Building a Better World for All of Us®

June 28, 2021

RE: PFAS Investigation Summary Report
Hayward Landfill (License #01751)
Hayward, Wisconsin
SEH #149241 14.00

Mr John Sager, Hydrogeologist
Wisconsin Department of Natural Resources
1701 North 4th Street
Superior, WI 54880

Dear Mr. Sager:

Short Elliott Hendrickson Inc. (SEH®) has completed an investigation for the presence of polyfluoroalkyl substances (PFAS), and more specifically, potential concentrations of perfluorooctanoic acid (PFOA) and perfluoroctanesulfonic acid (PFOS) in groundwater at the closed Hayward Landfill (WDNR licence #01751). This investigation was required by the Wisconsin Department of Natural Resources (WDNR) in an August 17, 2020 letter to the City of Hayward. The following sections describe the results of the investigation.

Background

The City of Hayward (City) operated the landfill for approximately 21 years and closed it in 1985. Municipal, commercial, and demolition waste were disposed in the waste containment area, which encompassed approximately 9.1 acres of the 20-acre site. Figure 1 (Site location). Due to the presence of volatile organic compounds (VOCs) identified in groundwater beneath and down gradient of the landfill, the City retained SEH to investigate the degree and extent of contamination, and ultimately design and install a remediation system to mitigate groundwater VOC impacts. The City operated an active LFG extraction system between 1998 and 2016 as a source abatement measure to limit the migration of VOCs from the landfill waste to the underlying groundwater. Induced atmospheric intrusion of oxygenated air into the landfill was implemented to accelerate decomposition of waste, reduce the anaerobic biochemical generation of vinyl chloride (VC), and reduce methane production. Based on the groundwater and landfill gas data collected between 1998 and 2019 the LFG system appears to have been effective.
The site contains 27 monitoring wells within and adjacent to the landfill site which included 15 shallow water table observation wells, six shallow to intermediate piezometers, and six deep piezometers. Groundwater flow across the monitoring area is south toward the Namekagon River and typically the horizontal hydraulic gradient is approximately 0.005 ft/ft. There are 17 landfill gas (LFG) monitoring probes installed in and around the perimeter of the waste footprint and 14 LFG extraction wells. In addition, up to 13 private wells were sampled at a minimum annually. The attached Figure 2 provides illustration of the monitoring well, piezometer and private well locations.

Due to near zero VOC and methane concentrations in the LFG extraction system effluent the system, in 2016 the WDNR approved a closure plan modification enabling the LFG extraction system to be shut down. As a result, the LFG extraction wells were converted to passive vents. The 2016 plan modification

also approved a reduction to the number of groundwater monitoring wells, private wells and gas probes monitored to assess possible rebounding groundwater contaminant trends.

In early 2020 it was discovered that the Hayward Landfill project had been transferred from the WDNR Remediation & Redevelopment (R&R) program to the WDNR Waste and Materials Management (WMM) program on March 5, 2018. Upon consultation with other WDNR R&R and WMM staff, Mr. Sager confirmed that the site had been transferred; however, it had not been "accepted" by the WMM program. Mr. Sager also indicated that the ongoing long-term care and reporting requirements of the WMM had not been established or discussed between the two programs. To facilitate the transfer and establishment of on-going long-term care requirements, the WDNR requested the City issue a case closure request and propose long-term care requirements. In effort to streamline the process, the WDNR indicated that the closure request and proposed long-term care requirements could be addressed within the 2019 Annual Progress Report. In May 2020 the WDNR WMM program issued to the City a DRAFT environmental monitoring plan for the Hayward LF, which allowed decreasing on-going monitoring frequency to annual collection at a smaller select set of monitoring wells and gas probes. The RR and WMM programs are also interested in the potential for PFAS contamination at the Hayward Landfill site.

In the August 17, 2020 letter to the City, the WDNR informed the City of their obligation to evaluate the Hayward Landfill for the presence of emerging contaminants specified in ch. NR 700 Wisconsin Administrative Code. The WDNR letter stated that an "evaluation of potential PFAS compounds and other applicable emerging contaminants that were historically or are presently produced, used, handled, or stored at the site." The evaluation should include any available information on whether any products containing polyfluoroalkyl substances (PFAS) were used in any process services, the duration of PFAS-containing product use, the type of PFAS contained in the product, and any areas of the site where PFAS-containing products may have been used, stored, managed, or discarded."

The City has acknowledged that due to the landfill history and likelihood that PFAS containing substances (which are contained on or within many household waste) were managed at the former landfill, the City proceeded with implementing the required sampling and analysis. An inventory of PFAS compounds that were handled or stored at the facility is not likely going to find "sources" of PFAS, however given the prevalence of PFAS within household waste, PFAS is likely present.

In an October 12, 2020 electronic mail, the WDNR agreed with the approach of sampling existing wells MW-1, MW-1S, MW-2, MW-3, MW-4, MW-5, MW-7, and MW-7SR for one round of PFAS analysis. Specifically, if either PFOA, PFOS, or the sum concentration of PFAO and PFOS exceeded 20 ng/L (approximately equivalent to parts per trillion), the WDNR would then determine if an additional round of PFAS sampling was warranted.

PFAS Investigation

On May 20, 2021, one round of groundwater samples was collected from the wells referenced above for the analysis of PFAS compounds. The samples were collected using the protocols for PFAS sampling defined by the Michigan Department of Environmental Quality's (MDEQ) October 16, 2018 document "PFAS Sampling Guidance" (previously submitted to WDNR). Water level measurements were recorded at each sampling location to confirm depth to groundwater and direction of groundwater flow. The groundwater samples were then collected using sample-dedicated polyethylene disposable bailers, placed in laboratory-clean analytical bottles, and chilled to four degrees C. The analytical samples were

submitted to Eurofins TestAmerica analytical laboratory in Sacramento, California via overnight courier for analysis. Sample collection, handling, and shipment was conducted using standard chain-of-custody documentation. The samples were analyzed for 36 PFAS compounds including PFOA and PFOS using EPA method 537.1.

