0150 CGMN-SBC-FTA03-0-0150 CGMN-SBC-FTA03-0-0150 CGMN-SBC-FTA03-0-0150 CGMN-SBC-FTA01-0-0000 CGMN-SBC-FTA01-0-0100 CGMN-SBC-FTA01-0-0100 CGMN-SBC-FTA01-0-0100 CGMN-SBC-FTA02-0-0150 CGMN-SBC-FTA02-0-0150 CGMN-SBC-FTA02-0-0200 CGMN-SBC-FTA02-0-0200

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Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081277	CGMN-SBC-D101-0-0100	96.10
C0081278	CGMN-SBC-D101-DB-0100	98.32
C0081279	CGMN-SBC-D101-0-0150	97.23
C0081280	CGMN-SBC-D101-0-0200	97.62
C0081281	CGMN-SBC:-D102-0-0000	82.22
C0081282	CGMN-SBC-D102-0-0050	90.33
C0081283	CGMN-SBC-D102-0-0100	97.68
C0081284	CGMN-SBC-D102-0-0150	97.52
C0081285	CGMN-SBC-D102-0-0200	97.71
C0081329	CGMN-SBC-WPA01-0-0000	85.53
C0081330	CGMN-SBC-WPA01-0-0050	90.31
C0081331	CGMN-SBC-WPA01-0-0100	86.85
C0081332	CGMN-SBC-WPA01-DB-0100	87.30
C0081333	CGMN-SBC-WPA01-0-0150	87.10
C0081334	CGMN-SBC-WPA01-0-0200	79.75
C0081335	CGMN-SBC-BKG01-0-0000	94.91
C0081336	CGMN-SBC-BKG01-0-0050	95.58
C0081338	CGMN-SBC-BKG01-0-0100	88.98
C0081339	CGMN-SBC-EIKG01-DB-0100	88.19
C0081340	CGMN-S8C-BKG01-0-0150	89.67
C0081341	CGMN-SBC-BKG01-0-0200	92.88
C0081342	CGMN-SBC-B1501-0-0000	93.16
C0081343	CGMN-S8C-81501-0-0050	94.09

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Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Cilent Sample ID	Total Solids (%)
C0081344	CGMN-SBC-B1501-0-0160	95.23
C0081345	CGMN-SBC-B1501-0-0150	94.22
C0081346	CGMN-SBC-B1501-0-0200	91.97
C0081347	CGMN-SBC-BKG02-0-0000	94.20
C0081348	CGMN-SBC-BKG02-0-0050	94.79
C0081349	CGMN-S8C-BKG02-DB-0100	95.75
C0081350	CGMN-SBC-BKG02-0-0100	95.96
C0081351	CGMN-SBC-BKG02-0-0150	95.98
C0081352	CGMN-SBC-BKG02-0-0200	94.36
C0081353	CGMN-SS-BKG01-0-0000	83.49
C0081354	CGMN-SS-BKG01-0-0005	90.25
C0081355	CGMN-SS-D601-0-0000	71.82
C0081358	CGMN-SS-D801-0-0005	83.00
C0081357	CGMN-SS-D801-DB-0005	82.50
C0081358	CGMN-SS-D101-0-0005	86.88
C0081359	CGMN-SS-D101-DB-0005	87.06
C0081360	CGMN-SS-D201-0-0000	74.02
C0081361	CGMN-SS-D201-0-0005	75.73
C0081362	CGMN-SS-D202-0-0000	86.36
C0981363	CGMN-SS-D202-0-0005	90.40
C0081365	CGMN-SS-B10201-0-0000	88.01
C0081366	CGMN-SS-B10201-0-0005	91.76
C0081367	CGMN-SS-B2201-0-0000	91.49

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Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081368	CGMN-SS-B2201-0-0005	90.23
C0081369	CGMN-SS-B2201-DB-0005	90.35
C0081370	CGMN-SS-B2501-0-0000	92.30
C0081371	CGMN-SS-B2501-0-0005	93.11
C0081372	CGMN-SS-B2601-0-0000	94.05
C0081373	CGMN-SS-B2601-0-0005	90.45
C0081374	CGMN-SS-D101-0-0000	84.08
C0081375	CGMN-SS-B1602-0-0000	90.45
C0081376	CGMN-SS-B1602-0-0005	93.07
C0081377	CGMN-SS-811201-0-0000	83.68
C0081378	CGMN-SS-B11201-0-0005	90.93
C0081379	CGMN-SS-FTA01-0-0000	76.47
C0081380	CGMN-SS-FTA01-0-0005	80.76
CD081381	CGMN-SS-FTA01-DB-0005	81.33
C0081382	CGMN-SS-FTA02-0-0000	75.05
C0081383	CGMN-SS-FTA02-0-0005	75.84
C0081385	CGMN-SS-I96801-0-0000	87.44
C0081386	CGMN-SS-B/5801-DB-0000	87.44
C0081387	CGMN-SS-EI6801-0-0005	91.15
C0081388	CGMN-SS-E/1502-0-0000	91.07
C0081389	CGMN-98-B1502-0-0005	92.87
C0081390	CGMN-SS-B1501-0-0000	93.19
C0081391	CGMN-SS-B1501-0-0005	94.32

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Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Cilent Sample ID	Total Solids (%)
C0081392	CGMN-SS-B1801-0-0000	94.42
C0081393	CGMN-SS-B1801-0-0005	85.94
C0061395	CGMN-SS-IC04-0-0000	86.57
C0081396	CGMN-SS-IC04-0-0005	92.70
C0081397	CGMN-SS-IC03-0-0000	80.68
C0081398	CGMN-SS-IC03-0-0005	87.72
C0081399	CGMN-SS-IC01-0-0000	87.21
C0081400	CGMN-SS-IC01-0-0005	89.80
C0081401	CGMN-SS-IC02-0-0000	78.12
C0081402	CGMN-SS-IC02-0-0005	91.41
C0081403	CGMN-SS-D503-0-0000	61.97
C0081404	CGMN-SS-D503-0-0005	89.70
C0081405	CGMN-SS-D501-0-0000	84.61
C0081406	CGMN-SS-D501-0-0005	87.43
C0081407	CGMN-SS-B801-0-0000	80.97
C0081408	CGMN-SS-B801-0-0005	83.25
C0081409	CGMN-SS-D502-0-0000	84.71
C0081410	CGMN-SS-D502-0-0005	86.22

Exygen Study No.: P0001400

## **FIGURES**

Exygen Research

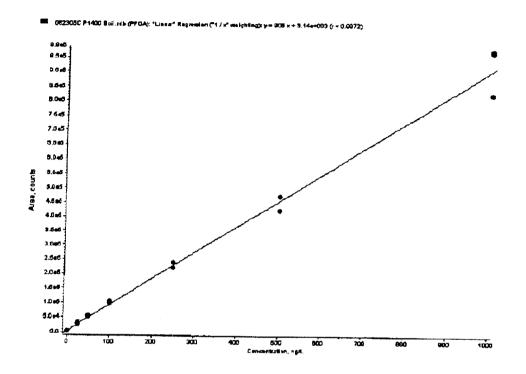
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THE REAL PROPERTY.

Interim Report #4 - Analysis of Cottage Grove Soil and Water Samples

Exygen Study No.: P0001400

Figure 1. Typical Calibration Curve for PFOA in Reagent Water

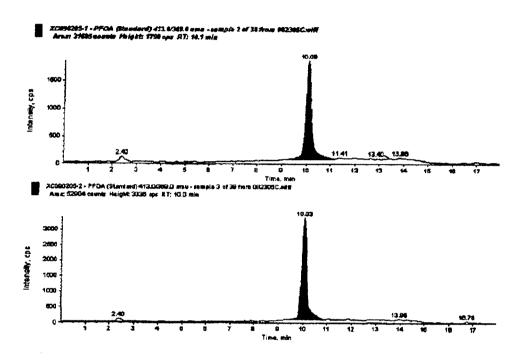


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Exygen Study No.: P0001400

Figure 2. Extracted Standards of PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

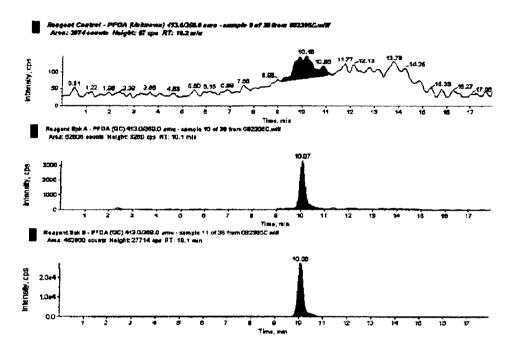


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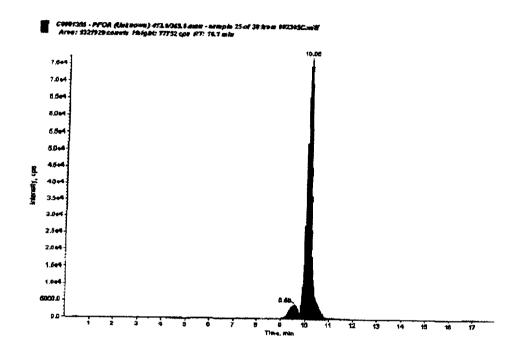
Exygen Study No.: P0001400

Figure 3. PFOA in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



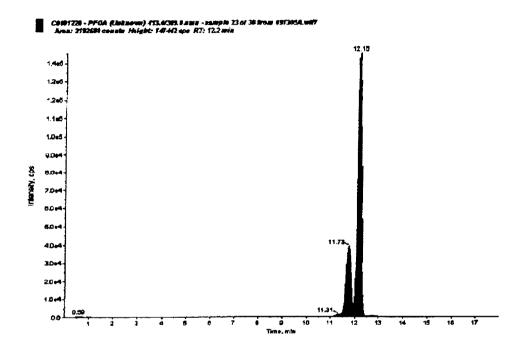
Exygen Study No.: P0001400

Figure 4. Chromatogram Representing a Soil Sample Analyzed for PFOA (Exygen ID: C0081355, Data Set: 082305C)



Exygen Study No.: P0001400

Figure 5. Chromatogram Representing a Ground Water Sample Analyzed for PFOA (Exygen ID: C0081228, Data Set: 091305A)

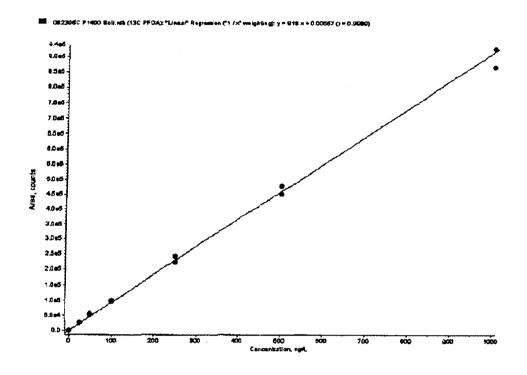


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Exygen Study No.: P0001400

Figure 6. Typical Calibration Curve for <sup>13</sup>C PFOA in Reagent Water



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Figure 7. Extracted Standards of <sup>13</sup>C PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

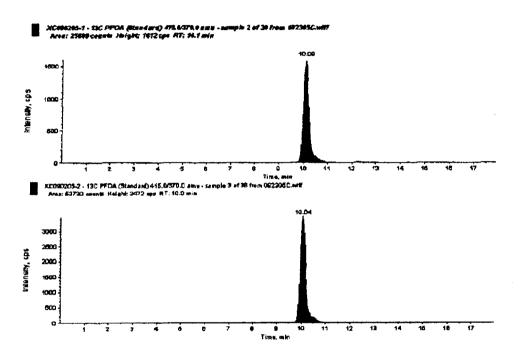
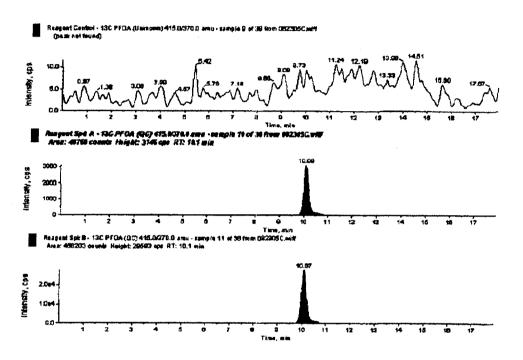
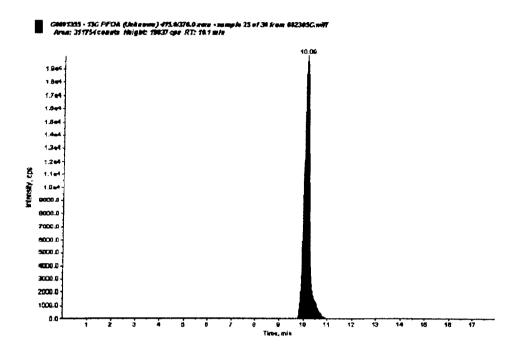


Figure 8. <sup>13</sup>C PFOA in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



Exygen Study No.: P0001400

Figure 9. Chromatogram Representing a Soil Sample Analyzed for <sup>13</sup>C PFOA (Exygen ID: C0081355, Data Set: 082305C)

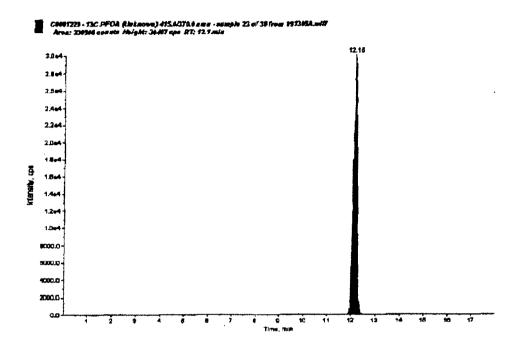


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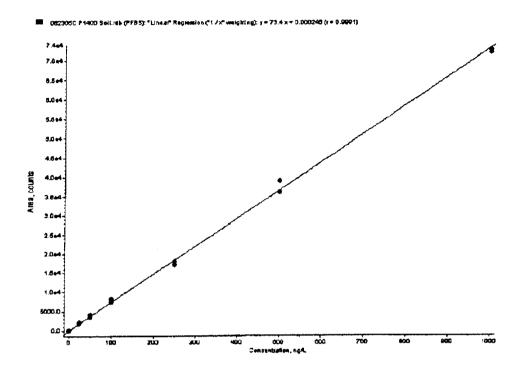
Figure 10. Chromatogram Representing a Ground Water Sample Analyzed for <sup>13</sup>C PFOA (Exygen ID: C0081228, Data Set: 091305A)



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Figure 11. Typical Calibration Curve for PFBS in Reagent Water



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Figure 12. Extracted Standards of PFBS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

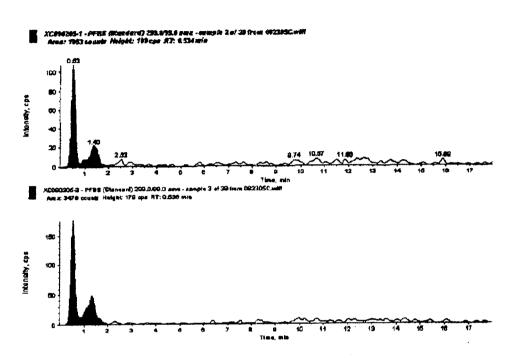
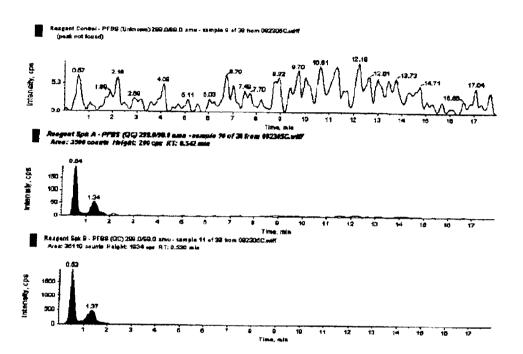
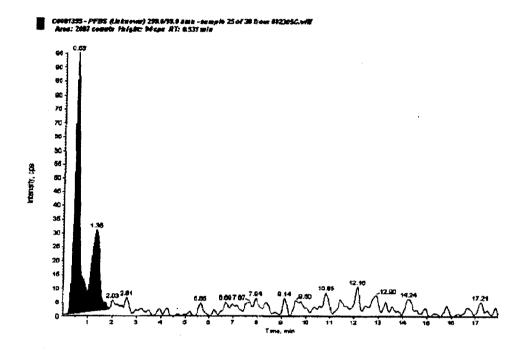


Figure 13. PFBS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



Exygen Study No.: P0001400

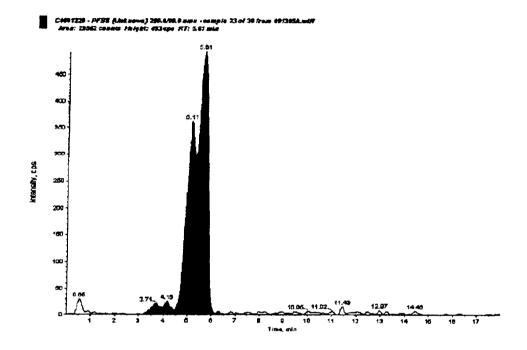
Figure 14. Chromatogram Representing a Soil Sample Analyzed for PFBS (Exygen ID: C0081355, Data Set: 082305C)



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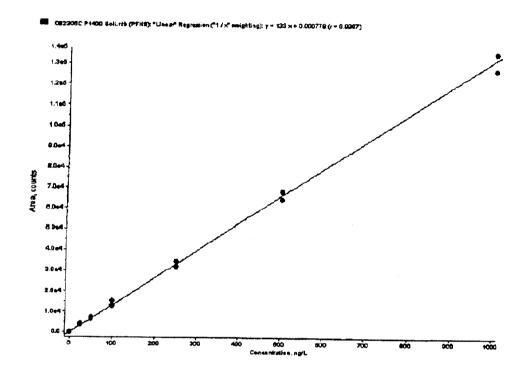
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Figure 15. Chromatogram Representing a Ground Water Sample Analyzed for PFBS (Exygen ID: C0081228, Data Set: 091305A)



Exygen Study No.: P0001400

Figure 16. Typical Calibration Curve for PFHS in Reagent Water

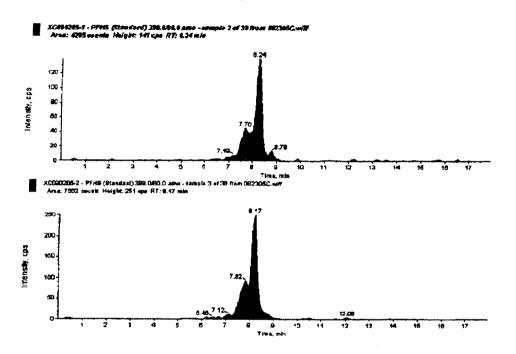


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Figure 17. Extracted Standards of PFHS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



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Figure 18. PFHS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively

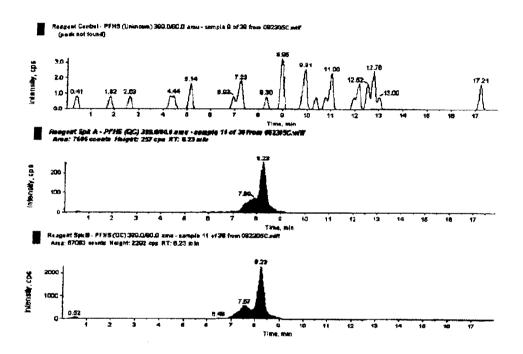
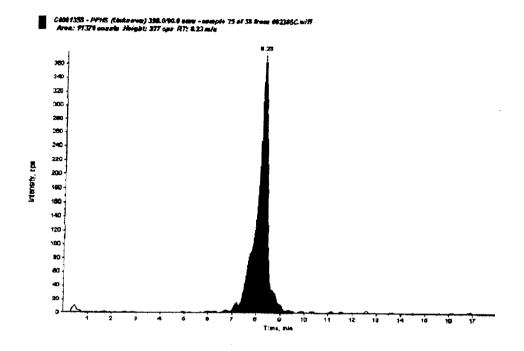
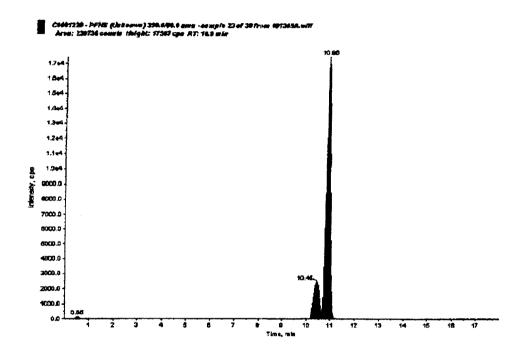


Figure 19. Chromatogram Representing a Soil Sample Analyzed for PFHS (Exygen ID: C0081355, Data Set: 082305C)



Exygen Study No.: P0001400

Figure 20. Chromatogram Representing a Ground Water Sample Analyzed for PFHS (Exygen ID: C0081228, Data Set: 091305A)

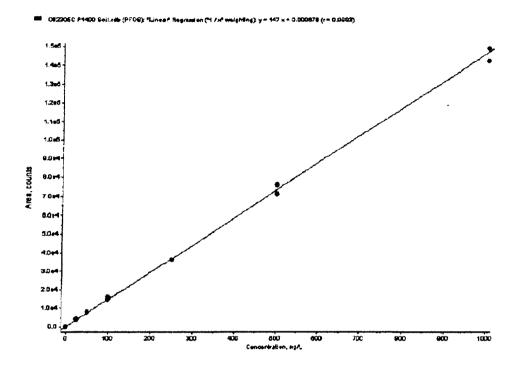


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Figure 21. Typical Calibration Curve for PFOS in Reagent Water

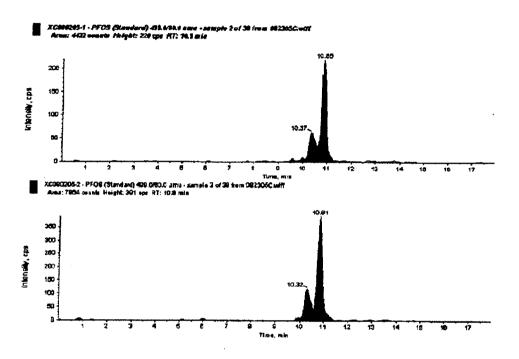


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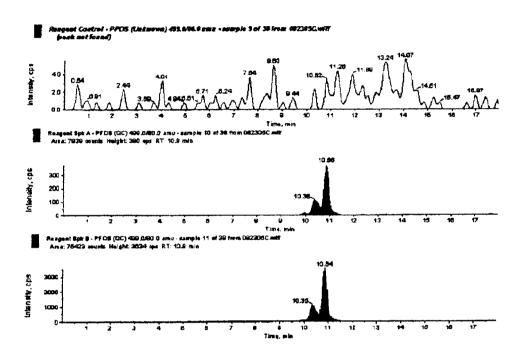
Figure 22. Extracted Standards of PFOS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



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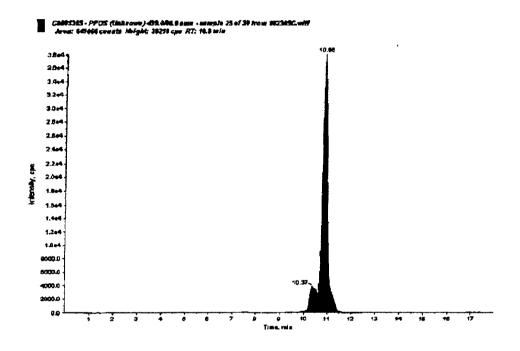
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Figure 23. PFOS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



Exygen Study No.: P0001400

Figure 24. Chromatogram Representing a Soil Sample Analyzed for PFOS (Exygen ID: C0081355, Data Set: 082305C)

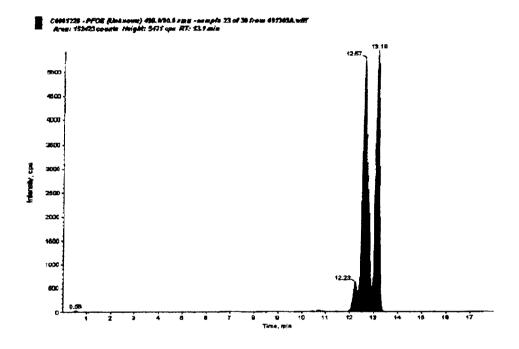


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Figure 25. Chromatogram Representing a Ground Water Sample Analyzed for PFOS (Exygen ID: C0081228, Data Set: 091305A)



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# INTERIM REPORT #5 - Analysis of Cottage Grove Sediment and Surface Water Samples

### STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS),
Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil,
Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring
Program

### **DATA REQUIREMENTS**

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

#### STUDY DIRECTOR

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380 Phone: 610-701-3761

#### INTERIM REPORT COMPLETION DATE

November 30, 2005

### PERFORMING LABORATORY

Exygen Research 3058 Research Drive State College, PA 16801 Phone: 814-272-1039

### STUDY SPONSOR

3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144 Phone: 651-733-6374

#### **PROJECT**

Protocol Number: P0001400 Exygen Study Number: P0001400

Total Pages: 114

Exygen Study No.: P0001400

### GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

John Flaherty

Principal Investigator Exygen Research

Jaisimha Kesari P.E., DEE

Study Director

Weston Solutions, Inc.

Robert A. Paschke Sponsor Representative

3M Company

Date

u/30/05

Date

---

Exygen Research

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Exygen Study No.: P0001400

### QUALITY ASSURANCE STATEMENT

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorobexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

<u>Phase</u>	Date Inspected	Date Reported to Principal Investigator	Date Reported to Exygen Management	Date Reported to Study Director
6. Raw Data Review and Final Interim Analytical Report Review	11/09-11/05	11/29/05	l 1/30/05	11/30/05

Lydia Shaffer
Technical Lead, Quality Assurance Unit

11/30/05

Date

Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

Exygen Research

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# Exygen Study No.: P0001400

# CERTIFICATION OF AUTHENTICITY

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by:

Exygen Research 3058 Research Drive State College, PA 16801 (814) 272-1039

(814) 2/2-103

John Flaherty
Vice President

John Flaherty
Vice President

Exygen Research Facility Management:

Principal Investigator, Exygen:

Richard A. Grazzini
President

Exygen Research

Exygen Research

30-NOV-05

Date

Study Director, Weston Solutions, Inc.

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 12/2/05 Date

Sponsor Representative, 3M Company:

Robert A. Paschke

Manager, 3M Corporate Environmental Programs

12/2/05

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Exygen Research

Exygen Study No.: P0001400

### STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:

P0001400

EXYGEN STUDY NUMBER:

P0001400

TYPE OF STUDY:

Residue

SAMPLE MATRIX:

Sediment and Surface Water

**TEST SUBSTANCE:** 

Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS)

SPONSOR:

3M Company

3M Building 0236-01-B-10

St. Paul, MN 55144

STUDY DIRECTOR:

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380

STUDY MONITOR:

Robert A. Paschke

3M Company

3M Building 42-02-E-27 St. Paul, MN 55144

PERFORMING LABORATORY:

Exygen Research 3058 Research Drive State College, PA 16801

ANALYTICAL PHASE

Study Initiation Date:

03/03/05

TIMETABLE:

Interim Analytical Start Date:

09/28/05

Interim Analytical Termination Date: 10/27/05

Interim Report Completion Date:

11/30/05

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### PROJECT PERSONNEL

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

Name

<u>Title</u>

John Flaherty

Vice President

Karen Risha

Laboratory Supervisor

Chrissy Edwards

Technician

Mark Ammerman

Sample Custodian

Eric Edwards

Sample Custodian

Amy Sheehan

Associate Scientist

Mindy Cressley

Technician

**Brittany Kravets** 

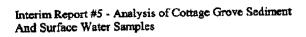
Technician

Exygen Research

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And Surface Water	Samples			

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### 1.0 SUMMARY

Exygen Research extracted and analyzed sediment and surface water samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Methods V0001782 and V0001780, respectively (Appendix A).

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in sediment was 0.4 ng/g (wet weight) and the limit of detection for PFOA, PFBS, PFHS and PFOS in sediment was 0.2 ng/g (wet weight). The limit of quantitation for PFOA, PFBS, PFHS and PFOS in surface water was 50 ng/L and the limit of detection for PFOA, PFBS, PFHS and PFOS in surface water was 25 ng/L.

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in sediment samples are summarized in Table I. Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in surface water samples and associated field QC samples are summarized in Table II.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the sediment samples are detailed in Tables III and IV. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the sediment samples were  $64 \pm 24\%$ ,  $49 \pm 8\%$ ,  $96 \pm 10\%$  and  $84 \pm 27\%$ , respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the surface water samples and associated field QC samples are detailed in Tables V and VI. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the surface water samples were  $93 \pm 18\%$ ,  $102 \pm 16\%$ ,  $109 \pm 13\%$  and  $98 \pm 18\%$ , respectively.

Fortification recoveries for  $^{13}$ C PFOA in the sediment samples are detailed in Table VII. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the sediment samples were  $66 \pm 13\%$ . Fortification recoveries for  $^{13}$ C PFOA in the surface water samples and associated field QC samples are detailed in Table VIII. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the surface water samples were  $88 \pm 11\%$ .

### 2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in sediment and surface water according to Protocol P0001400 (Appendix A).

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Exygen Study No.: P0001400

### 3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in sediment using the analytical method entitled, "V0001782: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Sediment by LC/MS/MS" and in surface water using the analytical method entitled, "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was September 28, 2005, and the analytical termination date for this interim report was October 27, 2005.

### 4.0 ANALYTICAL TEST SAMPLES

Twenty sediment samples and forty surface water samples (Exygen ID C0085575 – C0085634) were received at ambient temperature on August 15, 2005 from Charles Young at Weston Solutions, Inc. The twenty sediment samples represented twenty separate sample sites. The forty surface water samples represented nine sample sites and associated field QC samples. Three water samples represented a trip blank and two trip blank spikes. The samples were logged in by Exygen personnel and placed in refrigerated storage.

Sample log-in and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

# 5.0 REFERENCE MATERIAL

The analytical standard, PFOA, was purchased from Sigma Aldrich and was received at Exygen on December 08, 2003. The surrogate spiking standard, <sup>13</sup>C labeled perfluorooctanoic acid (<sup>13</sup>C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on May 13, 2005. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and <sup>13</sup>C PFOA were stored frozen and PFOS was stored refrigerated.

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Compound	Exygen Inventory No.	Lot #	Purity (%)	Expiration Date
PFOA	SP0003800	23116HB	97.64	12/08/05
13C PFOA	SP0004184	3507-195	97	03/29/09
• • • • • • • • • • • • • • • • • • • •	SP0005726	101	96.7	12/04/06
PFBS	SP0003720 SP0002401	SE036	98.6	10/18/06
PFHS	SP0002401 SP0002694	430180/1	101.2	10/31/07
PFOS	SP0002094	4201001	101.0	10.52.01

The molecular structures of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS are given on the following pages:

### **PFOA**

Chemical Name: Perfluorooctanoic acid

Molecular Weight: 414

Transitions Monitored: 413 -> 369 (for quantification) and

 $413 \rightarrow 219$  (for confirmation)

Structure:

$$F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} O$$

### 13C PFOA

Chemical Name: 1,2-13C perfluorooctanoic acid

Molecular Weight: 416

Transition Monitored: 415 → 370

Structure:

$$F \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{I^3C} OH$$

#### **PFBS**

Chemical Name: Perfluorobutanesulfonate

Molecular Weight: 338 supplied as the potassium salt (C<sub>4</sub>F<sub>9</sub>SO<sub>3</sub> K<sup>+</sup>)

Transitions Monitored: 299 → 99

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Structure:

$$F \xrightarrow{F} F \xrightarrow{F} F SO_3$$

**PFHS** 

Chemical Name: Perfluorohexanesulfonate

Molecular Weight: 438 supplied as the potassium salt (C<sub>6</sub>F<sub>13</sub>SO<sub>3</sub>K<sup>†</sup>)

Transitions Monitored: 399 → 80

Structure:

**PFOS** 

Chemical Name: Perfluorooctanesulfonate

Molecular Weight: 538 supplied as the potassium salt (C<sub>8</sub>F<sub>17</sub>SO<sub>3</sub>K<sup>+</sup>)

Transitions Monitored: 499 → 80

Structure:

$$F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} SO_3$$

# 6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical methods "V0001782: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Sediment by LC/MS/MS" and "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS" were used for this study.

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### 6.1 Extraction Procedure for Sediment

Before the samples were weighed for the extraction, they were mixed thoroughly by vigorously shaking the container. A 5-gram portion of sediment was weighed into a fiftymilliliter centrifuge tube for the extraction. After fortification of appropriate samples, 35 mL of 1% acetic acid in water was added to the samples. The samples were vortexed and allowed to shake on a wrist action shaker for ~60 minutes. The samples were centrifuged for ~20 minutes at ~3000 rpm. The supernatant was then loaded onto a C18 SPE cartridge conditioned with 10 mL of methanol and 20 mL of water. The eluate was discarded. Twenty milliliters of methanol was added to the sediment samples left in the centrifuge tube. The samples were vortexed and allowed to shake on a wrist action shaker for another 30 minutes. The samples were centrifuged again for ~20 minutes at ~3000 rpm. The supernatant was then loaded onto the same C18 SPE cartridge. The eluate was collected into a 500 mL Nalgene Bottle. The column was washed with 4 mL of methanol. The wash was collected in the same bottle as the eluate. Approximately two hundred milliliters of water was added to the bottles. The samples were mixed by shaking and loaded onto another C18 SPE cartridge conditioned with 10 mL of methanol and 20 mL of water. The eluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of eluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

### 6.2 Percent Solids Procedure For Sediment

Percent solids were determined using the procedure indicated in Exygen method V0000427. Approximately 20 grams of sample was weighed into a pan. The weight of the sample plus the pan was recorded. The samples was then dried in an oven overnight at 104 ± 2 °C. Then the samples were transferred to a dessicator and allowed to cool for ~15 minutes. Each sample was then weighed again, including the weight of the pan. The percent solid for each sample was then calculated.

### 6.3 Extraction Procedure for Water

A 40 mL aliquot of the water sample was used for the extraction procedure. After fortification of appropriate samples, the samples were loaded onto a C<sub>18</sub> SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The cluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of cluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

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## 6.4 Preparation of Standards and Fortification Solutions

A mixed stock standard solution of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS was prepared at a concentration of 1000 µg/mL by dissolving 100 mg of each of the standards (corrected for purity and salt content, if necessary) in methanol. From this solution, a 100 µg/mL fortification standard solution was prepared by taking 10 mL of the stock and bringing the volume up to 100 mL with methanol. By taking 10 mL of the 100 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 10 µg/mL fortification standard was prepared. By taking 10 mL of the 10 µg/mL fortification standard were prepared. By taking 10 mL of the 1.0 µg/mL fortification standard were prepared. By taking 10 mL of the 1.0 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.1 µg/mL fortification standard was prepared. By taking 10 mL of the 0.1 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.01 µg/mL fortification standard were prepared.

A set of standards containing PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS were prepared in water and processed through the extraction procedure, identical to samples. The following concentrations were prepared:

Conc. of Fort Solution (ng/mL) <sup>1</sup>	Fort Volume (µL)	Volume of Fortified Sample (mL)	Final Conc. of Calibration Std. (ng/L)
0	0	40	0
10	100	40	25
10	200	40	50
10	400	40	100
100	100	40	250
100	200	40	500
100	400	40	1000
	PFOA, PFB	S, PFHS and PFOS	

An additional stock solution of <sup>13</sup>C PFOA was prepared at 100 µg/mL and diluted to 1.0 and 0.1 µg/mL for bottle spiking purposes. Complete details can be found in the raw data package associated with this study.

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator  $(4^{\circ} \pm 2^{\circ}C)$  when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

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#### 6.5 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~10.5 min, ~0.5 mins, ~9 mins, and ~11.5 mins, respectively. Peaks above the LOD were not detected in any of the reagent blank samples corresponding to the analyte retention time.

#### 6.6 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 25 ng/L of PFOA, PFBS, PFHS and PFOS.

## 6.7 Description of LC/MS/MS Instrument and Operating Conditions

Instrument:

API 4000 Biomolecular Mass Analyzer

Interface:

Turbo Ion Spray Liquid Introduction Interface

Computer:

**DELL OptiPlex GX400** 

Software:

Windows NT, Analyst 1.4.1

HPLC:

Hewlett Packard (HP) Series 1100

HP Quat Pump

HP Vacuum Degasser

HP Autosampler

HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm

Column Temp.: 30° C Injection Vol.: 15 µL

Mobile Phase (A): 2 mM Ammonium Acetate in water

Mobile Phase (B): Methanol

Time (min)	% A	%B
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min Flow Rate: 0.3 mL/min

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#### Ions monitored:

			Approximate
Analyte	Mode	<b>Transition</b>	Retention Time
<del></del>	<del></del>	<b>Monitored</b>	(min)
PFOA	negative	$413 \rightarrow 369$	~10.5 min.
PFOA Confirm Ion	negative	$413 \rightarrow 219$	~10.5 min.
<sup>13</sup> C PFOA	negative	$415 \rightarrow 370$	~10.5 min.
PFBS	negative	$299 \rightarrow 99$	~0.5 min.
PFHS	negative	$399 \rightarrow 80$	~9 min.
PFOS	negative	$499 \rightarrow 80$	~11.5 min.

#### 6.8 Quantitation and Example Calculation

Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using six concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/mL, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

#### Equation 1:

Analyte found  $(ng/L) = (Peak area - intercept) \times DF$ slope

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

For samples fortified with known amounts of analyte prior to extraction, Equation 2 was used to calculate the percent recovery.

## Equation 2:

Recovery (%) =

(analyte found (ng/L) - analyte in control (ng/L)) ×100% amount added (ng/L)

Note: For the analyte recovery calculation, the "control" is the unspiked aliquot of the primary field sample.

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Equation 3 was used to convert the amount of analyte found in ng/mL to ng/g (ppb).

#### Equation 3:

Analyte found wet weight (ppb) = [analyte found (ng/L)  $\times$  volume extracted (L)] sample weight (g)

Equation 4 was then used to calculate the amount of analyte found in ppb based on dry weight.

#### Equation 4:

Analyte found (ppb) dry weight = Analyte found (ppb) x [100% / total solids(%)]

An example of a calculation using an actual sample follows:

Sediment sample Exygen ID C0085617 Spk G (Set: 100505AR), fortified at 500 ng/L with PFOA where:

peak area	=	469822
intercept	=	2120
slope	==	3150
dilution factor	=	10
ng/L analyte added (fort level)	=	500
amt in corresponding sample (ng/L)*	=	1060
volume extracted (L)	=	0.04
sample weight (g)	=	5
total solids (%)	=	68.21

<sup>\*</sup>The primary sample result was used for all calculations

#### From equation 1:

Analyte found (ng/L) = 
$$[469822 - 2120] \times 10$$
  
3150

= 1485 ng/L

From equation 2:

% Recovery = 
$$\frac{(1485 \text{ ng/L} - 1060 \text{ ng/L})}{500 \text{ ng/L}} \times 100\%$$

= 85 %

From equation 3:

Analyte found wet weight (ppb) = 
$$(1485 \text{ ng/L} \times 0.04 \text{ L})$$
  
5 g

= 11.9 ppb

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From equation 4:

Analyte found (ppb) dry weight = 11.9 ppb x (100% / 68.21%)

= 17.4 ppb

NOTE: This value may be slightly different than that of the raw data due to rounding.

#### 7.0 EXPERIMENTAL DESIGN

<sup>13</sup>C PFOA was used as a surrogate for all the samples. <sup>13</sup>C PFOA was added to the sediment samples and sample replicates in the laboratory after collection. <sup>13</sup>C PFOA was added to the surface water sample collection bottles in the laboratory before being shipped to the field for sampling. For surface water samples designated as field matrix spikes, PFOA, PFBS, PFHS and PFOS were also added at a known concentration to the bottles in the laboratory before being shipped to the field. The surface water sample bottles were filled to a 200 mL volumetric fill line in the field.

The sediment samples were extracted in six sets, one of which was a re-extraction. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The first five sediment sets contained four samples each. The sixth sediment set contained a re-extraction of one sample. For each sample, a laboratory duplicate of the sample and two laboratory matrix spikes were also extracted. The laboratory spikes were fortified with known concentrations of PFBS, PFHS, PFOS, PFOA and <sup>13</sup>C PFOA.

The surface water samples were extracted in five sets, one of which was a re-extraction. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The first surface water set contained four sample sites, along with a trip blank and trip blank spikes collected for the surface water samples. The second surface water set contained three sample sites. The third surface water set contained three sample sites. The fourth surface water set contained one sample site and a re-extraction for one sample site. The fifth surface water set was a re-extraction for one sample site. For each site, a sample, a field duplicate and two-matrix field spikes were collected. For each site, a laboratory duplicate of the primary sample was extracted and two laboratory matrix spikes were also extracted. For the two laboratory matrix spikes, two 40 mL portions of the primary sample collected for the site was poured from the bottle and fortified. Not only were PFBS, PFHS, PFOS and PFOA added in the laboratory prior to extraction, but also 13C PFOA was added. In some cases, the additional 13C PFOA was added because the levels of PFBS, PFHS, PFOS and PFOA spiked into the samples were known to exceed the calibration ranges and were not analyzed without dilution; therefore, 13C PFOA levels were adjusted to require the same dilution as the other analytes.

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#### 8.0 RESULTS

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in sediment samples are summarized in Table 1. Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in surface water samples and associated field QC samples are summarized in Table II.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the sediment samples are detailed in Tables III and IV. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the sediment samples were  $64 \pm 24\%$ ,  $49 \pm 8\%$ ,  $96 \pm 10\%$  and  $84 \pm 27\%$ , respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the surface water samples and associated field QC samples are detailed in Tables V and VI. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the surface water samples were  $93 \pm 18\%$ ,  $102 \pm 16\%$ ,  $109 \pm 13\%$  and  $98 \pm 18\%$ , respectively.

Fortification recoveries for  $^{13}$ C PFOA in the sediment samples are detailed in Table VII. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the sediment samples were  $66 \pm 13\%$ . Fortification recoveries for  $^{13}$ C PFOA in the surface water samples and associated field QC samples are detailed in Table VIII. The average percent recoveries  $\pm$  standard deviations for  $^{13}$ C PFOA in the surface water samples were  $88 \pm 11\%$ .

#### 9.0 CONCLUSIONS

The sediment and surface water samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical methods V0001782 and V0001780, respectively. There were no circumstances that may have affected the data quality or integrity.

### 10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the study director. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

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## **TABLES**

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Summary of PFBS, PFHS, PFOS and PFOA in Sediment Table I. Samples

		C4 Sulfane		C# Bullions		CB Sulferia		CS Add	
		Analyte Found	Assassed			Analyte Found		Analyte Found	
		Ony Weight	Accuracy	Ory Weight	Accuracy	Day Weight	Accuracy	Dry Weight	Accuracy
Exygen to	Ctient Sample ID	(ppt, ng/gt	(4%1-%)	(ppb, ng/b)	14%1-10	(000, 19/9)	(+%)-%)	appb, ng/g)	(+767-76
						5.75	30	1.00	30**
C0066615	CGMN-SD-MR006-0-050609* CGMN-SD-MR006-0-050609*	NC NC	60 60	ND ND	30 30	5.75	30	1.17	30**
C0065615 Rep									
C0085616	CGMN-SD-MR004-0-050609	NO	60	ND ND	30	NQ NQ	30 30	NC NC	30** 30**
C0085616 Rep	C3MN-SD-MR004-0-050808"	NO	60		30		•••		
C0085617	CGMN-SD-MR003-0-060809	NC	80	1.44	30	7.56	30	12.4	30**
C0085617 Rep	CGMN-SD-MR003-0-050808*	0.680	60	1.86	30	8.89	30	14.0	30~
C0065618	CGMN-SD-MR002-0-050600	ND	80	ND	30	NO.	30	ND:	40**
C0065618 Rep	CGM+-SD-MR002-0-050809*	ND	80	ND	30	NQ.	30	NO	40**
C0095619	CGMN-SD-MR001-0-050606	ND	60	ND	30	NO	30	ND:	40**
C0085619 Rep	CGMH-SD-MR001-0-050808"	ND	80	ND:	30	NO	30	NO.	40~
C0085620	CGMN-SD-MR008-0-050608	ND	60	NO.	30	1.30	40	ND	40**
C0065620 Rep	CGMN-SD-MR006-0-050809"	ND ND	60	NO.	30	1.40	40	ND	40**
C0085821	CGMW-SO-EC011-0-080810	1.34	60	1,81	30	51.2	30	13.5	30**
C0065621 Rec	C3MR-SD-EC011-0-050810*	1.32	60	1.81	30	47.3	30	11.0	30***
	***************************************			1.22	30	31.1	30	13.0	907**
C0055622	CGMN-SD-EC012-0-050610 CGMN-SD-EC012-0-050610*	1.12	60 80	1.33	30	32.7	30	14.0	30~
CD085622 Rep	•••••		1						
C0095623	CGMN-SD-EC021-0-050810	4.06	80	5.36	30	297	50***	27.2	30**
CD085623 Rep	CGMN-SD-EC021-0-050810*	4.17	€0	9.28	30	236	30	30.2	
CD065624	CGMN-SD-EC022-0-050810	6.48	60	2.48	30	58.9	30	16.4	50**
C0085624 Rep	CG&W-3D-EC022-0-050610*	6.74	80	2.43	36	57. <del>9</del>	30	16.6	50**
C0085625	CGMH-SD-EC031-0-050810	1.44	60	2.67	30	107	30	26.0	40**
C0085625 Rep	CGMN-SD-60031-0-050910*	1.50	50	2.83	30	112	30	26.9	40**
C0085626	CCMM-SD-EC032-0-050810	2 37	60	1.18	30	24.1	30	11.9	50**
CD085628 Reo	CGMH-30-EC032-0-050810"	2.16	60	1.20	30	24.2	50	11.5	50-
CD086827	CGMN-SD-WC011-0-050816	ND	50	6.30	30	86.0	30	13.5	50**
C0085627 Reo	CGMN-SD-WC011-0-050810"	NO	50	6.56	30	71.2	30	13.7	50**
	CGMN-SD-W0012-0-050816	ND	50	9.10	310	77.5	80°°	21.4	30**
C0085626 CD085626 Rec	CGMN-SD-WC012-0-050810*	. ND	so l	8.66	30	80.9	60-	17.4	30
	1	1		****	•••	•		30.7	50***
C0065629	CCMN-8D-WC021-0-050810	NQ NQ	50 50	10.1 11.1	30	77.1 105	30	30.7 34.1	50**
C0665628 Rep	CGMN-SD-WC021-0-050810*		1	,				*	
C0085630	CGMN-SD-WC022-0-050610	NO	50	7.51	30	34.2	30	37.5	50**
C0055650 Rep	CGMN-3D-WC022-0-050810*	ND	50	7.13	30	39.5	30	39.8	50-
C0065631	CGMR4-SD-WC031-0-090810	ND	50	2.00	30	11.9	60~	3.85	40~
C0065631 Pap	CGNN-SD-WC031-0-050810"	ND	30	2.26	30	18.4	60**	4.36	40**
C0066832	CGMN-SD-WC032-0-050810	ND	50	2.08	30	20.0	40	4.52	40***
20088832 Rep	CGMN-SD-WC032-0-060610*	ND	50	2.09	30	16.P	40	4.40	40***
CD088633	CGMN-SD-WUD11-0-030812	ND:	40	1.36	30	15.2	30	1.51	50**
CD085633 Rec	CGMN-SD-WU011-0-050812	ND	40	1.50	35	18,3	36	1.59	8C**
C0085834	CGMN-SD-EU011-0-050812	NO	40	0.855	30	10.1	30	19.7	40**
20085634 Reo	CGMN-SD-EU011-0-050812*	NO	40	0.877	30	10.1	30	19.0	40**
		-			1				

<sup>&</sup>quot;Laboratory Dupticase
"The accuracy results for this sample are based on aptics recovering coupled with surrogets recovery date.
"The accuracy results for this sample are based on surrogets recovery date.
ND = Not described at or score 0.2 rips (revi weight).
ND = Not countribable = Measured concentration (envese 0.2 rips) (wet weight) and the Limit of Quantitation.

Summary of PFBS, PFHS, PFOS and PFOA in Surface Table II. **Water Samples** 

		C# Sulfors	e PFBS	CR Sulfone	o PFHS	CS Bullons	te FFOS	CB Acte	FCA .
-		Analyte Feenal	Assessed	Artalyte Found	Aroneed	Analytis Found		Analyse Found	Assessed
		Dry Weight	Accuracy	Cry Weight	Acourtey	Dry Westght	Accuracy	Dry Weight	Assuracy
Strygen IO	Client Sample ID	(pph, rept)	1981-96	(ppb, spig)	(+%/-%)	(ageb, no/b)	1-761-76	(ppt, ng/g)	(**/- 74)
C0085575	CGMH-SW-MR005-0-050809	103	36	NC:	30	109	30	134	30
C0065675 Rato	CGMN-SW-MR005-0-050808**	86.B	30	NG	30	95.1	30	129	3C
C0085578	CGMN-SW-MR005-0-050609 Dup	90.5	30	NQ.	30	89.2	30	134	30
C0085579	CQMN-9W-MR004-0-060808	NQ.	30	NO	30	ND	30	ND:	30
C0086679 Rap	COMN-SW-MR004-0-050809*	NQ:	30	NΩ	30	NC	30	NO.	30
C0085580	CGMN-SW-MR004-0-050609 Dup	NQ:	30	ND	90	ND	30	NO	30
C0086663	CGMN-SW-MR003-0-060809	NQ.	30	ND	30	NO.	90	ND	30
C0085563 Rep	CGMN-SW-MR003-0-060808*	NQ.	30	ND	30	NO	30	NO.	30
C0085584	CGMN-SW-MR003-0-050809 Dup	NQ	36	NEO	320	ND	360	NO	30
C0085587	CGMH-SW-MR002-0-050800	50.0	30	NC	30	ND	340	NQ	30
C0065587 Reo	CGMN-SW-MR002-0-050809°	50.4	30	77.8	30	NO	30	NQ	30
C0085588	CGA/N-SW-AFR202-0-050800 Dup	NC)	30	NG	30	ND	30	NO.	20
C0085391	CGMN-SW-MR001-0-050809	NC.	30	NO	30	ND	30	ND	30
C0096591 Red	COMN-SW-MR001-0-050800"	NQ	30	ND	30	ND	30	ND	30
C0085592	CGMN-SW-MP201-0-050809 Dup	NC.	30	ND	30	ND	30	ND	30
C0085595	CGMN-SW-MF008-0-050800	N/Q	30	ND	340	NQ	30	NQ	30
C0085696 Rep	CGMN-SW-MR006-0-050609*	NQ	30	ND	30	NQ	30	NQ	30
C0005506	CGMN-SW-MR008-0-050809 Dup	NC:	30	ND	30	NO	30	NQ	50
C0085509	CGMN-SW-EC011-0-050810	12200	40**	4720	40*	22500	40**	15300	40**
C0085599 Rep	COMN-SW-EC011-0-050810*	13300	40**	4680	40**	23500	40**	15800	40***
C8085806	CGMN-SW-EC011-0-080810 Eup	13700	40**	4750	40"	29900	40**	17100	40**
COOKSBOS	CGMH-9W-WCD11-0-060810	90.1	343	384	30	1310	30	707	30
C1065803 Rec	CGMN-SW-WC011-0-050810*	73.2	30	335	30	1170	36	573	30
C0095804	CGMN-SW-WC011-0-050610 Dup	82.5	340	570	30	1330	30	702	80
C0085807	CGMN-SW-EU011-0-050812	NO	30	ND	30	ND	30	66.5	30
C0088807 Res	CGMN-SW-ELR11-0-050812*	NO	30	NO	30	NC.	30 !	65.9	30
C0085808	CGMN-BW-ELIO11-0-050812 Dup	ND	30	ND	30	NC	30	68.5	30
C0095811	C/3MH-5W-MP1006-2-050609	ND	30	ND	30	ND	30	ND	30
C0085811 Rep	CGMN-SW-MR008-2-050809"	ND	30	NO	30	NIC	30	ND	30
C0005512	Trip Stank	ND	30	ND	30	ND	30	ND	30

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Table III. Matrix Spike Recovery of PFBS and PFHS in Sediment Samples

Sample Description	Amount Splitted (mg/s)	_	4 Sulforate PFSS Amount Recovered (nglg, wet wt.)	Recovery (%)	Ameunt Spiked (noig)		A Sufference PFHS Associat Recovered (ng/g, wet WL)	Recovery (%)
CGMN-SD-MR005-0-050509 (C066045 Spin C, 4 ng/L Lab Spins)	4	ND	1.78	45		ND	4.09	102
CGMN-SD-MR005-0-060800- (CXCHERT Sys. D., All myrt, Lub Belle)	40	ND	18.0	45	45	ND:	39.4	90
CGMN+50-MR00+0-0-06000 (C000011 Spit E, 4 ngit tub Spilus)		NED	1.82	48		NO	3.94	90
CCMM-SD-AFREDH-G-060800 (CROMMS Sylv F, 48 mg/L Laib Spille)	48	NØ.	18.5	48	40	NO	37.1	93
CGMN-SD-MR003-0-060808 (CBM847 Spt. Q. 4 ug/L Lub Spfin)	4	NQ	2.02	51	4	0.984	5.18	194
COMM-SID-MR003-0-050800 (CMMM7 SpirK; 40 right Lab Spills)	40	MO	16.4	41	*	0.054	37.9	62
CCMM-SD-MR002-0-000806 (0008698 Sph I. 4 mpt. Lab Spilin)	4	ND	1.69	42	4	ND	3.70	93
CCHOISEIS Spir.J., 40 mg/L Lab Spira)	40	NE	15.4	39	40.	NO	37.1	93
CCIAIN-SCI-NROOT-0-080609 (Combine Spir. C. 4 right, Lain Spiring)	4	MD	1.74	44	4	NO	3.90	96
CGMH-SD-MR001-0-050808 (Consess Spix 8, 40 mg/L Unit Spille)	40	ND	15.0	42	•	NO	37.8	96
CCMH-SC-MR006-0-060600 (CHR0088 Spirit, 4 ngh. Lab Spirit)	4	HID	1.02	48	4	ND	4.02	101
(Canadata Shir K. 40 mlyr. (my ghun)	44	ND	17.7	44	44	ВÓ	35.2	86
CGMN-SC-EC011-C-050610 (CHMM25 Spix G, 4 rg/L-Lan Spins)	4	1.07	2.97	48	4	1.25	5.06	100
CGMR-SD-EC011-0-050910 (C000931 State H, 46 mg/L Cash Spilling		1.07	18.3	43	49	1.25	36.6	98
CGMH-SD-EC012-0-050810 (CHRHSS Spir.L. 4 npt. Len Spire)	•	0.004	2.86	42	4	0.962	5.30	110
CCMM-SD-EC012-0-050810 (C808822 Spit-I, 46 right Late Spite)	**	0.904	17.0	40	*	0.992	36.3	<b>98</b>
CGMH-SD-EC021-C-080810 (CHMM25 Sph C, 4 mpt. Lab Sphid CGMH-8D-EC021-C-080810	4	2.87	4.06	45	•	3.78	7.50	•
(Coostazs Sph D. 40 ng/L Lab Spina)	-	2,87	19.5	æ	40	3.79	41.0	93
CGMN-SD-EC022-0-050610 (CRESES Spir.E. 4 right Link Spirite.)	4	5.00	6.48	37	4	1.90	6.15	198
CGAMIL-SD-EC022-0-060810 (Canadian Spirit, 48 mg/L Lab Spirits)	44	5.00	28.1	<b>6</b> 0	40	1.90	38.6	92

<sup>&</sup>quot;Sample residue authorist the spiking level algoriticantly (Dx spiking level); Exercises, an accurate recovery value cannot be calculated

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<sup>183</sup> or Not describe an elemental concentration between 0.2 rold (wat weight) and the Limit of Concentration (LCC) which is 0.4 rold (wat weight)

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Table III. Matrix Spike Recovery of PFBS and PFHS in Sediment Samples Continued

Semple Dyscription	Amount Spiked (PS/S)	Ami Found in Sample (agry, well wt.)	4 Sulfonate PFSB Amount Recovered (ng/g, wat wf.)	Recovery (%)	Armount Spiced (mg/g)		C8 Sufficients PFHS Amount Recovered (rig/g, wet wit)	Recover (%)
CGL64-SD-8C031-0-050610 (CR000000 Spin G, 4 ngtl. Lob Spino)	4	6,10	2.42	. 43		2.20	634	80
CCMM-SD-EC031-0-050810		1.70		~	"	1.44		_
(COORTERS Syd H, 40 mg/L Lats Sydfe)	49	1.10	20.8	40	40	2.20	65.1	133
CGN/N-80-EC032-0-060810								
(COMMISSE Spirit, 4 mg/L Lab Spirin)	1	1.91	3.40	37	•	0.952	4.80	96
CGAN-SD-EC032-0-050610 (C000820 Spk J, 40 mg/L Lab Splint)	-	1.91	20.9	47	40	0.952	38.6	94
CGMN-SD-WC011-0-050810	4	j						
(CROSSET Sph.C. 4 ngs. Lab Sphis)	4	i ND	2.94	61	4	2.35	6.10	95
CGMN-80-WC011-0-050810	-	1	~ ^	63		2.36	41.1	27
(CFR65427 Ryst D, 40 mg/L Last Spiller)		, ND	21.0	63	~	2.00	<b>4</b> 1.1	•
COMM-SD-WC012-0-060610		ND	2.19	56	4	3.67	7.50	80
CCGM-SD-WC012-0-060819	'	NO.	6.10	<b>U</b> U	7	0.01		~
(Created by F. 40 agt. Leb Balled	40	NÖ	21.4	54	44	5.87	38.6	87
CGMH-SD-WC021-0-050610	1				[			
(COMMENT Set G. 4 mg/L Lab Sette)	- 4	NQ	230	58	4	8.22	8.72	88
CGMH-85-WC021-0-060610	1 1				_			ac)
(C1000GM Spix H <sub>4</sub> 40 agri, Lab Spife)	40	NG	19.5	40	**	6.22	<b>41.1</b>	90
CGMH-SD-WC022-0-080810	.		2.27	67		4.22	8.00	95
(CONSTRUCTION CONTROL	4	MC	2.27	57	•	4.22	a.w	•••
CGMH-SD-WC022-0-060818 (C008500 Sph J, 48 mg/L Lish Solfed	40	NQ	22.1	85	•	4.22	39.8	66
CGMH-8D-WC031-0-060810								
(COORDIN'S Spin C. 4 regil.) Late Spilling	•	ND	222	56	4	1.34	5.29	90
OGMH-SD-WC031-0-060810	-		22.4	66	_	1.34	35.6	86
(COOKERS State D. 40 mg/L Lab Spille)	7	NID	2.4	-	~	1.34	30.0	•••
CGMN-SD-WC032-0-050818	1 . 1		217	54		3.12	4.97	95
(CHORREST Sight St. 4 mg/L Lurb Spiffer)	•	NE	217	•	•	1.12	4.97	100
CGM1-SD-WC032-0-090810 (C090807 bps F, 40 ogf. Lab Spite)	-	NO	22.4	56	48	1.12	37.8	92
CGMR-SD-WIDTI LD-080812					ļ			
(Cootseld box Q. 4 mg/L Lab Spiles)	4	MD	2.41	60	4	1.07	4.15	78
CG864-8D-WU011-0-000812 (C606603 Spit H, 48 mg/L Lab Spite)	#	NO	25.8	68	40	1.07	35.4	- 86
CGMN-SD-EU011-0-050812				1				
(C9843654 Spir I, 4 ng/L Lab Spire)	4	ND	2.64	86	4	0.554	5.02	112
CGMH-SD-EU011-0-050812 (D088634 3ak J. 44 npt. Lab Splin)	40	NO	27.3	58	40	0.554	30.0	96
	با سمواد	*****	Average:	*			Average:	94 10

"Sample mission exceeds the spiking level against making level; therefore, an accurate necessity value control to calculated

ND > Not detected at or above 0.2 ng/g (wat weight).
NO x Not exempliable w Misseured concentration between 0.2 ag/g (wat weight) and the Limit of Colembration (LCC) writes it 0.4 ng/g (wat weight).

High: Since this exercises table above rounded results, secovery values may very slightly from the values in the new date.

Table IV. Matrix Spike Recovery of PFOS and PFOA in Sediment Samples

	Cit Sulvanate PFOB Cit Antel PFOA							
Sample Description	Amouni Spiked (ng/g)	Ant Found in Sample (ng/g, wet wt.)	Amount Recovered (right, wet will)	Recovery (%)	Amount Spiked (ng/p)	Amt Found in Sample (ng/s, wet wt.)	Amount Recovered (mg/g, wet wt.)	Recovery (%)
CGMM-SC-MFR005-G-050809								
grassestil type C, 4 reg/L Law Spite)	4	2.90	6.82	98	+	0.550	9.70	79
CGMM-SD-LFR005-G-050800 (C0000015 Spit D, 40 mg/L Lob Spitu)	*	2.90	39.5	65	44	0.590	27.5	8#
CGMN+30-MF004-0-000606 (CRRRR1E3pt E, 4 ng/L Lab Spile)		NQ:	3.58	69	•	, NO	3.03	76
CGANN-SD-MF004-0-050800 (C0480016 Spirit, 40 mg/L Lab Spirit)	**	NG.	34.1	85	#	NC	24.6	62
CGMNLSD-MR003-0-050608 (CN00017 Bair O, 4 ng/L Lab SpRn)	4	5.22	9.84	116	4	8.48	11.8	59
CGMN-SD-MR003-0-050609								
(CAMMAST Spir H, 46 mg/L Laix Spiles)	40	5.22	38.4	83	44	8.48	33.1	62
COMM-SD-MEXO2-0-050009	•	NG.	3.30	63	4	NID:	2.67	67
COMPLETE Byt. J. 40 mg/L Left Spilling	46	29	51.2	78	40	ND	23.4	50
CIGMIN-SD-MIRCO 1-G-050809 (C000819 State C, 4mg/L Lata Spilm)		NQ.	3.B1	90		NED	2.70	69
CGMN-SD-MR001-0-050808 (CHR8618 SHI D) 48 M/LLID SHIM)	40	NQ	28.0	70	**	ND	21.8	55
CGMM-SD-MR008-0-090809 (C008890 Spin E, A ngil. Lab Sping)		0.748	3.33	es		ND.	2.72	68
CGMN+SC-MINOS-9-050808 (C006829 Bph F, 45 mgE, Lain Spille)	4.0	0.745	29.4	72	48	NO.	20.1	50
CGMN4-SD-EC011-0-050810 (C088021 Style G, 4 agril, Lash Stylin)	4	39.8	60.6	.	4	10.5	15.1	115
CGMN-SD-EC011-G-050810 (CRRRENT Spit H, 40 ng/L Entr Spitin)	40	398	69.9	78	40	10.5	30.7	51
CGMN-SD-EC012-0-080810 (C088822 Sph. L 4 mpl. Lab Spine )		25.0	38.9	•		10.5	155	125
CGMN-SD-EC012-0-050910 (C008/02 Sys J. 40 ng/L Lish Spille)	40	25.0	67.4	106	40	10.5	33.8	58
CGV64-SD-EC021-0-050610 (C0000037 Sight C, 4 Appl. Late Sights)	.	219	145			19,3	18.0	•
CGMN-SIC-EC021-0-050810 (CMN5023 Spix C, 49 ng/L Lub Spike)	44	210	191	.	40	19.3	47.7	71
CC3MIN-SD-EC022-0-050810 (C0000005 Spin E, 4 repl. Linb Spine )	4	45.4	56.3		4	12.6	13.8	•
CGMN-SD-EC022-0-050610 (C000034 Spit F, 40 upt, Late Spite)	40	45.4	70.6	63	•	12.6	36.8	58

<sup>&</sup>quot;Sample residue exceeds the aptions level significantly (its uptions level); transfore, an accumite recovery value cannot be calculated

NO = Not quantificate = Massured construction between 0.2 rapig (wat weight) and the Carro of Quantification (LOQ) which is 0.4 rapig (wat weight) and the Carro of Quantification (LOQ) which is 0.4 rapig (wat weight)

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Table IV. Matrix Spike Recovery of PFOS and PFOA in Sediment Samples Continued

Semple Description	Amount Spiked (ng/s)		Bulfonate PFOG Amount Recovered (ng/g, wet art.)	Recovery	Amount Spliced (ng/g)	And Found in Sample (ng/g, wet wi.)	CB Acid PPDA Amount Recovered (ng/g, wet wt.)	Hecover (%)
COMN-SD-EC031-0-050610								•
(COONSESS Blob Cl. 4 reg/L Last Spilles)	4	81.6	76.3	•	4	78,9	13.8	-
CGMA-SD-EC031-0-060610 (CH08805 Spit H <sub>1</sub> 49 HpFL Leb Spite)	40	81.6	114	81	40	19.6	75.7	140
CGMN-SD-EC032-0-050810 (CRESTAN Sight & 4 mg/L Link Spiller)	4	19.4	23.6		4	9.80	9.92	8
CGMN-3D-EC032-0-050810 (0000000 Balk L, 48 rept. Lub Salber)	+0	19.4	63.6	86	40	9.80	30.1	51
CGMN-SD-WC011-G-050810		24.7	30.1		4	5.07	7.10	51
(CRESSEZ? Spit C, 4 ng/L Lab Spite)	1	24.7	34.1		•	3.07	7.10	31
CGMN-SD-WC011-0-050818 (CR08827 3ph D, 46 m/L Leb 3phu)	40	24.7	56.6	80	40	6.07	28.0	57
CGMN-SEI-WC012-0-050810 (Cabintati Buk II, 4 ng/L.Lab Bulla)		\$3.0	38.9			9.12	12.1	78
CGM+8D-WC012-0-050819			44.4			9.12	25.6	42
(CHARLES Sub F, 48 rept. Lab Splin)	<b>"</b>	39.0	47.4	36	40	W.12	20.6	42
CGMN-3D-WC021-0-050610	1 . 1			.	4	15.9	17.8	
(COORDING Style St. 4 rept. Lab Stylin)	4	39.9	42.2	·	•	1278	17.9	
CCMM-SD-WCC21-0-050810 (CN0)M028 Sph N, 46 npl. Lab Spho)	40	39.9	78.6	97	40	16.9	37.0	53
CGMN-8t3-WC022-0-080810					.		22.0	
(COOCOUN Spirit, 6 agril Lab Spirito)	•	19.2	27.8	· 1	4	21.0	42.6	
(CGMN-SD-WC022-0-050810 (C000000 Spir J, 45 opt. Lab Spiro)	40	10.2	44.4	63	40	21.0	40.0	50
CCBMN-SD-WC031-0-050810 (C0008021 Rult C, 4 ngll, Lub Spillin)		7.65	18.1	186		2.49	5.14	-67
CCMN-SD-WC031-0-05081D	1 1				1			
(Continue Spir D. 40 mg/L Lub Spirm)	44	7.58	25.4	45	43	2.46	19.0	41
CGMH-SD-WC032-0-050810 (C006032 Syst E, 4 myl. Lab Syste )	4	109	13.4	63	4	2.48	4.84	60
CGMN-80-WC032-0-050910 (CT000023 Spin P. 48 NgPu Luib Spillio.)	40	10.9	31.6	62	44	2.46	20.8	45
CGMN-90-WU011-0-050812 gccossess that 0.4 mail. Lab Ballini	4	120	15.5	95		1.19	2.86	42
CGMR4-SC-WU011-0-050812 (C0006035 Spir H, 40 ng/L Lub Spille)	40	12.0	41.8	75	46	1.19	16.1	42
COMM-SD-EUC11-0-050812 (COMMS4 Spix ( 4 mg/L Luts Spiller )		6.58	11.0	111	4	122	10.7	•
CGMN-SD-EU011-0-050812 (C60600-4 Run J. 49 not. Lab Rolls 1	40	6.55	40.4	85	40	12.2	32.6	89
	<u> </u>		Anaraga:	<u> </u>			Average:	14

<sup>&</sup>quot;Sample residue exceeds the spiking level significantly (3x aptiong level); therefore, an accurate recovery value convol to concusted

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NC = Not quantifiable = Measured concentration between 0.2 right (net weight) and the Limit of Quantifiable (5.0Q) which is 0.4 right (net weight).

Matrix Spike Recovery of PFBS and PFHS in Surface Table V. Water Samples

	C4 Sulfonate PFB8 Amount Amt Found Amount				America	Ant Found	S Sulfonzio PRA Amount	1
Sample Description	Spiked (ng/L)		ftecovered (ng/L)	Recovery (%)		in Sample (NG/L)	Recovered (ng/L)	Recovery (%)
CGMN-SW-MR006-0-050898 (C006873 Sph C, 199 mg/L Lab Sphm)	100	103	193	90	100	MQ	150	150
CGMH_SW-MR008-0-650800 (C000075 Spic 9, 1000 mg/L Lab Spite)	1000	103	1180	108	1000	NC	1080	104
CG)494-SW-44R005-0-050009 Low Spike 0.1 ppb (C0000977, 198 mg/L Flold Spike)	100	103	230	127	196	NC:	127	127
CGMN-SW-MR005-0-050808 High Spike 1.0 ppb (C000674, 1800 typ. Plaid Spine)	1000	103	863	79	1000	NG	980	<b>*</b> .
CGASN-SW-LARGO+-0-080800 (Stream) Spin S, 100 hg/L Liab Spins	100	NQ	121	121	100	ND	\$1 <b>0</b>	118
CGMN-SW-MR004-0-050809 (CREATER SPLE) 1000 Agril Lab Spleat	1000	NQ:	989	97	1000	NO	1080	196
CGANI-SAV-ARRODA-0-050809-Low-Spike 0.1 ppb (cossinat, 494 upt. Rade lipila)	100	NO	S2.9	93	100	NEO	106	185
CGAIN-SW-ARROW-0-050509 High Spike 1.0 ppb (constrat, 1908 rept. Plant Spike)	1000	NQ	948	28	1000	ND	961	96
CGMN-SW-MR003-0-050800 (C00080) Tipl: G, 100 mg/L Lab Spilm)	100	NQ	114	114	100	ND	114	114
CGMN-SW-MR003-0-050809 (C000883 Spir II, 1446 mg/L Lub Syllm)	1000	NQ	990	es	1000	ND	1080	108
CGMY4-SW4-MF1003-0-050508 Low Spike 0.1 ppb (C000000, 100 ng/L Piyld Spike)	100	NQ	86.3	86	100	ND	90.0	91
CGSAN/SW-MR003-0-960809 High Spike 1.0 ppb cossess, 1881 ngt. Field Spike)	1000	NQ	868	87	1000	ND	915	<b>82</b>
CGUIN-SW-MR002-0-050809 (CB0808F Slpt C, 188 mg/L Lub Slptm)	1000	50.0	931	<b>68</b>	1000	NQ:	1089	106
CGMH-SW-MR002-0-090909 (CHRISTER Spit II, 1608 ng/L Lub Spitist)	10006	50.0	9890	96	17000	NQ	9750	86
CGMPNSW AVROD2-0-050609 Low Spike 0.1 ppb (COMMEN, 160 mg/L Plant Spike)	100	<b>5</b> 5,0	118	86	100	NG	113	113
CGMN-SW-MM802-0-060809 High Spike 1.0 pps (Celassion, 100a ng/L Plaid Spike)	1900	80.0	830	78	1000	NQ	907	<b>9</b> 1
CGNN-SW-MR001-0-060809 (C88889) Byt 8, 104 ng/L Lab Spine)	100	NQ:	129	129	100	ND	112	112
CGNN-SW-MR001-0-060808 (C008801 Sph F, 1909 ng/L Leb Sphig)	1900	NQ	1240	124	1000	ND	1110	111
CGAN-SW-ARK001-6-050809 Eau Spike 0 1 ppb (088890), 189 npt. Reid Spike)	100	NQ	84.9	86	100	ND	90.1	80
CCBAN-SW-MAROC1-C-060809 High Spike 1.0 pcb (C088884, 1680 mg/L Fleid Spike)	1000	NC;	946	96	1000	ND	1000	100
CGMM-3W-MR008-0-060808 (Cossilié Spir G. 180 mg/r. Lab Spire)	100	NQ	103	133	100	ND	124	124
CGMN-SW-A#2008-0-050800 (Constité Spir H, 1600 ng/L Lab Spilm)	1000	NQ	1200	126	1000	MD	1179	117
CG16N-SIV-MR006-0-050809 Low Spike (I 1 ppb (C846807, 198 mpt. Plant Spike)	100	NQ	122	122	106	ND	127	127
CGNIN-SW-MR086-0-056809 High Spike 1.0 ppb (C088886, 1904 ne/l. Floid Spike)	1006	NQ	975	98	:000	NO	957	99

en 25 ng/L (9x) and the Limit of Countinion (LOC) which is 50 ng/L gold. Ex. recovery values may vary alightly from the values in the owy data.

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Table V. Matrix Spike Recovery of PFBS and PFHS in Surface Water Samples Continued

Semple Dascription	Amount Spliced (ng/L)	Ant Found in Sample (ng/L)	C4 Sufforete FFRS Amount Recovered (ng/L)	Recovery (%)		Amt Found In Sampto (ngAL)	A Buforete PFHE Amount Recovered (ngfL)	Recovery (%)
CGABL-SW-EC011-0-050B10 (continues and conti	100	12200	13306	•	10C	4720	4500	•
CGMN-SW-EC811-0-050810 (C006006 Spt 0. 1001 hpt Lab Spins)	1000	12200	15200		1000	4720	5770	•
CGMN+SW-EC011-0-080810 Low Spike 9.1 ppb (C000801, 100 agt. Field Skills)	100	12200	13300	•	100	4720	4879	•
CGILM-SW-EC011-0-050810 High Spike 1.0 ppb (C0040001, 1900 cpd, Field Spike)	1000	12200	13300		1000	4720	5400	•
CGMN-SW-WCD11-0-050810 (C008803 Bpk E, 100 ng/L Laž Spillo)	100	<b>90.1</b>	172	82	100	364	467	•
COMNI-SW-WCD11-0-080810 (COMMAN Byli F, 1000 Hyr. Late Sylles)	1000	90.1	1130	104	1900	304	1470	111
CGMN-SW-WC011-0-060810 Low Spike 0.1 ppb (C008005, 100 agr. Field Spike)	100	90.1	172	82	100	364	457	
CCNPY-SW-WC011-0-050B10 High Spike 1.0 ppb (Creation, 1600 right Field Spike)	1000	90.1	1000	190	1000	364	1630	117
CGMN-SW-EU011-0-050812 (200887 Spir 6, 197 ng % Lui Spiro)	100	ND	147	117	100	ND	113	113
CGMN-SW-EU011-0-050812 (C008807 Spt H, 1609 agri, Laté Spillo)	10000	ND	1020	102	1000	ND	1050	105
CGAMA-SW-EU011-0-050612 Low Spike 0.1 ppb (C000000, 110 agil. Flata Spike)	100	ND	111	111	100	NO	119	119
CGLIN-SW-EU011-0-050812 High Spice 1.0 ppb (content, 1991 agt. Plant Sylle)	1000	ND	1065	106	1000	NO	1160	118
CGM#4-SW-MR008-2-050809 (CR08014 Sph L 100 ngt. Lab Spho)	100	ND	115	118	100	NO	101	101
CGMBL-5W-MP008-2-060800 (Constant Sant J. 1000 April Laik Spi ke)	1000	ND	1070	107	1000	NO	1130	113
Trip Blank Low Spike 0.1 ppb (2008815, 100 apt. Flati Spike)	100	NO	94.3	94	100	NO	107	107
Trip Blank High Spike 1.0 ppb (0000014, 1010 ug/L Pold Spike)	1000	NC	- 1130	713	1000	ND	1190	119
	<u></u>		Averege:	162	باستينيس		Average:	100

"Sample residue exceeds the apturing level algorithments (>3x sprang level); therefore, an excurate recovery value cannot be calculated.

NC = Not quantitable = Measured concentration between 25 mg/L (ppf) and the Limit of Quantitation (LOC) which is 50 mg/L (ppf)

Motor: Blease this seminary table shows counsed reselts, recovery values may vary slightly from the values in the new data

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Table VI. Matrix Spike Recovery of PFOS and PFOA in Surface Water Samples

Sumple Description	Arented Spiled (Ag/L)	Amt Found	CB Builfenate PFOS Amount Recovered (ng/L)	Recovery (%)		Ant Found In Semple (ng/L)	CB Acid PPOA Amount Recovered (ng/L)	Recovery (%)
CGAN-SW-MR006-0-050800 (CANNERS Both C, 1998 Agil. Lab Spiles)	100	109	216	107	100	134	235	101
CGANN-SW-MR006-0-050800 (CR00608 Suit D. 1000 right Lab Spite)	1000	100	1030	92	1000	134	800	76
CGMPH-SW-MPR005-Q-050808 Low Spike 0.1 ppb (C008877_100 agri, Faid Spike)	100	106	179	70	100	134	267	123
CGMR-SVY-MR005-0-650800 High Spike 1.0 ppb (C808876, 1000 hgrt, Field Spike)	1000	109	763	68	1000	134	863	73
CGMN-SW-44R004-0-050800 (C0000078 Spix E, 100 Agril, Lab Spike)	100	ND	104	104	100	ND	02.3	92
CCGAN'S-SNF-ARRODA-D-DEDECO (CCENTER) Spit F, 1865 right, Len Spite)	1000	ND	906	et	1000	NO.	747	75
CGN/N-6NY-MR004-0-06060V Low Sprice 0.1 ppb: (C000601, 10F agd. Full Sylle)	100	NO	84.6	56	150	ND	73.0	73
CGNN-SW-MR004-0-050809 High Splice 1.0 ppb (CONSERE, 1880 mg/L Flats Spline)	1000	OR	654	35	1000	ND	756	79
CGMN-SW-MR003-0-060809 (0608038 Spx 6, 160 ng/L Lub Spilo)	100	ND	103	103	100	NO	<b>60.</b> 5	60
CGMN-SN/-MR003-D-060809 (C800808 Bpit H, 1900 ngit Lub Spillo)	1000	ND	952	95	1000	ND	731	73
CGMN4-SNY-MR003-0-060000 Low Spike 0.1 ppb (CBMN88), 100 kg/L Plate Batha)	100	ND	50.5	81	100	ND	88.1	88
CGLIN-SW-MR00S-0-050809 High Spike 1.0 ppb (COCCESS), 1000 mg/L Fluid Spike)	1900	NO	780	78	1000	NO	806	87
CGMN-5W-4RR002-0-050809 (C986687 Bak C, 198 mg/L Lab Bohn)	1000	ND	997	100	1000	NQ	718	72
CGMN-SW-MR002-0-000809 (CMMRR7 Sylt II, 1901 Nyr. Lub Sylthy)	10000	NO	9320	23	10000	NQ	7930	79-
CGNN-SW-NR002-0-050606 Low Spike 9.1 ppb (Consiste), 100 og/L Pietr Spike)	100	ND	100	100	100	NQ.	88.7	<b>20</b>
CGUN-SNV-MR002-0-050800 High Spike 1.0 ppb (Cassess, 1988 mpf. Plant Spilin)	1000	NO	688	<b>80</b>	1000	NQ.	814	81
CGNIN-SW-MR001-0-060809 (C088881 Spit E, 140 right Lab Spiting	100	NID	108	108	100	NØ	63.0	93
CGAN-LSW-AAR001-0-060608 (CA06861 Rph F, 1408 mg/L Lub Rprim)	1000	NED	918	922	1000	NIC	908	æi
CGMN-8W-MR90 1-0-000806 Lew Spike 0.1 ppts (CRESSES, 150 ng/L Pield Spike)	700	NC	62.8	82	1000	MD	87.5	80
CGMN-SW-MR001-0-060808 High Spike 1 0 ppb (C080904, 1999 mpt. Field Spike)	100C	NO	505	<b>81</b>	1000	ND	<b>#53</b>	<b>80</b>
CGBM4-SW-4#7008-Q-040809 (C0458866 Bpk &, 190 mpk, Lasb Status)	100	NQ	117	117	100	NQ	124	124
CCGAN-SW-LARCOS-O-DEGISCO COSSISSE Syli K, 1909 mg/L Lais Spring)	1000	NQ	968	96	1000	NQ	838	84
CGNeV-RW MR008-0-060800 Low Spike 0.1 ppb (CB08887, 188 agr. Fuel Spike)	190	NQ	133	:303	100	NQ.	144	144
CGN:H-SW-NR006-0-060609 High Spike 1.0 ppb (C086686, 1866 right, Fluid Spike)	1000	NO	908	57	1000	NQ	674	97

<sup>&</sup>quot;Semple residual exceeds the aptining level significantly (>3x epiting level); therefore, an accusete recovery vertue cernot be calculat RD = Not celescated as or above 25 right, (ppt). RQ = Not celescated as or above 25 right, (ppt). Rober States this summerly lable shower provision results, recovery valued every englightly from the values in the law data.

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Table VI. Matrix Spike Recovery of PFOS and PFOA in Surface Water Samples Continued

Sample Description	Amoust Spiked (hg/L)	Amt Found in Sample (ng/L)	E Bullenute PPOS Amount Recovered (ng/L)	Recevery (%)		Ant Found in Sample (ng/L)	CE Axid PPCA Amount Recevered (ngfL)	Recovery (%)
CGMN-5W-EC011-0-050810 (C4010808 State C, 100 mart, Lab Sortia)	100	22500	27600		100	15300	18100	
CGMN-SW-EC011-0-060810	1000	22500	24800		1000	15300	15800	
CGMN-SW-EC011-0-050810 Low Spike 0.1 ppb (C1005001, 455 mpt. Feb. Spike)	100	22500	25000		190	15300	16300	
CCMAN-SAY-ECD 11-0-050810 High Spike 1.6 ppb (C000002, 1000 mpf. Plots Satios)	1000	22800	22900		1000	15300	14600	
CGMN-SW-WC011-0-080810 (C008000 Sph. E, 100 mpt. Lab Sphin)	190	1310	1470		100	707	957	
CGMW-SW-WC011-0-050810 (C006883 Spir F, 1080 ng/L Lais Spitin)	1000	1310	2470	116	1000	707	1630	62
CGMH-SA-WC011-0-050810 Low Spike 0.1 ppb (CMMHH), 169 np/L Reid Selle)	190	1310	1300	.	100	707	787	
CGMN-SW-WC011-0-050810 High Spike 1.0 ppb (C008000, 1000 agt, Flaid Spike)	1000	1310	2800	126	1000	707	1960	125
CGMN-SW-ELIOT1-0-050812 (C089817 Spl. Q 100 nph. Lub Splin)	100	ND	117	117	100	66.5	156	.00
CGMN-8W-EU011-0-050812 (C048807 Spir H, 1008 apr. Late Spiras)	1000	ND	1040	104	1000	86.5	882	82
CGMN-SW-EU011-0-050812 Low Spike 0.1 ppb (C0101010, 100 mpl. Park Spike)	100	NB	136	138	100	86.5	182	116
CGMN-SW-EU011-0-050812 High Spike 1 0 ppb (C808814, 1988 apt. Rold Spike)	1909	ND	1206	120	1000	68.5	1240	197
CGMN-SW-MR008-2-050809 (C00081) Spit (190 mg/L Leb Spite)	100	ND	84.6	26	100	NEC	103	100
(CGMN-5W-NF006-2-050309 (CMMN-5W-NF006-2-050309	1000	NÖ	e+Z	94	1000	NO	624	<b>82</b>
7rip Blank Low Spike 6.1 ppb (0000013, 101 kpl. Reid Spike)	100	ND	101	101	100	ND	110	110
Trip Blank High Spike 1.0 ppb (C0068H4, 1000 npf. Held Spike)	1000	NO	1190	119	1000	NO	1180	118
			Average		<u> </u>		Average:	12

<sup>&</sup>quot;Serrote residue exceeds the splitting level significantly (\*) is splitting level); therefore, an accusable recovery value cannot be calculated MC to these sections of and (\*).

NQ = Not quantificate = Measured concentration between 25 rops, (ppt) and the Limit of Quantitation (LOQ) which is 58 rops, (ppt) blade: Stress this summany table shows recorded results, measurery values may your efficiely from the values in the results and the control of the

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Table VII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Sediment Samples

		<sup>13</sup> C-PFOA			
_		Amount	Amount		
Extygen	Semple	Splited	Recovered	Recovery	
ID	Description	(ng/g)	(ng/g)	(%)	
C0085815	COMN-SD-MR005-0-050609	4	3.48	87	
C0085815 Rep	CGMN-SD-MR005-0-850809	ì	3.42	86	
C0085615 Spk C	CGMN-SD-MR005-0-050809	i	3.10	78	
C0085615 Spk D	CGMN-SD-MR005-0-050809	40	26.6	. 67	
C0085618	CGMN-SD-MR004-0-050809	4	3.12	78	
C0065616 Rec	CGMN-SD-MR004-0-050809	ì	3.38	P4	
C0085616 Sck E	CGMN-SD-MR004-0-050809	4	2.77	69	
C0085616 Spk F	CGMN-SD-MR004-0-050809	40	25.7	58	
C0085617	CGMN-SD-MR003-0-050809	4	3.38	85	
C0085817 Rep	CGMN-SD-MR003-3-050809	4	3.50	90	
C0085617 Spk G	CGMN-SD-MR003-0-050809	4	2.95	74	
C0085617 Spik H	CGMN-SP-MR003-0-050809	40	23.4	50	
C0085618	CGMN-SD-MR002-0-050809	4	3.40	85	
C0085618 Rep	CGMN-SD-MR002-0-050809	4	3.50	58	
C0085618 Spk I	CGMN-SD-MR002-0-050809	1	2.87	67	
C0085618 Spk J	CGMN-SD-MR002-0-050809	40	22.4	58	
C0085619	CGMN-SD-MR001-0-050809	4	3.14	79	
C0085619 Rep	CGMN-8D-MR001-0-050809	4	2.98	75	
C0085619 Spk C	CGMN-SD-MR001-0-050809	à	2.52	63	
C0085619 Spk D	CGMN-SD-MR001-0-050809	40	21.4	54	
C0085820	CGMN-SD-MR006-0-050809	4	3.08	77	
C0085620 Rap	CGMN-SD-MR006-0-050809	4	3.20	80	
C0085620 Spk E	CGMN-SD-MR006-0-050809	4	2.68	67	
C0085620 Spk F	CGMN-SD-MR006-0-050809	40	19.3	48	
C0085821	CGMN-SD-EC011-0-050810	4	3.01	75	
C0085621 Rep	CGMN-SD-EC011-0-050810	4	3.14	79	
C0085621 Spk G	CGMN-SD-EC011-0-050810	4	2.54	64	
C0085821 Spk H	CGMN-SD-EC011-0-050810	40	21.3	53	
C0085622	CGMN-SD-EC012-0-050810	4	3.17	79	
C0085622 Rep	CGMN-SD-EC012-0-050810	4	2.95	74	
C0085622 Spk I	CGMN-SD-EC012-0-050818	4	2.37	59	
C0085622 Spk J	CGMN-SD-EC012-0-050810	40	19.7	49	
C0065623	CGMN-SD-EC021-0-050810	. 4	3.40	86	
C0085623 Rep	CGMN-SD-EC021-0-050810	4	3.40	85	
C0085623 Spk C	CGMN-SD-EC021-0-050810	4	2.70	58	
C0085623 Spk D	CGMN-SD-EC021-0-050810	40	23.0	58	
C0085624	CGMN-SD-EC022-0-050810	4	3.29	82	
C0085624 Rep	CGMN-SD-EC022-0-050810	4	3.14	79	
00085624 Spk E	CGMN-SD-EC022-0-050810	4	2.58	55	
00085824 Spk F	CGMN-SD-EC022-0-050810	40	21.4	54	

Note: Since this summary table shows rounded results, recovery values may vary alightly from the values in the raw data.

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Table VII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Sediment Samples Continued

			12C-PFOA	
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
ID	Description	(ng/g)	(ng/g)	(%)
C0085625	CGMN-SD-EC031-0-050810	4	3.10	78
C0085625 Rep	CGMN-SD-EC031-0-050810	4	3.04	76
C0085625 Sok G	CGMN-SD-EC031-0-050810	À	2.56	64
C0085825 Spk H	CGMN-SD-EC031-0-050610	40	22.0	55
C0085628	CGMN-SD-EC032-0-050810	4	3.08	77
C0065626 Rep	CGMN-SD-EC032-0-050810	À	3.18	80
C0085626 Sek I	CGMN-SD-EC032-0-050810	4	2.46	82
C0085826 Spk J	CGMN-SD-EC032-0-050810	40	22.2	56
C0085627	CGMN-SD-WC011-0-050810	4	2.50	63
C0065627 Rep	CGMN-SD-WC011-0-050810	4	2.49	62
C0085627 Spk C	CGMN-SD-WC011-0-050810	4	2.08	52
C0095627 Spk D	CGMN-SD-WC011-0-050810	40	21.4	54
C0085528	CGMN-SD-WC012-0-050810	4	2.61	55
C0085628 Rep	CGMN-SD-WC012-0-050810	4	2.51	63
C0085828 Sok E	CGMN-SD-WC012-0-050810	4	2.28	57
C0086628 Splk F	CGMN-SD-WC012-0-050810	40	19.2	48
C0085629	CGMN-SD-WC021-0-060810	4	2.73	68
C0085629 Rep	CGMN-SD-WC021-0-060810	4	2.68	67
C0085629 Spk G	CGMN-SD-WC821-0-060810	4	2.08	52
C0085529 Spk H	CGMN-SD-WC021-0-050810	40	19.5	48
C0085630	CGMN-SD-WC022-0-050810	4	2.42	61
C0085630 Rep	CGMN-SD-WC022-0-050810	4	2.43	61
C0085630 Spk I	CGMN-SD-WC022-0-050810	4	2.27	57
C0085630 Spk J	CGMN-SD-WC022-0-050810	40	18.7	47
C0085631	CGMN-SD-WC031-0-050810	4	2.21	55
C0085631 Rep	CGMN-SD-WC031-0-050810	4	2.42	61
C0085631 Spk C	CGMN-SD-WC031-0-060810	4	2.14	54
C0065631 Spk D	CGMN-SD-WC031-0-050810	40	16.2	41
C0085632	CGMN-8D-WC032-0-050810	4	2.43	61
C0085632 Rep	CGMN-SD-WC032-0-050810	4	2.48	62
C0085632 Spk E	CGMN-8D-WC032-0-050810	4	2.10	53
C0085632 Spk F	CGMN-SD-WC032-0-050810	40	17.8	45
C0085633	COMN-SD-WU011-0-050812	4	2.87	67
C0085633 Rep	CGMN-SD-WU911-0-050812	4	2.58	67
C0085633 Spk G	CGMN-SD-WU011-0-050612	4	1.79	45
C0085833 Spk H	CGMN-SD-WU011-0-050812	40	17.5	44
C0085634	CGMN-SD-EU011-0-050812	4	3.18	80
C0085634 Rep	CGMN-SD-EU011-0-050812	4	3.33	83
C0085634 Spk I	CGMN-SD-EU011-0-050812	4	2.71	68
C0085834 Spk J	CGMN-SD-EU011-0-050812	40	25.2	63

Standard Deviation: 1

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Surface Water Samples

	·		13C-PFOA	
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recover
<u>iD</u>	Description	(ng/L)	(ng/L)	(%)
C0085575	CGMN-SW-MR005-0-050800	500	420	84
C0085575 Rep	CGMN-SW-MR005-0-050809	500	409	82
C0085575 Spk C	CGMN-SW-MR005-0-050809	600	568	95
C0085575 Spk D	CGMN-SW-MR005-0-050809	1500	1190	79
C0085576	CGMN-SW-MR005-0-050809 Dup	500	483	97
C0085577	CGMN-SW-MR005-0-050809 Low Spike 0.1 ppb	100	92.5	93
C0085578	CGMN-SW-MR005-0-050809 High Spike 1.0 ppb	1000	703	70
C0085579	CGMN-SW-MR004-0-050809	500	414	83
C0085579 Res	CGMN-SW-MR004-0-050609	500	464	93
C0085579 Sok E	CCMN-SW-MR004-0-050809	600	479	80
00085579 Sok F	CGMN-SW-MR004-0-050809	1500	1170	78
C0085580	CGMN-SW-MR004-0-050809 Dup	500	441	88
C0085581	CGMN-SW-MR004-0-050809 Low Spilte 0.1 ppb	100	111	111
C0085582	CGMN-SW-MR004-0-050809 High Spike 1.0 ppb	1000	1120	112
C0085583	CGMN-SW-MR003-0-050809	500	484	93
C0085583 Rep	CGMN-SW-MR003-0-050809	500	424	35 85
C0085583 Sok G	CGMN-SW-MR003-0-050809	600	583	97
		1500	1220	9/ 81
20085583 Spk H	CGMN-SW-MR003-0-050809			
C0085584	CGMN-SVV-MR003-0-050809 Dup	500	454	91
C0D86585	CGMN-SW-MR003-0-050809 Law Spike 0.1 ppb	100	83.5	84
C0085585	CGMN-SW-MR003-0-050809 High Spike 1.0 ppb	1903	818	82
C0085587	CGMN-SW-MR002-0-050609	500	403	80
C0085587 Rep	CGMN-SW-MR002-0-050809	500	433	87
20085587 Spk C	CGMN-SW-MR002-0-050809	1500	1090	73
20085587 Spk D	CGMN-SW-MR002-0-050809	10500	8190	78
C0085588	CGMN-SW-MR002-0-050809 Dup	500	428	88
C0085588	CGMN-SW-MR002-0-050809 Low Spike 0.1 ppb	100	114	114
C0085590	CGMN-SW-MR002-0-050809 High Spike 1.0 ppb	1000	898	90
C0086591	CGMN-SW-MR001-0-050609	500	418	84
C0085591 Rep	CGMN-SW-MR001-0-050809	500	432	86
0085591 Sok E	CGMN-SW-MR001-0-050809	500	579	97
20085691 Sok F	CGMN-SW-MR001-0-050809	1500	1160	77
C0085592	CGMN-SW-MR001-0-050809 Dup	500	484	97
C0065593	CGMN-SW-MR001-0-050809 Low Spike 0.1 ppb	100	84.1	84
C0086594	CGMN-SW-MR001-0-050809 High Spike 1.0 ppb	1000	849	85
C0085595	CGMN-SW-MR008-0-050809	500	449	93
C0085595 Rec	CGMN-SW-MR008-0-050809	500	445	89
	CGMN-SW-MR006-0-050809	600	601	100
0085595 Spk G	CCMLSW-4R006-0-050809	1500	1210	81
20085596 Spk H	CGMN-SW-MR008-0-050809 Dup	500	484	97
C0065598		100	106	37 106
C0065597	CGMN-SW-MR006-0-050809 Low Spike 0.1 ppb		106 256	96
C0085598	CGMN-SW-MR006-0-050809 High Spike 1.0 ppb	1000	ಕವರ	50

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table VIII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Surface Water Samples Continued

			13C-PFOA	
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
<u>iĎ</u>	Description	(ng/L)	(ng/L)	(%)
C0085599	CGMN-SW-EC011-D-050810	500	347	69
C0085599 Rep	CGMN-SW-EC011-0-050810	500	343	69
C0085599 Spk C	CGMN-SW-EC011-0-050810	600	404	67
C0065599 Spk D	CGMN-SW-EC011-0-050810	1500	1170	78
C0085800	CGMN-SW-EC011-0-050810 Dup	500	352	70
C0085601	CGMN-SW-EC011-0-050810 Low Spike 0.1 ppb	100	80.9	B1
C0085802	CGMN-SW-EC011-0-050810 High Spike 1.0 ppb	1000	827	83
C0085603	CGMN-SW-WC011-0-050810	500	439	88
C0085603 Rep	CGMN-SW-WC011-0-050810	500	397	79
C0085603 Spk E	CGMN-SW-WC011-0-058810	600	551	92
C0085603 Spk F	CGMN-SW-WC011-0-050818	1500	1230	82
C0065604	CGMN-SW-WC011-9-050810 Dub	500	415	83
C0085805	CGMN-SW-WC011-0-050810 Low Spike 0.1 ppb	100	82.2	82
C0085606	CGMN-SW-WC011-0-050810 High Spike 1.0 ppb	1000	1030	103
C0085607	CGMN-SW-EU011-0-060812	500	453	91
C0085607 Rep	CGMN-SW-EU011-0-050812	500	471	94
20065607 Spk G	CGMN-SW-EU011-0-050812	600	582	99
20085607 Spk H	CGMN-SW-EU011-0-050812	1500	1310	87
C0085608	CGMN-SW-EU011-0-050812 Dup	500	430	88
C0085609	CGMN-SW-EU011-0-050812 Low Spike 0.1 ppb	100	108	108
C0085610	CGMN-SW-EU011-0-050812 High Spike 1.0 ppb	1000	1080	108
C0085611	CGMN-SW-MR006-2-050809	600	403	57
C0085611 Rep	CGMN-SW-MR008-2-050809	500	401	80
20085611 Spk !	CGMN-SW-MR006-2-050809	500	463	93
0085611 Spk J	CGMN-SW-MR008-2-050809	1500	1250	83
C0085612	Trip Blank	500	517	103
C0085613	Trip Blank Low Spike 0.1 ppb	100	108	108
C0085614	Trito Blank High Spike 1.0 ppb	1000	1160	116

Note: Since this euromany table shows rounded results, recovery values may vary slightly from the values in the raw date.