Sampling precautions against outside contaminants being introduced to the samples included:

- Washing the water level indicator with an Alconox/ PFAS free water solution followed by a PFAs free water rinse after each measurement,
- Utilizing PFAS-free bailers and bailer rope,
- Utilizing clothing and equipment of acceptable materials as defined in the MDEQ PFAS Sampling Guidance.
- Refraining from the use of sun black or insect repellant before and during sampling and sample processing,
- Use of sample specific powder free nitrile gloves,
- Purging of five well volumes of water from each sampled well prior to sampling,
- Filling of sample bottles directly from the bailer,
- Refrain from placement of sample bottles or caps on the ground during the sampling procedure,
- Placing each discreet sample, as well as sample ice in closed zipper-locking plastic bags for shipment,
- Collection of equipment blank and trip blank samples for quality control purposes.

Upon completion of sampling, each sampling point was secured. The one-time use sampling equipment was disposed as solid waste.

PFAS Investigation Results

The groundwater elevation data collected during the PFAS investigation indicates direction of groundwater flow is to the south at a horizontal hydraulic gradient of 0.0045 ft/ft. This is consistent with historic groundwater flow patterns at the site. The groundwater elevation contours are depicted on attached Figure 1, “Groundwater Elevation Contours.”

One or more PFAS compound was detected in seven of the eight sampling points selected for the PFAS investigation. No PFAS were detected above the laboratory detection level in well MW-5 (both the sample and the sample duplicate), and only one PFAS compound was detected in well MW-3. Wells MW-5 and MW-3 are upgradient wells. No PFAS were detected in the field blank. The analytical results are summarized on the attached table entitled “Summary of Analytical Results, Eurofins TestAmerica, Sacramento 320-74044-1.” The complete analytical package received from Eurofins TestAmerica is also attached.

As presented on the attached table, the wells at which PFOA, PFOS, or PFOA + PFOS exceeded 20 ng/L included MW-1 (49 ng/L PFOA and 120 ng/L PFOS), MW-4 (56 ng/L PFOA and 32 ng/L PFOS), MW-7 (29 ng/L PFOA and 14 ng/L PFOS) and MW-7SR (19 ng/L PFOA and 3.3 ng/L PFOS). The remaining four sampling points were below 20 ng/L for combined PFOA and PFOS.

Discussion

Based on the analytical results obtained during the PFAS sampling round, it appears relatively low concentrations of PFAS are present in the groundwater below the Hayward Landfill. Since the upgradient wells (MW-3 and MW-5) were found to have minimal impact from PFAS, it appears the materials disposed in the Hayward Landfill are the likely source of PFAS impacts. Concentrations of PFOS, PFOA, or the sum of these two compounds exceeded the WDNR's criteria of 20 ng/L in four of the eight sampling points included in the PFAS investigation.

Closure

We trust the information provided in this report provides the data related to PFAS groundwater impacts that was required in the August 17, 2020 and October 12, 2020 correspondence from WDNR. Please contact me at 715.271.7516 if you have ongoing questions or comments related to the PFAS groundwater investigation of the Hayward Landfill.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

John E. Guhl, PG
Project Hydrogeologist

JEG/jeg/hbh/BLK

Attachments:
Figure 1, Groundwater Elevation Contours
Table, Summary of Analytical Results, Eurofins Sacramento 320-74044-1
Eurofins Sacramento Analytical Package, 6/03/2021

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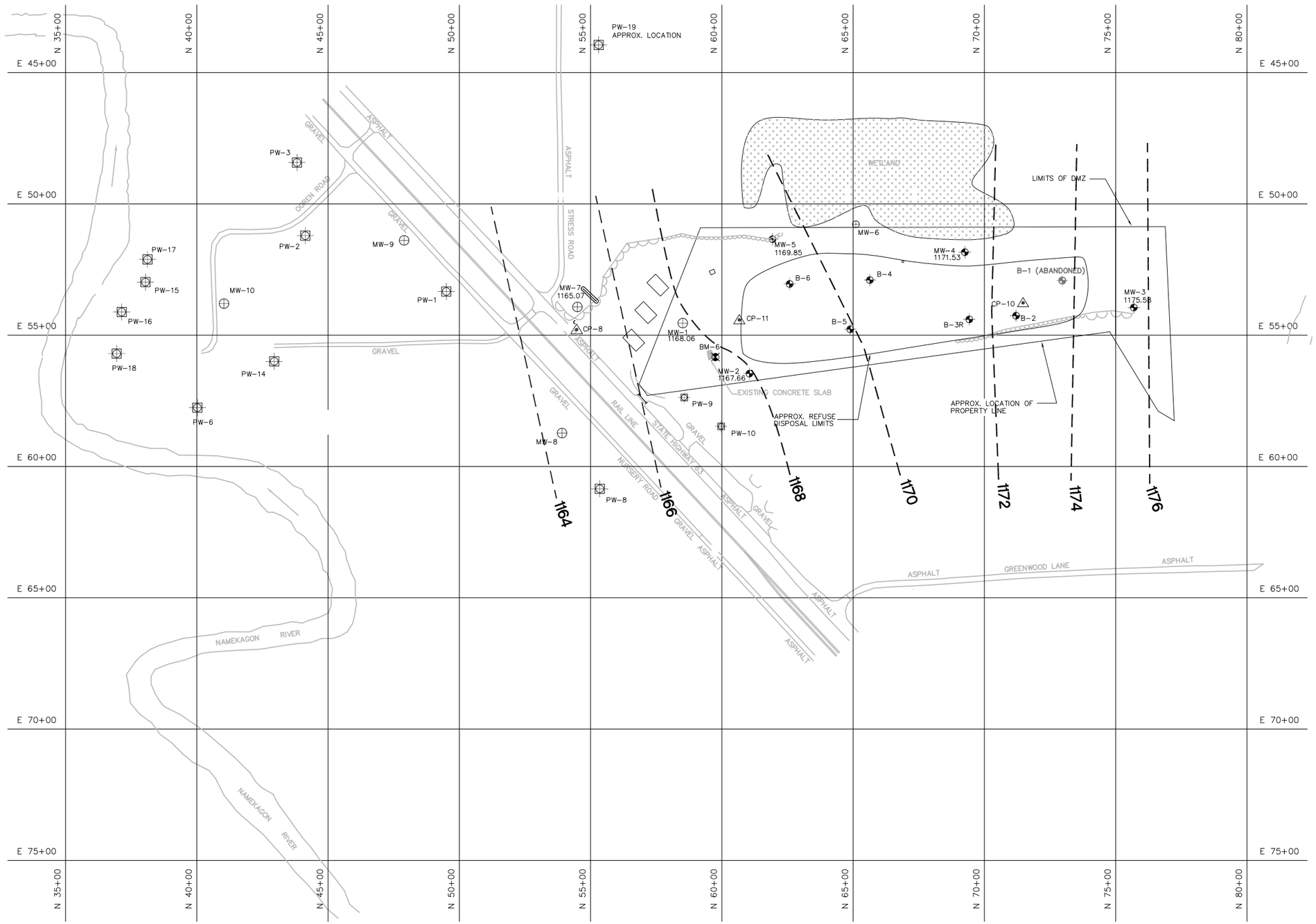