Table IX. Total Percent Solids for Sediment Samples

Exygen ID	Client Sample ID	Total Solids (%)
C0085615	CGMN-SD-MR005-0-050809	50.49
C0085616	CGMN-SD-MR004-0-050809	70.65
C0085617	CGMN-SD-MR003-0-050809	68.21
C0085618	CGMN-SD-MR002-0-050809	89.69
C0085619	CGMN-SD-MR001-0-050809	58.90
C0085620	CGMN-SD-MR006-0-050809	57 <b>.5</b> 6
C0085621	CGMN-SD-EC011-0-050810	77.75
C0085 <del>822</del>	CGMN-SD-EC012-0-050810	80.50
C0085623	CGMN-SD-EC021-0-050810	70.82
C0085824	CGMN-SD-EC022-0-050810	77.14
C0085625	CGMN-SD-EC031-0-050810	76.58
C0085626	CGMN-SD-EC032-0-050810	80.66
C0085627	CGMN-SD-WC011-0-050810	37.44
C0085628	CGMN-SD-WC012-0-050810	42.53
C0085629	CGMN-SD-WC021-0-050810	51.79
C0085830	CGMN-SD-WC022-0-050810	56,14
C0085631	CGMN-SD-WC031-0-050810	63.84
C0085832	CGMN-SD-WC032-0-050810	54.37
C0085633	CGMN-SD-WU011-0-050812	78.79
C0086834	CGMN-SD-EU011-0-050812	54.88

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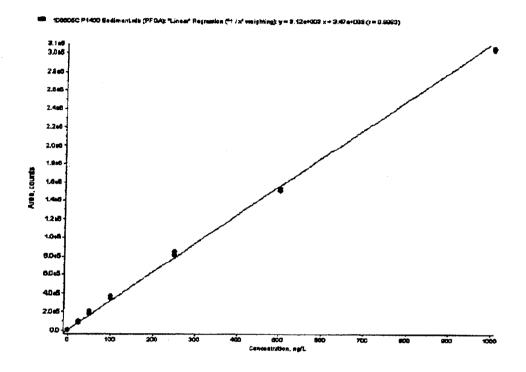
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Figure 1. Typical Calibration Curve for PFOA in Reagent Water

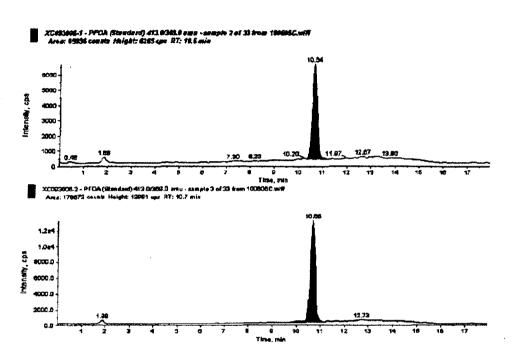


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Figure 2. Extracted Standards of PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively



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Figure 3. PFOA in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively

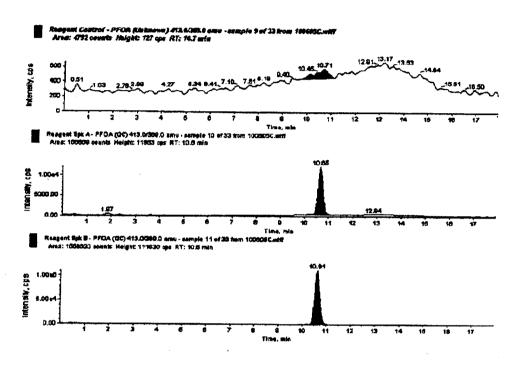
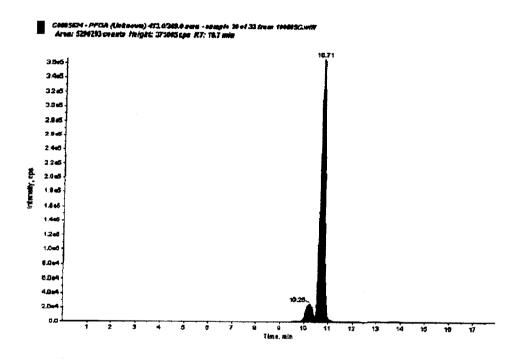
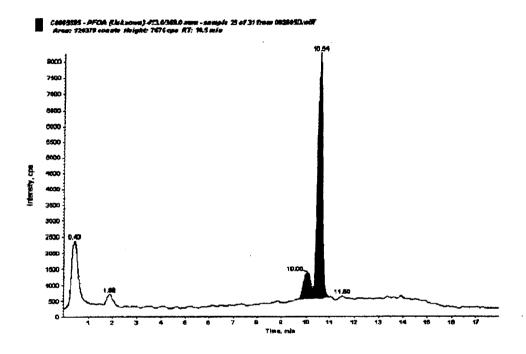


Figure 4. Chromatogram Representing a Sediment Sample Analyzed for PFOA (Exygen ID: C0085624, Data Set: 100605C)



Exygen Study No.: P0001400

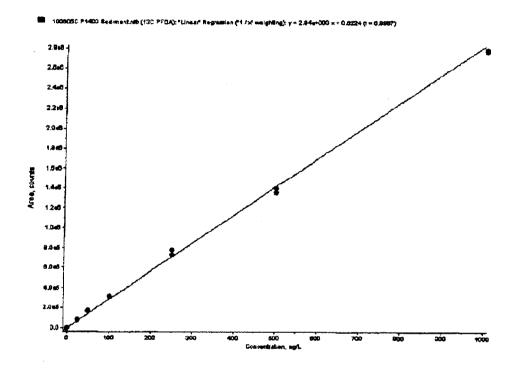
Figure 5. Chromatogram Representing a Surface Water Sample Analyzed for PFOA (Exygen ID: C0085595, Data Set: 092805D)



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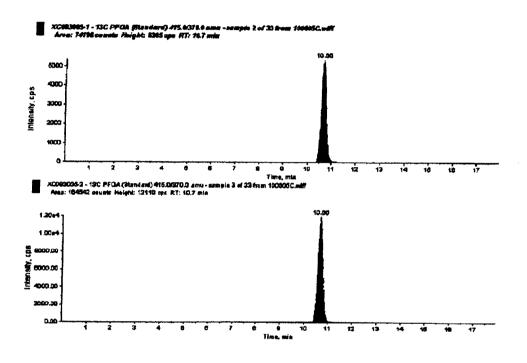
Figure 6. Typical Calibration Curve for <sup>13</sup>C PFOA in Reagent Water



Exygen Research

Exygen Study No.: P0001400

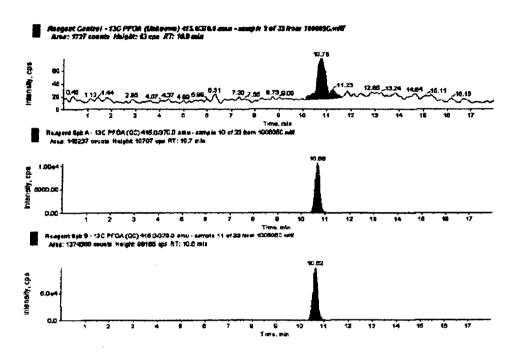
Figure 7. Extracted Standards of <sup>13</sup>C PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively



Exygen Research

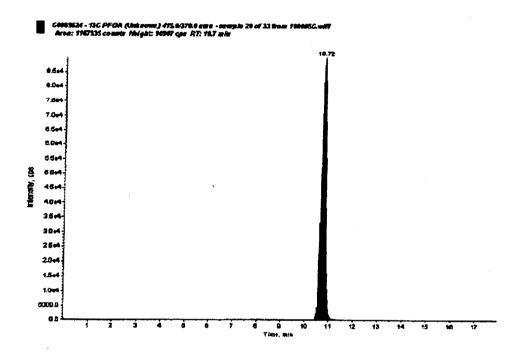
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Exygen Study No.: P0001400

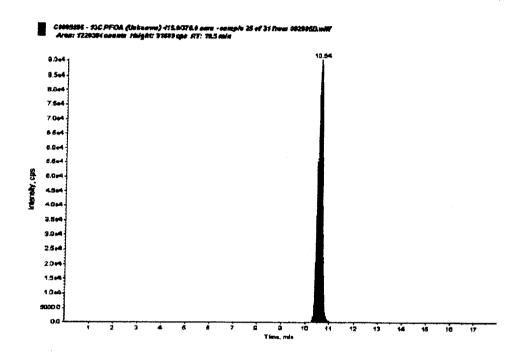
Figure 9. Chromatogram Representing a Sediment Sample Analyzed for <sup>13</sup>C PFOA (Exygen ID: C0085624, Data Set: 100605C)



Exygen Research

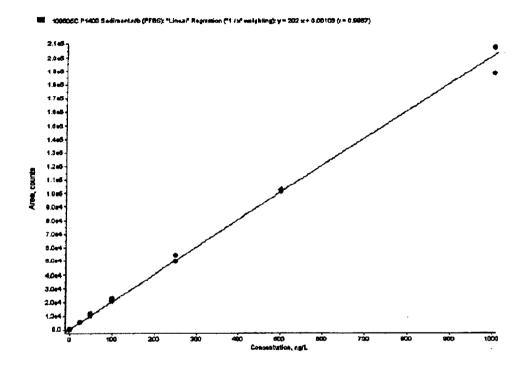
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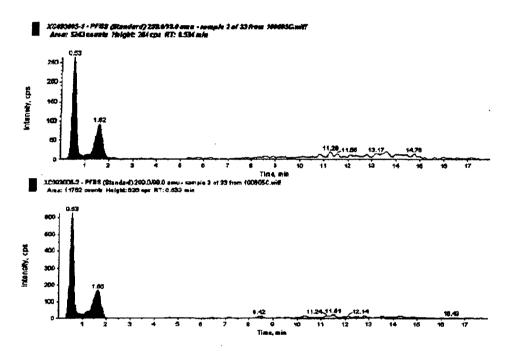


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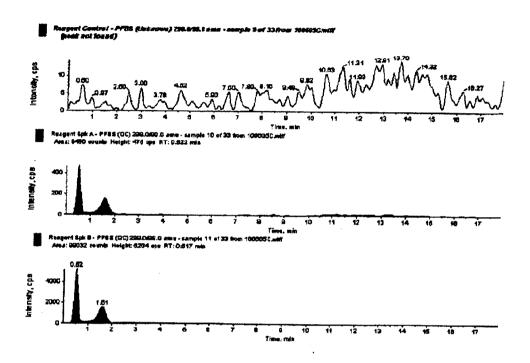
Figure 12. Extracted Standards of PFBS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



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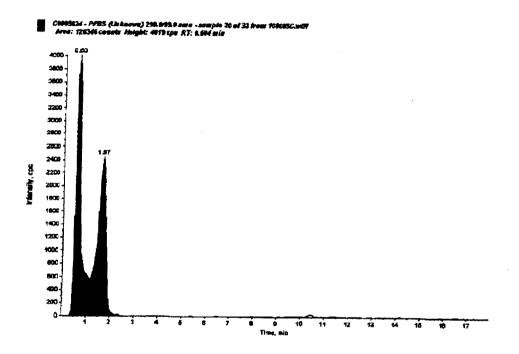
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Figure 13. PFBS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



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Figure 14. Chromatogram Representing a Sediment Sample Analyzed for PFBS (Exygen ID: C0085624, Data Set: 100605C)

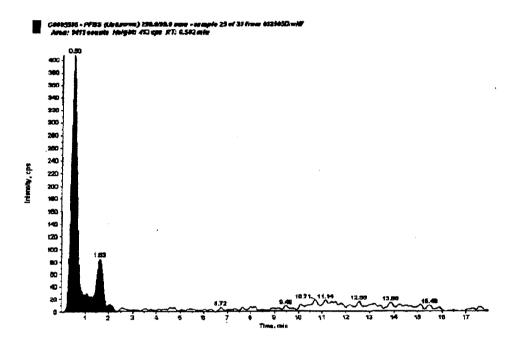


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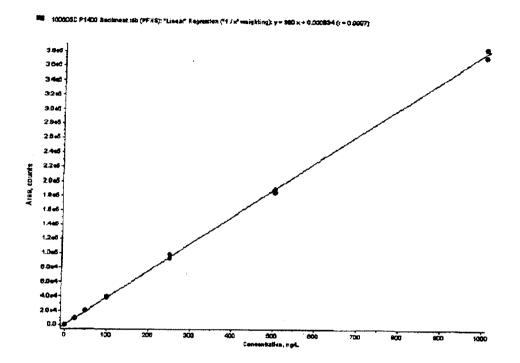
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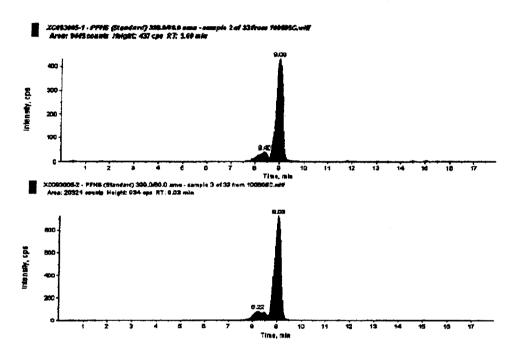


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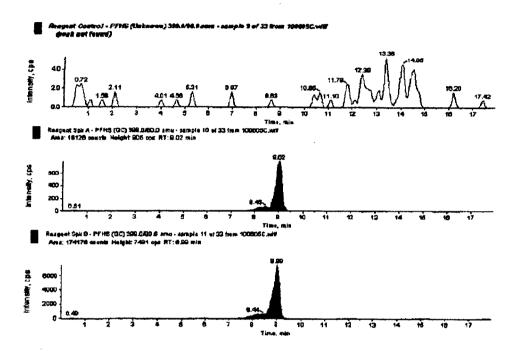
Exygen Study No.: P0001400

Figure 17. Extracted Standards of PFHS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



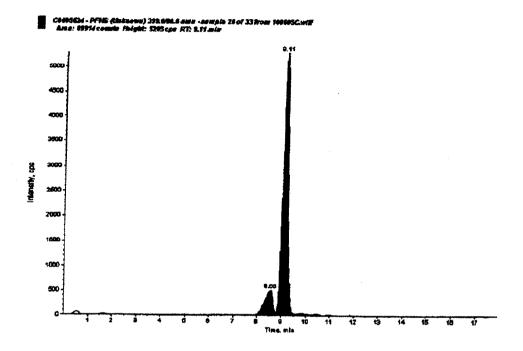
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Figure 18. PFHS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



Exygen Study No.: P0001400

Figure 19. Chromatogram Representing a Sediment Sample Analyzed for PFHS (Exygen ID: C0085624, Data Set: 100605C)

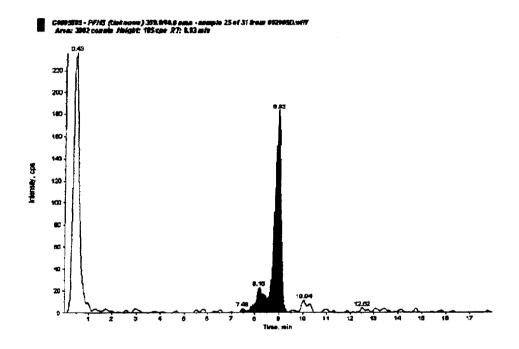


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Figure 20. Chromatogram Representing a Surface Water Sample Analyzed for PFHS (Exygen ID: C0085595, Data Set: 092805D)

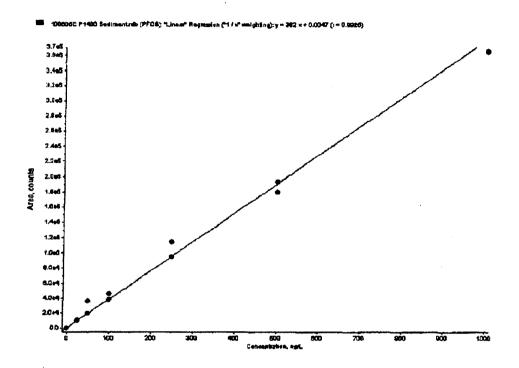


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Figure 21. Typical Calibration Curve for PFOS in Reagent Water

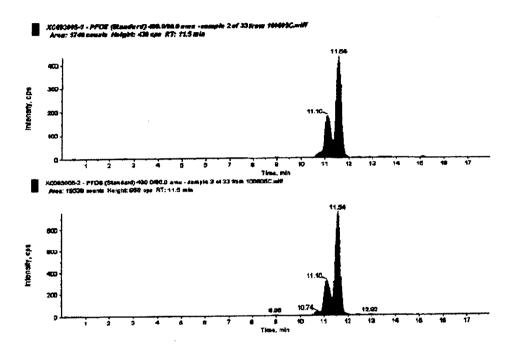


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Figure 22. Extracted Standards of PFOS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



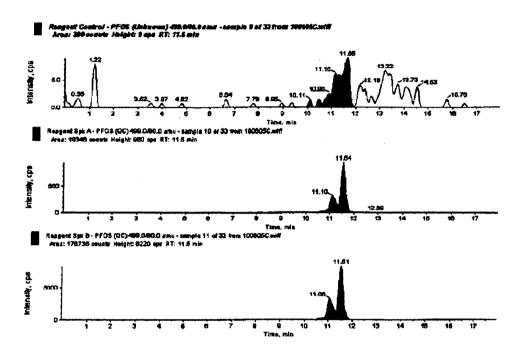
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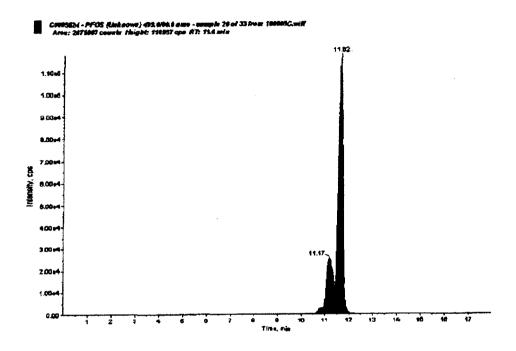
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Exygen Study No.: P0001400

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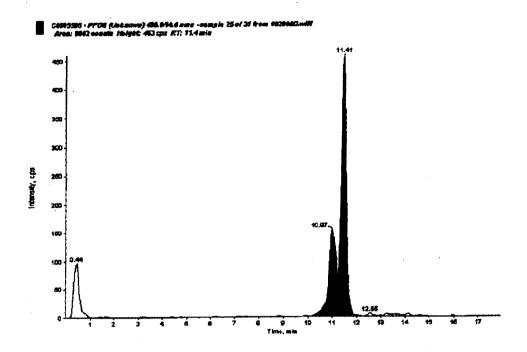


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Figure 25. Chromatogram Representing a Surface Water Sample Analyzed for PFOS (Exygen ID: C0085595, Data Set: 092805D)



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# INTERIM REPORT #6 - Analysis of Cottage Grove Fish Samples

# STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

#### **DATA REQUIREMENTS**

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

#### STUDY DIRECTOR

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380 Phone: 610-701-3761

# INTERIM REPORT COMPLETION DATE

February 7, 2006

#### PERFORMING LABORATORY

Exygen Research 3058 Research Drive State College, PA 16801 Phone: 814-272-1039

#### STUDY SPONSOR

3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144 Phone: 651-733-6374

#### **PROJECT**

Protocol Number: P0001400 Exygen Study Number: P0001400

Total Pages: 130

# GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

John Flaherty

Principal Investigator Exygen Research

Jaisimha Kesari P.E., DEE

Study Director

Weston Solutions, Inc.

Robert A. Paschke Sponsor Representative

3M Company

2/9/06 Date

Exygen Research

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## **QUALITY ASSURANCE STATEMENT**

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

	Date	Date Reported to Principal	Date Reported to Exygen	Date Reported to
<u>Phase</u>	<u>Inspected</u>	Investigator	Management	Study Director
14. Raw Data Review and Final Analytical Report Review	12/14-21/05	12/21/05	12/21/05	12/21/05
15. Raw Data Review and Final Analytical Report Review	02/03/06	02/07/06	02/07/06	02/07/06

Lydia Shaffer
Teghnical Lead, Quality Assurance Unit

Date

<sup>1</sup>Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

# **CERTIFICATION OF AUTHENTICITY**

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by:	Exygen Research 3058 Research Drive State College, PA 16801 (814) 272-1039	
Principal Investigator	r, Exygen:	
O.L m Flat	Y	1/1/06
John Flaherty		Date
Vice President		
Exygen Research		
Exygen Research Fac	cility Management:	
So araul A	/an-	9-165-66
Richard A. Grazzini		Date
President		
Exygen Research		
Study Director West  Jaisimha Kesari P.E., Weston Solutions, In	<b>JUÍ</b> , DEE	2/9/06 Date
Sponsor Representation Robert A. Paschke Manager, 3M Corpor	ate Environmental Programs	2/9/06 Date

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Exygen Study No.: P0001400

## STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:

P0001400

**EXYGEN STUDY NUMBER:** 

P0001400

TYPE OF STUDY:

Residue

SAMPLE MATRIX:

Fish

**TEST SUBSTANCE:** 

Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS)

SPONSOR:

3M Company

3M Building 0236-01-B-10

St. Paul, MN 55144

STUDY DIRECTOR:

Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380

STUDY MONITOR:

Robert A. Paschke

3M Company

3M Building 42-02-E-27 St. Paul, MN 55144

PERFORMING LABORATORY:

Exygen Research 3058 Research Drive State College, PA 16801

ANALYTICAL PHASE

Study Initiation Date:

03/03/05

TIMETABLE:

Interim Analytical Start Date:

10/18/05

Interim Analytical Termination Date: 01/27/06

Interim Report Completion Date:

02/07/06

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# **PROJECT PERSONNEL**

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

<u>Name</u>

**Title** 

John Flaherty

Vice President

Karen Risha

Laboratory Supervisor

Chrissy Edwards

Technician

Mark Ammerman

Sample Custodian

Amy Sheehan

Associate Scientist

Mindy Cressley

Technician

**Brittany Kravets** 

Technician

Christa Gallant

Technician

Eric Edwards

Sample Custodian

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## 1.0 SUMMARY

Exygen Research extracted and analyzed fish samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Method V0001783 (Appendix A).

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in fish was 0.5 ng/g for the five gram samples and 2.5 ng/g for the one gram samples.

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in fish samples are summarized in Table I.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the fish samples are detailed in **Tables II and III**. The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the fish samples were 95  $\pm$  16%, 76  $\pm$  14%, 99  $\pm$  8% and 100  $\pm$  22%, respectively. Fortification recoveries for <sup>13</sup>C PFOA in the fish samples are detailed in **Table** IV. The average percent recoveries  $\pm$  standard deviations for <sup>13</sup>C PFOA in the fish samples were 93  $\pm$  19.

Twenty of the sixty-two samples submitted for analysis did not meet quality control criteria for at least one compound. Upon client request, samples C0096730 – C0096732 were reextracted and analyzed for PFBS and <sup>13</sup>C PFOA. Initial results from analyses of samples with low sample mass due to the size of the individual specimens did not meet PFOA spike recovery criteria. Consequently, composite samples were prepared from the remaining tissue homogenate for reanalysis. Samples C0096735 – C0096739, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788 were combined into groups, based on sample site and fish species, and re-extracted and analyzed for PFOA and <sup>13</sup>C PFOA. For the exact groupings, see the correspondence section of the raw data package.

Analytical results for the analysis of PFOA and PFBS in the re-extracted fish samples are summarized in Table V.

Fortification recoveries for PFOA and PFBS in the re-extracted fish samples are detailed in **Table VI**. The average percent recoveries  $\pm$  standard deviations for PFOA and PFBS in the re-extracted fish samples were 111  $\pm$  11% (n=12) and 85  $\pm$  62% (n=3), respectively. Fortification recoveries for <sup>13</sup>C PFOA in the re-extracted fish samples are detailed in **Table VII**. The average percent recoveries  $\pm$  standard deviations for <sup>13</sup>C PFOA in the re-extracted fish samples were 99  $\pm$  17%.

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#### 2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in fish according to Protocol P0001400 (Appendix A).

## 3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in fish using the analytical method entitled, "V0001783: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Fish and Clams by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was October 18, 2005, and the analytical termination date for this interim report was January 27, 2006.

#### 4.0 ANALYTICAL TEST SAMPLES

Sixty-two fish samples (Exygen ID C0096695 – C0096742, C0096744, C0096747, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788) were received on dry ice September 14, 2005 from Charles Young at Weston Solutions, Inc. Sample ID coding included a five or six character set with the first character describing the sample location (Reach 1, 3, 5) followed by two characters describing the species of fish (IP = Ictalurus punctatus [channel catfish], MD = Micropterus dolomieu [smallmouth bass] and LM = Lepomis macrochirus [bluegill sunfish]) and a fourth character describing the type of sample (F = filet tissue, W = whole body tissue). The last two characters describe either the specimen number (01-05) for individual sample analyses or a composite sample (C) consisting of individual samples composited for reanalysis. A whole Whiting (Family: Gadidae) was purchased from a local grocer by Ed Carns on December 20, 2004 and was used as the control fish (Exygen ID C0054391). The samples were logged in by Exygen personnel and placed in frozen storage.

Sample login and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

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## 5.0 REFERENCE MATERIAL

The analytical standard, PFOA, was purchased from Oakwood Products, Inc. and was received at Exygen on March 17, 2004. The surrogate spiking standard, <sup>13</sup>C labeled perfluorooctanoic acid (<sup>13</sup>C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on May 13, 2005. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and <sup>13</sup>C PFOA were stored frozen and PFOS was stored refrigerated.

Compound	Exygen Inventory No.	Lot#	Purity (%)	Expiration Date
PFOA	SP0005444	203	99	03/31/07
<sup>13</sup> C PFOA	SP0004184	3507-195	97	03/29/09
PFBS	SP0005726	101	96.7	12/04/06
PFHS	SP0002401	SE036	98.6	10/18/06
PFOS	SP0002694	430180/1	101.2	10/31/07

The molecular structures of PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS are given on the following pages:

**PFOA** 

Chemical Name: Perfluorooctanoic acid

Molecular Weight: 414

Transitions Monitored: 413 → 369 (for quantification) and

 $413 \rightarrow 219$  (for confirmation)

Structure:

$$F \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{O} OH$$

<sup>13</sup>C PFOA

Chemical Name: 1,2-13C perfluorooctanoic acid

Molecular Weight: 416

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Exygen Study No.: P0001400

Transition Monitored: 415 → 370

Structure:

$$F \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{F} \xrightarrow{13} C \xrightarrow{13} C$$

#### **PFBS**

Chemical Name: Perfluorobutanesulfonate

Molecular Weight: 338 supplied as the potassium salt (C<sub>4</sub>F<sub>9</sub>SO<sub>3</sub>K<sup>+</sup>)

Transitions Monitored:  $299 \rightarrow 99$ 

Structure:

#### **PFHS**

Chemical Name: Perfluorohexanesulfonate

Molecular Weight: 438 supplied as the potassium salt (C₀F₁3SO₃'K<sup>+</sup>)

Transitions Monitored:  $399 \rightarrow 80$ 

Structure:

#### **PFOS**

Chemical Name: Perfluorooctanesulfonate

Molecular Weight: 538 supplied as the potassium salt (C<sub>8</sub>F<sub>17</sub>SO<sub>3</sub>'K<sup>+</sup>)

Transitions Monitored: 499 → 80

Structure:

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$$F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} F \xrightarrow{F} SO_3$$

## 6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical method "V0001783: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Fish and Clams by LC/MS/MS" was used for this study.

#### 6.1 Extraction Procedure for Fish

#### 6.1.1 Sample Preparation

Before the samples could be weighed for the extraction, they had to be processed. To process, the frozen samples were placed into a food processor and homogenized with dry ice. The samples were transferred to one-gallon Ziploc bags and placed in frozen storage with bag left open to allow the dry ice to sublime. After sublimation, the sample bags were sealed and remained in frozen storage until time of analysis. Sample processing records are located in the Sample Information section of the raw data package.

#### 6.1.2 Glassware Preparation

The 125 mL pear-shaped flasks were silanized by first rinsing the flask with 30% dimethyldichlorosilane in toluene solution. The flasks were rinsed once with toluene followed by three rinses with methanol. The flasks were allowed to air dry before use.

#### 6.1.3 Column Preparation

The 20 mL columns were packed at Exygen in sequence with 2 grams florisil, 2 grams silica gel, 2 grams of carbon, and 1 gram LC-NH<sub>2</sub>. The columns were conditioned on the day of extraction with 20 mL of methanol followed by 20 mL of acetonitrile. All washes were discarded. These clean-up columns were used to remove matrix interference and not to retain PFOA and <sup>13</sup>C PFOA. Additional details about the column packing materials can be found in the raw data package associated with this report.

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#### 6.1.4 Sample Extraction

A 5-gram\* portion of fish sample was weighed into a fifty-milliliter centrifuge tube for the extraction. After fortification of appropriate samples, 30 mL of acetonitrile was added to the samples. The samples were allowed to shake on a wrist action shaker for ~15 minutes. The samples were placed into a freezer for ~1 hour. Freezing of the samples allowed the fats and proteins to precipitate. The samples were centrifuged for ~10 minutes at ~2000 rpm. The supernatant was then loaded onto the conditioned clean-up column fitted inside the silanized pear shaped flask. The eluate was collected in the silanized pearshaped flask. This process removed the fats and proteins from the extract. Ten milliliters of acetonitrile was added to the samples left in the centrifuge tube. The remaining sample in the tube was homogenized using a tissumizer for ~30 seconds. The tissumizer was rinsed with ten milliliters of acetonitrile. The rinse was added to the sample tube. The samples were allowed to shake on a wrist action shaker for another 10 minutes. The samples were placed into a freezer for ~1 hour. The samples were centrifuged again for ~10 minutes at ~2000 rpm. The supernatant was then loaded onto the same clean-up column. The eluate was collected into the same pear-shaped flask. The column was washed with 20 mL of acetonitrile, collecting the wash in the pear-shaped flask. Approximately 3 or 4 drops of 1-octanol was added to the extracts in the flasks. The samples were evaporated using a rotary evaporator at reduced pressure. The 1-octanol held the analytes in the pear-shaped flask while the solvent evaporated. Two milliliters of 2% ascorbic acid in methanol was added to the flasks to make final volume. The flask was swirled to dissolve and mix the sample. The sample was transferred to a HPLC vial using a disposable pipet. Each sample was analyzed by LC/MS/MS electrospray.

\*Due to lack of sample, a one-gram portion of samples C0096735 – C0096739, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788 were used. All other samples were weighed out in 5-gram portions.

#### 6.2 Preparation of Standards and Fortification Solutions

A mixed stock standard solution of PFOA,  $^{13}$ C PFOA, PFBS, PFHS and PFOS was prepared at a concentration of  $1000~\mu g/mL$  by dissolving 100~mg of each of the standards (corrected for purity and salt content, if necessary) in methanol. From this solution, a  $100~\mu g/mL$  fortification standard solution was prepared by taking 10~mL of the stock and bringing the volume up to 100~mL with methanol. By taking 10~mL of the  $100~\mu g/mL$  fortification standard and bringing the volume up to 100~mL with methanol, a  $10~\mu g/mL$  fortification standard was prepared. By taking 10~mL of the  $10~\mu g/mL$  fortification standard was prepared. By taking 10~mL of the  $10~\mu g/mL$  fortification standard were

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prepared. By taking 10 mL of the 1.0  $\mu$ g/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.1  $\mu$ g/mL fortification standard was prepared. By taking 10 mL of the 0.1  $\mu$ g/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.01  $\mu$ g/mL fortification standard were prepared.

An additional stock solution of  $^{13}C$  PFOA was prepared at  $100~\mu g/mL$  and diluted to 1.0 and  $0.1~\mu g/mL$  for spiking purposes. Complete details can be found in the raw data package associated with this study.

A set of non-extracted standards containing PFOA, <sup>13</sup>C PFOA, PFBS, PFHS and PFOS were prepared in methanol. The following concentrations were prepared:

Conc. of Fort Solution	Volume (mL)	Final Volume (mL)	Final Conc. of Calibration Std.
(µg/mL) <sup>1</sup>	(1112)	()	(μg/mL)
1.0	5.0	100	0.05
1.0	2.5	100	0.025
1.0	1.0	100	0.01
0.05	10	100	0.005
0.025	10	100	0.0025
0.01	10	100	0.001
0.005	10	100	0.0005
1 of PFOA and 1	<sup>3</sup> C PFOA		

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator ( $4^{\circ} \pm 2^{\circ}$ C) when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

#### 6.3 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~11 min, ~2.5 mins, ~8.9 mins, and ~11.4 mins, respectively. Peaks above the LOD were not detected in any of the control blank samples corresponding to the analyte retention time.

#### 6.4 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 0.5 ng/mL of PFOA, PFBS, PFHS, PFOS and <sup>13</sup>C PFOA.

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# 6.5 Description of LC/MS/MS Instrument and Operating Conditions

Instrument: API 4000 Bio

API 4000 Biomolecular Mass Analyzer

Interface:

Turbo Ion Spray Liquid Introduction Interface

Computer:

DELL OptiPlex GX400

Software:

Windows NT, Analyst 1.4.1

HPLC:

Hewlett Packard (HP) Series 1100

HP Quat Pump

HP Vacuum Degasser HP Autosampler

HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm

Column Temp.: 30° C Injection Vol.: 15 µL

Mobile Phase (A): 2 mM Ammonium Acetate in water

Mobile Phase (B): Methanol

Time (min)	<u>% A</u>	<u>% B</u>
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min Flow Rate: 0.3 mL/min Ions monitored:

			Approximate
<u>Analyte</u>	<u>Mode</u>	<b>Transition</b>	Retention Time
		<b>Monitored</b>	<u>(min)</u>
PFOA	negative	$413 \rightarrow 369$	~11 min.
PFOA Confirm Ion	negative	$413 \rightarrow 219$	~11 min.
<sup>13</sup> C PFOA	negative	$415 \rightarrow 370$	~11 min.
PFBS	negative	$299 \rightarrow 99$	~2.5 min.
PFHS	negative	$399 \rightarrow 80$	~8.9 min.
PFOS	negative	$499 \rightarrow 80$	~11.4 min.

#### 6.6 Quantitation and Example Calculation

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Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using six concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/mL, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

#### Equation 1:

Analyte found  $(ng/mL) = (Peak area - intercept) \times DF$ slope

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

Equation 2 was used to convert the amount of analyte found in ng/mL to ng/g (ppb, wet weight).

#### Equation 2:

Analyte found (ppb, wet weight) = [Analyte found (ng/mL) × final volume (2 mL)] sample weight (5 g)\*

\*One gram for samples for which 1g was used for extraction.

For samples fortified with known amounts of analyte prior to extraction, Equation 3 was used to calculate the percent recovery.

#### Equation 3:

Recovery (%) =  $\underline{\text{(analyte found (ng/g) - analyte in control (ng/g))}} \times 100\%$ amount added (ng/g)

Note: For the analyte recovery calculation, the "control" is the unspiked aliquot of the primary field sample.

An example of a calculation using an actual sample follows:

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Fish sample Exygen ID C0096695 Spk D (Set: 101805A), fortified at 100 ng/g with PFOA where:

peak area 7428926 intercept 79100 slope 292000 dilution factor 10 ng/g analyte added (fort level) 100 amt in corresponding sample (ng/g) 0.808 final volume (mL) 2 sample weight (g) 5

#### From equation 1:

Analyte found (ng/mL) = 
$$[7428926 - 79100] \times 10$$
  
292000

= 252 ng/mL

#### From equation 2:

Analyte found ng/g (ppb, wet weight) = 
$$(252 \text{ ng/mL} \times 2 \text{ mL})$$
  
5 g

= 101 ng/g (ppb)

#### From equation 3:

% Recovery = 
$$(101 \text{ ng/g} - 0.808 \text{ ng/g}) \times 100\%$$
  
100 ng/g

= 100 %

# 7.0 EXPERIMENTAL DESIGN

<sup>13</sup>C PFOA was used as a surrogate for all the samples. <sup>13</sup>C PFOA was added to the fish samples in the laboratory after the samples were weighed for extraction. For fish samples designated as laboratory matrix spikes PFOA, PFBS, PFHS, and PFOS were also added at a known concentration to the samples in the laboratory after the samples were weighed for extraction.

The fish samples were extracted in eighteen sets, five of which were re-extraction sets. Each set included one control fish matrix blank and two control fish matrix blanks fortified at known concentrations. The first eleven sets of fish contained five samples each. Set twelve

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contained four samples and set thirteen contained three samples. Sets 14-16 each contained a re-extraction for one sample. Sets 17-18 contained the re-extracted and composited samples that were originally not reported due to quality control failure. Set seventeen contained re-extractions for three samples and extraction of two composite samples. Set eighteen contained extractions for four composite samples.

Accuracies were assessed for each sample by reviewing the individual QC results obtained for each sample. There were two laboratory spike recovery results available for each sample that were used to assess the accuracy. There were four individual <sup>13</sup>C PFOA recovery results per sample that were also used to assess the accuracy. In cases where the sample level significantly exceeded spiking level (> 3 times the spiking level), accurate recoveries could not be calculated and assessed accuracy was based on <sup>13</sup>C PFOA recovery. Twenty of the sixty-two samples submitted for analysis did not meet quality control criteria for at least one compound. Upon client request, samples C0096730 – C0096732 were re-extracted and analyzed for PFBS and <sup>13</sup>C PFOA. Initial results from analyses of samples with low sample mass due to the size of the individual specimens did not meet PFOA spike recovery criteria. Consequently, composite samples were prepared from the remaining tissue homogenate for reanalysis. Samples C0096735 – C0096739, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788 were combined into groups, based on sample site and fish species, and re-extracted and analyzed for PFOA and <sup>13</sup>C PFOA. For the exact groupings, see the correspondence section of the raw data package.

## 8.0 RESULTS

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in fish samples are summarized in Table I.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the fish samples are detailed in **Tables II and III.** The average percent recoveries  $\pm$  standard deviations for PFOA, PFBS, PFHS and PFOS in the fish samples were 95  $\pm$  16%, 76  $\pm$  14%, 99  $\pm$  8% and 100  $\pm$  22%, respectively. Fortification recoveries for <sup>13</sup>C PFOA in the fish samples are detailed in **Table IV**. The average percent recoveries  $\pm$  standard deviations for <sup>13</sup>C PFOA in the fish samples were 93  $\pm$  19.

Analytical results for the analysis of PFOA and PFBS in the re-extracted fish samples are summarized in Table V.

Fortification recoveries for PFOA and PFBS in the re-extracted fish samples are detailed in **Table VI**. The average percent recoveries  $\pm$  standard deviations for PFOA and PFBS in the re-extracted fish samples were 111  $\pm$  11% (n=12) and 85  $\pm$  62% (n=3), respectively. Fortification recoveries for <sup>13</sup>C PFOA in the re-extracted fish samples are detailed in **Table VII**. The average percent recoveries  $\pm$  standard deviations for <sup>13</sup>C PFOA in the re-extracted fish samples were 99  $\pm$  17%.

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#### 9.0 CONCLUSIONS

The fish samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical method V0001783. There were no circumstances that may have affected the data quality or integrity.

# 10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the study director. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

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# **TABLES**

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Table I. Summary of PFBS, PFHS, PFOS and PFOA in Fish Samples

		C4 Suttons	te PFBS	C6 Suffon	ate PFHS	C# Sulfon	ata PFOS	CB Acid PFCA		
Exygen ID	Client Sample ID	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)	
C0096695	CGMN-F01-1IPW01-0-050812	0.695	40	ND	30	17.0	30	0.806	30	
C0095695 Rep	CGMN-F01-1IPW01-0-050812	0.772	40	ND	30	19.6	30	0.812	30	
C0096895	CGMN-F01-1IPW02-0-050812	0.520	30	ND	30	32.2	30	0.932	30	
C0098696 Rep	CGMN-F01-1IPW02-0-050812*	0.508	30	ND	30	32.2	30	1.01	30	
C0096697	CGMN-F01-11PW03-0-050812*	ND	30	ND	30	14.3	40	0.900	30	
C0096697 Rep	CGMN-F01-11PW03-0-050812*	ND	30	ND	30	19.6	40	1.10	30	
C0095698	CGMN-F01-1IPW04-0-050812*	ND	40	ND	30	14.9	30	1.07	30	
C0096698 Rep	CGMN-F01-1IPW04-0-050812*	ND	40	ND	30	17.2	30	1.01	30	
C0098699	CGMN-F01-11PW05-0-050812	ND	30	ND	30	10.5	30	0.712	40	
C0098699 Rep	CGMN-F01-11PW05-0-050812*	ND	30	ND	30	11.5	30	1.05	40	
C0096700	CGMN-F01-3IPW01-0-050812	ND	30	2.34	30	552	40	1.54	30	
C0096700 Rep	CGMN-F01-3IPW01-0-050812*	ND	30	1.88	30	488	40	1.62	30	
C0096701	CGMN-F01-3IPW02-0-050812	ND	30	ND	30	45.2	30	0.836	40	
C0096701 Rep	CGMN-F01-3IPW02-0-050812	ND	30	ND	30	38.0	30	0.724	40	
C0098702	CGMN-F01-3IPW03-0-050812	ND	30	ND	30	17.0	30	1.14	30	
C0098702 Rep	CGMN-F01-3IPW03-0-050812*	ND	30	ND	30	18.2	30	1.05	30	
C0098703	CGMN-F01-3IPW04-0-050812	ND	30	ND	30	31.6	30	1.37	30	
C0098703 Rep	CGMN-F01-3IPW04-0-050812	ND	30	ND	30	29.6	30	1.35	30	
C0096704	CGMN-F01-3IPW05-0-050812	NO	30	ND	30	11.8	30	0.732	40	
C0096704 Rep	CGMN-F01-3IPW05-0-050812*	ND	30	ND	30	13.3	30	0.816	40	
C0098705	CGMN-F01-5IPW01-0-050812	ND	40	ND	30	54.4	30	1.26	30	
C0098705 Rep	CGMN-F01-5IPW01-0-050812	ND	40	ND	30	54.4	30	1.56	30	
C0098706	CGMN-F01-5/PW02-0-050812	ND	40	0.884	30	124	30	1,93	30	
C0098706 Rep	CGMN-F01-5/PW02-0-050812*	ND	40	1.00	30	128	30	1,92	30	
C0096707 Rep	CGMN-F01-5IPW03-0-050812	ND	40	1.08	30	313	30	2.56	30	
	CGMN-F01-5IPW03-0-050812	ND	40	1.03	30	326	30	2.40	30	
C0096708	CGMN-F01-5IPW04-0-050812*	ND	40	ND	30	125	30	2.55	30	
C0096706 Rep		ND	40	ND	30	125	30	2.52	30	
C0096709	CGMN-F01-5!PW05-0-050812	ND	50	ND	30	36.9	30	2.15	30	
C0096709 Rep	CGMN-F01-5!PW05-0-050812*	ND	50	ND	30	42.8	30	2.44	30	
C0095710	CGMN-F01-11PF01-0-050812	ND	50	<b>1</b> 0	30	2.98	30	ND	30	
C0096710 Rep	CGMN-F01-11PF01-0-050812*	ND	50		30	2.98	30	ND	30	
C0096711	CGMN-F01-1IPF02-0-050812	ND	40	ND ND	30	2.43	30	ND	30	
C0096711 Rep	CGMN-F01-1IPF02-0-050812	ND	40		30	2.24	30	ND	30	
C0098712	CGMN-F01-11PF03-0-050812*	ND	40	ND	30	4.04	30	ND	30	
C0098712 Rep	CGMN-F01-11PF03-0-050812*	ND	40	ND	30	4.00	30	NO	30	
C0096713	CGMN-F01-11PF04-0-050812	ND ·	50	ND	30	8.72	30	ND	30	
C0096713 Rep	CGMN-F01-11PF04-0-050812*		50	ND	30	9.44	30	NO	30	
C0098714	CGMN-F01-11PF05-0-050812	ND	40	ND	30	11.6	30	ND	30	
C0098714 Rep	CGMN-F01-11PF05-0-050812*	ND	40	ND	30	11.8	30	ND	30	
C0098715	CGMN-F01-3IPF01-0-050812	MD	40	<b>3</b> 2	30	8.68	30	ND	30	
C0098715 Rep	CGMN-F01-3IPF01-0-050812*	ND	40	0 22	30	8.40	30	ND	30	
C0095716	CGMN-F01-3IPF02-0-050812	ND	40	ND	30	94,4	30	ND	30	
C0095716 Rep	CGMN-F01-3IPF02-0-050812*	ND	40	ND	30	98.0	30	ND	30	
C0096717	CGMN-F01-3IPF03-0-050812	ND	30	NO	30	5.76	30	ND	30	
C0096717 Rep	CGMN-F01-3IPF03-0-050812*	ND	30	NO	30	5.44	30	ND	30	
C0096718	CGMN-F01-3IPF04-0-050812	ND	40	ND	30	5.92	30	ND	30	
C0096718 Rep	CGMN-F01-3IPF04-0-050812*	ND	40	ND	30	6.44	30	ND	30	
C0095719 C0095719 Rep	CGMN-F01-3IPF05-0-050812 CGMN-F01-3IPF05-0-050812*	ND ND	30 30	XD XD	30 30	10.2 11.2	30 30	ND ND	30	

<sup>\*</sup>Laboratory Duplicate

\*1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result feitures. See Table V 'Summary of PFBS and PFOA in Congosite Figh Samples' for reanalyzed results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 rigity (2.5 righty for 1 g sample).