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SCALE IN FEET

0 100 200 400

LEGEND:

- MW-2 — MONITORING WELL LOCATION AND NUMBER
- MW-1 — MONITORING WELL – PIEZOMETER NEST LOCATION AND NUMBER
- PW-9 — PRIVATE WELL LOCATION AND NUMBER
- B-6 — TEMPORARY MONITORING WELL LOCATION AND NUMBER
- BM-6 — BENCHMARK LOCATION AND NUMBER
- CP-11 — SURVEY CONTROL POINT LOCATION AND NUMBER
- 1172 — GROUNDWATER ELEVATION CONTOUR (MSL) 5/20/21

NOTES:

1. APPROXIMATE LOCATION OF FACILITY PROPERTY LINE BASED ON MAY 29, 1984 SITE SURVEY BY ANDERSON–RITCHIE ENGINEERING + SURVEY CO.
2. APPROXIMATE REFUSE DISPOSAL LIMITS BASED ON MAY 29, 1984 SITE SURVEY BY ANDERSON–RITCHIE ENGINEERING + SURVEY CO., AND ON SITE OBSERVATIONS BY SEH.
3. PIEZOMETERS ARE LOCATED IN GENERAL LOCATION OF CORRESPONDING NUMBERED MONITORING WELLS.

SURVEY CONTROL POINTS/ BENCHMARKS

NO.	STATION	DESCRIPTION	ELEV.
CP–8	54+47N, 54+79E	3/4" IRON PIPE	1192.86
CP–10	71+47N, 53+77E	3/4" IRON PIPE	1199.04
CP–11	60+66N, 54+42E	5/8" REBAR	1193.71
BM–6	59+75N, 55+84E	CONCRETE CORNER	1198.95

NO.	DATE	ISSUE/REVISIONS	DRAWN BY		DESIGN		FIELD REVIEW		QC CHECK	
1	06/21		RJH	06/21	JEG	06/21			JEG	06/21

SEH

PFAS INVESTIGATION
HAYWARD LANDFILL
HAYWARD, WISCONSIN

FIGURE 1
GROUNDWATER ELEVATION CONTOURS

PROJ. NO. HAYWA159031
DATE 06/23/21

FIGURE 1

DRAWING DIRECTORY: \\SEHLX\Projects\F\VH\Haywa\135542\OMM Report 2015\Figures\FIGURE 3

City of Hayward Landfill
SUMMARY OF ANALYTICAL RESULTS
Eurofins TestAmerica, Sacramento - 320-74044-1