Summary of PFBS, PFHS, PFOS and PFOA in Fish Samples Table I. Continued

		C4 Sulfons	to PFBS	Ct Sutton	ate PFHS	CS Sulfon	nto PFOS	CB Acid PFOA		
		Analyte Found	Assessed	Analyte Found	Assessed	Analyte Found	Assessed	Analyte Found	Assessed	
Exygen ID	Client Sample ID	Wet Weight (ppb, ng/g)	Accuracy (+%/-%)	Wet Weight (ppb, ng/g)	Accuracy (+% / - %)	Wet Weight (ppb, ng/g)	Accuracy (+% / - %)	Wet Weight (ppb, ng/g)	(+% / - %)	
C0096720	CGMN-F01-5IPF01-0-050812	ND	40	ND	30	70.8	30	0.504	30	
C0096720 Rep	CGMN-F01-5IPF01-0-050812*	ND	40	ND	30	67.5	30	0.540	30	
C0096721	CGMN-F01-5IPF02-0-050812	ND	40	ND	<b>3</b> 0	11.7	30	ND	30	
C0096721 Rep	CGMN-F01-5IPF02-0-050812	ND	40	ND	30	11.5	30	ND	30	
C0096722	CGMN-F01-5IPF03-0-050812	ND	40	ND	30	2.61	30	1.16	30	
C0096722 Rep	CGMN-F01-5IPF03-0-050812*	ND	40	DN	30	3.11	30	ND	30	
C0096723	CGMN-F01-5IPF04-0-050812	ND	40	ND	30	42.8	30	1.80	30	
C0096723 Rep	CGMN-F01-5IPF04-0-050812*	ND	40	ND	30	41.2	30	1.62	30	
C0096724	CGMN-F01-5IPF05-0-050812	ND	40	ND	30	8.28	30	1.20	30	
C0096724 Rep	CGMN-F01-5IPF05-0-050812*	ND	40	ND	30	7.20	30	1.47	30	
C0096725	CGMN-F01-1LMW01-0-050812*	4.04	30	ND	30	48.8	30	1.23	30	
C0096725 Rep	CGMN-F01-1LMW01-0-050812*	3.21	30	ND	30	44.8	30	1.81	30	
C0096726	CGMN-F01-1LMW02-0-050812	2.48	30	ND	30	33.7	30	1.04	30	
C0096726 Re	CGMN-F01-1LMW02-0-050812*	2.21	30	NO	30	33.2	30	1.05	30	
C0096727	CGMN-F01-1LMW03-0-050812	2.20	30	ND	30	72.4	30	0.824	40	
C0096727 Rep	CGMN-F01-1LMW03-0-050812*	2.46	30	NO	30	78.4	30	1.24	40	
C0096728	CGMN-F01-1LMW04-0-050812	1.12	30	ND	30	34.4	30	1.26	30	
C0096728 Rep	CGMN-F01-1LMW04-0-050812*	0.864	30	ND	30	34.8	30	1.37	30	
C0096729	CGMN-F01-1LMW05-0-050812*	ND	30	ND	30	34.2	30	0.964	30	
C0096729 Rep	CGMN-F01-1LMW05-0-050812*	0.500	30	ND	30	34.8	30	1.18	30	
C0096730	CGMN-F01-3LMW01-0-050812	NR	NR	4.60	30	9320	50	38.7	30	
C0096730 Rep	CGMN-F01-3LMW01-0-050812*	NR	NR	3.93	30	8680	50	37.0	30	
C0096731	CGMN-F01-3LMW02-0-050812	NR	NR	1.98	30	369	50	8.12	40	
C0096731 Rep	CGMN-F01-3LMW02-0-050812*	NR	NR	1.82	30	299	50	8.00	40	
C0096732	CGMN-F01-3LMW03-0-050812	NR	NR	ND	30	126	30	1.48	30	
C0096732 Rep	CGMN-F01-3LMW03-0-050812*	NR	NR	ND	30	118	30	1.25	30	
C0096733	CGMN-F01-3LMW04-0-050812	2.81	30	ND	30	53.2	30	1.18	30	
C0096733 Rep	CGMN-F01-3LMW04-0-050812*	2.98	30	ND	30	57.6	30	1.18	30	
C0096734	CGMN-F01-3LMW05-0-050812	2.22	30	ND	30	150	40	1.29	30	
C0096734 Rep	CGMN-F01-3LMW05-0-050812*	2.12	30	ND	30	153	40	1.39	30	
C0096735 <sup>A</sup>	CGMN-F01-5LMW01-0-050812	ND	30	ND	30	396	30	NR	NR	
C0096735 Rep <sup>A</sup>	CGMN-F01-5LMW01-0-050812*	ND	30	ND	30	338	30	NR	NR	
C0096736*	CGMN-F01-5LMW02-0-050812	7.52	30	ND	30	386	30	NR	NR	
C0096736 Rep*	CGMN-F01-5LMW02-0-050812*	4.46	30	ND	30	374	30	NR	NR	
C0096737A	CGMN-F01-5LMW03-0-050812	ND	30	ND	30	520	30	NR	NR	
C0096737 RegA	CGMN-F01-5LMW03-0-050812*	ND	30	ND	30	638	30	NR	NR	
C0096738 <sup>A</sup>	CGMN-F01-5LNW04-0-050812	20.6	50	NED	30	606	40	NR	NR	
C0096738 Rep <sup>A</sup>	CGMN-F01-6LMW04-0-050812*	27.4	50	NED	30	518	40	NR	NR	
C0096739 <sup>A</sup>	CGMN-F01-5LMW05-0-050812	ND	30	ND	30	388	30	NR	NR	
C0096739 Rep <sup>A</sup>	CGMN-F01-5LMW05-0-050812*	ND	30	ND	30	392	30	NR	NR	
C0096740	CGMN-F01-1MDF01-0-050812	ND	30	NID	30	168	30	0.916	30	
C0096740 Rep	CGMN-F01-1MDF01-0-050812*	ND	30	NID	30	188	30	0.980	30	
C0098741	CGMN-F01-1MDF02-0-050812	ND	30	NEO	30	96.8	40	1,04	30	
C0098741 Rep	CGMN-F01-1MDF02-0-050812*	ND	30	NEO	30	80.8	40	0.904	30	
C0096742	CGMN-F01-1MDF03-0-050812	ND	30	NID	30	20.2	30	0.856	30	
C0096742 Reo	CGMN-F01-1MDF03-0-050812*	ND	30	NID	30	17.8	30	0.856	30	
C0096744	CGMN-F01-1MDF04-0-050812	ND	30	NED	30	51.2	30	0.836	30	
C0096744 Rep	CGMN-F01-1MDF04-0-050812*	ND	30	NED	30	55.2	30	0.756	30	
C0096747	CGMN-F01-1MDF05-0-050812	ND	30	ND	30	46.0	30	0.904	30	
C0096747 Rep	CGMN-F01-1MDF05-0-050812	ND	30	ND	30	44.0	30	0.904	30	

Summary of PFBS, PFHS, PFOS and PFOA in Fish Samples Table I. Continued

		C4 Sulfonate PFBS		C4 Sulfon	ate PFHS	C6 Sulfonate PFOS		CS Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)	Arusyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)
C0096750^	CGMN-F01-1LMF01-0-050812	ND	30	ND	30	32.4	30	NR	NR
C0096750 Rep^	CGMN-F01-1LMF01-0-050812*	ND	30	NO	30	32.2	30	NR	NR
C0096753*	CGMN-F01-1LMF02-0-050812	ND	40	ND	30	30.2	30	NIR	NR
C0096753 Rep*	CGMN-F01-1LMF02-0-050812*	ND	40	ND	30	30.4	30	NIR	NR
C0096755 <sup>A</sup>	CGMN-F01-3MDF01-0-050812	ND	30	ND	30	548	30	NR	NR
C0096755 Rep <sup>A</sup>	CGMN-F01-3MDF01-0-050812*	ND	30	ND	30	630	30	NR	NR
C0096758*	CGMN-F01-3MDF02-0-050812	ND	30	ND	30	110	30	NR	NR
C0096758 Rep*	CGMN-F01-3MDF02-0-050812*	ND	30	ND	30	110	30	NR	NR
C0096781*	CGMN-F01-3MDF03-0-050812	ND	30	ND	30	1360	30	NR	NR
C0096781 Rep*	CGMN-F01-3MDF03-0-050812*	ND	30	ND	30	1280	30	NR	NR
C0096782*	CGMN-F01-3LMF01-0-050812	ND	30	ND	30	798	30	NR	NR
C0096782 Rep*	CGMN-F01-3LMF01-0-050812*	ND	30	ND	30	620	30	NR	NR
C0096783^	CGMN-F01-3LMF02-0-050812	ND	30	ND	30	54.2	50	NR	NR
C0096783 Rep^	CGMN-F01-3LMF02-0-050812*	ND	30	NO	30	65.2	50	NR	NR
C0096784*	CGMN-F01-5MDF01-0-050812*	3.42	30	ND	30	256	30	NR	NR
C0096784 Rep*	CGMN-F01-5MDF01-0-050812*	3.24	30	ND	30	324	30	NR	NR
C0096785*	CGMN-F01-5MDF02-0-050812*	ND	30	ND	30	51 <b>60</b>	50	NR	NR
C0096785 Rep*		ND	30	ND	30	51 <b>4</b> 0	50	NR	NR
C0096766*	CGMN-F01-5MDF03-0-050812*	ND	30	ND	30	892	50	NR	NR
C0096786 Rep*	CGMN-F01-5MDF03-0-050812*	ND	30	ND	30	876	50	NR	NR
C0096787*	CGMN-F01-5LMF01-0-050812	ND	30	ND	30	334	30	NR	NR
C0096787 Rep*	CGMN-F01-5LMF01-0-050812*	ND	30	ND	30	328	30	NR	NR
C0096788*	CGMN-F01-5LMF02-0-050812*	ND	30	ND	30	348	30	NFR	NR
C0096788 Rep*	CGMN-F01-5LMF02-0-050812*	ND	30	ND	30	312	30	NFR	NR

<sup>&</sup>quot;Laboratory Duplicate

\*1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table V Summary of PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOC) which is 0.5 rig/g (2.5 rig/g for 1 g sample).

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples

		C4 Sulfonate PFBS Amount Amt Found Amount As					CS Sulfonate PFHS				
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery			
CGMN-F01-1IPW01-0-060812											
(C0090000 Spk C, 10 ng/g Lab Spike)	10	0.696	7.48	68	10	ND	10.5	105			
CGMN-F01-1IPW01-0-050812											
(C0000000 Spk D, 100 ng/g Lab Spills)	100	0.696	63.2	63	190	ND	97.2	97			
CGMN-F01-11PW02-0-050812					1 . 1						
(C0000000 3pk E, 10 ng/g Leb Spike)	10	0.620	8.24	76	10	ND	11.D	110			
CGMN-F01-11PW02-0-050812	1										
(C000000 Spit F, 190 mg/g Lab Spille)	100	0,620	67.2	67	100	ND	108	108			
CGMN-F01-1IPW03-0-050812											
(C0098887 Spk G, 10 ng/g Lab Spike)	10	ND	7.76	78	10	ND	10.5	105			
CGMN-F01-11PW03-0-050612											
(C0000007 Spk H, 100 ng/g Lab Spilin)	100	ND	<b>82</b> .0	62	100	ND	98.4	98			
CGMN-F01-11PW04-0-050812											
(Copeess Spk I, 19 ng/g Lab Spite)	10	ND	6.84	66	10	ND	9.28	93			
CGMN-F01-11PW04-0-050812											
(Ceccett Spk J, 100 ng/g Lab Splite)	100	ND	80.8	81	100	ND	94.0	94			
CGMN-F01-11PW05-0-050812											
(C0000000 Spix K, 10 ng/g Lath Spiller)	10	ND	7.44	74	10	ND	10.8	108			
CGMN-F01-1/PW05-0-060812	- 1 1										
(C8090009 Spk L, 190 ng/g Lab Spike)	100	ND	64.4	64	100	ND	96.0	96			
CGMN-F01-3IPW01-0-060812											
(C0096799 Spk C, 19 ng/g Lab Spike)	10	ND	7.72	77	10	2.34	12.4	101			
CGMN-F01-3IPW01-0-050812	-   -				1 1						
(C0096700 Spk D, 100 ng/g Lab Splite)	100	ND	62.8	63	100	2.34	96.4	94			
CGMN-F01-3/PW02-0-050812											
(C0086701 Spk E, 19 ng/g Lab Splike)	10	NO	8.24	82	10	ND	10.5	105			
CGMN-F01-3/PW02-0-050812											
(C0000701 Spk F, 100 ng/g Lab Splike)	100	ND	66.8	67	100	NO	109	109			
CGMN-F01-3IPW03-0-050812	1 1										
(C0094702 Spk G, 10 ng/g Lab Spiles )	10	NED	8.04	80	10	ND	11,1	111			
CGMN-F01-3/PW03-0-050812	- 1 - 1				j						
(C0000702 Spk H, 100 ng/g Lab Splim )	190	ND	58.0	68	190	ND	104	104			
CGMN-F01-3IPW04-0-060812											
(C0096703 Sek I, 10 ng/g Lab Selliu)	10	NED	8.48	85	10	ND	10.9	109			
CGMN-F01-3IPW04-0-050812	1 1										
(C0000703 Spk J, 100 ng/g Lab Spike)	100	ND	66.0	66	100	ND	94.4	94			
CGMN-F01-3IPW05-0-050812					1						
(C0096794 Spk K, 19 ng/g Lab Spiles )	16	NO	8.90	88	10	ND	10.8	106			
CGMN-F01-3IPW05-0-050812	-   -				]						
(C0096704 Spk L, 100 ng/g Lab Spike )	100	ND	64.0	64	100	ND	108	108			

A 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result tailures. See Table VI Metrix: Spike Recovery Summary for PF
Composite Fish Samples' for reensized results.

NO = Not destroad at or above the Limit of Custratistion (LOQ) which is 0.5 rays (z.5 rays for 1 g sample).

Note: Since this summary table shows rounded nesults, recovery values may vary slightly from the value.

Matrix Spike Recovery of PFBS and PFHS in Fish Samples Table II. Continued

			Sulfonate PF	BS	_	C6 Sulforate PFHS			
Sample Description	Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Anst Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	
CGMN-F01-5IPW01-0-050812 (C0096705 Spix C, 10 rg/g Lab Spile)	10	ND	6.52	65	10	ND	11.2	112	
CGMN-F01-5(PW01-0-050812 (C0000705 Spk D. 100 ng/g Lab Splin)	100	ND	62.4	62	100	ND	90.0	90	
CGMN-F01-5IPW02-0-050812 (C0086708 Spix E, 18 ng/g Lab Spita)	10	ND	6.36	64	10	0.884	12.0	111	
CGMN-F01-SPW02-0-050812 (C0084706 Spk F, 100 ng/g Lab Splks)	100	ND	74.4	74	100	0.884	96.0	95	
CGMN-F01-5IPW03-0-050812 (C0006707 Spix G, 10 ng/g Leb Spile)	10	ND	6.64	66	10	1.06	11.9	108	
CGMN-F01-5IPW03-0-050812 (C0086707 Spk H, 100 ng/g Lab Spike)	100	ND	81.2	61	100	1.06	92.0	91	
CGMN-F01-5IPW04-0-050812 (C0006708 Spit I, 10 re/g Lab Spito)	10	NO	5.98	60	10	ND	10.0	100	
CGMN-F01-5IPW04-0-050812 (C0004708 5pk J, 100 rg/g Lab Spike)	100	ОИ	64.0	64	100	ND	88.8	89	
CGMN-F01-5 PW05-0-050812 (C000700 Spk K, 10 ng/g Lab Spliu)	10	ND	5.72	57	10	ND	10.2	102	
CGMN-F01-5IPW05-0-050812 (C9094799 Spk L. 190 ng/g Lab Spike)	100	ND	63.2	63	100	ND	88.4	88	
CGMN-F01-11PF01-0-050812 (C0090710 Spix C, 10 rig/g Lab Spiko)	10	ND	5.92	59	10	ND	9.48	95	
CGMN-F01-1(FF01-0-060812 (C0090710 Spk D, 100 ng/g Lab Spite)	100	ND	70.8	71	100	ND	94.0	94	
CGMN-F01-11PF02-0-050812 (C0088711 Spik E, 10 ng/g Lab Spika)	10	ND	6.04	60	10	ND	10.3	103	
CGMN-F01-1iPF02-0-050812 (C0004711 Spik F, 100 ng/g Lab Spike)	100	ND	68.8	69	100	ND	91.6	92	
CGMN-F01-11PF03-0-050812 (C0004712 Spit G, 19 ng/g Lab Spille )	10	ND	5.98	80	16	ND	9.80	98	
CGMN-F01-1/PF03-0-050612 (C0096712 Spik H, 180 ng/g Leb Spike )	100	ND	85.6	66	100	ND	87.6	88	
CGMN-F01-18PF04-0-050812 (C0096713 Spit I, 10 ng/g Lab Spitin)	10	ND	5.44	54	10	NO	9.84	98	
CGMN-F01-1IPF04-0-050812 (C0094713 Spik J, 108 ng/g Leb Spike)	108	ND	69.2	68	100	NO	90.0	90	
CGMN-F01-11PF05-0-050812 (C0086714 Spit K, 10 ng/g Laib Spitio )	10	ND	B.04	ec	10	ND	11.1	111	
CGMN-F01-1IPF05-0-050812 (C0096714 Spit L, 189 ng/g Lab Spito )	100	ND	88.4	68	100	ND	84.4	84	

A 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VI Matrix Spike Recovery Summary for PRBS and PPOA in Composite fiels Samples' for resembyzed results.

ND = Not described for showly the Lamfor Quantitation (LOQ) which is 0.5 rig/g (2.5 rig/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples Continued

Sample Description   Spilled (ng/g)		C4 Sulfonate PFBS					C6 Sulfonate PFHS				
CGMN-F01-3IPF02-0-05812 (CORRETT Bys. 6. 10 angle Lab Spring)		Spiked	In Sample	Recovered		Spliked	in Sample	Recovered			
CGAN-EP1-3PF02-0-50812 (CROSST12 Spet. 1 to 100 mg/s Lab Spillo)   100   ND   75.2   75   100   ND   93.6   94	CGMN-F01-3iPF01-0-050812										
COMM-POI-3PP02-0-050812 (COMM-POI-3PP02-0-050812 (COMM-POI-3PP02-0-050812 (COMM-POI-3PP02-0-050812 (COMM-POI-3PP02-0-050812 (COMM-POI-3PP02-0-050812 (COMM-POI-3PP03-0-05	(C6086715 Splt C, 10 ng/g Lab Splita)	10	ND	6.40	64	10	ND	10.8	108		
CGMN-F01-3 PF02-0-050812 (crosser/s spark : 19 mays Lab Sparks)   18	CGMN-F01-3/PF01-0-050812	i									
COMM-F01-SIPF02-O-050812 (COMM-F01-SIPF03-O-050812 (COMM-F01-SIPF01-O-050812 (COMM-F01-SIPF01-O-050812 (COMM-F01-SIPF03-O-050812 (COMM-F01-SIPF01-	(C0096715 Spk D, 100 mg/g Lab Spike)	100	ND	75.2	75	100	ND	93.6	94		
CGMN-F01-3IPF02-0-050812 (cooser*1 spike, 10 mg/g Lab Spike) 109 ND 60.6 70 100 ND 86.0 36 CGMN-F01-3IPF03-0-050812 (cooser*1 Spike, 10 mg/g Lab Spike) 100 ND 76.4 78 109 ND 10.6 108 CGMN-F01-3IPF03-0-050812 (cooser*1 Spike, 14 00 mg/g Lab Spike) 100 ND 76.4 78 109 ND 04.4 94 CGMN-F01-3IPF03-0-050812 (cooser*1 Spike, 15 mg/g Lab Spike) 100 ND 66.8 65 10 ND 10.8 108 CGMN-F01-3IPF04-0-050812 (cooser*1 Spike, 15 mg/g Lab Spike) 100 ND 66.4 68 109 ND 86.8 87 CGMN-F01-3IPF05-0-050812 (cooser*1 Spike, 15 mg/g Lab Spike) 100 ND 70.8 71 10 ND 11.0 110 CGMN-F01-3IPF05-0-050812 (cooser*1 Spike, 15 mg/g Lab Spike) 100 ND 70.8 71 10 ND 11.0 110 CGMN-F01-SPF05-0-050812 (cooser*1 Spike, 15 mg/g Lab Spike) 100 ND 70.8 73 100 ND 90.8 93 CGMN-F01-SPF01-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 70.8 73 100 ND 90.8 93 CGMN-F01-SPF01-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 70.8 70 ND 80.8 93 CGMN-F01-SPF01-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 80.8 60 100 ND 80.8 89 CGMN-F01-SPF02-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 80.8 60 100 ND 80.8 89 CGMN-F01-SPF02-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 80.0 60 100 ND 80.0 88 CGMN-F01-SPF02-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 80.0 60 100 ND 80.0 88 CGMN-F01-SPF03-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 80.0 60 100 ND 80.0 88 CGMN-F01-SPF03-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 50.8 57 100 ND 92.4 92 CGMN-F01-SPF03-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 50.8 57 100 ND 92.4 92 CGMN-F01-SPF03-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 50.6 56 100 ND 94.4 94 CGMN-F01-SPF05-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 50.6 56 100 ND 94.4 94 CGMN-F01-SPF05-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 50.6 56 100 ND 94.4 94 CGMN-F01-SPF05-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 50.6 56 100 ND 94.4 94 CGMN-F01-SPF05-0-050812 (cooser*2 Spike, 16 mg/g Lab Spike) 100 ND 50.6 56 100 ND 94.4 94 CGMN-F01-SPF05-0-050812	CGMN-F01-3 PF02-0-050812										
(CDMN-FD1-3)FF03-Q-050812 (COMN-FD1-3)FF03-Q-050812 6716 Spk E, 10 ng/g Lab Spike)	10	ND	6.08	61	10	ND	11.2	112			
CGNN-F01-SIPF03-Q-050812 (C0009717 Spik 0, 10 ngrg Lub Spiku) 10 ND 7:00 70 10 ND 10.6 108 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 78.4 78 100 ND 94.4 94 CGNN-F01-SIPF04-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 6.48 65 10 ND 10.8 108 CGNN-F01-SIPF04-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 68.4 68 100 ND 96.8 87 CGNN-F01-SIPF05-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 7:08 71 10 ND 11.0 110 CGNN-F01-SIPF05-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 72.8 73 100 ND 92.8 93 CGNN-F01-SIPF01-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 72.8 73 100 ND 92.8 93 CGNN-F01-SIPF01-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.6 00 100 ND 86.6 69 CGNN-F01-SIPF01-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.6 00 100 ND 86.6 69 CGNN-F01-SIPF01-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.6 00 100 ND 88.0 88 CGNN-F01-SIPF02-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 80.0 60 100 ND 88.0 88 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 80.0 60 100 ND 88.0 88 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.8 57 100 ND 92.4 62 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.8 57 100 ND 92.4 62 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 92.4 62 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 94.4 94 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 1, 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 94.4 94 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 94.4 94 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 94.4 94 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 94.4 94 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 94.4 94 CGNN-F01-SIPF03-Q-050812 (C0009718 Spik 10 ngrg Lub Spiku) 100 ND 56.6 58 100 ND 94.4 94 CGNN-F01-SIPF03-Q-050812	CGMN-F01-3/PF02-0-050812										
18	(C0096716 Spk F, 100 ng/g Lab Splice)	100	ND	69.6	70	100	ND	86.0	86		
DGMN-F01-3IPF03-O-050812 (COMM-F01-3IPF04-	CGMN-F01-3IPF03-0-050812	1									
COMMINION - COMM	(C0096717 Spk G, 10 ng/g Lab Splke)	10	NO	7.00	70	10	ND	10.6	106		
CGAN-F01-3IPF04-0-050812 (C0000718 spin, 1/0 ngrg Lub Spina) 10 ND 6.46 65 10 ND 10.8 108 CGAN-F01-3IPF04-0-050812 (C0000718 spin, 1/0 ngrg Lub Spina) 100 ND 68.4 68 100 ND 86.8 87 CGAN-F01-3IPF05-0-050812 (C0000718 spin, 1/0 ngrg Lub Spina) 10 ND 7.06 71 10 ND 11.0 110 CGAN-F01-3IPF05-0-050812 (C0000718 spin, 1/0 ngrg Lub Spina) 10 ND 72.8 73 100 ND 92.8 93 CGAN-F01-SIPF01-0-050812 (C0000718 spin to, 10 ngrg Lub Spina) 10 ND 58.5 60 100 ND 88.6 60 CGAN-F01-SIPF01-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 58.6 60 100 ND 88.6 60 CGAN-F01-SIPF01-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 58.6 60 100 ND 88.6 60 CGAN-F01-SIPF01-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 88.6 60 CGAN-F01-SIPF02-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 88.0 88 CGAN-F01-SIPF02-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 88.0 88 CGAN-F01-SIPF03-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 86.6 60 ND 88.0 88 CGAN-F01-SIPF03-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 86.6 60 ND ND 88.0 88 CGAN-F01-SIPF03-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 86.6 60 ND ND 92.4 62 CGAN-F01-SIPF03-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 86.8 60 ND ND 92.4 62 CGAN-F01-SIPF03-0-050812 (C0000723 spin to, 100 ngrg Lub Spina) 100 ND 86.8 60 ND ND 92.4 62 CGAN-F01-SIPF03-0-050812 (C0000723 spin to 100 ngrg Lub Spina) 100 ND 86.8 60 ND ND 94.4 94 CGAN-F01-SIPF03-0-050812 (C0000723 spin to 100 ngrg Lub Spina) 100 ND 86.3 60 ND 94.4 94 CGAN-F01-SIPF03-0-050812 (C0000723 spin to 100 ngrg Lub Spina) 100 ND 86.3 60 ND 94.4 94 CGAN-F01-SIPF03-0-050812 (C0000723 spin to 100 ngrg Lub Spina) 100 ND 86.3 60 ND 94.4 94 CGAN-F01-SIPF03-0-050812 (C0000723 spin to 100 ngrg Lub Spina) 100 ND 86.3 60 ND 94.4 94 CGAN-F01-SIPF03-0-050812 (C0000723 spin to 100 ngrg Lub Spina) 100 ND 86.3 60 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 94.4 94 ND 9	CGMN-F01-3/PF03-0-050812										
(CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right Less Spitial CORRETE Spit L 10 right L 10 rig	(C0096717 Spk H, 100 ng/g Lab Spiles)	100	ND	78.4	78	100	ND	94.4	94		
CGAN-FD1-3IPF04-D-050812 (C0098718 Spir-I, 100 mg/g Lab Spir-Ia) 100 ND 88.4 68 100 ND 88.8 87 CGAN-FD1-3IPF05-D-050812 (C0098718 Spir-I, 100 mg/g Lab Spir-Ia) 100 ND 7.08 71 10 ND 11.0 110 CGAN-FD1-SIPF05-D-050812 (C0098718 Spir-I, 100 mg/g Lab Spir-Ia) 100 ND 72.8 73 100 ND 92.8 93 CGAN-FD1-SIPF01-D-050812 (C0098723 Spir-Ia) 100 ND 52.8 60 100 ND 10.6 106 CGAN-FD1-SIPF01-D-050812 (C0098723 Spir-Ia) 100 ND 52.6 60 100 ND 88.8 89 CGAN-FD1-SIPF02-D-050812 (C0098723 Spir-Ia) 100 ND 80.0 81 10 ND 10.2 102 CGAN-FD1-SIPF02-D-050812 (C0098723 Spir-Ia) 100 ND 80.0 81 10 ND 10.2 102 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 80.0 80 100 ND 88.0 88 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 80.0 80 100 ND 80.0 80 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 80.0 80 100 ND 92.4 92 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 56.8 57 100 ND 92.4 92 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 56.8 57 100 ND 92.4 92 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 56.8 57 100 ND 92.4 92 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 94.4 94 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 94.4 94 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 94.4 94 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 94.4 94 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 94.4 94 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 94.4 94 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 94.4 94 CGAN-FD1-SIPF03-D-050812 (C0098723 Spir-Ia) 100 ND 55.6 56 100 ND 10.3 103 CGAN-FD1-SIPF03-D-050812	CGMN-F01-3IPF04-0-050812										
COMM-F01-SIPF05-O-050812   COMM-F01-SIPF05-O-050812   COMM-F01-SIPF05-O-050812   COMM-F01-SIPF05-O-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF01-D-050812   COMM-F01-SIPF02-D-050812   COMM-F01-SIPF02-D-050812   COMM-F01-SIPF02-D-050812   COMM-F01-SIPF02-D-050812   COMM-F01-SIPF02-D-050812   COMM-F01-SIPF02-D-050812   COMM-F01-SIPF03-D-0	(C0001718 Spk i, 10 ng/g Lab Spike)	10	ND	6.48	65	10	ND	10.8	108		
CGMN-F01-SIPF03-0-050812 (C0008731 Spik K, 10 regig Lab Spike)  CGMN-F01-SIPF05-0-050812 (C0008731 Spik L, 100 regig Lab Spike)  CGMN-F01-SIPF01-0-050812 (C0008731 Spik L, 100 regig Lab Spike)  CGMN-F01-SIPF01-0-050812 (C0008732 Spik D, 100 regig Lab Spike)  CGMN-F01-SIPF01-0-050812 (C0008732 Spik D, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008731 Spik F, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008731 Spik F, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008732 Spik D, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008732 Spik R, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008732 Spik R, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008732 Spik R, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008732 Spik R, 100 regig Lab Spike)  CGMN-F01-SIPF03-0-050812 (C0008732 Spik R, 100 regig Lab Spike)  100 ND 56.8 57 100 ND 92.4 62  CGMN-F01-SIPF04-0-050812 (C0008733 Spik R, 100 regig Lab Spike)  100 ND 55.6 56 100 ND 94.4 94  CGMN-F01-SIPF05-0-050812 (C0008733 Spik R, 100 regig Lab Spike)  100 ND 55.6 56 100 ND 94.4 94  CGMN-F01-SIPF05-0-050812 (C0008733 Spik R, 100 regig Lab Spike)  100 ND 55.6 56 100 ND 94.4 94  CGMN-F01-SIPF05-0-050812 (C0008733 Spik R, 100 regig Lab Spike)  100 ND 55.6 56 100 ND 94.4 94	CGMN-F01-3IPF04-0-050812										
10	(C0004718 Spk J, 100 ng/g Lab Spike)	100	ND	68.4	66	100	ND	86.8	87		
CGMN-F01-SIPF05-0-050812 (C0006721 Spik C, 100 mg/g Lab Spike)  100 ND 72.8 73 100 ND 92.8 93  CGMN-F01-SIPF01-0-050812 (C0006723 Spik C, 100 mg/g Lab Spike)  100 ND 52.8 93  100 ND 10.6 106  CGMN-F01-SIPF01-0-050812 (C0006723 Spik C, 100 mg/g Lab Spike)  100 ND 58.6 60 100 ND 88.8 89  CGMN-F01-SIPF02-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 6.06 61 10 ND 10.2 10.2  CGMN-F01-SIPF02-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 60.0 60 100 ND 88.0 88  CGMN-F01-SIPF03-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 6.64 66 10 ND 10.6 106  CGMN-F01-SIPF03-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 56.8 57 100 ND 92.4 62  CGMN-F01-SIPF04-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 56.8 57 100 ND 92.4 62  CGMN-F01-SIPF04-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 55.6 56 100 ND 94.4 94  CGMN-F01-SIPF04-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 55.6 56 100 ND 94.4 94  CGMN-F01-SIPF05-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 55.6 56 100 ND 94.4 94  CGMN-F01-SIPF05-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 55.6 56 100 ND 94.4 94  CGMN-F01-SIPF05-0-050812 (C0006723 Spik E, 100 mg/g Lab Spike)  100 ND 8.36 64 10 ND 10.3 103	CGMN-F01-3IPF05-0-050812										
CGMN-F01-SIPF01-Q-050812   CGMN-F01-SIPF01-Q-050812   CGMN-F01-SIPF01-Q-050812   CGMN-F01-SIPF01-Q-050812   CGMN-F01-SIPF01-Q-050812   CGMN-F01-SIPF02-Q-050812   CGMN-F01-SIPF02-Q-050812   CGMN-F01-SIPF02-Q-050812   CGMN-F01-SIPF02-Q-050812   CGMN-F01-SIPF02-Q-050812   CGMN-F01-SIPF02-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF03-Q-050812   CGMN-F01-SIPF04-Q-050812   CGMN-F01-SIPF04-Q-050812   CGMN-F01-SIPF04-Q-050812   CGMN-F01-SIPF04-Q-050812   CGMN-F01-SIPF04-Q-050812   CGMN-F01-SIPF04-Q-050812   CGMN-F01-SIPF03-Q-0	(C0096718 Spit K, 10 ng/g Lab Spika)	10	ND	7.08	71	10	ND	11.0	110		
CGMN-F01-SIPF01-0-050812 (C0008723 Spik C, 10 egyg Leb Spike) 10 ND 8.20 62 10 ND 10.6 108 CGMN-F01-SIPF01-0-050812 (C0008723 Spik D, 100 egyg Leb Spike) 100 ND 58.6 60 100 ND 88.8 69 CGMN-F01-SIPF02-0-050812 (C0008721 Spik E, 100 egyg Leb Spike) 100 ND 6.06 61 10 ND 10.2 102 CGMN-F01-SIPF03-0-050812 (C0008721 Spik E, 100 egyg Leb Spike) 100 ND 6.06 60 100 ND 88.0 88 CGMN-F01-SIPF03-0-050812 (C0008722 Spik E, 100 egyg Leb Spike) 100 ND 6.64 66 10 ND 10.6 106 CGMN-F01-SIPF03-0-050812 (C0008723 Spik E, 100 egyg Leb Spike) 100 ND 56.8 57 100 ND 92.4 62 CGMN-F01-SIPF04-0-050812 (C0008723 Spik E, 100 egyg Leb Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF04-0-050812 (C0008723 Spik E, 100 egyg Leb Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF05-0-050812 (C0008723 Spik E, 100 egyg Leb Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF05-0-050812 (C0008723 Spik E, 100 egyg Leb Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF05-0-050812 (C0008723 Spik E, 100 egyg Leb Spike) 100 ND 8.36 64 10 ND 10.3 103 CGMN-F01-SIPF05-0-050812	CGMN-F01-3IPF05-0-050812					i					
10	(C0006719 Spk L. 100 ng/g Lab Spike)	100	ND	72.8	73	100	NĐ	92.8	93		
CGMN-F01-5IPF01-0-050812 (C0000723 Spik-D, 100 ng/g Lab Spike) 100 ND 56.6 80 100 ND 88.6 89 CGMN-F01-5IPF02-0-050812 (C0000721 Spik E, 100 ng/g Lab Spike) 10 ND 6.06 61 10 ND 10.2 102 CGMN-F01-SIPF03-0-050812 (C0000723 Spik E, 100 ng/g Lab Spike) 100 ND 8.64 66 10 ND 10.6 106 CGMN-F01-SIPF03-0-050812 (C0000723 Spik E, 100 ng/g Lab Spike) 100 ND 56.8 57 100 ND 92.4 62 CGMN-F01-SIPF04-0-050812 (C0000723 Spik E, 100 ng/g Lab Spike) 100 ND 56.8 57 100 ND 92.4 62 CGMN-F01-SIPF04-0-050812 (C0000723 Spik E, 100 ng/g Lab Spike) 100 ND 55.6 56 100 ND 92.4 92 CGMN-F01-SIPF04-0-050812 (C0000723 Spik E, 100 ng/g Lab Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF04-0-050812 (C0000723 Spik E, 100 ng/g Lab Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF05-0-050812 (C0000723 Spik E, 100 ng/g Lab Spike) 100 ND 8.36 64 10 ND 10.3 103 CGMN-F01-SIPF05-0-050812	CGMN-F01-5IPF01-0-050812					İ					
106   ND   58.5   60   100   ND   88.6   89	(C0006728 Spit C, 10 ng/g Leb Spike)	10	NO	6.20	62	10	ND	10.6	106		
106   ND   58.5   60   100   ND   88.6   89	CGMN-F01-5IPF01-0-050812										
10   ND   5.08   61   10   ND   10.2   102		100	ND	59.5	60	100	ND	88.8	89		
CGMN-F01-8IPF02-0-050812 (C0000723 Spik F, 100 ng/g Lab Spike) 100 ND 80.0 60 100 ND 88.0 88 CGMN-F01-SIPF03-0-050812 (C0000723 Spik G, 10 ng/g Lab Spike) 10 ND 8.64 68 10 ND 10.6 106 CGMN-F01-SIPF03-0-050812 (C0000723 Spik K, 100 hg/g Lab Spike) 100 ND 56.8 57 100 ND 92.4 92 CGMN-F01-SIPF04-0-050812 (C0000723 Spik K, 100 ng/g Lab Spike) 10 ND 5.20 52 10 ND 10.5 105 CGMN-F01-SIPF04-0-050812 (C0000723 Spik K, 100 ng/g Lab Spike) 100 ND 55.6 58 100 ND 94.4 94 CGMN-F01-SIPF05-0-050812 (C0000723 Spik K, 100 ng/g Lab Spike) 100 ND 55.6 58 100 ND 94.4 94 CGMN-F01-SIPF05-0-050812 (C0000723 Spik K, 100 ng/g Lab Spike) 10 ND 8.36 64 10 ND 10.3 103 CGMN-F01-SIPF05-0-050812	CGMN-F01-SIPF02-0-050812										
CONSTRAT Spak F, 100 right Lab Spition   100 ND 86.0 60 100 ND 88.0 88	(C0000721 Spk E, 10 ng/g Lab Spike)	10	ND	6.08	61	10	ND	10.2	102		
CGMN-F01-SIPF03-D-050812 (C0008722 Spk K, 100 ng/g Lab Spike) 10 ND 8.64 68 10 ND 10.6 106 CGMN-F01-SIPF03-D-050812 (C0008722 Spk K, 100 lng/g Lab Spike) 100 ND 56.8 57 100 ND 92.4 52 CGMN-F01-SIPF04-D-050812 (C0008723 Spk K, 100 ng/g Lab Spike) 10 ND 5.20 52 10 ND 10.5 105 CGMN-F01-SIPF04-D-050812 (C0008723 Spk K, 100 ng/g Lab Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF05-D-050812 (C0008723 Spk K, 100 ng/g Lab Spike) 100 ND 8.36 64 10 ND 10.3 103 CGMN-F01-SIPF05-D-050812	CGMN-F01-5IPF02-0-050812					1					
(C00001722 Style K, 10 ng/g Leb Spiller) 10 ND 6,64 66 10 ND 10.6 106 CGMN-F01-SIPF03-O-050812 (C00001722 Style K, 10 ng/g Leb Spiller) 100 ND 56.8 57 100 ND 92.4 92 CGMN-F01-SIPF04-O-050812 (C00001723 Spiller) 10 ND 5.20 52 10 ND 10.5 10.5 CGMN-F01-SIPF04-O-060812 (C00001723 Spiller) 100 ND 55.6 56 100 ND 94.4 94 CGMN-F01-SIPF05-O-050812 (C00001723 Spiller) 100 ND 6.36 64 10 ND 10.3 103 CGMN-F01-SIPF05-O-050812	(C0096721 Spk F, 100 ng/g Lab Spike)	100	ND	<b>6</b> 0.0	60	100	ND	88.0	88		
(C00001722 Style K, 10 ng/g Lab Spike) 10 ND 6,64 66 10 ND 10.6 106 CGMN4-F01-SIPF03-O-050812 (C00001723 Style K, 100 ng/g Lab Spike) 100 ND 56.8 57 100 ND 92.4 92 CGMN4-F01-SIPF04-O-050812 (C00001723 Spike K, 10 ng/g Lab Spike) 10 ND 5.20 62 10 ND 10.5 10.5 CGMN4-F01-SIPF05-O-050812 (C00001723 Spike K, 10 ng/g Lab Spike) 100 ND 55.6 56 100 ND 94.4 94 CGMN4-F01-SIPF05-O-050812 (C00001723 Spike K, 10 ng/g Lab Spike) 10 ND 8.36 64 10 ND 10.3 103 CGMN4-F01-SIPF05-O-050812	CGMN-F01-5IPF03-0-050812										
COMMN-F01-SIPF04-0-050812   COMMN-F01-SIPF04-0-050812   COMMN-F01-SIPF04-0-050812   COMMN-F01-SIPF04-0-050812   COMMN-F01-SIPF04-0-050812   COMMN-F01-SIPF04-0-050812   COMMN-F01-SIPF05-0-050812		10	ND	6.64	66	10	NO	10.6	106		
COMM-F01-SIPF04-0-050812   COMM-F01-SIPF04-0-050812   COMM-F01-SIPF04-0-050812   COMM-F01-SIPF04-0-050812   COMM-F01-SIPF04-0-050812   COMM-F01-SIPF04-0-050812   COMM-F01-SIPF04-0-050812   COMM-F01-SIPF05-0-0	CGMN-F01-SIPF03-0-050812										
(C0084723 Sph I, 10 ng/g Lab Sphila) 10 ND 5.20 52 10 ND 10.5 105 CG4N+LF01-SIPF04-0-080812 (C0084723 Sph I, 100 ng/g Lab Sphila) 100 ND 55.6 58 100 ND 94.4 94  CGAN-LF01-SIPF05-0-080812 (C0084724 Sph K, 10 ng/g Lab Sphila) 10 ND 8.36 64 10 ND 10.3 103  CGMN-LF01-SIPF05-0-050812		100	ND	56.8	57	100	ND	92.4	92		
(C0086F23 Sph I, 10 ng/g Lab Sphia) 10 ND 5.20 52 10 ND 10.5 105 CGAN-LEO1-SIPF04-0-060812 (C0086F23 Sph I, 100 ng/g Lab Sphia) 100 ND 55.6 56 100 ND 94.4 94  CGAN-LEO1-SIPF05-0-050812 (C008F24 Sph K, 10 ng/g Lab Sphia) 10 ND 8.36 64 10 ND 10.3 103  CGAN-LEO1-SIPF05-0-050812	CGMNJE01_SIPE04_0.050812				İ						
CGAN-LF01-SIPF04-0-060812 (C0000723 3pk J, 100 ng/g Lab 3pike) 190 ND 55,6 56 100 ND 94.4 94  CGAN-LF01-SIPF05-0-050812 (C0000723 3pk K, 10 ng/g Lab 3pike) 10 ND 6.36 64 10 ND 10.3 103  CGAN-LF01-SIPF05-0-050812		10	ND	5.20	62	10	ND	10.5	105		
CGMN-F01-5IPF05-0-050812 (C0008724 Sph Kt. 10 ng/g Lab Spilia) 10 ND 8.36 64 10 ND 10.3 103 CGMN-F01-5IPF05-0-050812		1 1									
(CD008724 Sph K. 10 ng/g Lab Sphile) 10 ND 6.36 64 10 ND 10.3 103 CGMN-F01-SIPF05-0-050812	(C0006723 Spk J, 100 ng/g Lab Spike)	190	ND	55.6	56	100	ND	94.4	94		
(CD008724 Sph K. 10 ng/g Lab Sphile) 10 ND 6.36 64 10 ND 10.3 103 CGMN-F01-SIPF05-0-050812	CGMN-F01-SIPF05-0-050812				1	- [					
CGMN-F01-SIPF05-0-050812	• • • • • • • • • • • • • • • • • • • •	10	ND	6.36	64	10	ND	10.3	103		
	(C0066724 Spk L, 100 ng/g Leb Spike)	190	NO	58.0	58	100	ND	89.6	90		

<sup>A 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result features. See Table VI Matrix Spike Recovery Summary for PPBS and PFOA in Composite Fish Samples' for resensived results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 note (2.5 no/e for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw dail.</sup> 

Matrix Spike Recovery of PFBS and PFHS in Fish Samples Table II. Continued

	C4 Sulfonate PFBS			C6 Sulfonate PFHS				
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (rig/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-1LMW01-0-050812								
(C0096725 Spk C, 16 ng/g Lab Spike)	10	4.04	15.0	110	10	ND	9.52	95
CGMN-F01-1LMW01-0-050812								
(C0099725 Spk D, 100 ng/g Leb Spike)	100	4.04	<b>67.2</b>	83	100	ND	106	105
CGMN-F01-1LMW02-0-050812								
(C0006726 Spk E, 10 ng/g Lab Spile)	10	2.48	10.0	75	10	ND	9.68	97
CGMN-F01-1LMW02-0-050812	İ							
(C0096726 Spk F, 100 ng/g Lab Spike)	100	2.48	78.4	76	190	ND	110	110
CGMN-F01-1LMW03-0-050812								
(C0016727 Spk G, 10 ng/g Lab Spike)	10	2.20	10.2	80	10	ND	10.0	100
CGMN-F01-1LMW03-0-050812	1				i 1			
(C0090727 Spk H, 100 ng/g Leb Splite)	100	2.20	8.8	85	100	ND	106	106
CGMN-F01-1LMW04-0-050812								
(C0016725 Spk I, 10 ng/g Lab Splite)	10	1.12	8.44	73	10	ND	9.88	99
CGMN-F01-1LMW04-0-050812								
(C0006729 Spk J, 100 ng/g Lab Splin)	100	1,12	86.0	85	100	ND	118	118
CGMN-F01-1LMW05-0-050812								
(C0000729 Spk K, 16 ng/g Lab Spille)	10	NO	7.44	74	10	ND	9.24	92
CGMN-F01-1LMW05-0-050812								
(C0006779 Spk L, 100 ng/g Lab Spine)	190	ND	88.4	88	100	ND	110	110
CGMN-F01-3LMW01-0-050812								
(C0096730 Spk C, 10 ng/g Lab Spite)	10	NR	NR	NR	10	4.60	13.2	86
CGMN-F01-3LMW01-0-050612	1							
(C0096730 Spk D, 100 ng/g Lab Splite)	100	NR	NR	NR	160	4.60	116	111
CGMN-F01-3LMW02-0-060812	1 1							
(C0096731 Spk E, 10 ng/g Leb SpRe)	10	NR	NR	NR	10	1,96	10.5	85
CGMN-F01-3LMW02-0-050812	1							
(C0006731 Spik F, 100 ng/g Lab Spike)	100	NR	NR	NR	100	1.96	105	103
CGMN-F01-3LMW03-0-050812								
(C0098712 Sph G, 16 ng/g Lab Spile)	10	NR	NR	NR.	10	ND	9.48	95
CGNN-F01-3LMW03-0-050812								
(C0004732 Spk H, 100 ng/g Lab Splin)	100	NR	NR	NR	100	ND	105	105
CGMN-F01-3LMW04-0-050812	1 1							
(C0046733 Spk i, 10 ng/g Lab Spike)	10	2.81	11.1	83	10	ND	9.80	98
CGNN-F01-3LMW04-0-050812	1 1							
(C0096733 Spk J, 100 ng/g Lab Spike)	100	2.81	88.4	86	106	ND	107	107
CGNN-F01-3LMW05-0-050812								
(C0090734 Spk K, 10 ng/g Lab Splite)	10	2.22	9.84	76	10	ND	10.0	100
CGNN-F01-3LMW05-0-050812 (C0096734 Spk L, 100 ng/g Lab Spite)	100	2.22	86.0	84	100	ND	105	105
(remains the river line with ran along)								

<sup>A 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples for resnelyzed results.

NO = Not detacted at or above the Limit of Quantitation (LOQ) which is 0.5 rapig (2.5 rapig for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.</sup> 

Matrix Spike Recovery of PFBS and PFHS in Fish Samples Table II. Continued

			Suffonate PF	88		CS Sulfonate PFHS			
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Ant Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	
CGMN+F01-5LMW01-0-050812* (C0006736 Spit C, 50 ng/g Lab Spika)	50	NO.	55.0	110	50	ND	54.0	108	
CGMN-F01-5LMW01-0-050812 <sup>A</sup> (C0006736 Spk D, 800 ng/g Lab Spike)	500	NO	520	104	500	ND	530	106	
CGMN-F01-5LMW02-0-050612* (C0096736 5pk E, 59 ng/g Lab Spika)	50	7.52	<b>6</b> 0,0	105	50	ND	56.4	113	
CGMN-F01-5LMW02-0-050812 <sup>A</sup> (C0000736 Spk F, 800 ng/g Lab Splie)	500	7.52	506	100	500	ND `	504	101	
CGNN-F01-5LMW03-0-050812 <sup>4</sup> (C0008737 Sph Q, 30 ng/g Lob 3phin)	50	NID	51.0	102	50	ND	52.6	105	
CGMN-F01-5LMW03-0-050B12 <sup>A</sup> (C006737 Spk H, 800 ng/g Leb Spite)	500	ND	460	92	500	ND	476	95	
CGMN-F01-5LMW04-0-050812 <sup>a</sup> (C004738 Spk I, 50 ng/g Lpb Spline)	50	20.8	44.8	48	\$0	ND	56.6	111	
CGMN-F01-6LMW04-0-050812 <sup>A</sup> (C1006738 Spik J, 300 mg/g Lath Spike)	500	20.8	368	69	500	ND	476	95	
CGMN-F01-5LMW05-0-050812* (C0098738 Spk K, 50 ng/g Lab Spline)	50	NO	52.6	105	50	ND	50.4	101	
CGMN-F01-5LMW05-0-050812 <sup>4</sup> (C6066739 Spit L, 500 ng/g Lab Spike)	500	NO	490	98	500	NO	520	104	
CGMN-F01-1MDF01-0-050812 (C0006740 Spik C, 10 ng/g Laib Spikin)	10	NO	9.48	95	10	ND	10.0	100	
CGMN-F01-1MDF01-0-050812 (C4046740 Spk D, 100 ng/g Lab Spike)	100	ND	93.2	<b>9</b> 3	100	ND	94.4	94	
CGMN-F01-1MDF02-0-050812 (C008741 Spk E. 10 mg/g Leb Splin)	10	NED.	9.64	96	10	ND	9.40	94	
CGMN-F01-1MDF02-0-050812 (C0096741 Spit F, 100 ng/g Lab Spita)	100	ND	90.4	90	100	ND	92.4	92	
CGMN-F01-1MDF03-0-050812 (C0086742 Spix G, 18 ng/g Lab Spixa )	10	ND	9.88	99	10	ND	9.44	94	
CGMN-F01-1MDF03-0-050812 (C0086742 Spk H, 100 ng/g Lab Spike)	100	NO	94.0	94	100	NO	83.6	94	
CGMN-F01-1MDF04-0-050812 (C0006744 Spk t, 10 ng/g Lab Spille)	10	ND	9.52	96	10	NO	9.52	95	
CGMN-F01-1MO/F04-0-050812 (C1098744 Spk J, 100 ng/g Lab Spike)	100	ND	90.8	91	100	NO	92.8	93	
CGMN-F01-1MDF05-0-050812 (C000747 Spk K, 10 ng/g Lab Spike )	10	ND	9.84	98	10	ND	9.88	99	
CGMN-F01-1MDF05-0-050812 (C006747 Spli L, 100 ng/g Lab Splike)	100	ND	88.4	88	100	ND	85.6	86	

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result fatures. See Table VI Metrix Spike Recovery Summary for PFBS and PFOA in
Composite Fish Samples' for reansityzed results.