Sample ID	Enforcement Standard	Preventive Action Limit	MW-1 (801)		MW-2 (802)		MW-3 (803)		MW-4 (804)		MW-5 (805)		MW-7 (811)		PZ-7SR (902)		MW-5 (805) Duplicate		Field Blank		MW-1S (806)	
Lab Sample Number			320-74044-1		320-74044-2		320-74044-3		320-74044-4		320-74044-5		320-74044-6		320-74044-7		320-74044-8		320-74044-9		320-74044-10	
Sampling Date			05/20/2021 01:05:00		05/20/2021 10:35:00		05/20/2021 09:30:00		05/20/2021 11:00:00		05/20/2021 11:40:00		05/20/2021 02:25:00		05/20/2021 01:50:00		05/20/2021 11:40:00		05/20/2021 09:00:00		05/20/2021 12:25:00	
Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Dilution Factor			1		1		1		1		1		1		1		1		1		1	
Units			ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
			Low		Low		Low		Low		Low		Low		Low		Low		Low		Low	
LCMS - 537 (modified)																						
Perfluorobutanoic acid (PFBA)	NE	NE	2.2	J	<2.0	U	<2.0	U	8.7		<2.0	U	7.5		5.6		<2.0	U	<2.0	U	11	
Perfluoropentanoic acid (PFPeA)	NE	NE	2.6		<0.40	U	<0.41	U	12		<0.41	U	5.8		11		<0.42	U	<0.41	U	19	
Perfluorohexanoic acid (PFHxA)	NE	NE	4.2		0.76	J	<0.49	U	15		<0.49	U	7.2		11		<0.49	U	<0.49	U	21	
Perfluoroheptanoic acid (PFHpA)	NE	NE	4.7		0.36	J	<0.21	U	12		<0.21	U	6.1		6.3		<0.21	U	<0.21	U	12	
Perfluorooctanoic acid (PFOA)	NE	NE	49		1.8		0.78	J	56		<0.72	U	29		19		<0.73	U	<0.71	U	43	
Perfluorononanoic acid (PFNA)	NE	NE	1.5	J	<0.22	U	<0.23	U	3.5		<0.23	U	<0.23	U	<0.23	U	<0.23	U	<0.23	U	<0.22	U
Perfluorodecanoic acid (PFDA)	NE	NE	<0.26	U	<0.25	U	<0.26	U	0.62	J	<0.26	U	<0.27	U	0.63	J	<0.26	U	<0.26	U	<0.25	U
Perfluoroundecanoic acid (PFUnA)	NE	NE	<0.92	U	<0.90	U	<0.93	U	<0.93	U	<0.93	U	<0.95	U	<0.94	U	<0.94	U	<0.92	U	<0.90	U
Perfluorododecanoic acid (PFDoA)	NE	NE	<0.46	U	<0.45	U	<0.46	U	0.94	J	<0.46	U	<0.48	U	<0.47	U	<0.47	U	<0.46	U	<0.45	U
Perfluorotridecanoic acid (PFTrDA)	NE	NE	<1.1	U	<1.1	U	<1.1	U	1.1	J	<1.1	U	<1.1	U	<1.1	U	<1.1	U	<1.1	U	<1.1	U
Perfluorotetradecanoic acid (PFTeA)	NE	NE	<0.61	U	<0.60	U	<0.61	U	1.2	J	<0.62	U	<0.63	U	<0.62	U	<0.62	U	<0.61	U	<0.60	U
Perfluoro-n-hexadecanoic acid (PFHxDA)	NE	NE	<0.74	U	<0.73	U	<0.75	U	<0.75	U	<0.75	U	<0.77	U	<0.76	U	<0.76	U	<0.75	U	<0.73	U
Perfluoro-n-octadecanoic acid (PFODA)	NE	NE	<0.78	U	<0.77	U	<0.79	U	<0.80	U	<0.79	U	<0.81	U	<0.80	U	<0.80	U	<0.79	U	<0.77	U
Perfluorobutanesulfonic acid (PFBS)	NE	NE	1.4	J	0.30	J	<0.17	U	1.7		<0.17	U	1.4	J	2.3		<0.17	U	<0.17	U	3.6	
Perfluoropentanesulfonic acid (PFPeS)	NE	NE	0.87	J	<0.25	U	<0.25	U	1.1	J	<0.25	U	1.1	J	1.4	J	<0.26	U	<0.25	U	2.5	
Perfluorohexanesulfonic acid (PFHxS)	NE	NE	4.2		<0.47	U	<0.48	U	5.5		<0.48	U	3.9		3.1		<0.49	U	<0.48	U	6.4	
Perfluoroheptanesulfonic Acid (PFHpS)	NE	NE	2.8		<0.16	U	<0.16	U	0.70	J	<0.16	U	0.50	J	<0.16	U	<0.16	U	<0.16	U	0.35	J
Perfluorooctanesulfonic acid (PFOS)	NE	NE	120		2.4		<0.45	U	32		<0.46	U	14		3.3		<0.46	U	<0.45	U	5.2	I
Perfluorononanesulfonic acid (PFNS)	NE	NE	<0.31	U	<0.30	U	<0.31	U	<0.31	U	<0.31	U	<0.32	U	<0.32	U	<0.32	U	<0.31	U	<0.30	U
Perfluorodecanesulfonic acid (PFDS)	NE	NE	<0.27	U	<0.26	U	<0.27	U	0.53	J	<0.27	U	<0.28	U	<0.27	U	<0.27	U	<0.27	U	<0.26	U
Perfluorododecanesulfonic acid (PFDoS)	NE	NE	<0.81	U	<0.79	U	<0.82	U	0.89	J	<0.82	U	<0.84	U	<0.83	U	<0.83	U	<0.81	U	<0.80	U
Perfluorooctanesulfonamide	NE	NE	1.2	J	<0.80	U	<0.82	U	2.2		<0.83	U	<0.85	U	<0.84	U	<0.84	U	<0.82	U	<0.81	U
NEtFOSA	NE	NE	<0.73	U	<0.71	U	<0.73	U	<0.74	U	<0.73	U	<0.75	U	<0.74	U	<0.74	U	<0.73	U	<0.71	U
NMeFOSA	NE	NE	<0.36	U	<0.35	U	<0.36	U	<0.36	U	<0.36	U	<0.37	U	<0.37	U	<0.37	U	<0.36	U	<0.35	U
NMeFOSAA	NE	NE	<1.0	U	<0.98	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<0.99	U
NEtFOSAA	NE	NE	1.6	J	<1.1	U	<1.1	U	1.7	J	<1.1	U	<1.1	U	<1.1	U	<1.1	U	<1.1	U	<1.1	U
NMeFOSE	NE	NE	<1.2	U	<1.1	U	<1.2	U	<1.2	U	<1.2	U	<1.2	U	<1.2	U	<1.2	U	<1.2	U	<1.2	U
NEtFOSE	NE	NE	<0.71	U	<0.69	U	<0.72	U	<0.72	U	<0.72	U	<0.74	U	<0.73	U	<0.73	U	<0.71	U	<0.70	U
4:2 FTS	NE	NE	<0.20	U	<0.20	U	<0.20	U	<0.20	U	<0.20	U	<0.21	U	<0.21	U	<0.20	U	<0.20	U	<0.20	U
6:2 FTS	NE	NE	<2.1	U	<2.0	U	<2.1	U	<2.1	U	<2.1	U	<2.2	U	<2.1	U	<2.1	U	<2.1	U	<2.1	U
8:2 FTS	NE	NE	<0.38	U	<0.38	U	<0.39	U	<0.39	U	<0.39	U	<0.40	U	<0.39	U	<0.39	U	<0.39	U	<0.38	U
10:2 FTS	NE	NE	<0.56	U	<0.55	U	<0.56	U	0.95	J	<0.56	U	<0.58	U	<0.57	U	<0.57	U	<0.56	U	<0.55	U
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NE	NE	<0.33	U	<0.33	U	<0.34	U	<0.34	U	<0.34	U	<0.35	U	<0.34	U	<0.34	U	<0.33	U	<0.33	U
HFPO-DA (GenX)	NE	NE	<1.3	U	<1.2	U	<1.3	U	<1.3	U	<1.3	U	<1.3	U	<1.3	U	<1.3	U	<1.3	U	<1.2	U
9Cl-PF3ONS	NE	NE	<0.20	U	<0.20	U	<0.20	U	<0.20	U	<0.20	U	<0.21	U	<0.21	U	<0.20	U	<0.20	U	<0.20	U
11Cl-PF3OUdS	NE	NE	<0.27	U	<0.26	U	<0.27	U	0.77	J	<0.27	U	<0.28	U	<0.27	U	<0.27	U	<0.27	U	<0.26	U

I : Value is EMPC (estimated maximum possible concentration).
J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U : Indicates the analyte was analyzed for but not detected.

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ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-74044-1
Client Project/Site: Hayward Landfill PFAS Investigation

For:
Short Elliott Hendrickson, Inc. dba SEH
10 North Bridge Street
Chippewa Falls, Wisconsin 54729-3374

Attn: Mr. Mike Rohlik

Authorized for release by:
6/3/2021 2:28:18 PM

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

Table of Contents

Definitions/Glossary

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Qualifiers

LCMS

Qualifier	Qualifier Description
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 320-74044-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-74044-1

Comments
No additional comments.

Receipt
The samples were received on 5/21/2021 9:35 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.8º C.

Receipt Exceptions

The COC lists sample 7's ID as PZ-7SR (902), while the container lists the ID as MW-7SR (902). Logged and labeled according to COC.PZ-7SR (902) (320-74044-7).