ND = Not detected at or above the Lunk of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary eligibly from the values in the raw dail

Matrix Spike Recovery of PFBS and PFHS in Fish Samples Table II. Continued

	C4 Sulfonate PFBS				-	6 Sulfonata PFH		
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-1LMF01-0-050812 <sup>A</sup> (C0006780 Spit C, 50 ng/g Lab Spites)	50	ND	35.8	72	50	ND	47.6	95
CGMN-F01-1LMF01-0-050812^ (C8098750 3pk D, 590 ng/g Leo 3pixe)	500	ND	364	73	500	ND	498	100
CGMN-F01-1LMF02-0-050812 <sup>A</sup> (C0099753 Spk E, 50 ng/g Lab Spike)	50	ND	34.4	69	50	ND	48.8	98
CGMN-F01-1LMF02-0-050812 <sup>4</sup> [C0005783 Spk F, 500 ng/g Lab Spike)	500	ND	356	71	500	ND	472	94
CGMN-F01-3MDF01-0-050812^ (C008795 Spit G, 50 ng/g Lab Spite)	50	ND	38.0	76	50	ND	52.2	104
CGMN-F01-3MDF01-0-050812^ (C0096785 Spik H, 500 ng/g Lab Spike)	500	ND	352	70	500	ND	484	93
CGMN-F01-3MDF02-0-050812^ (C0086758 Spk I, 50 ng/g Lab Spite)	50	ND	38.2	76	50	ND	49.4	99
CGMN-F01-3MDF02-0-050812 <sup>4</sup> (C9098758 Spk J, 560 ng/g Leb Spike)	500	ND	368	74	500	ND	480	96
CGMN-F01-3MDF03-0-050812 <sup>A</sup> (C0096781 Spit K, 59 ng/g Lab Spite)	50	ND	37.6	75	59	ND	50.2	100
CGMN-F01-3MDF03-0-050812^ (C0006781 Spk L, 600 ng/g Lab Spike)	\$00	ND	368	74	500	ND	492	98
CGMN-F01-3LMF01-0-050812^ (C0068782 Spit C, 80 ng/g Lab Spiins)	50	ND	51.2	102	50	ND	51.8	103
CGMN-F01-3LMF01-0-050612 <sup>A</sup> (C006762 Spk D, 500 ng/g Leb Spilie)	500	NO	490	96	500	ND	476	96
CGMN-F01-3LMF02-0-050812^ (C0096783 Spk E, 50 rg/g Lab Spike)	50	ND	49.0	98	50	ND	47.2	94
CGMN-F01-3LMF02-0-050812^ (C908783 Spk F, 500 ng/g Leb Spike)	500	ND	484	97	500	ND	448	90
CGMN-F01-5MDF01-0-050812^ (C006784 Spk G, 59 ng/g Lab Splite )	50	3.40	53.0	99	50	NID	47.4	95
CGMN-F01-5MDF01-0-050812 <sup>a</sup> (C0096784 Spk H, 500 ng/g Lab Spike )	500	3.40	524	104	500	ND	458	82
CGMN-F01-SMDF02-0-050812^ (C0006768 Spk I, 50 ng/g Lab Splin)	50	ND	49.4	89	50	ND	49.2	98
CGMN-F01-5MDF02-0-050512^ (C0096785 Spk J. 500 ng/g Leb Spike)	500	ND	432	86	500	ND	402	80
CGMN-F01-SMDF03-0-050812^ (C008786 Spk C, 50 ng/g Lab Spile )	50	ND	36.0	72	50	ND	43.0	86
CGMN-F01-5MDF03-0-050812^ (C6068786 Spk D, 800 ng/g Lab Spike )	500	ND	376	75	500	NID	492	98

<sup>\*1.0</sup> g of sample used for extraction instead of 5.0 g.

NR × Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in
Composite Fish Samples for results/22d results.

NO = Not detected at or elsow the Limit of Quantitation (LOQ) which is 0.5 rg/g (2.5 rg/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw dail

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples
Continued

		C4	Suffonate PF	B\$		C6 Sulfonate PFHS				
Semple Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)		
CGMN-F01-5LMF01-0-050812 <sup>A</sup> (C8096787 Spk E, 50 ng/g Lab Spike)	50	ND	34.8	70	50	NED	44.0	68		
CGMN-F01-5LMF01-0-050812 <sup>A</sup> (C0006787 Spik F, 800 ng/g Lab Spika)	500	ND	338	68	500	ND	442	88		
CGMN-F01-SLMF02-0-050812^ (C0096788 Spit G, 60 ng/g Lab Spilin)	50	ND	38.4	73	50	ND	46.4	93		
CGMN-F01-8LMF02-0-050812* (C006738 Spk H, 500 ng/g Lab Spline)	500	ND	378	76	\$00	ND	470	94		
			Average:	76	<u> </u>		Average:	90		

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

NR \* Not reported due to quality control result failures. See Table VI Matrix Spike Recovery Summary for PFBS and PFQA in

Not a section at or above the Emit of Quarterson (COQ) which a U.S ngrg (2.5 ngrg for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples

			Sulfonata PF	os			CE Acid PFOA		
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recevered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	
CGMN-F01-1IPW01-0-050812									
(C0000005 Spk C, 10 ng/g Lub Spile)	10	17.0	34.5	175	10	0.808	8.64	78	
CGMN-F01-11PW01-0-050812	ļ.,								
(C0091005 Spk D, 104 ng/g Lab Spike)	100	17.0	128	111	100	0.808	101	100	
CGMN-F01-1IPW02-0-050812									
(C0096006 Spit E, 10 ng/g Lab Spiks)	10	32.2	43.6	•	10	0.932	8.56	76	
CGMN-F01-1IPW02-0-050812	1								
(CCCB4666 Spit F, 100 ng/g Lab Spite)	100	32.2	140	108	106	0.932	101	100	
CGMN-F01-1FPW03-0-050812									
(C000007 Spk G, 10 ng/g Lab Spiks)	10	14.3	28.3	140	10	0.900	8.76	79	
CGNN-F01-1IPW03-0-050812									
(C0000007 Spk H, 100 ng/g Lab Epille)	100	14.3	124	110	100	0.900	104	103	
CGMN-F01-1IPW04-0-050812									
(C000000E Spk I, 10 ng/g Lab Splits)	10	14.9	24.7	98	10	1.07	8.08	70	
CGMN-F01-11PW04-0-050812						4.07			
(C0004688 Spk J, 100 ng/g Lab Splite)	100	14.9	115	100	100	1.07	97.2	98	
CGMN-F01-1IPW05-0-050812									
(C000000 Spk K, 10 mg/g Lab Spilts)	10	10.5	18.7	82	10	0.712	7.52	68	
CGMN-F01-1IPW05-0-050812	1 1			Ì					
(Coosedire Spk L, 100 raging Lab Spiles)	100	10.5	116	106	100	0.712	102	101	
CGMN-F01-3IPW01-0-050612									
(C0006700 Spk C, 10 ng/g Lab Spike)	10	552	500	•	10	1.54	10.0	85	
CGMN-F01-3IPW01-0-050812									
(C0004700 Spk D, 100 ng/g Lab Splits)	100	552	612	•	100	1.54	115	113	
CGMN-F01-3/PW02-0-050812									
(C0096701 Spk E, 10 ng/g Lab Splits)	10	45.2	53.6	•	10	0.836	6.80	60	
CGMN-F01-3/PW02-0-050812	1 i								
(C0864701 Spit F, 100 ng/g Lab Spills)	100	45.2	142	97	100	0.836	98.8	98	
CGMN-F01-3iPW03-0-050812					1				
(C0094702 Spk G, 10 ng/g Lab Spike )	10	17.0	36.7	197	10	1.14	9.44	83	
CGMN-F01-3IPW03-0-050812									
(C0006702 Spik H, 100 ng/g Lab Spike )	100	17.0	128	109	100	1,14	105	104	
CGMN-F01-3/PW04-0-050812									
[C0098703 Spic I, 19 ng/g Lab Spiles]	10	31.6	45.6	•	10	1.37	10.5	91	
CGMN-F01-3/PW04-0-050812				1					
(C0000703 Spk J, 100 ng/g Lab Spike)	100	31.6	129	97	100	1.37	98.0	97	
CGMN-F01-3IPW05-0-050812									
(C0004764 8 pk K, 10 ng/g Lab 8 plks)	10	11.8	20.5	87	10	0.732	7.20	65	
CGMN-F01-3/PW05-0-050812				400		0.770	***	402	
(C0086704 Spk L, 100 ng/g Lab Spito )	106	11.8	120	108	190	0.732	104	103	

<sup>A 1.0 g of sample used for extraction instead of 5.0 g.
"Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calcula

NR = Not reported due to quality control result failures. See Table VI Twetric Spike Recovery Summary for PPBS and PPOA in

Composite Fish Samples' for reanalyzed results.

ND = Not detected at or showe the Limit of Quantitation (LOQ) which is 0.5 raying (2.5 raying for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.</sup> 

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

		CS	Sulfonate PF			C8 Acid PFOA		
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5/PW01-0-050812								
(C0066705 Spix C, 10 ng/g Lasb Spiles)	10	54.4	78.0	•	10	1.26	9.44	82
CGMN-F01-5IPW01-0-050812	1	ĺ			1			
(C0800705 Spk D, 100 ng/g Lab Spike)	100	54.4	140	86	100	1.28	108	105
CGMN-F01-5IPW02-0-050812								
(C0066706 Spk E, 18 ng/g Lab Spike)	16	124	143	•	10	1.93	11.0	91
CGMN-F01-5IPW02-0-050812					i			
(C0004708 Spk F, 100 ng/g Lab Spline)	100	124	225	101	100	1.93	118	116
CGMN-F01-5IPW03-0-050812	1							•
(C0096707 Spit G, 10 mg/g Lab Spike)	10	313	384	•	10	2.56	10.7	81
CGMN-F01-5IPW03-0-050812								
(C0004707 Spk H, 100 ng/g Lab Spike)	190	313	390	•	100	2.56	99.6	97
CGMN-F01-5IPW04-0-050812					ļ			
.(C0000700 Spk l, 10 spig Lab Spike)	10	125	131	•	10	2.55	11.8	93
CGNN-F01-5IPW04-0-050812								
(C0004708 Spk J, 180 ng/g Lab Spike)	100	125	218	93	100	2.55	92.8	90
CGNN-F01-SIPW05-0-050812								
(C0086708 Spk K, 10 ng/g Leb Spike)	10	36.9	50.8	•	10	2.15	12.7	106
CGMN-F01-SIPW05-0-050812	1 !				1			
(C0096709 Spk L. 100 ng/g Lab Spike)	100	36,9	125	88	190	2.15	98.8	95
CGMN-F01-1IPF01-0-050812	1 1							
(C0094710 Spk C, 10 ng/g Lab Spike)	10	2.96	11.9	89	10	ND	10.8	108
CGMN-F01-1IPF01-0-050812	"				[		15.5	
(C0086710 Spk D, 100 ng/g Leb Sphie)	100	2.98	102	90	100	NO	98.0	96
CGMN-F01-1IPF02-0-050812					1			
(C0099711 Spk E, 10 ag/g Lab Spike)	10	2.43	11.5	91	10	ND	10.6	106
CGMN-F01-1IPF02-0-050812							10.0	
(C0096791 Spik F, 100 ng/g Lab Spike)	100	2.43	98.0	96	100	NO	98.4	98
CGMN-F01-11PF03-0-050812					1			
(C8086712 Spir G, 10 ng/g Lab Spike )	10	4.04	13.3	93	10	ND	11.1	111
CGMN-F01-1IPF03-0-050812								
(C3004712 Spk H, 100 mg/g Lab Spike )	100	4.04	97.6	94	100	ND	96.8	97
CGMN-F01-1IPF04-0-050812				l	1			
(C0000713 Spit 1, 10 ng/g Leb Spite)	10	8.72	17.1	84	10	ND	10.8	108
CGMN+F01-1IPF04-0-050812	-		••••	~			10.0	100
(C0000713 Spk J, 190 ng/g Lab Spite)	100	8.72	104	95	100	ND	95.2	95
CGMN-F01-1IPF05-0-050812								
(C0006714 Spk K, 10 ng/g Lab Spike )	10	11.6	24.4	128	10	ND	11.6	116
CGMN-F01-1IPF05-0-050812				J	1			
(C0006794 Spk L, 100 ng/g Lab Splite )	100	11.8	102	90	100	ND	89.2	89

<sup>\*1.0</sup> g of sample used for extraction instead of 5.0 g.

"Sample residue exceeds the spiking level significantly (Sx spiking fewel); therefore, an accurate recovery value cannot be calculate
NR = Not reposted due to qualify control result salures. See Table V1 Natrix Spike Recovery Summary for PFBS and PFOA in
Composite Fish Samples' for reanalyzed results.

Not describe for above the Limit of Quantitation (LOQ) which is 0.5 rejig (2.5 rejig for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

	Cit Sulfor					C8 Acid PF			
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	
CGMN-F01-3IPF01-0-050812									
(C0000718 Spk C, 10 ng/g Lati Spite)	10	8.88	18.0	93	10	ND	19.3	103	
CGMN-F01-3/PF01-0-050812	1								
(C0091715 Spk D, 100 ng/g Leb Spike)	106	8.66	112	103	100	ND	91.2	91	
CGMN-F01-3IPF02-0-050812									
(C0006716 Spk E, 10 ng/g Lab Splin)	10	94.4	103.0	•	10	ND	11.4	114	
CGMN-F01-3IPF02-0-050812	1								
(C0004718 Spk F, 100 ng/g Lab Spike)	100	94.4	184	90	100	ND	95.2	95	
CGMN-F01-3IPF03-0-050812	1								
(C0008717 Spk G, 10 ng/g Lab Spile)	10	5.78	15.4	96	10	ND	12.0	120	
CGMN-F01-3IPF03-0-050812	1 1								
(C0091717 Spk H, 100 ng/g Lab Spine)	100	5.76	106	102	100	ND	96.8	97	
CGMN-F01-3IPF04-0-050812									
(C0006718 Spk I, 10 ng/g Lab Spike)	10	5.92	14.4	85	10	ND	10.8	108	
CGMN-F01-3IPF04-0-050812	1								
(C0001718 Spk J, 100 ng/g Lab Spite)	100	5.92	98.4	92	100	ND	88.8	89	
CGMN-F01-3IPF05-0-050812									
(C0091719 Spk K, 10 ng/g Lab Spike)	10	10.2	19.7	95	10	ND	11.3	113	
CGMN-F01-3IPF05-0-050812									
(C0001716 Spk L, 100 ng/g Lab Spihe)	100	10.2	108	98	190	ND	100	100	
CGMN-F01-5IPF01-0-050812									
(C0096720 Spk C, 10 ng/g Lab Spike)	10	70.8	85.6	•	10	0.604	10.9	103	
CGMN-F01-5IPF01-0-050812					}				
(G0094720 Spk D, 160 ng/g Lab Splie)	100	70.8	164	93	100	0.604	96.4	98	
CGMN-F01-5IPF02-0-050812									
(C0006721 Spix E, 10 ng/g Lab Splins)	10	11.7	23.2	115	10	ND	11.1	111	
CGMN-F01-5IPF02-0-050812									
(C0004721 Spit F, 100 ng/g Leb Spike)	100	11.7	110	98	100	ND	90.0	90	
CGMN-F01-5IPF03-0-050812									
(C0004722 Spk G, 19 ng/g Lab Spike )	16	2.61	11.7	91	10	1.18	10.4	93	
CGMN-F01-5/PF03-0-050812									
(C0006722 Spt H, 100 ng/g Lab Spike )	100	2.81	102	99	106	1.18	104	103	
CGMN-F01-5iPF04-0-050812									
(C0006723 Spk I, 10 ng/g Lab Spike)	10	42.8	52.8	•	10	1.80	12.4	106	
CGMN-F01-5IPF04-0-050812 (C0096723 Spk J, 100 ng/g Lab Spike)	100	42.8	135	92	100	1.80	91.2	89	
(Conserve of the title free plant)		70.0	,50	-	.54	50			
CGMN-F01-5IPF05-0-050812		9.00		7.0		1 20	10.7	95	
(C0091724 Spk K, 10 ng/g Leb Splke )	10	8.28	15.9	76	10	1.20	10.7	95	
CGMN-F01-5IPF05-0-050812					400	4.00	92.4	91	
(C0086724 Spk L, 100 mg/g Lab Spilur )	100	8.28	105	97	100	1.20	WZ.4	Ai	

<sup>^ 1.0</sup> g of sample used for extraction insteed of 5.0 g.

"Sample readule exceeds the spitting level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated NR = Not reported due to quality control result failures. See Table VI Matrix Spike Recovery Summary for PRBS and PFOA in Composite Plats Samples' for reanalyzed results.

ND = Not described at or showe the Limit of Quartitation (LOQ) which is 0.5 rig/g (2.5 rig/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples **Continued** 

			Sulfonate PF	os			CB Acid PFOA	
Sample Description	Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-1LMW01-0-050812			1				,:: <b></b>	7.7
(C0096725 Spit C, 16 ng/g Lab Spike)	10	48.8	65.6	•	10	1,23	9.92	87
CGMN-F01-1LMW01-0-050812	"	70.0	0.0		"	1.23	9.82	8/
(C0086725 Spit D, 400 ng/g Lab Spitia)	100	48.8	139	90	100	1.23	120	119
CGMN-F01-1LMW02-0-050812	1	ļ						
(C0098726 Spk E, 10 mg/g Lmb Spite)	10	33.7	50.4	•	10	1.04	9.28	82
CGMN-F01-1LMW02-0-050812								
(C0096728 Spk F, 100 ng/g Lab Spike)	100	33.7	133	99	100	1.04	115	114
CGMN-F01-1LMW03-0-050812					İ			
(C6086727 Spk 0, 10 mg/g Lab Splks)	10	72.4	94.8	•	10	0.824	14.0	132
CGMN-F01-1LMW03-0-050812								
(C000E727 Spk H, 100 ng/g Lab SpRus)	100	72.4	169	97	100	0.824	116	115
CGMN-F01-1LMW04-0-050812	J i				Į			
(C0098728 Bpk I, 10 mg/g Lab Spiles)	10	34.4	43.2	•	10	1.28	10.0	87
CGMN-F01-1LMW04-0-050812								•
(C0006728 Spk J, 100 mg/g Lab Splks)	100	34.4	140	106	100	1.28	128	127
CGMN-F01-1LMW05-0-050812	]							
(C0904720 Spk K, 10 mg/g Lab Spiles)	10	34.2	48.8	•	10	0.964	9.08	81
CGMN-F01-1LMW05-0-050812	l i							
(C0084729 Spk L, 190 ng/g Lnb Spike)	190	34.2	128	94	100	0.964	135	134
CGMN-F01-3LMW01-0-050812*								
(C0004730 Spk C, 10 ng/g Lab Spline)	10	9320	8640		50	194	242	
CGMN-F01-3LMW01-0-050812*								
(C9096730 Spk D, 100 ng/g Lab Spike)	100	9320	10400	•	500	194	658	93
CGMN-F01-3LMW02-0-050812								
(C0004731 Spk E, 10 ng/g ("ab Spiko)	10	389	361	•	10	8.12	14.8	65
CGMN-F01-3LMW02-0-050812				1				
(C0096731 Spk F, 100 ng/g Lab Spite)	100	369	436	•	100	8.12	130	122
CGMN-F01-3LMW03-0-050812					ŀ			
(C0006732 Spk G, 10 ng/g Lab Spike)	10	128	128	•	10	1.48	9.38	79
CGMN-F01-3LMW03-0-050812				1	1			
(C9096732 Spk H, 100 ng/g Lab Spite)	100	128	247	121	100	1.48	115	114
CGMN-F01-3LMW04-0-050812				ł				
(C0094733 Spk I, 10 ng/g Lab Splite)	10	53.2	66.0	•	10	1.18	9.16	80
CGMN-F01-3LMW04-0-050812								
(C0006733 Spk J, 100 ng/g Lab Splice)	100	53.2	150	97	100	1.18	121	120
CGMN-F01-3LMW05-0-050812	40	460	400					
(COCOCTS4 Spik K, 10 ng/g Lab Spike)	10	150	160	•	10	1.29	9.68	84
CGMN-F01-3LMW05-0-050812 (C0006734 8pit L, 100 ng/g Lab 8pito)	100	150	283	133	100	1.29	116	115

<sup>^1.0</sup> g of sample used for extraction instead of 5.0 g.

'Sample restitue exceeds the spiking level atgrificantly (3x spiking level); therefore, an accurate recovery value cannot be calculated NR = Not reported due to quality control result failures. See Table VI Martix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for remembrad results.

ND = Not detacted at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

Sample Spiked in Sample Recovered Recovery Spiked in Sample (ng/g) (ng/g) (ng/g) (%) (mg/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g) (ng/g)	Recovery (%)
	NR
	NR
(C0046735 Spit C, 56 mg/g Lab Spite) 50 396 378 * 50 NR NR	
CGMN-F01-5LMW01-0-050812 <sup>4</sup>	
(C0006735 Bpk D, 500 ng/g Lab Spike) 500 396 854 92 500 NR NR	NR
CGMN-F01-5LMW02-0-050812*	
(C0006736 Sph E, S0 ng/g Lab Sphia) 50 388 412.0 ° 56 NR NR	NR
CGMN-F01-5LMW02-0-050812^	
(C0098738 Bpix F, 500 ng/g Laio 8phine) 500 388 822 87 508 NR NR	NR
CGMN-F01-5LMW03-0-050812 <sup>A</sup>	
(C0000737 Spik 0, 30 ng/g Lab Spike) 50 620 730 * 50 NR NR	NR
CGMN-F01-5LMW03-0-050812*	
(C0008757 Sipit: H. 800 reg/g Linb Sipitor) 500 620 988 70 500 NR NR	NR
CGMN-F01-5LMW04-0-050812*	
(C0046738 Spik i, 50 mg/g Lab Spiku) 50 606 676 * 50 NR NR	NR
CGMN-F01-5LMW04-0-050812^	
(C0088738 Sipit J, 500 ng/g Lab Spiles) 500 608 934 56 500 NR NR	NER
CGMN-F01-SLMW05-0-050812^	
(C0086739 Spir K, 50 ng/g Leb Spiths) 50 388 482 * 50 NR NR	NR
CGMN-F01-SLMW05-0-050812^	
(C00081736 Spit. L, 500 mg/g Link Spitine) 500 388 648 92 500 NR NR	NR
CGNN-F01-1MDF01-0-050812	
(C0008740 Spit C, 10 mg/g Lab Spitts) 10 168 128 10 0.916 8.28	74
CGMN-F01-1MDF01-0-050812	
(C00001740 Spk D, 100 ng/g Lan Sphin) 100 168 240 72 100 0.918 87.2	86
CGNN-F01-1MDF02-0-050812	
(C0086741 Spit E, 10 mg/g Lab Spitia) 16 98.8 114 * 19 1,04 8,16	71
CGNN-F01-1MDF02-0-050812	
(C0004741 Apx F, 140 mg/g Lab Spito) 190 98.8 152 53 100 1,04 80.0	79
CGNN-F01-1MDF03-0-050812	
(C0004742 Spik G, 10 ng/g Laib Spiko ) 10 20.2 32.2 120 16 0.856 8.08	72
CGNN-F01-1MDF03-0-050812	
(CORRENT42 Spit H. 100 mg/g Lab Spite ) 190 20.2 118 98 190 0.856 86.0	85
CGMN-F01-1MDF04-0-050812	
(C0008744 Spk I, 10 ng/g Lub Spitus) 16 51.2 52.4 * 16 0.836 7.80	70
CGMN-F01-1MDF04-0-050812	
(COMMITT44 Spk J, 100 ng/g (aib Spite) 100 51.2 136 85 100 0.836 85.2	84
CGMN-F01-1MDF05-0-050812	
(C0094747 Spit K, 10 ng/g Leb Spitter) 10 46.0 57.6 * 10 0.904 8.24	73
CGMN-F01-1MDF05-0-050812	
(COOMMETAT Spik L., 1000 rig/g Laio Spika ) 190 48.0 121 75 100 0.804 74.8	74

A 1.0 g of sample used for extraction instead of 5.0 g.

"Sample readine exceeds the spiking level significantly (3x spiking level): therefore, an accurate recovery value cannot be calculate. NR = Not reported due to quality control result failures. See Table VI Matrix Spike Recovery Summery for PFBS and PFOA in Composite Rah Samples' for resemblyzed results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 rags (2.5 rags for 1 g sample).

Note: Since this summery table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

		C8 Sulfonale PFOS					C8 Acid PFOA			
******	Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	
	CGMN-F01-1LMF01-0-050812*									
	(C0086790 Spk C, SG ng/g Lab Splin)	50	32.4	74.2	84	50	NR	NR	NR	
	CGMN-F01-1LMF01-0-050812*		1							
	(C0094750 Spk D, 500 ng/g Lab Spliu)	500	32.4	536	101	500	NR	NR	NR	
	CGMN-F01-1LMF02-0-050812*					1				
	(C0006793 Spk E, 80 ng/g Lab Spike)	50	30.2	81.6	103	5Q	NR	NR	NR	
	CGMN-F01-1LMF02-0-050812 <sup>A</sup>									
	(C0086753 Spk F, 500 ng/g Lab Spike)	500	30.2	512	96	500	NR	NR	NR	
	CGMN-F01-3MDF01-0-050812*					l i				
	(C0096755 Spk G, 50 ng/g Lab Spike)	50	548	570	•	50	NR	NR	NR	
	CGMN-F01-3MDF01-0-050812*									
	(C0096755 Spk H, 500 ng/g Lab Splin)	500	548	972	85	500	NR	NR	NR	
	CGMN-F01-3MDF02-0-050812*	1		*						
	(C0006758 Spk i, 50 ng/g Lab Spike)	50	110	172	124	50	NR	NR	NR	
	CGMN-F01-3MDF02-0-050812*									
	(C0096756 Spk J, 500 ng/g Lab Epitia)	500	110	592	96	500	NR	NR	NR	
	CGMN-F01-3MDF03-0-050612*									
	(C0096781 Spk K, 50 ng/g Lab Spike)	50	1380	1260	•	50	NR	NR	NR	
	CGMN-F01-3MDF03-0-050812*									
	(C9094781 Spli L. 509 ng/g Lab Spiho)	500	1360	1880	100	500	NR	NR	NR	
	CGMN-F01-3LMF01-0-050812^	i					•			
	(C0004782 Spk C, 50 ng/g Lab Spike)	50	798	754	•	50	NR	NR	NR	
	CGMN-F01-3LMF01-0-050812^	1								
	(C0006782 Spit D, 500 ng/g Lab Spilte)	500	798	1290	98	500	NR	NR	NR	
	CGMN-F01-3LMF02-0-050812^									
	(C0006763 Spk E, 50 ng/g Lab Spike)	50	54.2	127	148	50	NR	NR	NR	
	CGMN-F01-3LMF02-0-050812*									
	(C0096763 Spit F, Sue ng/g Lab Spite)	500	54.2	558	101	500	NR	NR	NR	
	CGMN-F01-5MDF01-0-050812*									
	(C0096794 Spk G, 50 ng/g Lab Splke )	50	258	334	.	50	NR	NR	NR	
	CGMN-F01-5MDF01-0-050812*				_			_	_	
	(C0096784 Spk H, 500 ng/g Lab Spiles)	500	258	842	117	500	NR	NR	NR	
	CGMN-F01-5MDF02-0-050812*									
	(C0090785 Spk I, 50 ng/g Lab Spike)	50	5160	5340	•	50	NR	NR	NR	
	CGMN-F01-5MDF02-0-050812*									
	(CORRETAL Spix J, 500 ng/g Lab Spike)	500	51 <del>6</del> 0	5780	-	500	NR	NR	NR	
	CGMN-F01-5MDF03-0-050812*									
	(COORSTON SIDE C, 50 ng/g List Spille )	50	892	1030	-	50	NR	NR	NR	
	CGMN-F01-5MDF03-0-0508124				[					
	(C0096796 Spk D, 500 ng/g Leb Spike )	500	692	1780	174	500	NR	NR	NR	

^1.0 g of sample used for extraction instead of 5.0 g.

"Sample residue exceeds the spiking level significantly (0x spiking level); therefore, an accurate recovery value cannot be calculated. Re- Not reported due to quality control results failures. See Table VI Matrix Spike Recovery Summery for PFBS and PFOA in Composite Fish Samples' for reamalyzed results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this summery table shows reunded results, recovery values may vary slightly from the values in the raw date.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

Sample Description	Amount Spiked (ng/g)	Cs Amt Found In Sample (ng/g)	Sulfonate PF Amount Recovered (ng/g)	OS Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5LMF01-0-050812^							_	
(C0016767 Spk E, 50 ng/g Lab Spike)	50	334	354	•	50	NR	NR	NR
CGMN-F01-5LMF01-0-050812^								
(C0000787 Spk F, 500 ng/g Lab Splin)	500	334	790	91	500	NR	NR	NR
CGMN-F01-5LMF02-0-050812^								
(C0006786 Spk G, 50 ng/g Lab Splin)	50	348	390	•	50	NR	NR	NR
CGMN-FD1-5LMF02-0-050812 <sup>A</sup>	- 1				İ			
(C0086788 Bpk H, 500 ng/g Lab Spike)	500	348	786	88	500	NR	NR	NR
			Average:	100			Average:	95

A 1.0 g of sample used for extraction instead of 5.0 g.

"Sample realdue exceeds the splking level significantly (3x splking level); therefore, an accurate recovery value cannot be calculated. NR = Not reported due to quality control result failures. See Table VI "Matrix Spike Recovery Summary for PPBS and PFOA in Composite Fish Sample's for real-spike results.

ND = Not detected at or above the Limit of Quantitation (...QQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this auremany table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Fish Samples

		<sup>13</sup> C-PFOA				
		Amount	Amount			
Exygen	Sample	Spiked	Recovered	Recovery		
10	Description	(ng/g)	(ng/g)	(%)		
C0096695	CGMN-F01-1IPW01-0-050812	10	7.40	74		
C0096595 Rep	CGMN-F01-1IPW01-0-050812	10	7.12	71		
C0096695 Spk C	CGMN-F01-1IPW01-0-050812	10	6.32	63		
C0096695 Spk D	CGMN-F01-1IPW01-0-050812	100	97.6	98		
C0096696	CGMN-F01-1IPW02-0-050812	10	7.52	75		
C0096696 Rep	CGMN-F01-1IPW02-0-050812	10	7.96	80		
C0096696 Spk E	CGMN-F01-1IPW02-0-050812	10	7.32	73		
C0096696 Spk F	CGMN-F01-1IPW02-0-050812	100	104	104		
C0096697	CGMN-F01-1IPW03-0-050812	10	7.12	71		
C0096697 Rep	CGMN-F01-1IPW03-0-050812	10	8.92	89		
C0096697 Spk G	CGMN-F01-1 PW03-0-050812	10	7.92	79		
C0096697 Spk H	CGMN-F01-1IPW03-0-050812	100	107	107		
C0096698	CGMN-F01-1/PW04-0-050812	10	8.08	81		
C0096698 Rep	CGMN-F01-1IPW04-0-050812	10	8.20	82		
	CGMN-F01-1IPW04-0-050812	10	7.08	71		
C0096698 Spk I C0096698 Spk J	CGMN-F01-1IPW04-0-050812 CGMN-F01-1IPW04-0-050812	10 100	100	100		
C00aopae 2bk 1	CGMN-F01-11F4V04-0-050812	100	100	100		
C0096699	CGMN-F01-1IPW05-0-050812	10	7.60	76		
C0096699 Rep	CGMN-F01-1IPW05-0-050812	10	9.04	90		
C0096699 Spk K	CGMN-F01-11PW05-0-050812	10	6.76	68		
C0096699 Spk L	CGMN-F01-1IPW05-0-050812	100	105	105		
C0096700	CGMN-F01-3IPW01-050812	10	6.60	66		
C0096700 Rep	CGMN-F01-3IPW01-050812	10	6.44	64		
C0096700 Spk C	CGMN-F01-3IPW01-050812	10	6.00	60		
C0096700 Spk D	CGMN-F01-3IPW01-050812	100	85.6	86		
C0096701	CGMN-F01-3IPW02-050812	10	5.48	55		
C0096701 Rep	CGMN-F01-3IPW02-050812	10	6.16	62		
C0096701 Spk E	CGMN-F01-3IPW02-050812	10	5.32	53		
C0096701 Spk F	CGMN-F01-3IPW02-050812	100	88.4	88		
C0096702	CGMN-F01-3!PW03-050812	10	7.20	72		
C0096702 Rep	CGMN-F01-3IPW03-050812	10	7.72	77		
C0096702 Spk G	CGMN-F01-3IPW03-050812	10	7.20	72		
C0096702 Spk H	CGMN-F01-3IPW03-050812	100	98.0	98		
C0006702	CGMN-F01-3IPW04-050812	10	7.84	78		
C0096703	CGMN-F01-3IPW04-050812	10	7.0 <del>4</del> 7.72	70 77		
C0096703 Rep	CGMN-F01-3IPW04-050812 CGMN-F01-3IPW04-050812	10	7.72 7.96	80		
C0096703 Spk I	CGMN-F01-3IPW04-050812 CGMN-F01-3IPW04-050812	100	7.90 87.2	87		
C0096703 Spk J	COMM-L01-31LA104-020017	100	01.2	O1		
C0096704	CGMN-F01-3IPW05-050812	10	5.12	51		
C0096704 Rep	CGMN-F01-3IPW05-050812	10	6.00	60		
C0096704 Spk K	CGMN-F01-3IPW05-050812	10	5.56	56		
C0096704 Spk L	CGMN-F01-3IPW05-050812	100	95.2	95		

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

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NR III Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of <sup>13</sup>C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Fish Samples Continued

		<sup>13</sup> C-PFOA				
		Amount	Amount	<del></del>		
Exygen	Sample	Spiked	Recovered	Recovery		
ID	Description	(ng/ <b>g</b> )	(ng/g)	(%)		
C0096705	CGMN-F01-5IPW01-0-050812	10	8.36	84		
C0096705 Rep	CGMN-F01-5IPW01-0-050812	10	9.48	95		
C0096705 Spk C	CGMN-F01-5IPW01-0-050812	10	7.88	79		
C0096705 Spk D	CGMN-F01-5IPW01-0-050812	100	106	106		
C0096706	CGMN-F01-5IPW02-0-050812	10	9.12	91		
C0096706 Rep	CGMN-F01-5IPW02-0-050812	10	8.96	90		
C0096706 Spk E	CGMN-F01-5IPW02-0-050812	10	8.44	84		
C0096706 Spk F	CGMN-F01-5IPW02-0-050812	100	119	119		
C0096707	CGMN-F01-5IPW03-0-050812	10	10.2	102		
C0096707 Rep	CGMN-F01-5IPW03-0-050812	10	9.52	95		
•		10	8.36	84		
C0096707 Spk G	CGMN-F01-5IPW03-0-050812	100	0.30 99.6	100		
C0096707 Spk H	CGMN-F01-5IPW03-0-050812	100	99.6	100		
C0096708	CGMN-F01-5IPW04-0-050812	10	12.5	125		
C0096708 Rep	CGMN-F01-5IPW04-0-050812	10	12.2	122		
C0096708 Spk I	CGMN-F01-5IPW04-0-050812	10	9.36	94		
C0096708 Spk J	CGMN-F01-5IPW04-0-050812	100	88.0	88		
C0096709	CGMN-F01-5IPW05-0-050812	10	12.4	124		
C0096709 Rep	CGMN-F01-5IPW05-0-050812	10	13.6	136		
		10	10.8	108		
C0096709 Spk K	CGMN-F01-5IPW05-0-050812 CGMN-F01-5IPW05-0-050812	100	94.0	94		
C0096709 Spk L	CGMN-F01-3IFW03-0-030812	100	94.0	34		
C0096710	CGMN-F01-1IPF01-0-050812	10	12.0	120		
C0096710 Rep	CGMN-F01-11PF01-0-050812	10	11.2	112		
C0096710 Spk C	CGMN-F01-1IPF01-0-050812	10	10.6	106		
C0096710 Spk D	CGMN-F01-1IPF01-0-050812	100	91.2	91		
C0096711	CGMN-F01-1IPF02-0-050812	10	11.8	118		
C0096711 Rep	CGMN-F01-1IPF02-0-050812	10	11.9	119		
C0096711 Spk E	CGMN-F01-1IPF02-0-050812	10	10.3	103		
C0096711 Spk F	CGMN-F01-1IPF02-0-050812	100	90.0	90		
C0096712	CGMN-F01-1IPF03-0-050812	10	11.9	119		
C0096712 Rep	CGMN-F01-1IPF03-0-050812	10	12.3	123		
C0096712 Spk G	CGMN-F01-1IPF03-0-050812	10	10.5	105		
C0096712 Spk G	CGMN-F01-11PF03-0-050812	100	84.8	85		
			44.7	447		
C0096713	CGMN-F01-1IPF04-0-050812	10	11.7	117		
C0096713 Rep	CGMN-F01-1IPF04-0-050812	10	12.0	120		
C0096713 Spk I	CGMN-F01-1IPF04-0-050812	10	10.5	105		
C0096713 Spk J	CGMN-F01-1IPF04-0-050812	100	90.8	91		
C0096714	CGMN-F01-1IPF05-0-050812	10	12.3	123		
C0096714 Rep	CGMN-F01-1IPF05-0-050812	10	11.6	116		
C0096714 Spk K	CGMN-F01-1IPF05-0-050812	10	11.2	112		
C0096714 Spk L	CGMN-F01-1IPF05-0-050812	100	86.8	87		

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of <sup>13</sup>C-PFOA in Composite Fish Samples' for reanalyzed results.

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Fish Samples Continued

			13C-PFOA	
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recover
ID	Description	(ng/g)	(ng/g)	(%)
C0096715	COMM FOR DIDERA O OCCUPA			
	CGMN-F01-3IPF01-0-050812	10	11.8	118
C0096715 Rep	CGMN-F01-3IPF01-0-050812	10	12.1	121
C0096715 Spk C	CGMN-F01-3IPF01-0-050812	10	10.2	102
C0096715 Spk D	CGMN-F01-3IPF01-0-050812	100	88.4	88
C0096716	CGMN-F01-3IPF02-0-050812	10	12.0	120
C0096716 Rep	CGMN-F01-3IPF02-0-050812	10	11.5	115
C0096716 Spk E	CGMN-F01-3!PF02-0-050812	10	10.9	109
C0096716 Spk F	CGMN-F01-3IPF02-0-050812	100	89.2	89
C0096717	CGMN-F01-3IPF03-0-050812	10	12.8	128
C0096717 Rep	CGMN-F01-3IPF03-0-050812	10	12.1	121
C0096717 Sok G	CGMN-F01-3IPF03-0-050812	10	11.5	115
C0096717 Spk H	CGMN-F01-3IPF03-0-050812	100	95.2	95
·	_			
C0096718	CGMN-F01-3IPF04-0-050812	10	12.0	120
C0096718 Rep	CGMN-F01-3IPF04-0-050812	10	11.4	114
C0096718 Spk I	CGMN-F01-3IPF04-0-050812	10	10.2	102
C0096718 Spk J	CGMN-F01-3IPF04-0-050812	100	84.4	84
C0096719	CGMN-F01-3IPF05-0-050812	10	11.0	110
C0096719 Rep	CGMN-F01-3IPF05-0-050812	10	12.4	124
C0096719 Spk K	CGMN-F01-3IPF05-0-050812	10	10.8	108
C0096719 Spk L	CGMN-F01-3IPF05-0-050812	100	90.4	90
C0096720	CGMN-F01-5IPF01-0-050812	10	10.4	104
C0096720 Rep	CGMN-F01-5IPF01-0-050812	10	10.4	116
C0096720 Spk C	CGMN-F01-5IPF01-0-050812	10	10.4	104
C0096720 Spk D	CGMN-F01-5IPF01-0-050812	100	95.6	96
C0090720 3pk D	CGMN-F01-SIFF01-0-0508  2	100	95.6	90
C096721	CGMN-F01-5IPF02-0-050812	10	12.6	126
C0096721 Rep	CGMN-F01-5/PF02-0-050812	10	12.0	120
C0096721 Spk E	CGMN-F01-5IPF02-0-050B12	10	10.8	108
C0096721 Spk F	CGMN-F01-5IPF02-0-050812	100	92.0	92
C096722	CGMN-F01-5IPF03-0-050812	10	10.1	101
C0096722 Rep	CGMN-F01-5IPF03-0-050812	10	10.4	104
C0096722 Spk G	CGMN-F01-5IPF03-0-050812	10	9.08	91
C0096722 Spk H	CGMN-F01-5IPF03-0-050812	100	103	103
C0096723	CGMN-F01-5iPF04-0-050812	10	12.9	129
C0096723 Rep	CGMN-F01-5IPF04-0-050812	10	12.4	124
C0096723 Spk I	CGMN-F01-5IPF04-0-050812	10	10.9	109
C0096723 Spk J	CGMN-F01-5IPF04-0-050812	100	90.0	90
C0096724	CGMN-F01-5iPF05-0-050812	10	12.2	122
C0096724 Rep	CGMN-F01-5IPF05-0-050812	10	12.2	115
C0096724 Rep C0096724 Sok K	CGMN-F01-5IPF05-0-050812	10	11.5 11.0	115
*	CGMN-F01-5IPF05-0-050812	100	92.8	93
C0096724 Spk L	COMMEDITOR CONTROL OF	100	<del>3</del> 2.0	90

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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NR = Not reported due to quality control result failures. See Table VII "Surrogate Spike Recovery Summary of <sup>13</sup>C-PFOA in Composite Fish Samples' for reanalyzed results.

Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Fish Samples Continued

			13C-PFOA			
		Amount	Amount			
Exygen	Sample	Spiked	Recovered	Recovery		
ID	Description	(ng/g)	(ng/g)	(%)		
00000705	001015044150444444	40	0.00			
C0096725	CGMN-F01-1LMW01-0-050812	10	9.28	93		
C0096725 Rep	CGMN-F01-1LMW01-0-050812	10	8.84	88		
C0096725 Spk C	CGMN-F01-1LMW01-0-050812	10	8.68	87		
C0096725 Spk D	CGMN-F01-1LMW01-0-050812	100	116	116		
C0096726	CGMN-F01-1LMW02-0-050812	10	8.60	86		
C0096726 Rep	CGMN-F01-1LMW02-0-050812	10	8.88	89		
C0096726 Spk E	CGMN-F01-1LMW02-0-050812	10	8.44	84		
C0096726 Spk F	CGMN-F01-1LMW02-0-050812	100	112	112		
C0096727	CGMN-F01-1LMW03-0-050812	10	8.60	86		
C0096727 Rep	CGMN-F01-1LMW03-0-050812	10	9.32	93		
C0096727 Spk G	CGMN-F01-1LMW03-0-050812	10	10.2	102		
C0096727 Spk H	CGMN-F01-1LMW03-0-050812	100	112	112		
00000700	001411 F04 411411/04 0 055555	40	0.00	07		
C0096728	CGMN-F01-1LMW04-0-050812	10	9.68	97		
C0096728 Rep	CGMN-F01-1LMW04-0-050812	10	10.2	102		
C0096728 Spk I	CGMN-F01-1LMW04-0-050812	10	8.84	88		
C0096728 Spk J	CGMN-F01-1LMW04-0-050812	100	120	120		
C0096729	CGMN-F01-1LMW05-0-050812	10	8.88	89		
C0096729 Rep	CGMN-F01-1LMW05-0-050812	10	9.28	93		
C0096729 Spk K	CGMN-F01-1LMW05-0-050812	10	8.12	81		
C0096729 Spk L	CGMN-F01-1LMW05-0-050812	100	120	120		
C0096730	CGMN-F01-3LMW01-0-050812	10	6.60	66		
C0096730 Rep	CGMN-F01-3LMW01-0-050812	10	6.04	60		
C0096730 Spk C	CGMN-F01-3LMW01-0-050812	10	5.48	55		
C0096730 Spk D	CGMN-F01-3LMW01-0-050812	100	105	105		
C0096731	CGMN-F01-3LMW02-0-050812	10	8.16	82		
C0096731 Rep	CGMN-F01-3LMW02-0-050812	10	8.20	82		
00096731 Spk E	CGMN-F01-3LMW02-0-050812	10	7.64	76		
C0096731 Spk E	CGMN-F01-3LMW02-0-050812	100	116	116		
,	CGMN-F01-3LMW03-0-050812	10	9.00	90		
C0096732	• • • • • • • • • • • • • • • • • • • •			90 85		
C0096732 Rep	CGMN-F01-3LMW03-0-050812	10 10	8.48 7.88	85 79		
C0096732 Spk G	CGMN-F01-3LMW03-0-050812	100	7.66 115	115		
C0096732 Spk H	CGMN-F01-3LMW03-0-050812	100	113	113		
C0096733	CGMN-F01-3LMW04-0-050812	10	9.08	91		
C0096733 Rep	CGMN-F01-3LMW04-0-050812	10	8.80	88		
C0096733 Spk I	CGMN-F01-3LMW04-0-050812	10	7.92	79		
C0096733 Spk J	CGMN-F01-3LMW04-0-050812	100	114	114		
C0096734	CGMN-F01-3LMW05-0-050812	10	9.88	99		
C0096734 Rep	CGMN-F01-3LMW05-0-050812	10	9.52	95		
00096734 Spk K	CGMN-F01-3LMW05-0-050812	10	8.28	83		
C0096734 Spk L	CGMN-F01-3LMW05-0-050812	100	114	114		

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of <sup>13</sup>C-PFOA in Composite Fish Samples' for reanalyzed results.