The COC lists sample 8's ID as MW-5 (805) Duplicate, while the container lists the ID as MW-5 (805) (Dup). Logged and labeled according to COC.MW-5 (805) Duplicate (320-74044-8).

Samples all show discoloration in both containers. MW-1 (801) (320-74044-1), MW-3 (803) (320-74044-3), MW-4 (804) (320-74044-4), MW-5 (805) (320-74044-5), MW-7 (811) (320-74044-6) and MW-5 (805) Duplicate (320-74044-8)

LCMS
Method 537 (modified): The “I” qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limit. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgement was used to positively identify the analyte. MW-1S (806) (320-74044-10)

Method 537 (modified): The continuing calibration verification (CCV) associated with batch 320-494405 recovered above the upper control limit for 11Cl-PF3OUdS. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported. The associated samples are impacted: Field Blank (320-74044-9) and (CCV 320-494405/1).

Method 537 (modified): Internal standard (ISTD) response for 13C2 PFOA for the following sample was outside acceptance criteria: MW-5 (805) (320-74044-5). The sample was re-analyzed with concurring results. This ISTD does not correspond to any of the requested target compounds; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3535: The following samples are yellow and contain a thin layer of sediments at the bottom of the bottle prior to extraction: MW-1 (801) (320-74044-1), MW-2 (802) (320-74044-2), MW-3 (803) (320-74044-3), MW-4 (804) (320-74044-4), MW-5 (805) (320-74044-5), MW-7 (811) (320-74044-6), PZ-7SR (902) (320-74044-7), MW-5 (805) Duplicate (320-74044-8) and MW-1S (806) (320-74044-10). 320-492285 Method: PFC_IDA_WI Matrix: Water

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-492285. 320-492285 Method: PFC_IDA_WI Matrix: Water

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-1 (801) — Lab Sample ID: 320-74044-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.2	J	4.2	2.0	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.6		1.7	0.41	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	4.2		1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.7		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	49		1.7	0.71	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.5	J	1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	0.87	J	1.7	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.2		1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	2.8		1.7	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	120		1.7	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	1.2	J	1.7	0.82	ng/L	1		537 (modified)	Total/NA
NEtFOSAA	1.6	J	4.2	1.1	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-2 (802) — Lab Sample ID: 320-74044-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.76	J	1.6	0.47	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.36	J	1.6	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.8		1.6	0.69	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.30	J	1.6	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.4		1.6	0.44	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-3 (803) — Lab Sample ID: 320-74044-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.78	J	1.7	0.72	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-4 (804) — Lab Sample ID: 320-74044-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	8.7		4.2	2.0	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	12		1.7	0.41	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	15		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	12		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	56		1.7	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	3.5		1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.62	J	1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.94	J	1.7	0.47	ng/L	1		537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTrDA)	1.1	J	1.7	1.1	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	J	1.7	0.62	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.7		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	1.1	J	1.7	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	5.5		1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.70	J	1.7	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	32		1.7	0.46	ng/L	1		537 (modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	0.53	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorododecanesulfonic acid (PFDoS)	0.89	J	1.7	0.82	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	2.2		1.7	0.83	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-4 (804) (Continued) — Lab Sample ID: 320-74044-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
NEtFOSAA	1.7	J	4.2	1.1	ng/L	1		537 (modified)	Total/NA
10:2 FTS	0.95	J	1.7	0.57	ng/L	1		537 (modified)	Total/NA
11Cl-PF3OUdS	0.77	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-5 (805) — Lab Sample ID: 320-74044-5

No Detections.

Client Sample ID: MW-7 (811) — Lab Sample ID: 320-74044-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.5		4.3	2.1	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	5.8		1.7	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	7.2		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.1		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	29		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	1.1	J	1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.9		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.50	J	1.7	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	14		1.7	0.47	ng/L	1		537 (modified)	Total/NA

Client Sample ID: PZ-7SR (902) — Lab Sample ID: 320-74044-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	5.6		4.3	2.1	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	11		1.7	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	11		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.3		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	19		1.7	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.63	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.3		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	1.4	J	1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.1		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.3		1.7	0.46	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-5 (805) Duplicate — Lab Sample ID: 320-74044-8

No Detections.

Client Sample ID: Field Blank — Lab Sample ID: 320-74044-9

No Detections.

Client Sample ID: MW-1S (806) — Lab Sample ID: 320-74044-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	11		4.1	2.0	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	19		1.6	0.40	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	21		1.6	0.48	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	12		1.6	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	43		1.6	0.70	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1S (806) (Continued)
Lab Sample ID: 320-74044-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	3.6		1.6	0.16	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	2.5		1.6	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.4		1.6	0.47	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.35	J	1.6	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.2	I	1.6	0.44	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-1 (801)
Date Collected: 05/20/21 01:05
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.2**	**J**	4.2	2.0	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluoropentanoic acid (PFPeA)	**2.6**		1.7	0.41	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorohexanoic acid (PFHxA)	**4.2**		1.7	0.48	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluoroheptanoic acid (PFHpA)	**4.7**		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorooctanoic acid (PFOA)	**49**		1.7	0.71	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorononanoic acid (PFNA)	**1.5**	**J**	1.7	0.23	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorodecanoic acid (PFDA)	<0.26		1.7	0.26	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluoroundecanoic acid (PFUnA)	<0.92		1.7	0.92	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorododecanoic acid (PFDoA)	<0.46		1.7	0.46	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.7	1.1	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorotetradecanoic acid (PFTeA)	<0.61		1.7	0.61	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.74		1.7	0.74	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.78		1.7	0.78	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorobutanesulfonic acid (PFBS)	**1.4**	**J**	1.7	0.17	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluoropentanesulfonic acid (PFPeS)	**0.87**	**J**	1.7	0.25	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorohexanesulfonic acid (PFHxS)	**4.2**		1.7	0.48	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluoroheptanesulfonic Acid (PFHpS)	**2.8**		1.7	0.16	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorooctanesulfonic acid (PFOS)	**120**		1.7	0.45	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorononanesulfonic acid (PFNS)	<0.31		1.7	0.31	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorododecanesulfonic acid (PFDoS)	<0.81		1.7	0.81	ng/L		05/24/21 19:19	05/29/21 06:42	1
Perfluorooctanesulfonamide (FOSA)	**1.2**	**J**	1.7	0.82	ng/L		05/24/21 19:19	05/29/21 06:42	1
NEtFOSA	<0.73		1.7	0.73	ng/L		05/24/21 19:19	05/29/21 06:42	1
NMeFOSA	<0.36		1.7	0.36	ng/L		05/24/21 19:19	05/29/21 06:42	1
NMeFOSAA	<1.0		4.2	1.0	ng/L		05/24/21 19:19	05/29/21 06:42	1
NEtFOSAA	**1.6**	**J**	4.2	1.1	ng/L		05/24/21 19:19	05/29/21 06:42	1
NMeFOSE	<1.2		3.3	1.2	ng/L		05/24/21 19:19	05/29/21 06:42	1
NEtFOSE	<0.71		1.7	0.71	ng/L		05/24/21 19:19	05/29/21 06:42	1
4:2 FTS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 06:42	1
6:2 FTS	<2.1		4.2	2.1	ng/L		05/24/21 19:19	05/29/21 06:42	1
8:2 FTS	<0.38		1.7	0.38	ng/L		05/24/21 19:19	05/29/21 06:42	1
10:2 FTS	<0.56		1.7	0.56	ng/L		05/24/21 19:19	05/29/21 06:42	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.33		1.7	0.33	ng/L		05/24/21 19:19	05/29/21 06:42	1
HFPO-DA (GenX)	<1.3		3.3	1.3	ng/L		05/24/21 19:19	05/29/21 06:42	1
9Cl-PF3ONS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 06:42	1
11Cl-PF3OUdS	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 06:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*75*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:42*	*1*
13C5 PFPeA	*48*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:42*	*1*
13C2 PFHxA	*83*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:42*	*1*
13C4 PFHpA	*75*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:42*	*1*
13C4 PFOA	*89*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:42*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: MW-1 (801)
Lab Sample ID: 320-74044-1
Date Collected: 05/20/21 01:05
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	89		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C2 PFDA	98		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C2 PFUnA	91		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C2 PFDoA	83		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C2 PFTeDA	96		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C2 PFHxDA	125		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C3 PFBS	77		25 - 150	05/24/21 19:19	05/29/21 06:42	1
18O2 PFHxS	81		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C4 PFOS	83		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C8 FOSA	89		10 - 150	05/24/21 19:19	05/29/21 06:42	1
d3-NMeFOSAA	84		25 - 150	05/24/21 19:19	05/29/21 06:42	1
d5-NEtFOSAA	82		25 - 150	05/24/21 19:19	05/29/21 06:42	1
d-N-MeFOSA-M	79		10 - 150	05/24/21 19:19	05/29/21 06:42	1
d-N-EtFOSA-M	74		10 - 150	05/24/21 19:19	05/29/21 06:42	1
d7-N-MeFOSE-M	75		10 - 150	05/24/21 19:19	05/29/21 06:42	1
d9-N-EtFOSE-M	71		10 - 150	05/24/21 19:19	05/29/21 06:42	1
M2-4:2 FTS	119		25 - 150	05/24/21 19:19	05/29/21 06:42	1
M2-6:2 FTS	121		25 - 150	05/24/21 19:19	05/29/21 06:42	1
M2-8:2 FTS	127		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C3 HFPO-DA	79		25 - 150	05/24/21 19:19	05/29/21 06:42	1
13C2 10:2 FTS	96		25 - 150	05/24/21 19:19	05/29/21 06:42	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-2 (802)