Surrogate Spike Recovery of <sup>13</sup>C PFOA in Fish Samples Table IV. Continued

		13C-PFOA			
		Amount	Amount		
Exygen	Sample	Spiked	Recovered	Recover	
ID	Description	(ng/g)	(ng/g)	(%)	
C0096735^	CGMN-F01-5LMW01-0-050812	50	NR	NR	
	CGMN-F01-5LMW01-0-050812	50 50			
C0096735 Rep^			NR	NR	
C0096735 Spk C4	CGMN-F01-5LMW01-0-050812	50	NR	NR	
C0096735 Spk D^	CGMN-F01-5LMW01-0-050812	500	NR	NR	
C0096736 <sup>^</sup>	CGMN-F01-5LMW02-0-050812	50	NR	NR	
C0096736 Rep^	CGMN-F01-5LMW02-0-050812	50	NR	NR	
C0096736 Spk E^	CGMN-F01-5LMW02-0-050812	50	NR	NR	
C0096736 Spk F^	CGMN-F01-5LMW02-0-050812	500	NR	NR	
C0096737^	CGMN-F01-5LMW03-0-050812	50	NR	NR	
C0096737 Rep^	CGMN-F01-5LMW03-0-050812	50	NR	NR	
C0096737 Spk G^	CGMN-F01-5LMW03-0-050812	50	NR	NR	
C0096737 Spk H <sup>4</sup>	CGMN-F01-5LMW03-0-050812	500	NR	NR	
C0096738^	CGMN-F01-5LMW04-0-050812	50	NR	NR	
C0096738 Rep^	CGMN-F01-5LMW04-0-050812	50	NR	NR	
C0096738 Spk I^	CGMN-F01-5LMW04-0-050812	50	NR	NR	
C0096738 Spk J^	CGMN-F01-5LMW04-0-050812	500	NR	NR	
C0096739^	CGMN-F01-5LMW05-0-050812	50	NR	NR	
C0096739 Rep^	CGMN-F01-5LMW05-0-050812	50	NR	NR	
C0096739 Spk K^	CGMN-F01-5LMW05-0-050812	50	NR	NR	
C0096739 Spk L^	CGMN-F01-5LMW05-0-050812	500	NR	NR	
C0096740	CGMN-F01-1MDF01-0-050812	10	8.00	80	
C0096740 Rep	CGMN-F01-1MDF01-0-050812	10	8.24	82	
C0096740 Spk C	CGMN-F01-1MDF01-0-050812	10	7.36	74	
C0096740 Spk D	CGMN-F01-1MDF01-0-050812	100	84.8	85	
C0030740 3pk D	CSM14-1 01-11VID1 01-0-030012	100	04.0	65	
C0096741	CGMN-F01-1MDF02-0-050812	10	7.92	79	
C0096741 Rep	CGMN-F01-1MDF02-0-050812	10	6.72	67	
C0096741 Spk E	CGMN-F01-1MDF02-0-050812	10	7.08	71	
C0096741 Spk F	CGMN-F01-1MDF02-0-050812	100	· 74.8	75	
C0096742	CGMN-F01-1MDF03-0-050812	10	7.24	72	
C0096742 Rep	CGMN-F01-1MDF03-0-050812	10	6.72	67	
C0096742 Spk G	CGMN-F01-1MDF03-0-050812	10	6.80	68	
C0096742 Spk H	CGMN-F01-1MDF03-0-050812	100	82.4	82	
C0096744	CGMN-F01-1MDF04-0-050812	10	7.52	75	
C0096744 Rep	CGMN-F01-1MDF04-0-050812	10	6.56	66	
C0096744 Spk i	CGMN-F01-1MDF04-0-050812	10	6.68	67	
C0096744 Spk J	CGMN-F01-1MDF04-0-050812	100	80.0	80	
C0006747	CGMN-F01-1MDF05-0-050812	10	7.20	72	
C0096747		•			
C0096747 Rep	CGMN-F01-1MDF05-0-050812	10	7.08	71	
C0096747 Spk K	CGMN-F01-1MDF05-0-050812	10	6.76	68	
C0096747 Spk L	CGMN-F01-1MDF05-0-050812	100	71.6	72	

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

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NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of <sup>13</sup>C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Fish Samples Continued

			13G-PFOA	
		Amount	Amount	
Exygen	Sample	Spiked	Recovered	Recovery
ĪĎ	Description	(ng/g)	(ng/g)	(%)
C0096750^	CGMN-F01-1LMF01-0-050812	50	NR	NR
C0096750 Rep^	CGMN-F01-1LMF01-0-050812	50	NR	NR
C0096750 Spk C^	CGMN-F01-1LMF01-0-050812	50	NR	NR
C0096750 Spk D^	CGMN-F01-1LMF01-0-050812	500	NR	NR
C0096753^	CGMN-F01-1LMF02-0-050812	50	NR	NR
C0096753 Rep^	CGMN-F01-1LMF02-0-050812	50	NR	NR
C0096753 Spk E^	CGMN-F01-1LMF02-0-050812	50	NR	NR
C0096753 Spk F^	CGMN-F01-1LMF02-0-050812	500	NR	NR
C0096755 <sup>A</sup>	CGMN-F01-3MDF01-0-050812	50	NR	NR
C0096755 Rep^	CGMN-F01-3MDF01-0-050812	50	NR.	NR
C0096755 Spk G^	CGMN-F01-3MDF01-0-050812	50 50	NR	NR NR
•	CGMN-F01-3MDF01-0-050812	500	NR NR	NR NR
C0096755 Spk H^	CGMN-F01-3MDF01-0-030812	500	NK	NIK
C0096758 <sup>^</sup>	CGMN-F01-3MDF02-0-050812	50	NR	NR
C0096758 Rep^	CGMN-F01-3MDF02-0-050812	50	NR	NR
C0096758 Spk I^	CGMN-F01-3MDF02-0-050812	50	NR	NR
C0096758 Spk J^	CGMN-F01-3MDF02-0-050812	500	NR	NR
C0096781^	CGMN-F01-3MDF03-0-050812	50	NR	NR
C0096781 Rep^	CGMN-F01-3MDF03-0-050812	50	NR	NR
C0096781 Spk K^	CGMN-F01-3MDF03-0-050812	50	NR.	NR
C0096781 Spk L^	CGMN-F01-3MDF03-0-050812	500	NR	NR
C0096782^	CGMN-F01-3LMF01-0-050812	50	NR	NR
C0096782 Rep^	CGMN-F01-3LMF01-0-050812	50	NR	NR
C0096782 Spk C*	CGMN-F01-3LMF01-0-050812	50 50	NR NR	NR
•		500	NR NR	NR NR
C0096782 Spk D^	CGMN-F01-3LMF01-0-050812	500	NK	NPC
C0096783^	CGMN-F01-3LMF02-0-050812	50	NR	NR
C0096783 Rep^	CGMN-F01-3LMF02-0-050812	50	NR	NR
C0096783 Spk E^	CGMN-F01-3LMF02-0-050812	50	NR	NR
C0096783 Spk F^	CGMN-F01-3LMF02-0-050812	500	NR	NR
C0096784^	CGMN-F01-5MDF01-0-050812	50	NR	NR
C0096784 Rep^	CGMN-F01-5MDF01-0-050812	50	NR	NR
C0096784 Spk G^	CGMN-F01-5MDF01-0-050812	50	NR	NR
C0096784 Spk H^	CGMN-F01-5MDF01-0-050812	500	NR	NR
C0096785 <sup>A</sup>	CGMN-F01-5MDF02-0-050812	50	NR	NR
C0096785 Rep^	CGMN-F01-5MDF02-0-050812	50	NR	NR
C0096785 Spk I^	CGMN-F01-5MDF02-0-050812	50	NR	NR
C0096785 Spk J^	CGMN-F01-5MDF02-0-050812	500	NR	NR
C0096786*	CGMN-F01-5MDF03-0-050812	50	NR	NR
C0096786 Rep^	CGMN-F01-5MDF03-0-050812	50 50	NR	NR
	CGMN-F01-5MDF03-0-050812	50 50	NR	NR
C0096786 Spk C^			NR NR	NR NR
C0096786 Spk D^	CGMN-F01-5MDF03-0-050812	500	NA	NK

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

Note: Since this summary table shows rounded results, recovery values may vary alightly from the values in the raw data.

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NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of <sup>13</sup>C-PFOA in Composite Fish Samples' for reanalyzed results.

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Table IV. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Fish Samples Continued

		13C-PFOA		•
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0096787 <sup>4</sup>	CGMN-F01-5LMF01-0-050812	50	NR	NR
C0096787 Rep^	CGMN-F01-5LMF01-0-050812	50	NR	NR
C0096787 Spk E^	CGMN-F01-5LMF01-0-050812	50	NR	NR
C0096787 Spk F4	CGMN-F01-5LMF01-0-050812	500	NR	NR
C0096788^	CGMN-F01-5LMF02-0-050812	50	NR	NR
C0096788 Rep^	CGMN-F01-5LMF02-0-050812	50	NR	NR
C0096788 Spk G^	CGMN-F01-5LMF02-0-050812	50	NR	NR
C0096788 Spk H^	CGMN-F01-5LMF02-0-050812	500	NR	NR

Average: 93 Standard Deviation: 19

Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

<sup>^ 1.0</sup> g of sample used for extraction instead of 5.0 g.

NR 
Not reported due to quality control result failures. See Table VII Surrogate Spike Recovery Summary of 13C-PFOA in

Table V. Summary of PFBS and PFOA in Composite Fish Samples

			C4 Sulfonate PFBS		C8 Acid PFOA	
Client Sample ID	Exygen ID	Composited Client Sample ID	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+%/-%)
CGMN-F01-3LMW01-0-050812 CGMN-F01-3LMW01-0-050812*	C0096730^ C0096730 Rep^		127 116	60 60	-	_
CGMN-F01-3LMW02-0-050812 CGMN-F01-3LMW02-0-050812°	C0096731 <sup>A</sup> C0096731 Rep <sup>A</sup>		173 186	<b>6</b> 0	_	_
CGMN-F01-3LMW03-0-050812 CGMN-F01-3LMW03-0-050812°	C0096732^ C0096732 Rep^		140 170	60 60	_	=
CGMN-F01-5LMW01-0-050812 CGMN-F01-5LMW02-0-050812 CGMN-F01-5LMW03-0-050812 CGMN-F01-5LMW04-0-050812 CGMN-F01-5LMW05-0-050812	C0141931 C0141931 Rep	CGMN-F01-5LMWC-0-050812 CGMN-F01-5LMWC-0-050812		=	0.608 0.592	30 30
CGMN-F01-1LMF01-0-050812 CGMN-F01-1LMF02-0-050812	C0141932 C0141932 Rep	CGMN-F01-1LMFC-0-050812 CGMN-F01-1LMFC-0-050812*	. <u>.</u>	_	ND ND	30 30
CGMN-F01-3MDF01-0-050812 CGMN-F01-3MDF02-0-050812 CGMN-F01-3MDF03-0-050812	C0141933 C0141933 Rep	CGMN-F01-3MDFC-0-050812 CGMN-F01-3MDFC-0-050812*			0.516 0.644	30 30
CGMN-F01-3LMF01-0-050812 CGMN-F01-3LMF02-0-050812	C0141934 C0141934 Rep	CGMN-F01-3LMFC-0-050812 CGMN-F01-3LMFC-0-050812*		_	3.29 3.12	30 30
CGMN-F01-5MDF01-0-050812 CGMN-F01-5MDF02-0-050812 CGMN-F01-5MDF03-0-050812	C0141935 C0141935 Rep	CGMN-F01-5MDFC-0-050812 CGMN-F01-5MDFC-0-050812*			1.00 1.08	30 30
CGMN-F01-5LMF01-0-050812 CGMN-F01-5LMF02-0-050812	C0141936 C0141936 Rep	CGMN-F01-5LMFC-0-050812 CGMN-F01-5LMFC-0-050812*		_ _	ND 0.504	30 30

<sup>--- =</sup> Results shown in preceding tables; not a target analyte for reanalyses.

<sup>\*</sup>Laboratory Duplicate

<sup>\*</sup>Sample was re-extracted only. There was no composite made for this sample.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g.

Table VI. Matrix Spike Recovery of PFBS and PFOA in Composite Fish **Samples** 

	C4 Sulfonate PFBS					CS Acid PFOA		
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-3LMW01-0-050812 <sup>n</sup> (C0006730 Spk C, 10 ng/g Lab Spika)	10	127	148	•	10			_
CGMN-F01-3LMW01-0-050812 <sup>A</sup> (C0098730 Spk D, 100 ng/g Lab Spike)	100	127	172	45	100	<u> </u>	<del></del>	
CGMN-F01-3LMW02-0-050812^ (C0096731 Spk E, 10 ng/g Lab Spike)	10	173	177	•	10			
CGMN-F01-3LMW02-0-050812 <sup>A</sup> (C0096731 Spk F, 100 ng/g Lab Spike)	100	173	330	157	100		_	
CGMN-F01-3LMW03-0-050812 <sup>4</sup> (C0086732 Spik G, 16 ng/g Lab Spike)	10	140	152	•	10		_	_
CGMN-F01-3LMW03-0-050812 <sup>A</sup> (C0006732 8pk H, 100 ng/g Lab Spike)	100	140	193	53	100	_		
CGMN-F01-5LMWC-0-050812 (C0141931 Sek I, 10 ne/c Leb Selke)	10				10	0.608	9.56	90
CGMN-F01-5LMWC-0-050812 (C0141031 Spk J, 109 ng/g Lab Spike)	180	_	_	_	100	0.608	115	114
CGMN-F01-1LMFC-0-050812 (C0141832 Spk K, 10 ng/g Lab Spike)	10				10	ND	11.5	115
CGMN-F01-1LMFC-0-050812 (C9141932 8pk L, 100 ng/g Lab Spille)	100			_	100	ND	124	124
CGMN-F01-3MDFC-0-050812 (C0141833 Bpk C, 10 ng/g Lab Spike)	10	_		_	10	0.516	11.1	106
CGMN-F01-3MDFC-0-050812 (C0141933 5pk D, 100 ng/g Lab Spike)	100	_		_	100	0.516	108	105
CGMN-F01-3LMFC-0-050812 (C0141934 Spik E, 10 ng/g Leb Spike)	10		_		10	3.29	13.7	104
CGMN-F01-3LMFC-0-050812 (C0141934 Spit F, 100 ng/g Lab Spitia)	100	_		_	100	3.29	120	117
CGMN-F01-5MDFC-0-050812 (C0141935 8pk G, 10 ng/g Lab Spike )	10			_	10	1.00	10.8	98
CGMN-F01-5MDFC-0-050812 (C0141935 Spk H, 100 ng/g Lab Spike )	100	_		_	100	1.00	110	109
CGMN-F01-5LMFC-0-050812 (C0141938 Spk I, 10 ng/g Lab Spike)	10	_			10	ND	11,5	115
CGMN-F01-5LMFC-0-050812 (C0141938 8pk J, 100 ng/g Lab Sp8w)	100			_	100	ND	130	130
	<u></u>		Average (n=3): eviation (n=3):	85 62			verage (n=12): visition (n=12):	111 11

<sup>--- =</sup> Results shown in preceding tables; not a target analyte for reanalyses.

"Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated "Sample was re-extracted only. There was no composite made for this sample.

NO = Not destored at or above the Limit of Countitation (LOC) which is 0.5 ng/g.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Exygen Study No.: P0001400

Table VII. Surrogate Spike Recovery of <sup>13</sup>C PFOA in Composite Fish Samples

		13C-PFOA				
F	<b>9</b> 1	Amount	Amount			
Exygen	Sample	Spiked	Recovered	Recovery		
, (D	Description	(ng/g)	(ng/g)	(%)		
C0096730^	CGMN-F01-3LMW01-0-050812	10	6.08	61		
C0096730 Rep^	CGMN-F01-3LMW01-0-050812	10	5.96	60		
C0096730 Spk C^	CGMN-F01-3LMW01-0-050812	10	6.16	62		
C0096730 Spk D^	CGMN-F01-3LMW01-0-050812	100	108	108		
C0096731 <sup>A</sup>	CGMN-F01-3LMW02-0-050812	10	8.12	81		
C0096731 Rep*	CGMN-F01-3LMW02-0-050812	10	8.16	82		
C0096731 Spk E^	CGMN-F01-3LMW02-0-050812	10	8.52	85		
C0096731 Spk F^	CGMN-F01-3LMW02-0-050812	100	122	122		
C0096732^	CGMN-F01-3LMW03-0-050812	10	8.76	88		
C0096732 Rep^	CGMN-F01-3LMW03-0-050812	10	8.16	82		
C0096732 Spk G^	CGMN-F01-3LMW03-0-050812	10	9.40	94		
C0096732 Spk H^	CGMN-F01-3LMW03-0-050812	100	112	112		
C0141931	CGMN-F01-5LMWC-0-050812	10	8.96	90		
C0141931 Rep	CGMN-F01-5LMWC-0-050812	10	8.76	88		
C00141931 Spk I	CGMN-F01-5LMWC-0-050812	10	8.68	87		
C00141931 Spk J	CGMN-F01-5LMWC-0-050812	100	116	116		
C0141932	CGMN-F01-1LMFC-0-050812	10	11.4	114		
C0141932 Rep	CGMN-F01-1LMFC-0-050812	10	11.9	119		
C0141932 Spk K	CGMN-F01-1LMFC-0-050812	10	11.4	114		
C0141932 Spk L	CGMN-F01-1LMFC-0-050812	100	121	121		
C0141933	CGMN-F01-3MDFC-0-050812	10	10.6	106		
C0141933 Rep	CGMN-F01-3MDFC-0-050812	10	11.0	110		
C0141933 Spk C	CGMN-F01-3MDFC-0-050812	10	10.4	104		
C0141933 Dpk D	CGMN-F01-3MDFC-0-050812	100	105	105		
C0141934	CGMN-F01-3LMFC-0-050812	10	9.68	97		
C0141934 Rep	CGMN-F01-3LMFC-0-050812	10	10.0	100		
C0141934 Spk E	CGMN-F01-3LMFC-0-050812	10	9.96	100		
C0141934 Spk F	CGMN-F01-3LMFC-0-050812	100	114	114		
C0141935	CGMN-F01-5MDFC-0-050812	10	9.40	94		
C0141935 Rep	CGMN-F01-5MDFC-0-050812	10	9.68	97		
C0141935 Spk G	CGMN-F01-5MDFC-0-050812	10	9.56	96		
C0141935 Spk H	CGMN-F01-5MDFC-0-050812	100	109	109		
C01491936	CGMN-F01-5LMFC-0-050812	10	10.6	106		
C0141936 Rep	CGMN-F01-5LMFC-0-050812	10	11.3	113		
C0141936 Spk	CGMN-F01-5LMFC-0-050812	10	11.1	111		
C0141936 Spk J	CGMN-F01-5LMFC-0-050812	100	129	129		

Average: 99 Standard Deviation: 17

\*Sample was re-extracted only. There was no composite made for this sample.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Exygen Research

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Exygen Study No.: P0001400

## **FIGURES**

Exygen Research

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Figure 1. Typical Calibration Curve for PFOA in Methanol

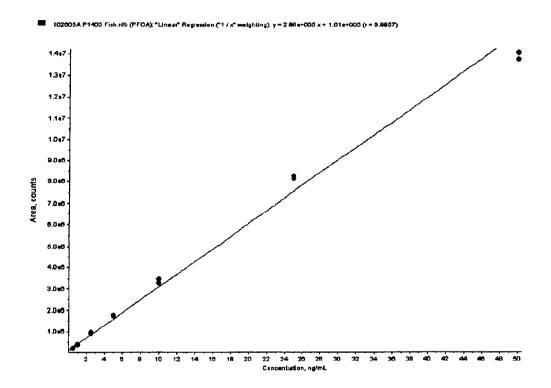


Figure 2. Non-extracted Standards of PFOA in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively

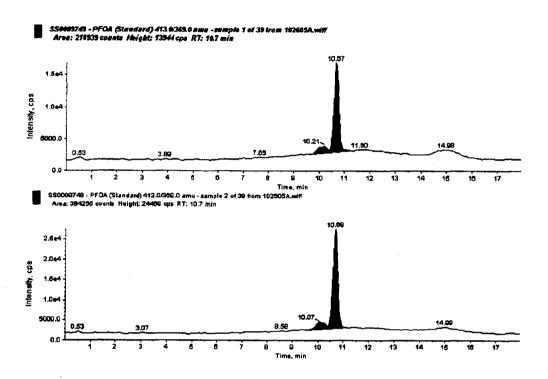


Figure 3. PFOA in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively

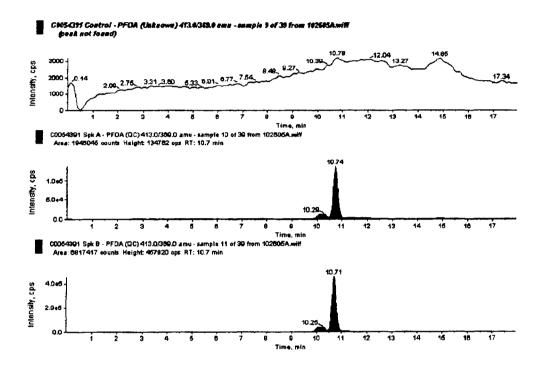


Figure 4. Chromatogram Representing a Fish Sample Analyzed for PFOA (Exygen ID: C0096710, Data Set: 102605A)

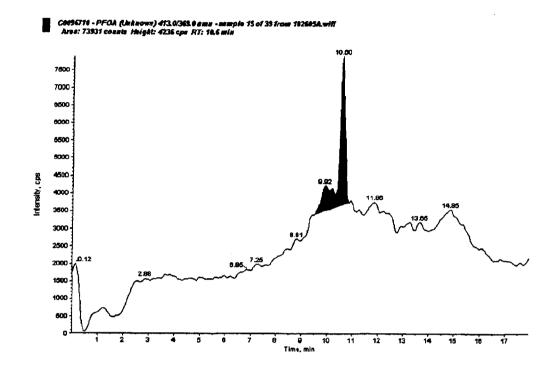


Figure 5. Typical Calibration Curve for <sup>13</sup>C PFOA in Methanol

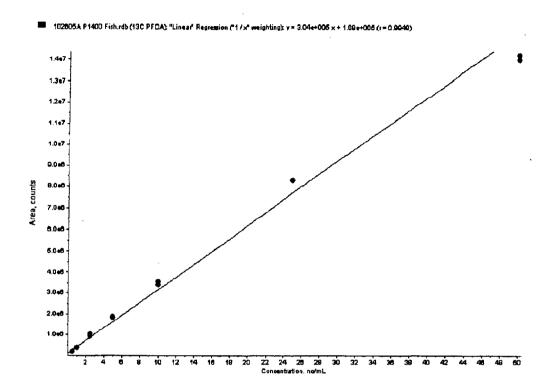


Figure 6. Non-Extracted Standards of <sup>13</sup>C PFOA in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively

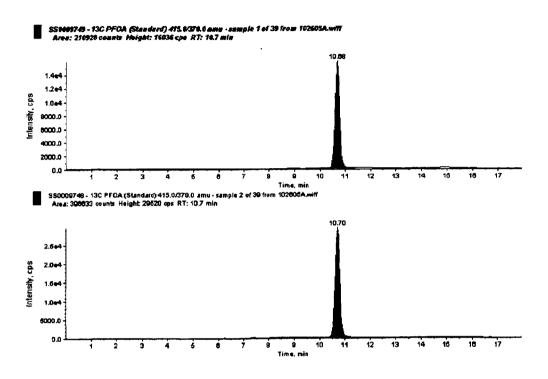


Figure 7. <sup>13</sup>C PFOA in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively

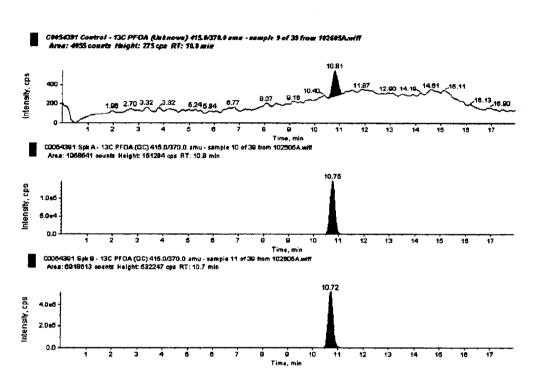


Figure 8. Chromatogram Representing a Fish Sample Analyzed for <sup>13</sup>C PFOA (Exygen ID: C0096710, Data Set: 102605A)

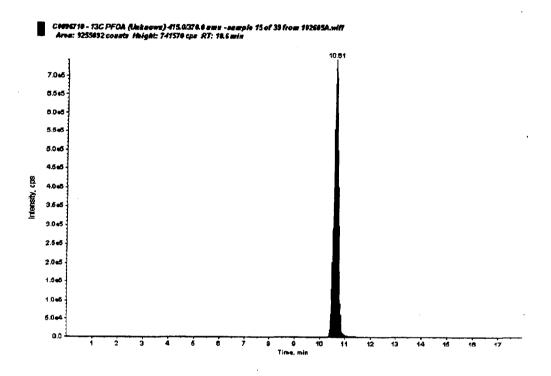
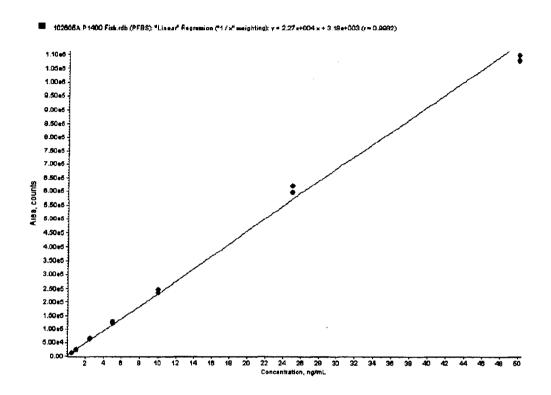


Figure 9. Typical Calibration Curve for PFBS in Methanol



Exygen Research

Figure 10. Non-Extracted Standards of PFBS in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively

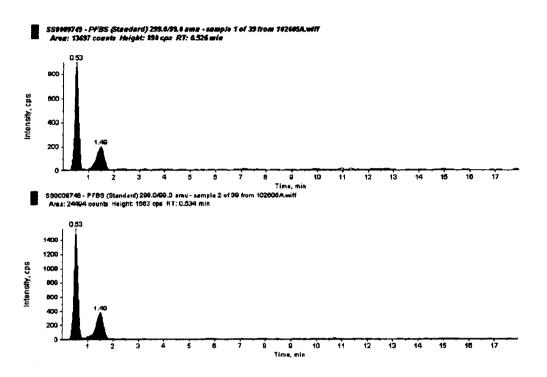


Figure 11. PFBS in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively

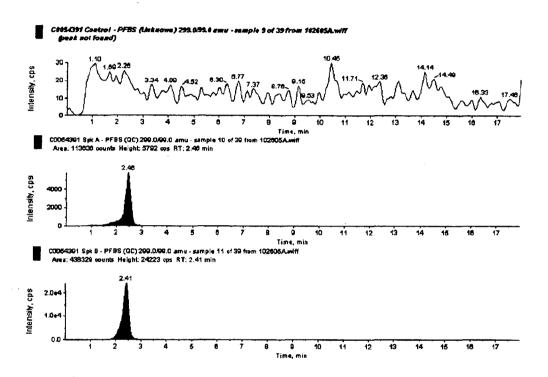


Figure 12. Chromatogram Representing a Fish Sample Analyzed for PFBS (Exygen ID: C0096710, Data Set: 102605A)

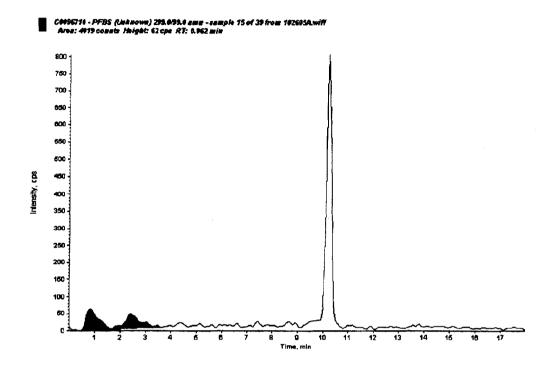
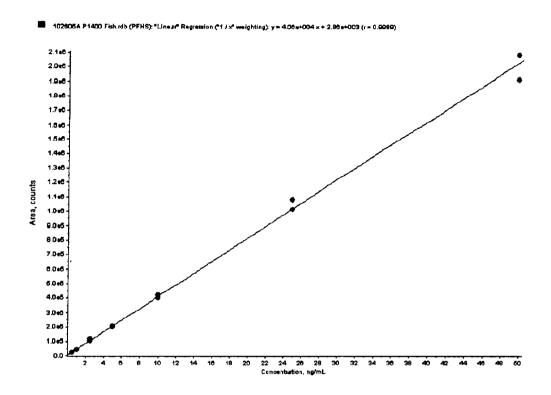
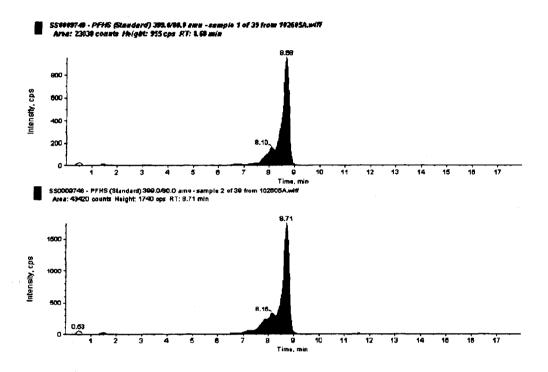


Figure 13. Typical Calibration Curve for PFHS in Methanol



Exygen Research

Figure 14. Non-Extracted Standards of PFHS in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively



Interim Report #6 - Analysis of Cottage Grove Fish Samples

Figure 15. PFHS in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively

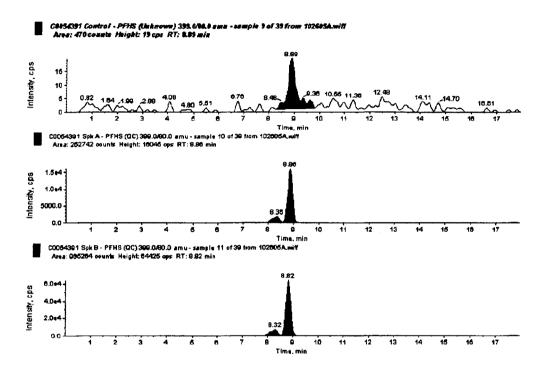


Figure 16. Chromatogram Representing a Fish Sample Analyzed for PFHS (Exygen ID: C0096710, Data Set: 102605A)

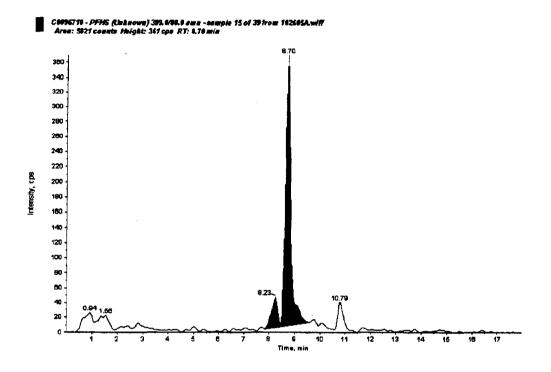
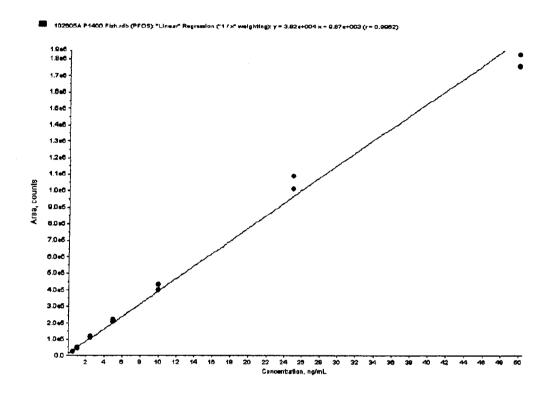


Figure 17. Typical Calibration Curve for PFOS in Methanol



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Interim Report #6 - Analysis of Cottage Grove Fish Samples

Figure 18. Non-Extracted Standards of PFOS in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively

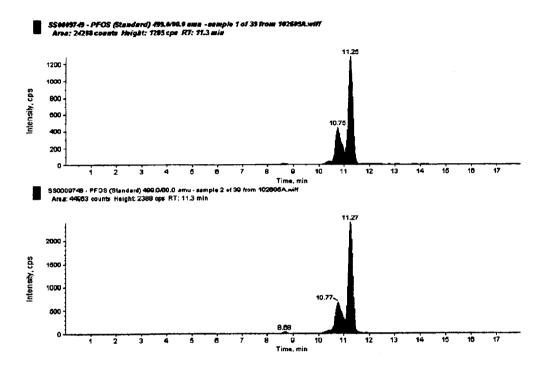


Figure 19. PFOS in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively

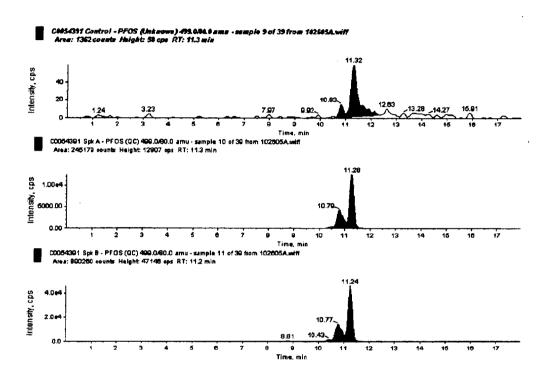
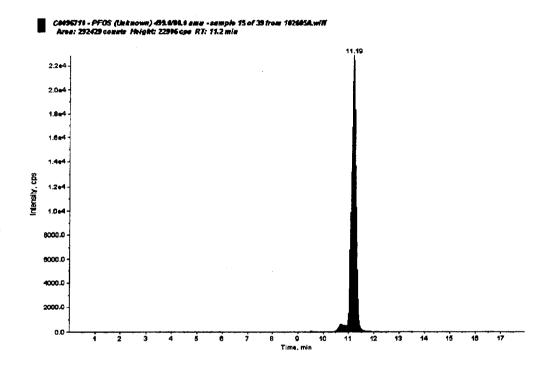


Figure 20. Chromatogram Representing a Fish Sample Analyzed for PFOS (Exygen ID: C0096710, Data Set: 102605A)





STL Chicago 2417 Bond Street University Park, IL 60466

Tel: 708 534 5200 Fax: 708 534 5211 www.stl-inc.com

# SEVERN TRENT LABORATORIES ANALYTICAL REPORT

JOB NUMBER: 236865

Prepared For:

Weston Solutions, Inc. 1400 Weston Way Building 5-2 West Chester, PA 19380-1499

Project: Confidential Client - Cottage Grove

Attention: Jai Kesari

Date: 06/13/2005

Signature

Name: Richard C. Wright

Title: Project Manager

E-Mail: rwright@stl-inc.com

Data

STL Chicago 2417 Bond Street

4/13/05

University Park, IL 60466

PHONE: (708) 534-5200 FAX..: (708) 534-5211

This Report Contains (35) Pages

Leaders in Environmental Testing

Severn Trent Laboratories, Inc.

## STL Chicago Wet Chemistry Case Narrative

Client:

Weston Solutions, Inc.

Job #:

236865

Date Rec'd:

05/23/05

- 1. This narrative covers the analysis of the samples in the above Job # for reactive CN and sulfide, flash point, pH, and TOC by the methods cited on the Laboratory Test Results pages.
- 2. The analysis was done within the EPA holding times. Refer to the Laboratory Chronicle Page for dates of sampling, receipt, and analysis.
- 3. The method blanks were less than the reporting limits.
- 4. The LCS recoveries were within acceptance limits.
- 5. See the Quality Control Results page for details of all matrix QC and non-matrix QC.

Diane L. Harper

Wet Chemistry Section Manager

Date

1.-305

### Severn Trent Laboratories - Chicago METALS CASE NARRATIVE

Client: Weston Solutions, Inc. Project ID: Conf. – Cottage Grove

STL Job#: 236865

Date Recd: 05/23/05

1. This narrative covers the Metals analysis of samples received in the above STL Job 236865.

Method Refs: USEPA, SW-846

- 2. All analyses were performed within the required holding times.
- 3. All Initial and Continuing Calibration Verification (ICV/CCV's) were within control limits.
- 4. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.
- 5. All Preparation/Method Blanks were less than the reporting limits.
- 6. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.
- 7. Laboratory Control Sample (LCS) recoveries were within the 80-120% control limits.
- 8. Matrix QC was performed on an alternate Job.

Jodi/L Gromala

Metals Section Manager

6-1-05

Date

#### Severn Trent Laboratories Chicago GC/MS Case Narrative

Weston Solutions Confidential Client: Cottage Grove Job Number: 236865 VOA DATA:

- 1. All samples were properly preserved and analyzed within the 14-day hold time from the date of collection.
- 2. All of the Method Blanks and Extraction Blank target compounds were below the reporting limits.
- 3. The LCS (Laboratory Control Sample) samples had all controlled spike recoveries within the inhouse generated QC limits for the water and soil samples.
- 4. Matrix Spike/Matrix Spike Duplicate analyses were mot performed on this sample set.
- 5. All of the volatile samples had surrogate recoveries within the in-house generated QC limits.
- 6. The TCLP samples were prepared using Method 5030. All samples were analyzed following SW846 Method 8260B and 8000B. All calibration criteria are met per method or SOP (for minimum R values for certain compounds). The low point in the initial calibration verifies the base reporting limits. The target compounds were quantitated using the initial calibration.
- 7. All of the internal standard areas and retention times were within SOP acceptance limits as compared to the corresponding calibration verification standard.
- 8. The TCLP samples were analyzed using a 10.0-mL purge volume with a 1/20 dilution.

John Nagel

GC/MS Dept.

Date

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#### Severn Trent Services - Chicago GC/MS BNA Case Narrative

Weston Solutions, Inc./Confidential Client - Cottage Grove

Job Number: 236865 BNA DATA: TCLP

- 1. All extractions and analyses were performed within recommended hold-times.
- 2. The MB (Method Blank) and the EB (TCLP blank) samples had all analytes undetected.
- 3. The LCS (Laboratory Control Sample) had the three control spike recoveries within the inhouse QC limits.
- 4. A MS (Matrix Spike) was not performed.
- 5. All samples had all surrogate recoveries within the in-house QC limits.
- 6. All samples had all internal standard areas and retention times within the SOP acceptance limits as compared to the corresponding calibration verification standard.
- 7. All samples were extracted and analyzed following USEPA SW846 8270C protocol. The samples and the TCLP Blank was extracted using 100-mL of the TCLP leachate. The MB and the LCS were extracted using 1000-mL of deionized water. The results and reporting limits were adjusted for the extraction volumes.

Gary Rynkar

GC/MS Section Manager

6/7/5

Date

### STL Chicago is part of Severn Trent Laboratories, Inc.

SAMPLE INFORMATION Date: 06/13/2005

Job Number:: 236865 Customer...: Weston Solutions, Inc. Attn.....: Jai Kesari

Project Number.....: 20005459
Customer Project ID...: CONF. - COTTAGE GROVE
Project Description...: Confidential Client - Cottage Grove

Laboratory	Customer	Sample	Date	Time	Date	Ţime
Sample 1D	Sample ID	Metrix	Sampled	Sampled	Received	Received
236865 - 1	C6MN SBC D201 0 0200	Soil	05/17/2005	11:30	05/23/2005	10:25
236865-2	C6MN SBC D104 0 0100	Soil	05/18/2005	09:45	05/23/2005	10:25
236865-3	C6MN SBC D104 0 0450	Soil	05/18/2005	11:20	05/23/2005	10:25
236865-4	C6MN SBC D103 0 0350	Soil	05/19/2005	08:35	05/23/2005	10:25
236865-5	C6MN SBC D103 O 0500	Soil	05/19/2005	09:30	05/23/2005	10:25
236865-6	C6MN D2005	Soil	05/17/2005	13:00	05/23/2005	10:25
236865-7	C6MN SBC D501 O 0150	Soil	05/20/2005	10:00	05/23/2005	10:25
236865-8	C6MN SBC D801 O 0050	Soil	05/20/2005	11:05	05/23/2005	10:25
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Page 1

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·•	Job Number: 236865	ABORATORY	TES	T RESULT	S L		Date: 0	Date: 06/13/2005		
CUSTOMER: Wes	CUSTOMER: Weston Solutions, Inc.	PROJECT: CONF.		COTTAGE GROV			ATTN:	Jai Kesari	T	
Custome Date Sa Time Sa Sample	Customer Sample ID: C6MN SBC D201 0 0200 Date Sampled: 05/17/2005 Time Sampled: 11:30 Sample Matrix: Soil		Labo Date Time	Laboratory Sample ID: 236865-1 Date Received: 05/23/2005 Time Received: 10:25	10: 236865-1 : 05/23/2005 : 10:25					
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT Q	FLAGS	10N	TA N	DILUTION	CWITS	BATCH D	DT DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	1400		62	270	-	mg/Kg	150758	<u>ි</u> සි	50 cts
								<u>_</u>		
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ري	* in Description = Dry Wgt.	Page 2	e 2							

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	Job Number: 236865	ABORATOR	YTES	T RESUL	S		Date:0	Date:06/13/2005		
CUSTOMER: Wes	CUSTOMER: Weston Solutions, Inc.	PROJECT	PROJECT: COMF C	COTTAGE GROV			ATTN:	Jai Kesari	ד	
Custome Date Sa Time Sa Sample P	Customer Sample ID: C6MN SBC D104 0 0100 Date Sampled: 05/18/2005 Time Sampled: 09:45 Sample Matrix: Soil		Labo Date Time	Laboratory Sample ID: 236865-2 Date Received: 05/23/2005 Time Received: 10:25	D: 236865-2 .: 05/23/2005 .: 10:25					
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q FLAGS	MOL	RL	DILUTION	STIMO	BATCH DT	DT DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	350		54	230		mg/Kg	150758	05/27/05 1357 cls	cls
				•						
ly.	* In Description = Dry Wgt.		Page 3							

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	Job Number: 236865	LABORATORY	TEST	RESUL	Ø In-		Date:06/13/2005	3/2005		
CUSTOMER: Wes	CUSTOMER: Weston Solutions, Inc.	PROJECT:	PROJECT: CONF COTTAGE GROV	TTAGE GROV			ATTN: Ja	Jai Kesari		
Custome Date Sa Time Sa Sample P	Customer Sample ID: C6MN SBC D104 0 0450 Date Sampled: 05/18/2005 Time Sampled: 11:20 Sample Matrix: S0il		Labor Date   Time	Laboratory Sample 1D: Date Received: Time Received	Laboratory Sample ID: 236865-3 Date Received: 05/23/2005 Time Received: 10:25					
TEST NETHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT (	Q FLAGS	NO.	RL	DILUTION L	E SINIT	BATCH DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	310		64	210		151 15	150758	05/27/05 1421 cls	<u> </u>
V.	* In Description = Dry Wgt.	e.g.	Page 4							

TECH 05/27/05 1441 cls BATCH OT DATE/TIME ATIN: Jai Kesari Date:06/13/2005 150758 CINITS mg/Kg DILUTION Laboratory Sample ID: 236865-4
Date Received...... 05/23/2005
Time Received...... 10:25 200 귤 RESULTS PROJECT: CONF. - COTTAGE GROV ē 24 TEST SAMPLE RESULT | 4 FLAGS Page 5 LABORATORY 240 PARAMETER/TEST DESCRIPTION \* In Description = Dry Wgt. Customer Sample 1D: C6MN SBC D103 0 0350 Date Sampled..... 05/19/2005 Time Sampled..... 08:35 Sample Matrix....: Soil Total Organic Carbon (Soils) TOC Average Duplicates, Solid CUSTOMER: Weston Solutions, Inc. Job Number: 236865 TEST METHOD Lloyd Kahn

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	Job Number: 236865	LABORATORY	S 3 L	T RESU	s 1 1		Date:0	Date:06/13/2005		
CUSTOMER: Wes	CUSTOMER: Weston Solutions, Inc.	PRDJECT: COVF.		+ COTTAGE GROV			ATTN:	Jai Kesari	ari	
Custome Date Sa Time Sa Sample	Customer Sample ID: C6MN SBC D103 0 0500 Date Sampled: 05/19/2005 Time Sampled: 09:30 Sample Matrix: Soil		Labo Date Time	Laboratory Sample ID: Date Received: Time Received:	10: 236865-5 : 05/23/2005 : 10:25					
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q FLAGS	NDL	RL	DILUTION	CHNITS	BATCH	DT DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	540		27	200		mg/Kg	150758	05/27/05 1502 cls	02 cls
										•
						:				
										_
									,	
				,		-				
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ę,	* In Description = Dry Wgt.	<b>a</b>	Page 6							

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	Job Number: 236865	ABORATOR	Y TES	ST RESUL	(/) 		Date:00	Date: 06/13/2005			
CUSTOMER: West	CUSTOMER: Weston Solutions, Inc.	PR0JECT:	: CONF	COTTAGE GROV			ATTN:	Jai Kesari	Ţ.		
Customer Date Sar Time Sar Sample N	Customer Sample ID: C6MN D2005 Date Sampled: 05/17/2005 Time Sampled: 13:00 Sample Matrix: Soil		Lal Dat Tin	Laboratory Sample ID: Date Received: Time Received:	ID: 236865-6 : 05/23/2005 : 10:25						
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q FLAGS	TOW	RL	PILUTION	UNITS	BATCH OT		DATE/TIME	TECH
7.3.3.2/9014	Reactivity, Cyanide Reactivity, Cyanide, Solid	2.3	5	2.3	2.3	1.	mg/Kg	151121	05/26/05 1159 mtb	1159	шtр
1010	Ignitability (Pensky-Martens Closed-Cup) Ignitability (Flashpoint), Solid	>200				<del></del>	degrees F	150475	05/31/05 1244 jmk	)5 1244	jīk
9045C	pH (Soil) Corrosivity (pH Solid), Solid	8.0		0.2	0.2	-	pH Units	150926			pmf
7.3.4.2/9034	Reactivity, Sulfide Reactivity, Sulfide, Solid	230	<u> </u>	8.1	230	ę	mg/Kg	150183	05/27/0	05/27/05 0929 mtb	шtр
7470A	Leachable, Mercury (CVAA) Mercury, TCLP Leach	0.0020	<b>-</b>	0.0020	0.0020		mg/L	150446	05/27/05 1538 gok	1538	gok
6010B	Leachable, Metals Analysis (ICAP) Arsenic, TCLP Leach Barium, TCLP Leach Cacmium, TCLP Leach Chromium, TCLP Leach Leach, TCLP Leach Selenium, TCLP Leach Selenium, TCLP Leach	0.10 0.48 0.050 0.050 0.050 0.10		0.010 0.010 0.002 0.010 0.010 0.010	0.10 1.0 0.050 0.050 0.050 0.10		98/F 98/F 98/F 98/F 98/F 98/F 98/F	150181 150181 150181 150181 150181	05/26/05 05/26/05 05/26/05 05/26/05 05/26/05 05/26/05 05/26/05	05 1813 05 1813 05 1813 05 1813 05 1813 05 1813	tds tds tds tds tds
<b>8270C</b>	Semivolatile Organics Pyridine, TCLP Leach 1,4-Dichlorobenzene, TCLP Leach 2-Methylphenol (o-cresol), TCLP Leach Hexachloroethane, TCLP Leach	200 100 100	בבבב	200 100 100		1.00000 1.00000 1.00000	7/6n 7/6n 7/6n 7/6n	151188 151188 151188 151188	06/06/05 06/06/05 06/06/05 06/06/05	05 1824 05 1824 05 1824 05 1824	\$ <del>\$</del> \$ \$
	* In Description = Dry Wgt.		Page 7						_		

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	Job Number: 236865	LABORATORY	E S	T RESUL	S		Date:0	Date:06/13/2005			
CUSTOMER: Wes	CUSTOMER: Weston Solutions, Inc.	PROJECT:	COMF.	COTTAGE GROV			ATTN:	Jai Kesari	ij		
Customer Date Sar Time Sar Sample P	Customer Sample ID: C6MN D2005 Date Sampled: 05/17/2005 Time Sampled: 13:00 Sample Matrix: Soil		Labor Date Time	Laboratory Sample ID: Date Received	D: 236865-6 .: 05/23/2005 .: 10:25				,		
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT G	G FLAGS	TOM	RL	DILUTION	CWITS	BATEH	DT DATE/TIME	TIME	TECH
82608	4-Wethylphenol (m/p-cresol), ICLP Leach Nitrobenzene, ICLP Leach Hexach lorobutadiene, TCLP Leach 2.4.6-Trichlorophenol, TCLP Leach 2.4.5-Trichlorophenol, TCLP Leach 2.4.5-Trichlorophenol, TCLP Leach Hexach lorobenzene, TCLP Leach Hexach lorobenzene, TCLP Leach Hexach lorobenzene, TCLP Leach Volatile Organics Vinyl chloride, TCLP Leach Chlorotom, TCLP Leach Chloroform, TCLP Leach Chloroform, TCLP Leach Carbon tetrachloride, TCLP Leach Carbon tetrachloroethene, TCLP Leach Carbon tetrachloroethene, TCLP Leach Lichloroethene, TCLP Leach Trichloroethene, TCLP Leach Tetrachloroethene, TCLP Leach Tetrachloroethene, TCLP Leach Tetrachloroethene, TCLP Leach Tetrachloroethene, TCLP Leach Tetrachloroethene, TCLP Leach Tetrachloroethene, TCLP Leach Tetrachloroethene, TCLP Leach Tetrachloroethene, TCLP Leach	000000000000000000000000000000000000000		ទីទីទីទីទីទីទីទី      សសសសសសសស	000000000000000000000000000000000000000	1.00000 1.00000 1.00000 1.00000 1.00000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	151188 151188 151188 151188 151188 151188 151453 151453 151453 151453 151453 151453	06/06/05 06/06/05 06/06/05 06/06/05 06/06/05 06/06/05 06/09/05 06/09/05 06/09/05 06/09/05 06/09/05 06/09/05	1824 1824 1824 1824 1824 1824 1824 1824	<del>इ. १. १. १. १. १. १. १. १. १. १. १. १. १.</del>
ς,	* In Description = Dry Wgt.	Page	8 eg								

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	Job Number: 236865	ABORATOR	Y TEST	RESUL	1 S		Date:0	Date:06/13/2005		
CUSTOMER: Wes	CUSTOMER: Weston Solutions, Inc.	PROJECT	PROJECT: CONF. + COTTAGE GROV	TAGE GROV			ATTN:	Jai Kesari	. <u>.</u>	
Custome Date Sar Time San Sample P	Customer Sample 1D: C6MN SBC D501 0 0150 Date Sampled: 05/20/2005 Time Sampled: 10:00 Sample Matrix: Soil		Labora Date R Time R	Laboratory Sample 1D: 236865-7 Date Received: 05/23/2005 Time Received: 10:25	D: 236865-7 .: 05/23/2005 .: 10:25					
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	066		88	380	<del>-</del>	mg/Kg	150758	05/27/05 1536 cls	c is
٤.	* In Description = Dry Wgt.	Pe	Page 9							