Date Collected: 05/20/21 10:35
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.0		4.1	2.0	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluoropentanoic acid (PFPeA)	<0.40		1.6	0.40	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorohexanoic acid (PFHxA)	**0.76**	**J**	1.6	0.47	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluoroheptanoic acid (PFHpA)	**0.36**	**J**	1.6	0.20	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorooctanoic acid (PFOA)	**1.8**		1.6	0.69	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorononanoic acid (PFNA)	<0.22		1.6	0.22	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorodecanoic acid (PFDA)	<0.25		1.6	0.25	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluoroundecanoic acid (PFUnA)	<0.90		1.6	0.90	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorododecanoic acid (PFDoA)	<0.45		1.6	0.45	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.6	1.1	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorotetradecanoic acid (PFTeA)	<0.60		1.6	0.60	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.73		1.6	0.73	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.77		1.6	0.77	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorobutanesulfonic acid (PFBS)	**0.30**	**J**	1.6	0.16	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluoropentanesulfonic acid (PFPeS)	<0.25		1.6	0.25	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorohexanesulfonic acid (PFHxS)	<0.47		1.6	0.47	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.6	0.16	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorooctanesulfonic acid (PFOS)	**2.4**		1.6	0.44	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorononanesulfonic acid (PFNS)	<0.30		1.6	0.30	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorodecanesulfonic acid (PFDS)	<0.26		1.6	0.26	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorododecanesulfonic acid (PFDoS)	<0.79		1.6	0.79	ng/L		05/24/21 19:19	05/29/21 06:52	1
Perfluorooctanesulfonamide (FOSA)	<0.80		1.6	0.80	ng/L		05/24/21 19:19	05/29/21 06:52	1
NEtFOSA	<0.71		1.6	0.71	ng/L		05/24/21 19:19	05/29/21 06:52	1
NMeFOSA	<0.35		1.6	0.35	ng/L		05/24/21 19:19	05/29/21 06:52	1
NMeFOSAA	<0.98		4.1	0.98	ng/L		05/24/21 19:19	05/29/21 06:52	1
NEtFOSAA	<1.1		4.1	1.1	ng/L		05/24/21 19:19	05/29/21 06:52	1
NMeFOSE	<1.1		3.3	1.1	ng/L		05/24/21 19:19	05/29/21 06:52	1
NEtFOSE	<0.69		1.6	0.69	ng/L		05/24/21 19:19	05/29/21 06:52	1
4:2 FTS	<0.20		1.6	0.20	ng/L		05/24/21 19:19	05/29/21 06:52	1
6:2 FTS	<2.0		4.1	2.0	ng/L		05/24/21 19:19	05/29/21 06:52	1
8:2 FTS	<0.38		1.6	0.38	ng/L		05/24/21 19:19	05/29/21 06:52	1
10:2 FTS	<0.55		1.6	0.55	ng/L		05/24/21 19:19	05/29/21 06:52	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.33		1.6	0.33	ng/L		05/24/21 19:19	05/29/21 06:52	1
HFPO-DA (GenX)	<1.2		3.3	1.2	ng/L		05/24/21 19:19	05/29/21 06:52	1
9Cl-PF3ONS	<0.20		1.6	0.20	ng/L		05/24/21 19:19	05/29/21 06:52	1
11Cl-PF3OUdS	<0.26		1.6	0.26	ng/L		05/24/21 19:19	05/29/21 06:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*71*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:52*	*1*
13C5 PFPeA	*59*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:52*	*1*
13C2 PFHxA	*90*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:52*	*1*
13C4 PFHpA	*80*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:52*	*1*
13C4 PFOA	*93*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:52*	*1*
13C5 PFNA	*83*		*25 - 150*	*05/24/21 19:19*	*05/29/21 06:52*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: MW-2 (802)
Lab Sample ID: 320-74044-2
Date Collected: 05/20/21 10:35
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	90		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C2 PFUnA	83		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C2 PFDoA	79		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C2 PFTeDA	91		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C2 PFHxDA	114		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C3 PFBS	81		25 - 150	05/24/21 19:19	05/29/21 06:52	1
18O2 PFHxS	83		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C4 PFOS	81		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C8 FOSA	89		10 - 150	05/24/21 19:19	05/29/21 06:52	1
d3-NMeFOSAA	84		25 - 150	05/24/21 19:19	05/29/21 06:52	1
d5-NEtFOSAA	82		25 - 150	05/24/21 19:19	05/29/21 06:52	1
d-N-MeFOSA-M	74		10 - 150	05/24/21 19:19	05/29/21 06:52	1
d-N-EtFOSA-M	69		10 - 150	05/24/21 19:19	05/29/21 06:52	1
d7-N-MeFOSE-M	73		10 - 150	05/24/21 19:19	05/29/21 06:52	1
d9-N-EtFOSE-M	66		10 - 150	05/24/21 19:19	05/29/21 06:52	1
M2-4:2 FTS	80		25 - 150	05/24/21 19:19	05/29/21 06:52	1
M2-6:2 FTS	83		25 - 150	05/24/21 19:19	05/29/21 06:52	1
M2-8:2 FTS	87		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C3 HFPO-DA	88		25 - 150	05/24/21 19:19	05/29/21 06:52	1
13C2 10:2 FTS	88		25 - 150	05/24/21 19:19	05/29/21 06:52	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-3 (803)
Date Collected: 05/20/21 09:30
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.0		4.2	2.0	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluoropentanoic acid (PFPeA)	<0.41		1.7	0.41	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorohexanoic acid (PFHxA)	<0.49		1.7	0.49	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluoroheptanoic acid (PFHpA)	<0.21		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorooctanoic acid (PFOA)	**0.78**	**J**	1.7	0.72	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorodecanoic acid (PFDA)	<0.26		1.7	0.26	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluoroundecanoic acid (PFUnA)	<0.93		1.7	0.93	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorododecanoic acid (PFDoA)	<0.46		1.7	0.46	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.7	1.1	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorotetradecanoic acid (PFTeA)	<0.61		1.7	0.61	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.75		1.7	0.75	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.79		1.7	0.79	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorobutanesulfonic acid (PFBS)	<0.17		1.7	0.17	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluoropentanesulfonic acid (PFPeS)	<0.25		1.7	0.25	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorohexanesulfonic acid (PFHxS)	<0.48		1.7	0.48	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorooctanesulfonic acid (PFOS)	<0.45		1.7	0.45	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorononanesulfonic acid (PFNS)	<0.31		1.7	0.31	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorododecanesulfonic acid (PFDoS)	<0.82		1.7	0.82	ng/L		05/24/21 19:19	05/29/21 07:01	1
Perfluorooctanesulfonamide (FOSA)	<0.82		1.7	0.82	ng/L		05/24/21 19:19	05/29/21 07:01	1
NEtFOSA	<0.73		1.7	0.73	ng/L		05/24/21 19:19	05/29/21 07:01	1
NMeFOSA	<0.36		1.7	0.36	ng/L		05/24/21 19:19	05/29/21 07:01	1
NMeFOSAA	<1.0		4.2	1.0	ng/L		05/24/21 19:19	05/29/21 07:01	1
NEtFOSAA	<1.1		4.2	1.1	ng/L		05/24/21 19:19	05/29/21 07:01	1
NMeFOSE	<1.2		3.4	1.2	ng/L		05/24/21 19:19	05/29/21 07:01	1
NEtFOSE	<0.72		1.7	0.72	ng/L		05/24/21 19:19	05/29/21 07:01	1
4:2 FTS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:01	1
6:2 FTS	<2.1		4.2	2.1	ng/L		05/24/21 19:19	05/29/21 07:01	1
8:2 FTS	<0.39		1.7	0.39	ng/L		05/24/21 19:19	05/29/21 07:01	1
10:2 FTS	<0.56		1.7	0.56	ng/L		05/24/21 19:19	05/29/21 07:01	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.34		1.7	0.34	ng/L		05/24/21 19:19	05/29/21 07:01	1
HFPO-DA (GenX)	<1.3		3.4	1.3	ng/L		05/24/21 19:19	05/29/21 07:01	1
9Cl-PF3ONS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:01	1
11Cl-PF3OUdS	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*59*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*
13C5 PFPeA	*47*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*
13C2 PFHxA	*71*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*
13C4 PFHpA	*68*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*
13C4 PFOA	*74*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*
13C5 PFNA	*70*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*
13C2 PFDA	*73*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*
13C2 PFUnA	*70*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:01*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-3 (803)
Date Collected: 05/20/21 09:30
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	59		25 - 150	05/24/21 19:19	05/29/21 07:01	1
13C2 PFTeDA	60		25 - 150	05/24/21 19:19	05/29/21 07:01	1
13C2 PFHxDA	57		25 - 150	05/24/21 19:19	05/29/21 07:01	1
13C3 PFBS	62		25 - 150	05/24/21 19:19	05/29/21 07:01	1
18O2 PFHxS	67		25 - 150	05/24/21 19:19	05/29/21 07:01	1
13C4 PFOS	64		25 - 150	05/24/21 19:19	05/29/21 07:01	1
13C8 FOSA	69		10 - 150	05/24/21 19:19	05/29/21 07:01	1
d3-NMeFOSAA	64		25 - 150	05/24/21 19:19	05/29/21 07:01	1
d5-NEtFOSAA	60		25 - 150	05/24/21 19:19	05/29/21 07:01	1
d-N-MeFOSA-M	56		10 - 150	05/24/21 19:19	05/29/21 07:01	1
d-N-EtFOSA-M	49		10 - 150	05/24/21 19:19	05/29/21 07:01	1
d7-N-MeFOSE-M	52		10 - 150	05/24/21 19:19	05/29/21 07:01	1
d9-N-EtFOSE-M	43		10 - 150	05/24/21 19:19	05/29/21 07:01	1
M2-4:2 FTS	59		25 - 150	05/24/21 19:19	05/29/21 07:01	1
M2-6:2 FTS	65		25 - 150	05/24/21 19:19	05/29/21 07:01	1
M2-8:2 FTS	75		25 - 150	05/24/21 19:19	05/29/21 07:01	1
13C3 HFPO-DA	69		25 - 150	05/24/21 19:19	05/29/21 07:01	1
13C2 10:2 FTS	70		25 - 150	05/24/21 19:19	05/29/21 07:01	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-4 (804)