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CUSTOMER: Weston Solutions, Inc.  Customer Sample ID: CGMN SBC D801 0 0050 Date Sampled: 05/20/2005 Time Sampled: soil Sample Matrix: Soil  TEST METHOD  Total Organic Carbon (Soils) TOC Average Duplicates, Solid	Notibet	SAMPLE: R	Labo Date 11 ine 1	Laboratory Sample ID: 236865-8   Date Received 05/23/2005   Time Received 10:25   Time Received 10:25   Time Received   10:25   Time Received	D: 236865-8 .: 05/23/2005 .: 10:25 RL RL	1 ptrution	Date: 06  WHITS  mg/Kg	ATTN: Jai Kesari ATTN: Jai Kesari /Kg 150758	DT DATE/T1ME TEG	ME TECH
* In Description = Dry Wgt.		۵.	Page 10							

Electronic Data Delivariable   1	Job	LABORATO Number: 236865	кт СН	KONI	CLE	Date:	06/13/2005	
METHOD   DESCRIPTION   RLM# BATCH# PREP BT #(S)   DATE/TIME AMALYZED   DILUTIO   DESCRIPTION   Total Organic Carbon (Soils)   1 150758   150758   05/27/2005   1150   DILUTIO   DESCRIPTION   DESCRIPTION   Total Organic Carbon (Soils)   1 150758   150758   05/27/2005   1357   DATE/TIME AMALYZED   DILUTIO   DESCRIPTION   Total Organic Carbon (Soils)   DESCRIPTION   DESCRIPTION	CUSTOMER: Weston	Solutions, Inc. PROJ	ECT: CONF.	- COTTA	GE GROV		ATTN: Jai Kesari	
Lloyd Kahn   Total Organic Carbon (Soits)   1   150758   150758   05/27/2005   1150	METHOD	DESCRIPTION	RUN#	cvd: 05, BATCH#	/23/2005 PREP BT	Sample #(S)	Date: 05/17/2005 DATE/TIME ANALYZED	DILUTIO
DESCRIPTION   Total Organic Carbon (Soils)   1 150758 150758   150758 150758		Total Organic Carbon (Soils)		150758	150758		05/27/2005 1150	
AB ID: 236865-3 Client ID: C6MN SBC D104 0 0450 DESCRIPTION TOTAL Organic Carbon (Soils)  METHOD DESCRIPTION TOTAL Organic Carbon (Soils)  Lloyd Kahn Total Organic Carbon (Soils)  Date Recvd: 05/23/2005 Sample Date: 05/19/2005 DATE/TIME ANALYZED OS/27/2005 I421  BID: 236865-4 Client ID: C6MN SBC D103 0 0350 DESCRIPTION TOTAL Organic Carbon (Soils)  Lloyd Kahn Total Organic Carbon (Soils)  Date Recvd: 05/23/2005 Sample Date: 05/19/2005 DATE/TIME ANALYZED OS/27/2005 I441  BID: 236865-5 Client ID: C6MN SBC D103 0 0500 DESCRIPTION TOTAL Organic Carbon (Soils)  Date Recvd: 05/23/2005 Sample Date: 05/19/2005 DATE/TIME ANALYZED OS/27/2005 I502  BD 1 150758 150758  Date Recvd: 05/23/2005 Sample Date: 05/19/2005 DATE/TIME ANALYZED OS/27/2005 I502  BD 1 236865-6 Client ID: C6MN D2005 DESCRIPTION TOTAL ORGANIC CARDON RUM# BATCH# PREP BT #(s) DATE/TIME ANALYZED OS/27/2005 I502  BD 1 236865-6 Client ID: C6MN D2005 DESCRIPTION PREP BT #(s) DATE/TIME ANALYZED OS/27/2005 I502  BD 1 1510758 150758  Date Recvd: 05/23/2005 Sample Date: 05/17/2005 DESCRIPTION PREP BT #(s) DATE/TIME ANALYZED OS/27/2005 I502  DATE RECVD: 05/23/2005 Sample Date: 05/17/2005 DESCRIPTION PREP BT #(s) DATE/TIME ANALYZED OS/27/2005 I502  DATE RECVD: 05/23/2005 Sample Date: 05/17/2005 DESCRIPTION PREP BT #(s) DATE/TIME ANALYZED OS/27/2005 I502  DATE RECVD: 05/23/2005 Sample Date: 05/17/2005 DESCRIPTION PREP BT #(s) DATE/TIME ANALYZED OS/27/2005 I303 DATE/TIME ANALYZED DATE/TIME	METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT	Sample #(\$)	DATE/TIME ANALYZED	DILUTION
METHOD   Lloyd Kahn   Total Organic Carbon (Soils)   1   150758   150758   150758   12072/2005   1421   12072/2005   12072/2005   1421   12072/2005	,							
METHOD   Lloyd Kahn	METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT		DATE/TIME ANALYZED	DILUTION
Date   Date	METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT		DATE/TIME ANALYZED	DILUTION
NETHOD   DESCRIPTION   Total Organic Carbon (Soils)   RIN# BATCH# PREP BT #(S)   DATE/TIME ANALYZED   DILUTIO								
METHOD DESCRIPTION RUM# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION SOURCE	METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT		DATE/TIME ANALYZED	DILUTIO
5030B	METHOD	DESCRIPTION	Date Re	evd: 05/ BATCH#	23/2005 PREP BT	Sample #(S)		DILUTION
3510C Extraction for TCLP (SVOC) 1 150294 149796 05/27/2005 1700 3510C Extraction for TCLP (SVOC) 2 150847 149796 05/27/2005 0700 1010 Ignitability (Pensky-Martens Closed-Cup) 1 150475 150475 05/31/2005 1244 6010B Leachable, Mercury (CVAA) 1 150466 150444-149796 05/27/2005 1538 6010B Leachable, Metals Analysis (ICAP) 1 150181 149954-149796 05/26/2005 1813 7.3.3.2/9014 Reactivity, Cyanide 1 151121 150073 05/26/2005 1159 7.3.4.2/9034 Reactivity, Sulfide 1 150183 150183 05/27/2005 0929 7470 SW846 Dig. Leachates (Hg) 1 150183 150183 05/27/2005 0929 7470 Sw846 Dig. Leachates (Hg) 1 150183 150847-149796 06/06/2005 1824 8270C Semivolatile Organics 1 151188 150847-149796 06/06/2005 1824 1311 TCLP Extraction 1 149796 05/26/2005 1345 1311 TCLP Zero Headspace Extraction 1 150105 05/26/2005 1340 8260B Volatile Organics 1 151453 151452-150105 06/09/2005 0750 1.0000 8260B Volatile Organics 1 151453 151452-150105 06/09/2005 0750 1.0000 8260B Volatile Organics 1 150926 150926  ab ID: 236865-7 METHOD DESCRIPTION RUM# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION Bat ID: 236865-8 Client ID: C6MN SBC D801 0 0050 Description RUM# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION  Bat ID: 236865-8 METHOD DESCRIPTION RUM# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH PREP BT #(S) DATE/TIME ANALYZED DILUTION	5030B	5030CP TCLP/SPLP Prep	1 2	151302 151452			06/07/2005 2046 06/09/2005 0750	
1010	3510C	Extraction for ICLP (SVOC)	1	150294	149796	•	05/27/2005 1700	
Solid	7470A	Ignitability (Pensky-Martens Closed-Cup) Leachable, Mercury (CVAA)	1	150475	150475	149796	05/31/2005 1244	
7470 SW846 Dig. Leachates (Hg) 1 150444 05/27/2005 075/27/2005 1015 8270C Semivolatile Organics 1 151188 150847-149796 06/06/2005 1824 1.00000 1311 TCLP Extraction 1 149796 05/24/2005 1345 1311 TCLP Zero Headspace Extraction 1 150105 05/26/2005 1400 8260B Volatile Organics 1 151453 151452-150105 06/09/2005 0750 1.0000 9045C pH (Soil) 1 150926 150926  ab ID: 236865-7 Client ID: C6MN SBC D501 0 0150 Date Recvd: D5/23/2005 Sample Date: 05/20/2005 METHOD DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION ab ID: 236865-8 Client ID: C6MN SBC D801 0 0050 Date Recvd: 05/23/2005 Sample Date: 05/20/2005 METHOD DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION DESCRIPTION	7.3.3.2/9014	Reactivity, Cyanide	1	151121	150073	149796	05/26/2005 1813 05/26/2005 1159	
1	7470 8270c	SW846 Dig. Leachates (Hg) Semivolatile Organics	1	150444		149796	05/27/2005 1015	1.00000
9045C pH (Soil) 1 150926 150926  ab ID: 236865-7 Client ID: C6MN SBC D501 0 0150 DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION  ab ID: 236865-8 Client ID: C6MN SBC D801 0 0050 DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION  ab ID: 236865-8 Client ID: C6MN SBC D801 0 0050 DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION  BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION	1311	TCLP Zero Headspace Extraction	1	149796 150105			05/24/2005 1345 05/26/2005 1400	
METHOD DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION Lloyd Kahn Total Organic Carbon (Soils) 1 150758 150758 05/27/2005 1536  ab ID: 236865-8 Client ID: C6MN SBC D801 0 0050 Date Recvd: 05/23/2005 Sample Date: 05/20/2005 METHOD DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION							06/09/2005 0750	1.0000
Lloyd Kahn Total Organic Carbon (Soils) 1 150758 150758 05/27/2005 1536  ab ID: 236865-8 Client ID: C6MN SBC D801 0 0050 Date Recvd: 05/23/2005 Sample Date: 05/20/2005  METHOD DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION						Sample		DILUTION
METHOD DESCRIPTION RUN# BATCH# PREP BT #(S) DATE/TIME ANALYZED DILUTION	Lloyd Kahn					#(3)		DILUTION
Lloyd Kahn Total Organic Carbon (Soils) 1 150758 150758 05/27/2005 1607	METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT	Sample #(S)		DILUTION
	Lloyd Kahn	Total Organic Carbon (Soils)				-		

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SURROGATE RECOVERIES REPORT

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.

PROJECT: CONF. - COTTAGE GROVE ATTN: Jai Kesari

Mo Mo	ethod: Volatile Organics. ethod Code: 8260B				: TCLP			Prep Batch: 151452
Lab ID	DT Sample ID		Date	12DCED	BRFLBE	DBRFLM	TOLD8	
LCD LCS MB 236865- 2369582			06/09/2005 06/08/2005 06/08/2005 06/09/2005 06/09/2005	104 104 114 106 108	100 101 96 95 91	95 95 98 98 100	95 97 94 94 96	
Test	Test Description	Limits						
12DCED BRFLBE DBRFLM TOLD8	1,2-Dichloroethane-d4 (surr) 4-Bromofluorobenzene (surr) Dibromofluoromethane (surr) Toluene-d8 (surr)	62 - 127 67 - 132 77 - 119 81 - 126	2					

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Job Number.: 236865	SURROGATE	RECOVERIES	REPORT Report Date.: 06/13/2005	
CUSTOMER: 483648	PROJEC	T: CONF COTTAGE GR	OVE ATTN: Jai Kesari	

	Method Method Code.	: Semivolatile Organics : 8270	•			.: TCLP .: 1511			Prep	Batch:	150847
Lab ID	DT	Sample ID		Date	246TBP	2FLUBP	2FLUPH	NITRD5	PHEND5	TERD14	
B1 B1 B2 CS B 36865-	6	C6MN D2005		06/06/2005 06/06/2005 06/06/2005 06/06/2005 06/06/2005 06/06/2005	57 57 62 63 59	71 68 67 82 75 65	56 53 53 57 62 49	81 79 81 87 85 78	36 35 36 38 40 35	78 80 85 94 88 95	
Test	Test Des	cription	Limits								
246TBP 2FLUBP 2FLUPH NITRD5 PHEND5 TERD14	2-Fluoro 2-Fluoro Nitroben Phenol-d	ibromophenol (surr) biphenyl (surr) phenol (surr) zene-d5 (surr) 5 (surr) l-d14 (surr)	29 - 126 34 - 112 21 - 100 38 - 113 18 - 100 10 - 119	) }							

Jo	b Number.: 236865	QUA	LITY C	NTROI	. RES	SULTS	Repo	rt Date	e.: 06/1	3/2005	
CUSTOMER: Westo	n Solutions, Inc.		PROJECT: (	ONF CO	TAGE GRO	)VE	ATTN	; Jai K	esari		
QC Type	Descriptio	n .		Reag. Code		Lab ID	Dit	ution F	actor	Dat	e Tim
Test Method Method Descript	: 8270C ion.: Semivolatile Org	anics				: GCL10 : 151188		······	Analys	t:	dpk
EB1 Ex	traction Blank 1				15	0847-003				06/06	/2005 14
Paramete	r/Test Description	Units	<b>Q</b> C Result	QC Res	ult T	rue Value	Orig.	Value	QC Cal	c. *	Limits
		ug/L ug/L ug/L ug/L ug/L	200.000 100.000 100.000 100.000 100.000	U U U U							

Page 14 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Jol	b Number.: 236865	QUAL	ITY CO	NTROL	RESULTS	Report Date.: 06/	13/2005
CUSTOMER: Weston	n Solutions, Inc.		PROJECT: CO	NF COTTA	GE GROVE	ATTN:	
QC Type	Description	on .	R	eag. Code	Lab ID	Dilution Factor	Date Time
Test Method Method Descript	: 8270C ion.: Semivolatile Org	ganics			Code: GCL10		st: dpk
EB1 Ex1	traction Blank 1				150847-003		06/06/2005 1510
Docamata	r/Test Description		QC Result	QC Resul		Orig. Value OC Ca	1

Parameter/Test Description	Uni ts	QC Result		QC Result	True Valu	ıe	Orig.	Value	QC	Calc.	*	Limits	
Pyridine, TCLP Leach	ug/L	200.000		• • • • • • • • • • • • • • • • • • • •	•				_				
1,4-Dichlorobenzene, TCLP Leach	ug/L	100.000	U										
2-Methylphenol (o-cresol), TCLP Leach	ug/L	100.000	U										
Hexachloroethane, TCLP Leach	ug/L	100.000	U										
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	100.000	U										
Nitrobenzene, TCLP Leach	ug/L	100.000	U										
Hexachlorobutadiene, TCLP Leach	ug/L	100.000	U										
2,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000	U										
2,4,5-Trichlorophenol, TCLP Leach	ug/L	500.000	U										
2,4-Dinitrotoluene, TCLP Leach	ug/L	100.000	U										
Hexachlorobenzene, TCLP Leach	ug/L	100.000	U										
Pentachlorophenol, TCLP Leach	ug/L	500.000	U										

Page 15 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

	Job Number.: 236865	QUA	LITY C	ONT	ROLR	ESULIS	Repo	rt Date	06/1	3/2005	
CUSTOMER: Wes	ton Solutions, Inc.		PROJECT:	CONF.	- COTTAGE	GROVE	ATTN	:			
QC Type	Description	on		Reag	Code	Lab ID	Dil	ution F	actor	Date	Time
Test Method Method Descri	: 8270C ption.: Semivolatile Org	anics		Equ Bat	ipment Coc	de: GCL10 : 151188			Analys	t: dpl	ς
	Extraction Blank 2 ter/Test Description	Units	QC Result		C Result	150847-005		777		06/06/20	005 154
yridine, TCLP ,4-Dichlorober -Methylphenol exachloroethar -Methylphenol itrobenzene, 1 exachlorobutac ,4,6-Trichlorc ,4,5-Trichlorc ,4-Dinitrotolu exachlorobenze	Leach Title Leach (o-cresol), TCLP Leach (o-cresol), TCLP Leach (m/p-cresol), TCLP Leac CCLP Leach ifene, TCLP Leach phenol, TCLP Leach phenol, TCLP Leach phenol, TCLP Leach phenol, TCLP Leach	ug/L ug/L ug/L	200.000 100.000 100.000 100.000 100.000 100.000 100.000 500.000 100.000 100.000	ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט	c result	True Value	Orig.	Value	QC Cald	:- * L	imits.

Job Number.: 236865

QUALITY CONTROL RESULTS
Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.
PROJECT: CONF. - COTTAGE GROVE
ATTN:

QC Type
Description
Reag. Code
Lab ID
Dilution Factor
Date Time

Test Method.....: 8270C Equipment Code...: GCL10 Analyst...: dpk
Method Description: Semivolatile Organics Batch.....: 151188

,4-Dichlorobenzene, TCLP Leach  '-Methylphenol (o-cresol), TCLP Leach u exachloroethane, TCLP Leach u -Methylphenol (m/p-cresol), TCLP Leac u itrobenzene, TCLP Leach	19/L 19/L 19/L	63.016 78.093 76.857	 100.000 100.000	20.000 10.000	U 63		16-100
Methylphenol (o-cresol), TCLP Leach uxachloroethane, TCLP Leach whethylphenol (m/p-cresol), TCLP Leac utrobenzene, TCLP Leach	ıg/L			10.000	11 70		
exachloroethane, TCLP Leach u Methylphenol (m/p-cresol), TCLP Leac u itrobenzene, TCLP Leach u	•-	76.857			U /0	%	38-100
Methylphenol (m/p-cresol), TCLP Leac u trobenzene, TCLP Leach			100.000	10.000	U 77	%	37-100
trobenzene, TCLP Leach		72.158	100.000		U 72	%	34-100
anning a second control of the contr	19/L 19/L	74.011 79.886	100.000	10.000	U 74	%	35-106
AGUILUIUGULGULERE. ILLY LEACH III	ig/L	62.966	100.000	10.000	U 80	%	41-105
1 1 max - 1	1g/L	85.824	100.000	10.000	U 63	%	41-100
/ C W= 1.1.1	ıg/L	82.419	100.000		U 86	%	51-101
	ıg/L	85.191	100.000		U 82	%	54-107
t.	ıg/L	75.485	100.000 100.000		U 85	%	56-115
	ig/L	67.542	100.000	10.000 50.000	U 75	%	50-113 50-112

Page 17 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

d.	lob Number.: 236865	QUA	LITY C	ONTROL R	ESULTS	Report Date.: 06/1	3/2005
CUSTOMER: West	on Solutions, Inc.		PROJECT: (	CONF COTTAGE	GROVE	ATTN:	
QC Type	Descriptio	n		Reag. Code	Lab ID	Dilution Factor	Date Time
Test Method Method Descrip	: 8270c rtion.: Semivolatile Org	anics		Equipment Cod Batch	de: GCL10 : 151188	Analys	t: dpk
MB M	ethod Blank				150847-001		06/06/2005 1335
		<u> </u>					
Paramet	er/Test Description	Units ug/L	QC Result	QC Result	True Value	Orig. Value QC Cal	

Page 18 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

•	Job Number.: 236865	QUALI	ΤΥ	CONT	R O L R	ESUL	rs	Report Date.: 06/	13/2005	
CUSTOMER: West	ton Solutions, Inc.		PROJEC	T: CONF.	COTTAGE	GROVE		ATTN:		
QC Type	Descriptio	n		Reag.	Code	Lab	1D	Dilution Factor	Date	Time

	~ <del>~~~</del>	
Test Method: 8260B Method Description:: Volatile Organics	Equipment Code: GCL16 Batch: 151453	Analyst: jdn
	00.000	

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	* Limits	F
Vinyl chloride, TCLP Leach	ug/L	100.000 U		<del></del>	•		. – – – – – –	
1,1-Dichloroethene, TCLP Leach	ug/L	100 000 U			•			
2-Butanone (MEK), TCLP Leach	ug/L	100.000 U						
Chloroform, TCLP Leach	ug/L	100.000 U						
Carbon tetrachloride, TCLP Leach	ug/L	100.000 U						
Benzene, TCLP Leach	ug/L	100.000 U						
1,2-Dichloroethane, TCLP Leach	ug/L	100.000 U						
Trichloroethene, TCLP Leach	ug/L	100.000 U						
Tetrachloroethene, TCLP Leach	ug/L	100.000 U						
Chlorobenzene, TCLP Leach	ug/L	100.000 U						

Page 19 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

•	Job Number.: 236865	QUALITY	CONTROL	RESULTS	Report Date.: 06/	13/2005	
CUSTOMER: I	Veston Solutions, Inc.	PROJE	CT: CONF COTTA	GE GROVE	ATTN:		
QC Type	Description		Reag. Code	Lab ID	Dilution Factor	Date	Time

	······································	
Test Method: 82608 Method Description: Volatile Organics	Equipment Code: GCL16 Batch 151453	Analyst: jdn

Units	<b>Q</b> C Result	QC Result	True Value	Orig. Value QC Calc.	* Limits
ug/L	440.306	430.582	500.000	100.000 U 88	% 52-134
ug/L	604.904	596.438	500.000	2 100.000 U 121	R 20 % 51-136
ug/L	409.448	418.416	500.000	1 100.000 U 82	R 20 % 29-139
ug/L	510.036	502.236	500.000	2 100.000 U 102	R 20 % 75-122
ug/L	541.028	536.628	500.000	2 100.000 U 108	R 20 % 64- <b>1</b> 32
ug/L	454.428	456.948	500.000	1 100.000 U 91	R 20 % 75-122
ug/L	533.606	530.044	500.000	1 100.000 U 107	R 20 % 67-120
ug/L	506.326	499.046	500.000	100.000 U 101	R 20 % 75-124
ug/L	464.208	477.414	500.000	1	R 20 % 70-125
ug/L	455.818	463.848	500.000	3 100.000 U 91	R 20 % 76-116
	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	ug/L       604.904         ug/L       409.448         ug/L       510.036         ug/L       541.028         ug/L       454.428         ug/L       533.606         ug/L       506.326         ug/L       464.208	ug/L       604.904       596.438         ug/L       409.448       418.416         ug/L       510.036       502.236         ug/L       541.028       536.628         ug/L       454.428       456.948         ug/L       533.606       530.044         ug/L       506.326       499.046         ug/L       464.208       477.414	Ug/L       604.904       596.438       500.000         Ug/L       409.448       418.416       500.000         Ug/L       510.036       502.236       500.000         Ug/L       541.028       536.628       500.000         Ug/L       454.428       456.948       500.000         Ug/L       533.606       530.044       500.000         Ug/L       506.326       499.046       500.000         Ug/L       464.208       477.414       500.000	ug/L     440.306     430.582     500.000     100.000     U 88       ug/L     604.904     596.438     500.000     100.000     U 121       ug/L     409.448     418.416     500.000     100.000     U 82       ug/L     510.036     502.236     500.000     100.000     U 102       ug/L     541.028     536.628     500.000     100.000     U 108       ug/L     454.428     456.948     500.000     100.000     U 91       ug/L     533.606     530.044     500.000     100.000     U 107       ug/L     506.326     499.046     500.000     100.000     U 101       ug/L     464.208     477.414     500.000     100.000     U 93

	Job Number.: 236865	QUALITY	CONTROL	RESULTS	Report Date.: 06/1	3/2005	
CUSTOMER: Wes	ston Solutions, Inc.	PROJEC	CT: CONF COTTAG	E GROVE	ATTN:		
QC Type	Descriptio			T	T T	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0 - 2 - 600 (1000)

Test Method: 8260B Method Description.: Volatile Organics	Equipment Code: GCL16 Batch	Analyst: jdn

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value QC Calc.	* Limits
inyl chloride, TCLP Leach	ug/L	430.582		500,000	100.000 U 86	% 52-13 <sub>0</sub>
1-Dichloroethene, TCLP Leach	ug/L	596.438		500.000	100.000 U 119	% 51-13
Butanone (MEK), TCLP Leach	ug/L	418.416		500,000	100.000 U 84	% 29-13
loroform, TCLP Leach	ug/L	502.236		500.000	100.000 U 100	% 75-12
rbon tetrachloride, TCLP Leach	ug/L	536.628		500,000	100.000 U 107	% 64-13
nzene, TCLP Leach	ug/L	456,948		500,000	100.000 U 91	% 75-12
2-Dichloroethane, TCLP Leach	ug/L	530.044		500.000	100,000 U 106	% 67-12
ichloroethene, TCLP Leach	ug/L	499.046		500,000	100.000 U 100	% 75-124
etrachloroethene, TCLP Leach	ug/L	477.414		500.000	100.000 U 95	% 70-12
nlorobenzene, TCLP Leach	ug/L	463.848		500.000	100.000 U 93	% 76-12:

	Job Number.: 236865	QUALITY	C.ONTROL	RESULTS	Report Date.: 06/	3/2005	
CUSTOMER: 1	Veston Solutions, Inc.	PROJEC	T: CONF COTTA	AGE GROVE	ATTN:		
QC Type	Description		Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8260B Equipment Code...: GCL16 Analyst...: jdn Method Description.: Volatile Organics Batch....: 151453

Parameter/Test Description	Uni ts	QC Result	QC Result	True Value	Orig. Value	QC Calc.	* limits	500.000
inyl chloride, TCLP Leach	ug/L	100.000	U					
,1-Dichloroethene, TCLP Leach	ug/L	100,000	ū					
-Butanone (MEK), TCLP Leach	ug/L	100.000	Ū					
nloroform, TCLP Leach	ug/L	100.000	Ü					
rbon tetrachloride, TCLP Leach	ug/L	100.000	Ü					
nzene, TCLP Leach	ug/L	100.000	Ŭ					
2-Dichloroethane, TCLP Leach	ug/L	100.000	Ū					
ichloroethene, TCLP Leach	ug/L	100.000	Ü					
trachloroethene, TCLP Leach	ug/L	100.000	•					
ntorobenzene, TCLP Leach	ug/L	100.000	_					

Page 22 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 236865	AUP	LITY CO	NTROL R	ESULTS	Report Date.: 06	/13/2005
CUSTOMER: Weston Solutions, Inc.		PROJECT: CO	NF COTTAGE	GROVE	ATTN: Jai Kesari	
QC Type Descript	tion	R	eag. Code	Lab ID	Dilution Factor	Date Time
Test Method: 6010B Method Description:: Leachable, Met	tals Analysis	(ICAP)	Equipment Coo	de: ICP4	Anal	yst: tds
EB1 Extraction Blank 1		149	9954	149954-001		05/26/2005 1509
Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value QC C	alc. * Limits
Arsenic, TCLP Leach Barium, TCLP Leach Cadmium, TCLP Leach Chromium, TCLP Leach Lead, TCLP Leach Selenium, TCLP Leach	mg/L mg/L mg/L mg/L mg/L mg/L	0.01000 t 0.01000 t 0.00200 t 0.01000 t 0.00500 t	) } }			

QUALITY CONTROL RESULTS Job Number.: 236865 Report Date.: 06/13/2005 CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN: QC Type Description Reag. Code Lab ID Dilution Factor Date Time Test Method.....: 6010B Method Description.: Leachable, Metals Analysis (ICAP) Analyst...: tds

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	* Lim	its	F
Arsenic, TCLP Leach Barium, TCLP Leach Cadmium, TCLP Leach Chromium, TCLP Leach Lead, TCLP Leach Selenium, TCLP Leach Silver, TCLP Leach	mg/L mg/L mg/L mg/L mg/L mg/L	0.01000 U 0.01000 U 0.00200 U 0.01000 U 0.00500 U 0.01000 U 0.00500 U						_	-

•	lob Number.: 236865	LITY	CONTI	ROLF	RESULTS	Report Date.: 06/	13/2005	
CUSTOMER: West	ion Solutions, Inc.	PROJECT	: CONF.	COTTAGE	GROVE	ATTN:		
QC Type	Description		Reag.	Code	Lab ID	Dilution Factor	Date	Time

Test Method: 6010B Method Description: Leachable, Metals Analysis (ICAP)	Equipment Code: ICP4 Batch	Analyst: tds

LGS Laboratory Control Sam	ple	M05E	SPK002	149954-003		05	/26/	2005 152	1
Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach Barium, TCLP Leach Cadmium, TCLP Leach Chromium, TCLP Leach Lead, TCLP Leach	mg/L mg/L mg/L mg/L mg/L	0.10135 1.91758 0.05023 0.19717 0.10452		0.10000 2.00000 0.05000 0.20000 0.10000		101 96 100 99	% % % %	80-120 80-120 80-120 80-120 80-120	
Selenium, TCLP Leach Silver, TCLP Leach	mg/L mg/L	0.09543 B 0.04579 B		0.10000 0.05000		95 92	% %	80-120 80-120	

Page 25 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

CU	ISTOMER: We	ton Soluti	ens. Inc.		PROJECT: C	ONF COTTAGE	GROVE		ATTN:	lai.	Kecari		
pret													- 100
Me	ethod Descr		activity, (	yanide		Batch Equipment Cod	••••••••••••••••••••••••••••••••••••••	151121 SPEC4			Analyst Test Code	.: mtb .: REACCN	
C.	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig.	Value	QC Calc.	F	* Limits	Date	Ti
	150073-004 150073-005	105BSTCN2	mg/L mg/L	0.01000 U 0.09190		0.10000	0.	.01000 U	92		% 85-115	05/26/2005 05/26/2005	
Me	thod Descr	: Ll ption.: To	tal Organic	Carbon (Soils) n, Tot. (TOC)		Batch Equipment Cod					Analyst Test Code		
26099 <b>3</b>	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig.	Value	QC Calc.	F	* Limits	Date	<u></u>
 3	150758-003		mg/Kg	29.00 U							- <del>'</del>	05/27/2005	
Me	thod Descri	: LL ption.: To	tal Organic	Carbon (Soils) uplicates		Batch Equipment Cod					Analyst Test Code	.: cls .: TOCAV2	
:	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig.	Value	QC Calc.	F	* Limits	Date	Ţ
cs -	150758-004	100FSTLK3	mg/Kg	5441.74		4780.00			114		% 53-140	05/27/2005	0
Мe	thod Descri	: 90 ption.: pH : Co	(Soil)	pH Solid)		Batch Equipment Cod		150926			Analyst Test Code	.: pmf :: CORSOL	
:	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig.	Value	QC Calc.	F	* Limits	Date	Ţ
H :	236865-6		pH Units	7.98000	<del></del>		7.	99000	0.01000	_	A 0.20000		
Me	thod Descri	: 90/ ption.: pH : pH	(Scil)			Batch Equipment Cod					Anelyst Test Code		
:	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig.	Value	QC Calc.	F	* Limits	Date	1
P	236865-6 150926-002 150926-003		pH Units pH Units pH Units	7.98000 7.00000 6.98000		7.00000 7.00000	7.	99000	0.01000 0.00 0.02000		A 0.20000 A 0.20000 A 0.20000		
Me	thod Descri	7.: ption.: Res	ectivity, S	ulfide ulfide		Batch Equipment Cod					Analyst., Test Code		48 W
456	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig.	Value	QC Calc.	F	* Limits	Date	T
	150183-001		mg/Kg	8.80 U								05/27/2005	_

Page 26 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 236865

QUALITY CONTROL RESULTS

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.

PROJECT: CONF. - COTTAGE GROVE ATTN: Jai Kesari

Me	est Method. ethod Descr erameter	iption.: Le	achable, I	Mercury (CVAA)		Batch Equipment Co	: 150448 de: HG4	,		Analyst. Test Code		
30	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc	. F ¹	* Limits	Date	Time
:B1	150293-007 150293-008 150293-009 150293-024 150444-007	784	ug/L ug/L mg/L mg/L ug/L	0.20 U 1.95 0.00200 U 0.00200 U 0.20 U		2.00	0.20	U <b>9</b> 8	;	80-120	05/27/2005 05/27/2005 05/27/2005 05/27/2005 05/27/2005	1333 1335 1415
:B1 :B1 :B2	150444-008 150444-009 150444-011 150444-012 150444-031	M04LSTK010 776 781 781 785	ug/L mg/L mg/L mg/L mg/L	1.87 0.00200 U 0.00200 U 0.00200 U 0.00200 U		2.00	0.20	U 94	,	80-120	05/27/2005 05/27/2005 05/27/2005 05/27/2005 05/27/2005	1441 1443 1447 1450

## QUALITY ASSURANCE METHODS REFERENCES AND NOTES

Report Date: 06/13/2005

#### REPORT COMMENTS

- 1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.
- 2) Soil, sediment and sludge sample results are reported on a "dry weight" basis except when analyzed for landfill disposal or incineration parameters. All other solid matrix samples are reported on an "as received" basis unless noted differently.
- 3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.
- 4) The test results for the noted analytical method(s) meet the requirements of NELAC. Lab Cert. [D# 100201 5) According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed
- immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH Field) they were not analyzed immediately, but as soon as possible on laboratory receipt.

Glossary of flags, qualifiers and abbreviations (any number of which may appear in the report) Inorganic Qualifiers (Q-Column)

- Analyte was not detected at or above the stated limit.
- Not detected at or above the reporting limit.
- Result is less than the RL, but greater than or equal to the method detection limit. Result is less than the CRDL/RL, but greater than or equal to the IDL/MDL.
- Result was determined by the Method of Standard Additions.
- AFCEE: Result is less than the RL, but greater than or equal to the method detection limit. Inorganic Flags (Flag Column)

- ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,MRL: Instrument related QC exceed the upper or lower control limits.
- LCS, LCD, MD: Batch QC exceeds the upper or lower control limits. MSA correlation coefficient is less than 0,995.
- - MS, MSD: The analyte present in the original sample is 4 times greater
  - than the matrix spike concentration; therefore, control limits are not applicable.
- SD: Serial dilution exceeds the control limits.
- MB, EB1, EB2, EB3: Batch QC is greater than reporting limit or had a
- negative instrument reading lower than the absolute value of the reporting limit.
- N MS, MSD: Spike recovery exceeds the upper or lower control limits.
  W AS(GFAA) Post-digestion spike was outside 85-115% control limits.
  Organic Qualifiers (Q Column)

- Analyte was not detected at or above the stated limit.
- Compound not detected. ND
- Result is an estimated value below the reporting limit or a tentatively
  - identified compound (TIC).
- Result was qualitatively confirmed, but not quantified. Pesticide identification was confirmed by GC/MS.
- The chromatographic response resembles a typical fuel pattern.
- The chromatographic response does not resemble a typical fuel pattern.
- Result exceeded calibration range, secondary dilution required.

  AFCEE:Result is an estimated value below the reporting limit or a tentatively identified compound (TIC) Organic Flags (Flags Column)
- MB: Batch QC is greater than reporting limit.
- LCS, LCD, ELC, ELD, CV, MS, MSD, Surrogate: Batch QC exceeds the upper or lower control limits. EB1, EB2, EB3, MLE: Batch QC is greater than reporting Limit Concentration exceeds the instrument calibration range
- Concentration is below the method Reporting Limit (RL)
- Compound was found in the blank and sample.
- Surrogate or matrix spike recoveries were not
  - obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D.
- Alternate peak selection upon analytical review
- Indicates the presence of an interfence, recovery is not calculated.
- Manually integrated compound.
- The lower of the two values is reported when the % difference between the results of two GC columns is

# QUALITY ASSURANCE METHODS REFERENCES AND NOTES

Report Date: 06/13/2005

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greater than 25%.
Abbreviations
         Post Digestion Spike (GFAA Samples - See Note 1 below)
AS
         Designation given to identify a specific extraction, digestion, preparation set, or analysis set
Batch
CAP
          Capillary Column CCB Continuing Calibration Blank
CCV
         Continuing Calibration Verification
         Confirmation analysis of original
Confirmation analysis of A1 or D1
CF
C1
         Confirmation analysis of A2 or D2
C2
C3
          Confirmation analysis of A3 or D3
         Low Level Standard Check - GFAA; Mercury
Low Level Standard Check - ICP
CRA
CRI
          Calibration Verification Standard
CV
         Dilution Factor - Secondary dilution analysis
Dil Fac
         Dilution 1
D1
         Dilution 2
DZ
D3
         Dilution 3
DLFac
         Detection Limit Factor
         Distilled Standard - High Level
Distilled Standard - Low Level
DSH
DSL
         Distilled Standard - Medium Level
DSM
          Extraction Blank 1
FR1
          Extraction Blank 2
FB2
          DI Blank
EB3
          Method Extracted LCS
FLC
          Method Extracted LCD
ELD
          Initial calibration
ICAL
          Initial Calibration Blank
ICB
ΙCV
          Initial Calibration Verification
IDL
          Instrument Detection Limit
          Interference Check Sample A - ICAP
ISA
          Interference Check Sample B - ICAP
The first six digits of the sample ID which refers to a specific client, project and sample group
ISB
Job No.
          Lab ID An 8 number unique Laboratory identification
          Laboratory Control Standard Duplicate
LCD
          Laboratory Control Standard with reagent grade water or a matrix free from the analyte of interest
LCS
MB
          Method Blank or (PB) Preparation Blank
MD
          Method Duplicate
          Method Detection Limit
MDL
MLE
          Medium Level Extraction Blank
MRL
          Method Reporting Limit Standard
          Method of Standard Additions
MSA
          Matrix Spike
Мς
          Matrix Spike Duplicate
MSD
          Not Detected
ND
          Preparation factor used by the Laboratory's Information Management System (LIMS)
PREPE
          Post Digestion Spike (ICAP)
PDS
          Re-analysis of original
RA
          Re-analysis of D1
A1
A2
          Re-analysis of D2
A3
          Re-analysis of D3
          Re-extraction of dilution
RD
          Re-extraction of original
RE
          Re-extraction Confirmation
RC
          Reporting Limit
          Relative Percent Difference of duplicate (unrounded) analyses
RPD
RRF
          Relative Response Factor
          Retention Time
```

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### QUALITY ASSURANCE METHODS

### REFERENCES AND NOTES

### Report Date: 06/13/2005

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six digits are referred as the job number
 SCB
                   Seeded Control Blank
 SD
                   Serial Dilution (Calculated when sample concentration exceeds 50 times the MDL)
                  Unseeded Control Blank
Second Source Verification Standard
 UCB
 SSV
                  Second Source Verification Standard
Solid Laboratory Control Standard(LCS)
pH Calibration Check LCSP pH Laboratory Control Sample
pH Laboratory Control Sample Duplicate
pH Sample Duplicate
 SLCS
 PHC
 LCDP
 MDPH
 MDFP
                   Flashpoint Sample Duplicate
 LCFP
                  Flashpoint LCS
 G1
                  Gelex Check Standard Range 0-1
 G2
                  Gelex Check Standard Range 1-10
Getex Check Standard Range 10-100
G4 Getex Check Standard Range 10-100
Note 1: The Post Spike Designation on Batch QC for GFAA is designated with an "S" added to the current abbreviation used. EX. LCS S=LCS Post Spike (GFAA); MSS=MS Post Spike (GFAA)
Note 2: The MD calculates an absolute difference (A) when the sample concentration is less than 5 times the reporting limit. The control limit is represented as +/- the RL.
```

Retention Time Window Sample ID A 9 digit number unique for each sample, the first

RTW

								201 100					n	Shaded Areas For Internal Use Only	Only of
	1	Contact:	F	J	∹			Contact	PAR		ZONETI1			1 ab 1 ot# 13(~9/-	2.18
SEVERN	STL		3 2	25 P	ر کر ا	PUMPHEN A	ens EN AVE		140	Company: WESTON SOLUTIONS	12070 120710	N.S	[34572	y general	Samples Scaled
STL Chicago	ı	1	AVBURN	A	AL	35601			という	WEST CHESTER	PA PA	_	:   S		Yes (No)
2417 Bond Street	2900	Phone:	18. 334-466-5653	3	15-51	8		Phone:	610-701	4-101	1 37	1 1	ا ا و	Received on Ice	Samples Intact
Phone: 708-534-5200 Fax: 708-534-5211	00 11	Fax: E-Mail:		TIGO - OGLO	30°	Stavo	- 766-5660 RINAKQUESTENSOLUTIONES	- デ で で (章	101-019		-7401		<b> 2</b>    	mperature 10 of 0	
Sampler Name:		Signature:			Parties &	2.0								ζ-	(0.0)
ETHAN C	CALDWELL	Jams			#/Cont	, E							5 is	•	Preserv/Indicated
Project Name:		Project Number:			Volume										Yes No (NA)
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Project Location:		Date Required				-	5.4						S	Sabels and CO	Agree No (18)
Lab PM:		Fax:				Sral	لمدا	·						) No	COC not present
Laboratory ID MS-MSD	Client Sample ID	ent de ID	Sampling Date Tim	ing Time	1sM	SoT	Stèrat				·	,		Additional Analyses / Remarks	Remarks
	CLMN SBC	2001000	11/5	138	15	<u> </u>		-		+	_		+		
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3	CLMN 53C Diey 0	Sto O hor	5/16	25	5	\ \ \ \ \				-	-		+-		
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	CLMN SRC DSBI D DISD	Desi o oise	5/20 10	1000	sc	X						-	$\vdash$		
$\Omega$	C6 MV 5BC	58c De0100050	5/20 11	105	3 C	⊢.		_				-	-		
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RELINQUISHED BY	,	COMPANY	DATE			TIME	<b>-</b>	RECEIVED BY	No.	1111	1	сомрумо		1	TIMPAO
	Matrix Key	ပိ	Container Key.	-	P. P. B. B. B. B. B. B. B. B. B. B. B. B. B.	Preservative Key	1	COMMENTS	4	The same				W/C2/W	1000
WW = Wastewater W = Water - S = Soil SL = Sludge MS = Miscellaneous OL = Off	SE = Sediment SO=Solid DS = Drum Solid DL = Drum Liquid L = Leachate WI = Wipe	 -  v  w  4 rv  rq 	Plastic VOA Vial Starile Plastic Arriber Glass Widemouth Glass Other	401 m 4 m m	HCI, Cool to 4* H2SO4, Cool to 4* HNO3, Cool to 4* NaOH, Cool to 4* NaOH/Zn, Cool to	HCI, Cool to 4* H2SO4, Cool to 4* HN03, Cool to 4* NaOH, Cool to 4* NaOH, Cool to 4* Cool to 4*	· .							Date Received Courier: Ha	Hand Delivered
A - Air	H 0				None										



STL Chicago 2417 Bond Street University Park, IL 60466

Tel: 708 534 5200 Fax: 708 534 5211 www.stl-inc.com

## SEVERN TRENT LABORATORIES ANALYTICAL REPORT

JOB NUMBER: 237037

Prepared For:

Weston Solutions, Inc. 1400 Weston Way Building 5-2 West Chester, PA 19380-1499

Project: Confidential Client - Cottage Grove

Attention: Jai Kesari

Date: 06/13/2005

Signature

Richard C. Wright Name:

Title: Project Manager

E-Mail: rwright@stl-inc.com

Date

STL Chicago

2417 Bond Street

University Park, IL 60466

6/13/05

PHONE: (708) 534-5200 FAX..: (708) 534-5211

This Report Contains (36

Leaders in Environmental Testing

Severn Trent Laboratories, Inc.

# STL Chicago Wet Chemistry Case Narrative

Client:

Weston Solutions, Inc.

Job#:

237037

Date Rec'd:

05/27/05

- 1. This narrative covers the analysis of the samples in the above Job # for CN, reactive sulfide, flash point, pH, and TOC by the methods cited on the Laboratory Test Results pages.
- 2. The analysis was done within the EPA holding times. Refer to the Laboratory Chronicle Page for dates of sampling, receipt, and analysis.
- 3. The method blanks were less than the reporting limits.
- 4. The LCS recoveries were within acceptance limits.
- 5. The reactive sulfide MS and MSD recoveries were low. See the Quality Control Results page for details of all matrix QC and non-matrix QC.

Diane L. Harper

Wet Chemistry Section Manager

Date

### Severn Trent Laboratories - Chicago METALS CASE NARRATIVE

Client: Weston Solutions, Inc.

Project ID: Confidential Client

STL Job#: 237037

1. This narrative covers the Metals analysis of samples received in the above STL Job 237037.

Method Refs: USEPA, SW-846

- 2. All analyses were performed within the required holding times.
- 3. All Initial and Continuing Calibration Verification (ICV/CCV's) were within control limits.
- 4. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.
- 5. All Preparation/Method Blanks were less than the reporting limits.
- 6. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.
- 7. Laboratory Control Sample (LCS) recoveries were within the 80-120% control limits.
- 8. Matrix QC was performed on an alternate Job.

Metals Section Manager

Date Recd: 05/27/05

### Severn Trent Laboratories Chicago GC/MS Case Narrative

Weston Solutions

Confidential Client: Cottage Grove

Job Number: 237037

VOA DATA:

- 1. All samples were properly preserved and analyzed within the 14-day hold time from the date of collection.
- 2. All of the Method Blanks and Extraction Blank target compounds were below the reporting limits.
- 3. The LCS (Laboratory Control Sample) samples had all controlled spike recoveries within the inhouse generated QC limits for the water and soil samples.
- 4. Matrix Spike/Matrix Spike Duplicate analyses were mot performed on this sample set.
- 5. All of the volatile samples had surrogate recoveries within the in-house generated QC limits.
- 6. The TCLP samples were prepared using Method 5030. All samples were analyzed following SW846 Method 8260B and 8000B. All calibration criteria are met per method or SOP (for minimum R values for certain compounds). The low point in the initial calibration verifies the base reporting limits. The target compounds were quantitated using the initial calibration.
- 7. All of the internal standard areas and retention times were within SOP acceptance limits as compared to the corresponding calibration verification standard.
- 8. The TCLP samples were analyzed using a 10.0-mL purge volume with a 1/20 dilution.

GC/MS Dept.

to the repeating

# Severn Trent Services - Chicago GC/MS BNA Case Narrative

Weston Solutions, Inc./Confidential Client - Cottage Grove

Job Number: 237037 BNA DATA: TCLP

- 1. All extractions and analyses were performed within recommended hold-times.
- 2. The MB (Method Blank) and the EB (TCLP blank) samples had all analytes undetected.
- 3. The LCS (Laboratory Control Sample) had the three control spike recoveries within the inhouse QC limits.
- 4. A MS (Matrix Spike) was not performed.
- 5. All samples had all surrogate recoveries within the in-house QC limits.
- 6. All samples had all internal standard areas and retention times within the SOP acceptance limits as compared to the corresponding calibration verification standard.
- 7. All samples were extracted and analyzed following USEPA SW846 8270C protocol. The samples and the TCLP Blank was extracted using 100-mL of the TCLP leachate. The MB and the LCS were extracted using 1000-mL of deionized water. The results and reporting limits were adjusted for the extraction volumes.

David P. Kozubal

GC/MS Dept.

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# SAMPLE INFORMATION Date: 06/13/2005

Job Number.: 237037 Customer...: Weston Solutions, Inc. Attn.....: Jai Kesari

Project Number.....: 20005459
Customer Project ID...: CONFIDENTIAL CLIENT
Project Description...: Confidential Client - Cottage Grove

Laboratory Sample 10	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
237037-1	CGMN SBC FTA02 00150	Soil	05/23/2005	13:40	05/27/2005	08:45
237037-2	CGMN SBC D101 00200	Soil	05/24/2005	13:40	05/27/2005	08:45
237037-3	CGMN SBC WPA01 00150	Soil	05/25/2005	09:40	05/27/2005	08:45
237037-4	CGMN SBC BKG01 00000	Soil	05/25/2005	10:40	05/27/2005	08:45
237037-5	CGMN SBC B1501 00100	Soil	05/25/2005	12:50	05/27/2005	08:45
237037-6	CGMN WASTE #2	Soil	05/26/2005	10:30	05/27/2005	08:45
		·			·	
-						
	·		·			

Page 1

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	L / Job Number: 237037	ABORATORY	7 E S	T RESUL	1 8		Date:06	Date:06/13/2005		
CUSTOMER: West	CUSTOMER: Weston Solutions, Inc.	PROJECT:	CONFIDENT	PROJECT: CONFIDENTIAL CLIENT			ATTN:	ATTN: Jai Kesari		
Customer Date Sam Time Sam Sample M	Customer Sample ID: CGMN SBC FTA02 00150 Date Sampled: 05/23/2005 Time Sampled: 13:40 Sample Matrix: Soil		Labo Date Time	Laboratory Sample 10: 237037-1 Date Received: 05/27/2005 Time Received: 08:45	10: 237037-1 : 05/27/2005 : 08:45					
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	q FLAGS	MOL	RL	DILUTION	UNITS	BATCH DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	5700		8	390		Mg/Kg	151124	06/02/05 1144 cls	\$ <del>7</del> 0
	* In Description = Dry Wgt.	4	Page 2							

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	Job Wumber: 237037	ABORATORY	E S	T RESUL	S L		Date:06	Date:06/13/2005		
CUSTOMER: West	CUSTOWER: Weston Solutions, Inc.	PROJECT:	CONFIDEN	PROJECT: CONFLOENTIAL CLIENT			ATTN:	Jai Kesari		
Customer Date Sam Time Sam Sample M	Customer Sample ID: CGWN SBC D101 00200 Date Sampled: 05/24/2005 Time Sampled: 13:40 Sample Matrix: Soil		Lab Dat Yim	Laboratory Sample ID: 237037-2 Date Received: 05/27/2005 Time Received: 08:45	10: 237037-2 : 05/27/2005 : 08:45					
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q FLAGS	TØN	RL	DILUTION	UNITS	BATCH DT	DATE/TIME	TECH
Lloyd Kahn	Toc Average Duplicates, Solid	380		8	780		п9/Кд	151124	06/02/05 1209 cls	0 0 0 c 1 8
	* In Description = Dry Wgt.	~ a	Page 3							

STL Chicago is part of Severn Trent Laboratories, Inc.

	Job Number: 237037	ABORATORY	T E S	T RESULT	1 S		Date:06	Date: 06/13/2005		
CUSTOMER: West	CUSTOMER: Weston Solutions, Inc.	PROJECT:	COMFIDEN	PROJECT: COMFIDENTIAL CLIENT			ATTN:	Jai Kesari		
Customer Date Sam Time Sample M	Customer Sample ID: CGMN SBC WPA01 00150 Date Sampled: 05/25/2005 Time Sampled: 07:40 Sample Matrix: Soil		Labu Datu Timu	Laboratory Sample ID: 237037-3 Date Received: 05/27/2005 Time Received: 08:45	ID: 237037-3 : 05/27/2005 : 08:45			•		
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q FLAGS	MDL	RL	OTTO	UNITS	BATCH	DT DATE/TIME	TECH
Lloyd Kahn	Toc Average Duplicates, Solid	3200		98	370		mg/Kg	151124	06/02/05 1234 c1s	¢ c1s
	* In Description = Dry Wgt.		Page 4							

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	L J Job Number: 237037	ABORATORY	F & 3 L	RESULT	S		Date:06	Date:06/13/2005		
CUSTOMER: West	CUSTOMER: Waston Solutions, Inc.	PROJECT:	PRDJECT: CONFIDENTIAL CLIENT	AL CLIENT			ATIN:	Jai Kesari		
Customer Date San Time San Sample M	Customer Sample ID: CGMM SBC BKG01 00000 Date Sampled: 05/25/2005 Time Sampled: 10:40 Sample Matrix: Soil		Labora Date F Time F	Laboratory Sample ID: 237037-4 Date Received 05/27/200 Time Received: 08:45	): 237037-4 .: 05/27/2005 .: 08:45					
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT Q	Q FLAGS	MDL	RL	DILUTION	UNITS	BATCH DT	T DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	098		97	200	-	пд/Кд	151124	06/02/05 1259 cls	cts
١٠	* In Description = Dry Wgt.	Pa	Page 5							

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Job Number; 237037 LABORATORY TEST RESULTS Date:06/13/2005	### FRO Solutions, Inc.  Customer Sample ID: CGMM SBC B1501 00100  Date Sampled: 05/25/2005  Time Sampled Matrix: Soil	OD PARAMETER/TEST DESCRIPTION SAMPLE RESULT G FLAGS NOE RL. DILUTION UNITS BATCH DT DATE/ITME TECH	10c Average Duplicates, Solid 530 65 280 1 mg/Kg 151124 06/02/05 1324 cls	7
Job Number	CusToMER: Weston Solutions, Inc. Customer Sample ID: CGMM S Date Sampled 12:50 Sample Matrix Soil	TEST METHOD	Lloyd Kahn Total Org	

STL Chicago is part of Severn Trent Laboratories, Inc.

	Job Number: 237037	ABORATOR	Y T E S	1 N E S N L	<i>S</i> ⊢		Date: 0	Date: 06/13/2005			
CUSTOMER: Wes	CUSTOMER: Weston Solutions, Inc.	PROJECT	PROJECT: CONFIDENTIAL	WTIAL CLIENT			ATTIK	Jat Kesari	i		
Custome Date Sa Time Sa Sample 1	Customer Sample ID: CGMN WASTE #2 Date Sampled: 05/26/2005 Time Sampled: 10:30 Sample Matrix: Soil		La Tig	Laboratory Sample ID: Date Received: Time Received	D: 237037-6 : 05/27/2005 : 08:45						
TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	a FLAGS	TOM	RL	DILUTION	SLIND	ВАТСН	DT DATE/TIME		TECH
9014/90108	Cyanide (Colorimetric) Reactivity, Cyanide (90108 Dist.), Solid	0.15	8	0.08	0.42	1	mg/Kg	150918	06/03/05 1339	1339 #	mtb
1010	Ignitability (Pensky-Martens Closed-Cup) Ignitability (Flashpoint), Solid	>200					degrees F	150769	06/02/05 1100 jmk	1100	
35706	pH (soil) Corrosivity (pH Solid), Solid	8.4		0.2	0.2	-	pH Units	151137	06/07/05 1035	1035	Ē
7.3.4.2/9034	Reactivity, Sulfide Reactivity, Sulfide, Solid	540		8.5	240		mg/Kg	150811	06/02/05 1438	1438 m	mtb
7470A	Leachable, Mercury (CVAA) Mercury, TCLP Leach	0.0020	2	0.0020	0.0020	<b>,</b>	mg/L	150805	06/02/05 1357	1357 9	gok
6010 <b>8</b>	Leachable, Metals Analysis (ICAP) Arsenic, ICLP Leach Barium, TCLP Leach Cadmium, TCLP Leach Chromium, TCLP Leach Lead, TCLP Leach Selenium, TCLP Leach	0.10 0.63 0.050 0.050 0.050		0.010 0.010 0.002 0.010 0.010	0.10 1.0 0.050 0.050	5 5 5 5 5 5 5 5 5 5	1/6w 1/6w 1/6w 1/6w 1/6w	150790 150790 150790 150790	06/02/05 06/02/05 06/02/05 06/02/05 06/02/05	1047 1047 1047 1047	td s tds tds tds tds
	Silver, TCLP Leach	0.050	5 5	0.005	0.050		1/6w	150790	06/02/05	1047	tds tds
8270c	Semivolatile Organics Pyridine, ICLP Leach 1,4-Dichlorobenzene, ICLP Leach 2-Nethylphenol (o-cresol), ICLP Leach Hexachloroethane, ICLP Leach	200 100 100 100	2222	200 100 100 100	200 100 100 100	1.00000 1.00000 1.00000	1/6n 1/6n 1/6n 1/6n 1/6n	151188 151188 151188	06/06/05 06/06/05 06/06/05 06/06/05	1647 1647 1647 1647	<del>\$\$\$\$</del>
, I	* In Description = Dry Wgt,		Page 7								7

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			DATE/TIME	06/06/05 1647 06/06/05 1647 06/06/05 1647 06/06/05 1647 06/06/05 1647 06/06/05 1647 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008 06/08/05 2008	
8	Kesari		E A		
Date: 06/13/2005	Jaj Ke		BATCH	151188 151188 151188 151188 151188 151188 151466 151466 151466 151466 151466 151466 151466 151466 151466 151466 151466 151466 151466	
Date:(	ATTN:		SLIN	7/8n 7/8n 7/8n 7/8n 7/8n 7/8n 7/8n 7/8n	
·		•	DILUTION	1.0000 1.00000 1.00000 1.00000 1.00000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000	
υ 1		10: 237037-6 : 05/27/2005 : 08:45	RL	200 200 200 200 200 200 200 200 200 200	
T RESUL	CONFIDENTIAL CLIENT	Laboratory Sample ID: Datc Received: Time Received:	MDL	55558658	
⊢ E S	CONFIDENT	Labor Date Time	2 FLAGS	מבבבבבב בבבבבב	Page 8
BORATORY	PRDJECT:		SAMPLE RESULT	001 001 001 001 001 001 001 001 001 001	ď
Job Number: 237037	customent: Weston Solutions, Inc.	Customer Sample ID: CGMN WASTE #2 Dete Sampled: 05/26/2005 Time Sampled: 10:30 Sample Matrix: Soil	PARANETER/TEST DESCRIPTION	4-Methylphenol (m/p-cresol), TCLP Leach Nitrobenzene, TCLP Leach Leach C.4.6-Trichlorophenol, TCLP Leach 2.4.6-Trichlorophenol, TCLP Leach 2.4.5-Trichlorophenol, TCLP Leach 2.4-5-Trichlorophenol, TCLP Leach Hexachlorophenol, TCLP Leach Hexachlorophenol, TCLP Leach Hexachlorophenol, TCLP Leach Volatile Organics Vinyl chloride, TCLP Leach Vinyl chloride, TCLP Leach 1,1-Dichloroethene, TCLP Leach Chloroform, TCLP Leach Chloroform, TCLP Leach Carbon tetrachloride, TCLP Leach Carbon tetrachloride, TCLP Leach Trichloroethene, TCLP Leach Trichloroethene, TCLP Leach Trichloroethene, TCLP Leach Trichloroethene, TCLP Leach Trichloroethene, TCLP Leach Trichloroethene, TCLP Leach	* In Description = Dry Wgt.
7	CUSTOMER: Westo	Customer Date Samp Time Sample Ma	TEST METHOD	82608	,i

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Job	L A B O : Number: 237037	RATORY CHI	RONI	CLE	Date:	06/13/2005		
CUSTOMER: Weston	Solutions, Inc.	PROJECT: CONFIDE	NTIAL (	LIENT		ATTN: Jai Kesar	î	
Lab ID: 237037-1 METHOD EDD	Client ID: CGMN SBC FTA02 00150 DESCRIPTION Electronic Data Deliverable	RUN#		27/2005 PREP BT		Date: 05/23/20 DATE/TIME AN		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	151124	151124		06/02/2005	1144	
Lab ID: 237037-2 METHOD Lloyd Kahn	Client ID: CGMN SBC D101 00200 DESCRIPTION Total Organic Carbon (Soils)	RUN#	BATCH#	27/2005 PREP BT 151124	Sample #(S)	Date: 05/24/20 DATE/TIME AN 06/02/2005	IALYZED	DILUTION
Lab ID: 237037-3 METHOD Lloyd Kahn	Client ID: CGMN SBC WPA01 00150 DESCRIPTION Total Drganic Carbon (Soils)		BATCH#	/27/2005 PREP BT 151124		Date: 05/25/20 DATE/TIME AN 06/02/2005	IALYZED	DILUTION
Lab ID: 237037-4 METHOD Lloyd Kahn	Client ID: CGMN SBC BKG01 00000 DESCRIPTION Total Organic Carbon (Soils)		BATCH#	/27/2005 PREP BT 151124		Date: 05/25/26 DATE/TIME AI 06/02/2005	IALYZED	DILUTIO
Lab ID: 237037-5 METHOD Lloyd Kahn	Client ID: CGMN SBC B1501 00100 DESCRIPTION Total Organic Carbon (Soils)		BATCH#	/27/2005 PREP BT 151124		Date: 05/25/26 DATE/TIME AI 06/02/2005		DILUTIO
Lab ID: 237037-6 METHOD 50308 3010A	Client ID: CGMN WASTE #2 DESCRIPTION 5030CP TCLP/SPLP Prep Acid Dig. Leachates (ICAP)		BATCH# 151445 150654	/27/2005 PREP BT 150489	#(S)	Date: 05/26/29 DATE/TIME AN 06/08/2005 06/01/2005	2008 1800	DILUTIO
9014/90108 3510c 1010	Cyanide (Colorimetric) Extraction for TCLP (SVOC) Ignitability (Pensky-Martens Clos	. 1 . 1 sed-Cup) 1	150847 150769	150918 150489 150769 150803-	150480	06/03/2005 06/03/2005 06/02/2005 06/02/2005	1339 0700 1100 1357	
7470A 6010B 7.3.4.2/9034 7470	Leachable, Mercury (CVAA) Leachable, Metals Analysis (ICAP) Reactivity, Sulfide SWB46 Dig. Leachates (Hg)	1 1 . 1	150790 150811 150803	150654- 150811	150489	06/02/2005 06/02/2005 06/02/2005	1047 1438 1030	
8270c 1311 1311	Semivolatile Organics TCLP Extraction TCLP Zero Headspace Extraction	1 1 1	150489 150487			05/31/2005 05/31/2005	1647 1400 1400	1.00000
82608 9045c	Volatile Organics pH (Soil)	1		151445- 151137	150487	06/08/2005 06/07/2005	2008 1035	1.0000

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Job Number.: 237037	SURROGATE RECOVERIES	REPORT Report Date.: 06/13/2005
CUSTOMER: Weston Solutions, Inc.	PROJECT: CONFIDENTIAL CLIENT	ATTN: Jai Kesari

		: Volatile Organics e: 8260B				: TCLP : 1514			Prep Batch: 151445
Lab ID	D	T Sample ID		Date	12DCED	BRFLBE	DBRFLM	TOLO8	
LCS MB 2368652 2369662 2370372 237037-	1 EB1	CGMN WASTE #2		06/08/2005 06/08/2005 06/08/2005 06/08/2005 06/08/2005 06/08/2005	103 108 107 102 107 109	99 95 90 83 89 90	94 97 97 94 95 100	96 95 93 90 92 95	
Test	Test D	escription	Limits	• •					
12DCED BRFLBE DBRFLM TOLD8	4-Brome Dibrome	chloroethane-d4 (surr) ofluorobenzene (surr) ofluoromethane (surr) e-d8 (surr)	62 - 127 67 - 132 77 - 119 81 - 126	2					

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SURROGATE RECOVERIES REPORT

		Job	Number.: 237037					Repo	ort Date.	: 06/13/	/2005	
CUSTOME	R: 48	3648		PROJECT: CO	NFIDENTIAL	CLIENT		ATTI	i: Jai K∈	sari		
			: Semivolatile Organics				.: TCLP			Prep	Batch:	150847
Lab ID		DT	Sample ID		Date	246TBP	2FLUBP	2FLUPH	NI TRD5	PHEND5	TERD 14	
EB1 EB1 EB2 LCS MB 237037- 237037-	6 6 MS		CGMM WASTE #2 CGMM WASTE #2		06/06/2005 06/06/2005 06/06/2005 06/06/2005 06/06/2005 06/06/2005	57 57 62 63 59 45	71 68 67 82 75 72 73	56 53 53 57 62 48 53	81 79 81 87 85 81 82	36 35 36 38 40 31 35	78 80 85 94 88 75 75	
Test  246TBP  2FLUBP  2FLUPH NITRD5 PHEND5 TERD 14	2, 2- 2- Ni Ph	4,6-T Fluor Fluor trobe enol-	scription ribromophenol (surr) obiphenyl (surr) ophenol (surr) nzene-d5 (surr) d5 (surr) yl-d14 (surr)	29 - 126 34 - 112 21 - 100 38 - 113 18 - 100 10 - 119								

QUALITY CONTROL RESULTS Report Date.: 06/13/2005 Job Number.: 237037 PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari CUSTOMER: Weston Solutions, Inc. Time Description Reag. Code Lab ID Dilution Factor Date QC Type Equipment Code...: GCL10 Batch...... 151188 Analyst...: dpk Test Method.....: 8270C Method Description.: Semivolatile Organics 150847-003 05/06/2005 1438 EB1 Extraction Blank 1 Units QC Result QC Result True Value Orig. Value QC Calc. \* Limits Parameter/Test Description Pyridine, TCLP Leach 1,4-Dichlorobenzene, TCLP Leach 2-Methylphenol (o-cresol), TCLP Leach 200.000 ug/L 100.000 ug/L ug/L 100.000 Hexachloroethane, TCLP Leach ug/L 4-Methylphenol (m/p-cresol), TCLP Leac ug/L 100.000 100.000 Nitrobenzene, TCLP Leach Hexachlorobutadiene, TCLP Leach 100.000 ug/L 100.000 2,4,6-Trichlorophenol, TCLP Leach 2,4,5-Trichlorophenol, TCLP Leach ug/L 500.000 u ug/L 100.000 U 2,4-Dinitrotoluene, TCLP Leach Hexachlorobenzene, TCLP Leach Pentachlorophenol, TCLP Leach ug/L 100.000 ug/L

500.000

ug/L

Job Number.: 237037	QUAL	ITY C	ONTROL	RESULTS	Report Date.: 06/1	3/2005
CUSTOMER: Weston Solutions, Inc.		PROJECT:	CONFIDENTIAL	CLIENT	ATTN:	
QC Type Description	n		Reag. Code	Lab ID	Dilution Factor	Date Time
Test Method: 82700 Method Description: Semivolatile Org	anics			Code: GCL10 : 151188	Analys	t: dpk
EB1 Extraction Blank 1				150847-003		06/06/2005 1510
Parameter/Test Description	Units	QC Result	: QC Resu	lt True Value	Orig. Value QC Cal	.c. * Limits
Pyridine, TCLP Leach 1,4-Dichlorobenzene, TCLP Leach 2-Methylphenol (o-cresol), TCLP Leach Hexachloroethane, TCLP Leach 4-Methylphenol (m/p-cresol), TCLP Leach Mitrobenzene, TCLP Leach Hexachlorobutadiene, TCLP Leach 2,4,6-Trichlorophenol, TCLP Leach 2,4-5-Trichlorophenol, TCLP Leach 2,4-Dinitrotoluene, TCLP Leach Hexachlorobenzene, TCLP Leach Pentachlorophenol, TCLP Leach	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	200.000 100.000 100.000 100.000 100.000 100.000 100.000 500.000 100.000	0	·		

Page 13 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 237037	AUP	LITY CO	) N T R O L	RESU	LTS	Repo	rt Date	:.: 06/1	3/2005	
CUSTOMER: Weston Solutions, Inc.		PROJECT: (	ONFIDENTIA	L CLIENT		ATTN	\$			
QC Type Descript	ion		Reag. Code	ı	.ab ID	Dil	ution F	actor	Date	e Time
Test Method: 8270C Method Description.: Semiyolatile O	rganics			t Code				Analys	t:	dpk
ES2 Extraction Blank 2					7-005				06/06	
Parameter/Test Description	Units	QC Result	QC Res	ult True	e Value	Orig.	Value	QC Cal	.c. *	Limits
yridine, TCLP Leach	ug/L	200.000								
,4-Dichlorobenzene, TCLP Leach	ug/L	100.000								
-Methylphenol (o-cresol), TCLP Leac	h ug/L ug/L	100.000 100.000								
exachloroethane, TCLP Leach -Methylphenol (m/p-cresol), TCLP Le		100.000								
itrobenzene, TCLP Leach	ug/L	100.000	_							
	ug/L	100.000		•						
exachioroputadiene, luly Leach										
exachlorobutadiene, TCLP Leach ,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000	U							
	ug/L ug/L	500.000	U							
,4,6-Trichlorophenol, TCLP Leach			บ บ							

Job Number.: 237037

QUALITY CONTROL RESULTS
Report Date.: 06/13/2005

CUSIGMER: Weston Solutions, Inc.

PROJECT: CONFIDENTIAL CLIENT

QC Type

Description

Reag. Code

Lab ID

Dilution Factor

Date

Time

Test Method.....: 8270C Equipment Code...: GCL10 Analyst...: dpk
Method Description: Semivolatile Organics Batch............. 151188

LGS Laboratory Control Sample	,	OSEL	ILMPCÅ	150847-002		05	/06/	2005 1406
Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits
Pyridine, TCLP Leach	ug/L	63,016	·	100.000	20.000 U	63	7%	16-100
1.4-Dichlorobenzene, TCLP Leach	ug/L	78.093		100.000	10.000 U	78	%	38-100
-Methylphenol (o-cresol), TCLP Leach	ug/L	76.857		100.000	10.000 U	77	%	37-100
exachloroethane, TCLP Leach	ug/L	72.158		100.000	10.000 U	72	%	34-100
-Methylphenol (m/p-cresol), TCLP Leac	•	74.011		100.000	10.000 U	74	%	35-106
itrobenzene, TCLP Leach	ug/L	79.886		100.000	10.000 U	80	%	41-105
exachlorobutadiene, TCLP Leach	ug/L	62,966		100.000	10.000 U	63	%	41-100
.4.6-Trichlorophenol, TCLP Leach	ug/L	85.824		100.000	10.000 U	86	%	51-101
.4.5-Trichlorophenol, ICLP Leach	ug/L	82,419		100.000	50.000 U	82	%	54-107
4-Dinitrotoluene, TCLP Leach	ug/L	85,191		100.000	10.000 U	85	%	56-115
exachlorobenzene, TCLP Leach	ug/L	75.485	•	100.000	10.000 U	75	%	50-113
Pentachlorophenol, TCLP Leach	ug/L	67.542		100.000	50.000 U	68	%	50-112

Job Number.: 237037

QUALITY CONTROL RESULTS
Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.
PROJECT: CONFIDENTIAL CLIENT

ATTN:

QC Type
Description
Reag. Code
Lab ID
Dilution Factor
Date
Time

Test Method.....: 82700 Equipment Code...: GCt10 Analyst...: dpk
Method Description: Semivolatile Organics Batch.....: 151188

	11-1	00 0	M0-00504	00 0	7 nua	Value	Onia	Value	റെ	Calc	*	Limits	
Parameter/Test Description	Units	QC Result		QC Result	i rue	value	orig.	value	-	tatt.		Limit's	'
Pyridine, TCLP Leach	ug/L	20.000	U		-								
.4-Dichlorobenzene, TCLP Leach	ug/L	10.000	ย										
	ug/L	10.000	U										
lexachloroethane, TCLP Leach	ug/L	10.000	U										
-Methylphenol (m/p-cresol), TCLP Leac	ug/L	10.000	U										
Mitrobenzene, TCLP Leach	ug/L	10.000	υ										
Mexachlorobutadiene, TCLP Leach	ug/L	10.000	IJ										
2.4.6-Trichlorophenol, TCLP Leach	ug/L	10.000	U										
.4.5-Trichlorophenol, TCLP Leach	ug/L	50.000	U										
4-Dinitrotoluene, TCLP Leach	ug/L	10.000	ប										
lexachlorobenzene, TCLP Leach	ug/L	10.000	υ										
Pentachlorophenol, TCLP Leach	ug/L	50.000	U										

QUALITY CONTROL RESULTS Job Number.: 237037 Report Date,: 06/13/2005 CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT QC Type Description Reag. Code Lab ID Dilution Factor Date Time Test Method......: 82700 Method Description:: Semivolatile Organics Equipment Code...: GCL10 Analyst...: dpk Batch..... 151188

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value QC	Calc. *	Limits
yridine, TCLP Leach	ug/L	412.457		1000,000	200.000 U 41	<del></del> -	16-100
4-Dichlorobenzene, TCLP Leach	ug/L	694.205		1000.000	100.000 U 69		
Methylphenol (o-cresol), TCLP Leach	ug/L	753.849		1000.000	100,000 U 75		37-100
Cachloroethane, TCLP Leach	ug/L	621.828		1000.000	100.000 U 62	ž	34-100
Methylphenol (m/p-cresol), TCLP Leac	ug/L	735.371		1000.000	100.000 U 74		35-106
robenzene, TCLP Leach	ug/L	785.401		1000.000	100.000 U 79	ž	41-105
	ug/L	559.664		1000.000	100.000 U 56	× ×	41-100
,6-Trichlorophenol, TCLP Leach	ug/L	812.893		1000,000	100.000 U 81	ž	51-101
,5-Trichlorophenol, TCLP Leach	ug/L	831.182		1000,000	500.000 U 83	Ŷ	54-107
-Dinitrotoluene, TCLP Leach	ug/L	889.368		1000,000	100.000 U 89	%	
xachtorobenzene, TCLP Leach	ug/L	709.603		1000.000	100.000 U 71	% %	50-113
ntachlorophenol, TCLP Leach	ug/L	687.933		1000.000	500,000 U 69	%	50-113

Page 17 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 237037	QUA	. ІТУ СО	NTROL R	ESULTS	Report Date.: 06/1	<b>3</b> /2005
CUSTOMER: Weston Solutions, Inc.		PROJECT: C	ONFIDENTIAL CLI	ENT	ATTN:	
QC Type Descrip	otion		Reag. Code	Lab ID	Dilution Factor	Date Time
Test Method: 8260B Method Description: Volatile Orga	anics		Equipment Cod Batch	de: GCL16 : 151446	Analys	t: jdn
ER1 Extraction Blank 1		69	66	151445-003		06/08/2005 1832
Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value QC Cal	c. * Limits
/inyl chloride, TCLP Leach	ug/L	100.000	U			
1,1-Dichloroethene, TCLP Leach	ug/L	100.000				
2-Butanone (MEK), TCLP Leach	ug/L	100.000	U			
-Butanone (MEK), ICLF Leach						
Chloroform, TCLP Leach	ug/L	100.000			•	
Chloroform, TCLP Leach	ug/L ug/L	100.000	ប		•	
Chloroform, TCLP Leach Carbon tetrachloride, TCLP Leach Benzene, TCLP Leach	ug/L ug/L ug/L	100.000 100.000	ប ប		·	
Chloroform, TCLP Leach Carbon tetrachloride, TCLP Leach Benzene, TCLP Leach 1,2-Dichloroethane, TCLP Leach	ug/L ug/L ug/L ug/L	100.000 100.000 100.000	บ บ บ		·	
Chloroform, TCLP Leach Carbon tetrachloride, TCLP Leach Benzene, TCLP Leach 1,2-Dichloroethane, TCLP Leach Trichloroethene, TCLP leach	ug/L ug/L ug/L ug/L ug/L	100.000 100.000 100.000 100.000	ช บ บ		·	
Z-Butanone (MRK), Tole Leach Carbon tetrachloride, TCLP Leach Benzene, TCLP Leach 1,2-Dichloroethane, TCLP Leach Trichloroethene, TCLP Leach Cetrachloroethene, TCLP Leach Chlorobenzene, TCLP Leach	ug/L ug/L ug/L ug/L	100.000 100.000 100.000	ช บ บ บ บ		•	

	Job Number.: 237037	QUAL	ITY CC	ONTROL	RESULTS	Report Date.: 06/1	3/2005
CUSTOMER: Wes	ton Solutions, Inc.		PROJECT: C	CONFIDENTIAL	CLIENT	ATTN:	
QC Type	Descript	ion		Reag. Code	Lab ID	Dilution Factor	Date Tim
	: 8260B ption.: Volatile Organ	fre			Code: GCL16	Analys	it: jdn
	·			Batch	: 151446	····	
EB1	Extraction Blank 1		70	Batch	151445-004	<u> </u>	06/08/2005 18
l		Units	70 QC Result		151445-804	Orig. Value QC Cat	

Page 19 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 237037	QUA	FITY CO	ONTROL R	LESULTS	Report Date.: 06/13/2005			
CUSTOMER: Weston Solutions, Inc.		PROJECT: (	CONFIDENTIAL CL	IENT	ATTN:			
QC Type Descript		Reag. Code	Lab ID	Dilution Factor	Date Time			
Test Method: 8260B Method Description.: Volatile Organ	ics			de: GCL16 : 151446	Analyst: jdn			
EB1 Extraction Blank 1		68	165	151445-005		06/08/2005 192		
EXTRACTION Blank 1 Parameter/Test Description	Units	GC Result	965 QC Result	151445-005 True Value	Orig. Value QC Ca	L		
Parameter/Test Description	Units ug/L		QC Result	<u> </u>	Orig. Value QC Ca	L		
Parameter/Test Description inyl chloride, TCLP Leach 1-Dichloroethene, TCLP Leach	ug/L ug/L	QC Result 100.000 100.000	QC Result U	<u> </u>	Orig. Value QC Ca	L		
Parameter/Test Description inyl chloride, TCLP Leach ,1-Dichloroethene, TCLP Leach -Butanone (MEK), TCLP Leach	ug/L ug/L ug/L	9C Result 100.000 100.000 100.000	QC Result U U U	<u> </u>	Orig. Value QC Ca	L		
Parameter/Test Description  Inyl chloride, TCLP Leach ,1-Dichloroethene, TCLP Leach Butanone (MEK), TCLP Leach nloroform, TCLP Leach	ug/L ug/L ug/L ug/L	QC Result 100.000 100.000 100.000 100.000	QC Result U U U U	<u> </u>	Orig. Value QC Ca	L		
Parameter/Test Description  Inyl chloride, TCLP Leach 1-Dichloroethene, TCLP Leach Butanone (MEK), TCLP Leach hloroform, TCLP Leach arbon tetrachloride, TCLP Leach	ug/L ug/L ug/L ug/L ug/L	QC Result  100.000 100.000 100.000 100.000 100.000	QC Result U U U U U U	<u> </u>	Orig. Value QC Ca	L		
Parameter/Test Description  Inyl chloride, TCLP Leach 1-Dichloroethene, TCLP Leach Butanone (MEK), TCLP Leach Idoroform, TCLP Leach arbon tetrachloride, TCLP Leach enzene, TCLP Leach	ug/l ug/l ug/l ug/l ug/l ug/l	0C Result 100.000 100.000 100.000 100.000 100.000 100.000	QC Result U U U U U U U U U U	<u> </u>	Orig. Value QC Ca	L		
Parameter/Test Description  Inyl chloride, TCLP Leach 1-Dichloroethene, TCLP Leach Butanone (MEK), TCLP Leach aldroform, TCLP Leach arbon tetrachloride, TCLP Leach enzene, TCLP Leach 2-Dichloroethane, TCLP Leach	ug/L ug/L ug/L ug/L ug/L ug/L ug/L	100.000 100.000 100.000 100.000 100.000 100.000 100.000 100.000	QC Result U U U U U U U U U U U U U U	<u> </u>	Orig. Value QC Ca	L		
	ug/l ug/l ug/l ug/l ug/l ug/l	0C Result 100.000 100.000 100.000 100.000 100.000 100.000	QC Result  U U U U U U U U U U U U U U U	<u> </u>	Orig. Value QC Ca	L		

	Job Number.: 237037	QUALITY	CONTROL	RESULTS	Report Date.: 06/	13/2005	
CUSTOMER: West	ion Solutions, Inc.	PROJE	CT: CONFIDENTIAL C	LIENT	ATTN:		
QC Type	Descriptio	n	Reag. Code	Lab 1D	Dilution Factor	Date	Time
Test Method Method Descrip	: 8260B ption:: Volatile Organic	s		ode: GCL16	Analys	st: jdn	
LCS i	aboratory Control Sampl	e	V05F08DSA	151445-002		06/08/2005	1100
Paramet	er/Test Description	Units QC Re	sult QC Result	True Value	Orig. Value QC Ca	lc. * Limi	its

LCS Laboratory Control Sample V05FQ8DSA 151445-002 06/08/2005 1100										
Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value QC Calc.	*	Limits F			
Vinyl chloride, TCLP Leach	ug/L	419.756		500,000	100.000 U 84	%	52-134			
1,1-Dichloroethene, TCLP Leach	ug/L	568,760		500.000	100.000 U 114	%	51-136			
2-Butanone (MEK), TCLP Leach	ug/L	450.964		500.000	100.000 U 90	%	29-139			
Chloroform, TCLP Leach	ug/L	483.812		500.000	100.000 U 97	%	75-122			
Carbon tetrachloride, TCLP Leach	ug/L	524.058		500.000	100.000 U 105	%	64-132			
Benzene, TCLP Leach	ug/L	446.642		500.000	100.000 U 89	%	75-122			
1.2-Dichloroethane, TCLP Leach	ug/L	510.630		500.000	100.000 U 102	%	67-120			
Trichloroethene, TCLP Leach	ug/L	453.156		500.000	100.000 U 91	%	75-124			
Tetrachloroethene, TCLP Leach	ug/L	456.820		500.000	100.000 U 91	%	70-125			
Chlorobenzene, TCLP Leach	ug/L	443.474		500.000	100.000 U 89	%	76-116			

Page 21 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS Job Number.: 237037 Report Date.: 06/13/2005 CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: QC Type Description Reag. Code Lab ID Dilution Factor Time Test Method.....: 8260B Equipment Code....: GCL16 Method Description .: Volatile Organics Analyst...: jdn Batch..... 151446 Method Blank 151445-001 06/08/2005 1036 Parameter/Test Description Units QC Result QC Result True Value Orig. Value QC Calc. \* Limits Vinyl chloride, TCLP Leach 1,1-Dichloroethene, TCLP Leach 2-Butanone (MEK), TCLP Leach Chloroform, TCLP Leach 100.000 U 100.000 U 100.000 U 100.000 U 100.000 U ug/L ug/L ug/L ug/L Carbon tetrachloride, TCLP Leach ug/L Benzene, TCLP Leach ug/L 100.000 U 1,2-Dichloroethane, TCLP Leach Trichloroethene, TCLP Leach Tetrachloroethene, TCLP Leach 100.000 U ug/L 100.000 U ug/L 100.000 Chlorobenzene, TCLP Leach ug/L 100.000 U

Job	Number.: 237037	AUP	LITY CO	NTROL R	ESULTS	Repor	rt Date	.: 06/1	3/2005	
CUSTOMER: Weston	Solutions, Inc.		PROJECT: CO	MFIDENTIAL CLI	ENT	ATTN	; Jai K	esari		
QC Type	Descript	on	ŗ	eag. Code	Lab ID	Dilu	ution F	actor	Date	e Tim
	; 6010B on.: Leachable, Meta	als Analysis		Equipment Coc Batch	e: 1CP5 : 150790			Analys	06/02)	:ds /2005 10/
Parameter,	/Test Description	Units	QC Result	QC Result	True Value	Orig.	Value	QC Cal	c. *	Limits
Arsenic, TCLP Lead Barium, TCLP Lead Cadmium, TCLP Lead Chromium, TCLP Lead Lead, TCLP Leach Selenium, TCLP Lead	n ch ach ach	mg/L mg/L mg/L mg/L mg/L mg/L	0.01000 0.01000 0.00200 0.01000 0.00500 0.01000 0.00500	บ บ บ บ บ						

Job	Number.: 237037	QUALITY	CONTROL	RESULTS	Report Date.: 06/1	3/2005	
	Solutions, Inc.	PROJEC	T: CONFIDENTIAL C	LIENT	ATTN:		
QC Type	Description	1	Reag. Code	Lab ID	Dilution Factor	Date	Time
Test Method	: 6010B on.: Leachable, Metals	Analysis (1CAP)		ode: ICP5	Analys	t: tds	

EB2 Extraction Blank 2				150654-002			06	/02/	2005 100	)9
Parameter/Test Description	Uni ts	QC Result	QC Result	True Value	Orig. V	/alue	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.01000 U								
Barium, TCLP Leach	mg/L	0.01000 U								
Cadmium, TCLP Leach	mg/L	0.00200 U								
Chromium, TCLP Leach	mg/L	0.01000 ป								
Lead. TCLP Leach	mg/L	0.00500 U								
Selenium, TCLP Leach	mg/L	0.01000 U								
Silver, TCLP Leach	mg/L	0.00500 ນ								

	Job Number.: 237037	QUA	LITY	CON	TRO	L R	ESU	LTS	Repo	ort Date	e.:	06/13	/2005		
CUSTOMER: W	eston Solutions, Inc.		PROJEC	r: CONF	FIDENTI	AL CLI	ENT		ATTN	);					
QC Type	QC Type Description					e	L	ab ID	Dil	ution (	act	or	Dat	е	Time
	: 6010B ription.: Leachable, Meta	als Analysis	(ICAP)		Equipme Batch			I CP5 150790	<u>-</u>		An	alyst	:	tds	<del></del>
EB3	D1 Blank						15065	4-012					6/02	/2005	1015
Param	meter/Test Description	Units	QC Rest	ılt	QC Re	sult	True	Value	Orig.	Value	QC	Calc	*	Lim	its
rsenic, TCLP arium, TCLP admium, TCLP hromium, TCL ead, TCLP Le elenium, TCL ilver, TCLP	Leach P Leach P Leach P Leach P Leach	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	0.01 0.00 0.01 0.00 0.01	000 U 000 U 200 U 000 U 500 U 000 U									<b></b>		
E83	DI Blank						15065	i-014				T	6/02	/2005	1019
Param	eter/Test Description	Units	QC Rest	lt	QC Res	ult	True	Value	Orig.	Value	QC	Calc	*	Lim	its
nrsenic, TCLP arium, TCLP admium, TCLP hromium, TCL ead, TCLP Le elenium, TCL ilver, TCLP	Leach Leach P Leach ach P Leach	mg/L mg/L mg/L mg/L mg/L mg/L	0.01 0.00 0.01 0.00 0.01	000 U 000 U 200 U 000 U 500 U 500 U									<del></del>		,

doL	Q U A   Number:: 237037	LITY CONTROL	. RESULTS	Report Date.: 06/	13/2005
CUSTOMER: Weston		PROJECT: CONFIDENTIA		ATTN:	
医多种畸形 网络海绵 化二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基					

Test Method: 6010B Method Description: Leachable, Metals Analysis (ICAP)	Equipment Code: ICPS Batch	Analyst: tds

LCS Laboratory Control Sam	ple	MQ5ES	PK00Z	150654-003		0	5/02/	2005 1024
Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits
Arsenic, TCLP Leach	mg/L	0.09857 B		0.10000	0.01000 U	99	%	80-120
Barium, TCLP Leach	mg/L	1.99410		2.00000	0.01000 U	100	%	80-120
Cadmium, TCLP Leach	mg/L	0.04931 B		0.05000	0.00200 U	99	%	80-120
Chromium, TCLP Leach	mg/L	0.19911		0.20000	0.01000 U	100	%	80~120
Lead. TCLP Leach	mg/L	0.10460		0.10000	0.00500 U	105	%	80-120
Selenium, TCLP Leach	mg/L	0.09794 B		0.10000	0.01000 U	98	%	80-120
Silver, TCLP Leach	mg/L	0.04770 B		0.05000	0.00500 U	95	%	80-120

		Job Numbe	er.: 237037	Q U A I	LITY CO	ONTROL R	ESUL	T S	Report	: Da1	te.: 06/13/7	2005	
Cl	JSTOMER: We	ston Solut	ions, Inc.		PROJECT: (	CONFIDENTIAL CL	IENT		ATTN:	Jai	Kesari		
Mi	est Method. ethod Descr	iption,: C	014/90108 yanide (Col yanide, Tot	orimetric) al		Batch: Equipment Co					Analyst. Test Code		
:	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. V	/alue	QC Calc.	F	* Limits	Date	Tim
	150918-004 150918-005		mg/L mg/L	0.00260 E 0.08780	,	0.10000		00260 E				06/03/2005 06/03/2005	133
Me		iption.: To	otal Organi	c Carboh (Soils on, Tot: (TOC)	)	Batch Equipment Cod	: 1 le,: 1	51124 004			Analyst Test Code		
:	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. V	'alue	QC Calc.	F	* Limits	Date	Tim
	151124-003		mg/Kg	29.00 U		<del></del>						06/02/2005	084
٩e		iption.: To		c Carbon (Soils Suplicates	)	BatchEquipment Cod					Analyst Test Code	.: cls .: TOCAV2	
	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. V	alue	QC Calc.	F	* Limits	Date	Tim
s	151124-004	100FSTLK3	mg/Kg	5059.77		4780.00			106		% 53-140	06/02/2005	091
(e	st Method. thod Descri rameter	ption.: pH	(Soil)			Batch Equipment God		51137			Analyst Test Code		
	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. V	alue	QC Calc.	F	* Limits	Date	Time
	151137-002 151137-003		pH Units pH Units	6.97000 6.95000		7.00000 7.00000	<del></del>	<del></del>	0.03000 0.05000		A 0.20000 A 0.20000	06/07/2005 06/07/2005	
lel	or Method thod Descri	ption.: Re	3.4.2/9034 activity, S activity, S	Bulfide Bulfide		Batch Equipment Cod		50811			Analyst Test Code		
	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. V	alue	QC Calc.	F	* Limits	Date	Time
3 1		105BSTSF1A 105BSTSF1 105BSTSF1A	mg/Kg	8.80 U 134.34 B 38.19 B 40.60 B	38.19	185.60 185.70 B 180.00	8.8 8.5	51 U	72 21 23	N :	% 25-116 % 25-116 % 25-116 R 50	06/02/2005	1429 1442

Page 27 \* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 237037	QUALITY CONTRO	RESULTS Report Date.: 06/13/2005	_ _
CUSTOMER: Weston Solutions, Inc.	PROJECT: CONFIDENT	FIAL CLIENT ATTN: Jai Kesari	

M	est Method. ethod Descr arameter	iption.: Le	eachable,	Mercury (CVAA)		Batch Equipment Coc	.,: 150805 le: HG4		Analyst Test Code	
QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc. F	* Limits	Date Time
LCS EB3 EB1 EB2	150803-007 150803-008 150803-009 150803-013 150803-014 150803-023	M04LSTK010 788 792 792	ug/L Jug/L mg/L mg/L mg/L mg/L	0.20 U 2.12 0.00200 U 0.00200 U 0.00200 U 0.00200 U		2.00	0.20 U	106	% 80-120	06/02/2005 1331 06/02/2005 1334 06/02/2005 1336 06/02/2005 1345 06/02/2005 1351 06/02/2005 1410

# QUALITY ASSURANCE METHODS REFERENCES AND NOTES

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#### REPORT COMMENTS 1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety. Soil, sediment and sludge sample results are reported on a "dry weight" basis except when analyzed for landfill disposal or incineration parameters. All other solid matrix samples are reported on an "as 2) Soil received" basis unless noted differently. 3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable. 4) The test results for the noted analytical method(s) meet the requirements of NELAC. Lab Cert. 1D# 100201 5) According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH Field) they were not analyzed immediately, but as soon as possible on laboratory receipt. Glossary of flags, qualifiers and abbreviations (any number of which may appear in the report) Inorganic Qualifiers (Q-Column) Analyte was not detected at or above the stated limit. Not detected at or above the reporting limit. Result is less than the RL, but greater than or equal to the method detection limit. Result is less than the CRDL/RL, but greater than or equal to the IDL/MDL. Result was determined by the Method of Standard Additions. AFCEE: Result is less than the RL, but greater than or equal to the method detection limit. Inorganic Flags (Flag Column) ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,MRL: Instrument related QC exceed the upper or lower control limits. LCS, LCD, MD: Batch QC exceeds the upper or lower control limits. MSA correlation coefficient is less than 0.995. MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable. SD: Serial dilution exceeds the control limits. MB, EB1, EB2, EB3: Batch QC is greater than reporting limit or had a negative instrument reading lower than the absolute value of the reporting limit. MS, MSD: Spike recovery exceeds the upper or lower control limits. AS(GFAA) Post-digestion spike was outside 85-115% control limits. Organic Qualifiers (Q - Column) Analyte was not detected at or above the stated limit. ND Compound not detected. Result is an estimated value below the reporting limit or a tentatively identified compound (TIC). Result was qualitatively confirmed, but not quantified. Pesticide identification was confirmed by GC/MS. The chromatographic response resembles a typical fuel pattern. The chromatographic response does not resemble a typical fuel pattern. Result exceeded calibration range, secondary dilution required. AFCEE:Result is an estimated value below the reporting limit or a tentatively identified compound (TIC) Organic Flags (Flags Column) MB: Batch QC is greater than reporting limit. LCS, LCD, ELC, ELD, CV, MS, MSD, Surrogate: Batch QC exceeds the upper or lower control limits-EBI, EB2, EB3, MLE: Batch QC is greater than reporting Limit Concentration exceeds the instrument calibration range A Concentration is below the method Reporting Limit (RL) Compound was found in the blank and sample. Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D. Alternate peak selection upon analytical review H Indicates the presence of an interfence, recovery is not calculated.

The lower of the two values is reported when the % difference between the results of two GC columns is

Manually integrated compound.

## QUALITY ASSURANCE METHODS REFERENCES AND NOTES

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greater than 25%.
Abbreviations
           Post Digestion Spike (GFAA Samples - See Note 1 below)
Designation given to identify a specific extraction, digestion, preparation set, or analysis set
Capillary Column CCB Continuing Calibration Blank
AS
Batch
CAP
           Continuing Calibration Verification
CCV
CF
           Confirmation analysis of original
С1
           Confirmation analysis of A1 or D1
C2
           Confirmation analysis of A2 or D2
c3
           Confirmation analysis of A3 or D3
CRA
           Low Level Standard Check - GFAA; Mercury
           Low Level Standard Check - ICP
CRI
CV
           Calilbration Verification Standard
Dil Fac
          Dilution Factor - Secondary dilution analysis
           Dilution 1
01
DZ
           Dilution 2
D3
          Dilution 3
          Detection Limit Factor
DLFac
DSH
           Distilled Standard - High Level
DSL
          Distilled Standard - Low Level
DSM
          Distilled Standard - Medium Level
EB1
           Extraction Blank 1
EB2
           Extraction Blank 2
EB3
          DI Blank
ELC
           Method Extracted LCS
           Method Extracted LCD
FLD
           Initial calibration
Initial Calibration Blank
ICAL
1CB
ICV
           Initial Calibration Verification
IDL
           Instrument Detection Limit
           Interference Check Sample A - ICAP
Interference Check Sample B - ICAP
ISA
Job No.
           The first six digits of the sample ID which refers to a specific client, project and sample group
           Lab ID An 8 number unique laboratory identification
          Laboratory Control Standard Duplicate
Laboratory Control Standard with reagent grade water or a matrix free from the analyte of interest
Method Blank or (PB) Preparation Blank
LCD
LCS
MB
          Method Duplicate
MD
          Method Detection Limit
MDL
MLE
          Medium Level Extraction Blank
          Method Reporting Limit Standard
MRL
MSA
          Method of Standard Additions
          Matrix Spike
MSD
          Matrix Spike Duplicate
ND
          Not Detected
PREPF
          Preparation factor used by the Laboratory's Information Management System (LIMS)
PDS
          Post Digestion Spike (ICAP)
RA
          Re-analysis of original
A1
A2
          Re-analysis of D1
          Re-analysis of D2
A3
          Re-analysis of D3
RD
          Re-extraction of dilution
RE
          Re-extraction of original
RC
          Re-extraction Confirmation
          Reporting Limit
RL
          Relative Percent Difference of duplicate (unrounded) analyses
RPD
RRF
          Relative Response Factor
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Retention Time

#### QUALITY ASSURANCE METHODS

### REFERENCES AND NOTES

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Retention Time Window Sample ID A 9 digit number unique for each sample, the first
RTW'
              six digits are referred as the job number
SCB
              Seeded Control Blank
              Serial Dilution (Calculated when sample concentration exceeds 50 times the MDL)
UCB
              Unseeded Control Blank
              Second Source Verification Standard
SSV
              Solid Laboratory Control Standard(LCS)
pH Calibration Check LCSP pH Laboratory Control Sample
SLCS
PHC
              pH Laboratory Control Sample Duplicate
pH Sample Duplicate
Flashpoint Sample Duplicate
Flashpoint LCS
LCDP
MOPH
MDFP
LCFP
              Gelex Check Standard Range 0-1
Gelex Check Standard Range 1-10
G1
              Gelex Check Standard Range 10-100
G3
              Gelex Check Standard Range 100-1000
Note 1: The Post Spike Designation on Batch QC for GFAA is designated with an "S" added to the current abbreviation used. EX. LCS S=LCS Post Spike (GFAA); MSS=MS Post Spike (GFAA) Note 2: The MD calculates an absolute difference (A) when the sample concentration is less than 5 times the reporting limit. The control limit is represented as +/- the RL.
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in a	Lab Lot# 23703   Package Sealed Samples Sealed (19) W. Yes (No. 18) W. Yes (No	Minutional Image (195 No NA Physical No NA Physical No NA Physical No NA National National Analyses / Remarks		DATE TIME  Date Received 5/27/05  Courter: Pk. Hand Daivered  Bill of Lading St. object.
	CT 7ATT 20NETTI  BOY, WESTON GOLLLIONS  NESTCHESSEL PA 93&0  C10-701-4524  C10-701-7401  OUDE:		At .	RECEIVED BY FEDEX COMPANY RECEIVED BY FEDEX COMPANY SR. COMMENTS
	Contact 71 M FRIPME Contact Contact Contact Company.  Address: 1625 Pump HREY AVE Company.  AVBULW AL 35101  Phone: 334-466-5153  Fax. 534-416-5166  Fax. Fax. Fax. MREWERDN Saugitus (Poly).	Signature: Project Number:  O 2109 1.003.010.000   Project Number: Date Required Hard Copy: Fax: And Copy:	00 5/23 1340 5 C X 00 5/44 1340 5 C X 000 5/25 0140 5 C X 000 5/25 1250 5 C X 000 5/25 1250 5 C X	Container Key.  1. Pastic. 2. ViOA Vial 3. Sierile Plastic. 4. Amber Glass 6. Cuber 6. Cuber 7. None
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310 Bank Street Decatur, Alabama 35601 256.353.2910 tele 256.353.3944 fax www.TTLINC.com

Decatur : Florence : Montgomery : Tuscaloosa ALABAMA
Albany : Valdosta GEORGIA

## **TRANSMITTAL**

TO:	TO: Weston Solutions, Inc.		DATE: August 5, 2005					
_	1625 Pumphrey Ave			020504-041				
-	Auburn, AL 36832		Mr. Tim F					
PROJ	ECT: Reference No. 02181-129-0	81-0001						
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Westor	n Solutions Chain of Custody / Analysis F	<u>kequest Forn</u>	n dated 06/08/	05 (copy attached)				
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