Date Collected: 05/20/21 11:00
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-4

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**8.7**		4.2	2.0	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluoropentanoic acid (PFPeA)	**12**		1.7	0.41	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorohexanoic acid (PFHxA)	**15**		1.7	0.49	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluoroheptanoic acid (PFHpA)	**12**		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorooctanoic acid (PFOA)	**56**		1.7	0.72	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorononanoic acid (PFNA)	**3.5**		1.7	0.23	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorodecanoic acid (PFDA)	**0.62**	**J**	1.7	0.26	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluoroundecanoic acid (PFUnA)	<0.93		1.7	0.93	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorododecanoic acid (PFDoA)	**0.94**	**J**	1.7	0.47	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorotridecanoic acid (PFTrDA)	**1.1**	**J**	1.7	1.1	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorotetradecanoic acid (PFTeA)	**1.2**	**J**	1.7	0.62	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.75		1.7	0.75	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.80		1.7	0.80	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorobutanesulfonic acid (PFBS)	**1.7**		1.7	0.17	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluoropentanesulfonic acid (PFPeS)	**1.1**	**J**	1.7	0.25	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorohexanesulfonic acid (PFHxS)	**5.5**		1.7	0.48	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.70**	**J**	1.7	0.16	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorooctanesulfonic acid (PFOS)	**32**		1.7	0.46	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorononanesulfonic acid (PFNS)	<0.31		1.7	0.31	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorodecanesulfonic acid (PFDS)	**0.53**	**J**	1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorododecanesulfonic acid (PFDoS)	**0.89**	**J**	1.7	0.82	ng/L		05/24/21 19:19	05/29/21 07:10	1
Perfluorooctanesulfonamide (FOSA)	**2.2**		1.7	0.83	ng/L		05/24/21 19:19	05/29/21 07:10	1
NEtFOSA	<0.74		1.7	0.74	ng/L		05/24/21 19:19	05/29/21 07:10	1
NMeFOSA	<0.36		1.7	0.36	ng/L		05/24/21 19:19	05/29/21 07:10	1
NMeFOSAA	<1.0		4.2	1.0	ng/L		05/24/21 19:19	05/29/21 07:10	1
NEtFOSAA	**1.7**	**J**	4.2	1.1	ng/L		05/24/21 19:19	05/29/21 07:10	1
NMeFOSE	<1.2		3.4	1.2	ng/L		05/24/21 19:19	05/29/21 07:10	1
NEtFOSE	<0.72		1.7	0.72	ng/L		05/24/21 19:19	05/29/21 07:10	1
4:2 FTS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:10	1
6:2 FTS	<2.1		4.2	2.1	ng/L		05/24/21 19:19	05/29/21 07:10	1
8:2 FTS	<0.39		1.7	0.39	ng/L		05/24/21 19:19	05/29/21 07:10	1
10:2 FTS	**0.95**	**J**	1.7	0.57	ng/L		05/24/21 19:19	05/29/21 07:10	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.34		1.7	0.34	ng/L		05/24/21 19:19	05/29/21 07:10	1
HFPO-DA (GenX)	<1.3		3.4	1.3	ng/L		05/24/21 19:19	05/29/21 07:10	1
9Cl-PF3ONS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:10	1
11Cl-PF3OUdS	**0.77**	**J**	1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*60*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:10*	*1*
13C5 PFPeA	*36*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:10*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: MW-4 (804)
Lab Sample ID: 320-74044-4
Date Collected: 05/20/21 11:00
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C4 PFHpA	71		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C4 PFOA	98		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C5 PFNA	85		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C2 PFDA	111		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C2 PFUnA	105		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C2 PFDoA	107		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C2 PFTeDA	122		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C2 PFHxDA	141		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C3 PFBS	71		25 - 150	05/24/21 19:19	05/29/21 07:10	1
18O2 PFHxS	86		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C4 PFOS	94		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C8 FOSA	105		10 - 150	05/24/21 19:19	05/29/21 07:10	1
d3-NMeFOSAA	96		25 - 150	05/24/21 19:19	05/29/21 07:10	1
d5-NEtFOSAA	94		25 - 150	05/24/21 19:19	05/29/21 07:10	1
d-N-MeFOSA-M	105		10 - 150	05/24/21 19:19	05/29/21 07:10	1
d-N-EtFOSA-M	96		10 - 150	05/24/21 19:19	05/29/21 07:10	1
d7-N-MeFOSE-M	85		10 - 150	05/24/21 19:19	05/29/21 07:10	1
d9-N-EtFOSE-M	86		10 - 150	05/24/21 19:19	05/29/21 07:10	1
M2-4:2 FTS	118		25 - 150	05/24/21 19:19	05/29/21 07:10	1
M2-6:2 FTS	144		25 - 150	05/24/21 19:19	05/29/21 07:10	1
M2-8:2 FTS	141		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C3 HFPO-DA	80		25 - 150	05/24/21 19:19	05/29/21 07:10	1
13C2 10:2 FTS	119		25 - 150	05/24/21 19:19	05/29/21 07:10	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-5 (805)

Date Collected: 05/20/21 11:40
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-5

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.0		4.2	2.0	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluoropentanoic acid (PFPeA)	<0.41		1.7	0.41	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorohexanoic acid (PFHxA)	<0.49		1.7	0.49	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluoroheptanoic acid (PFHpA)	<0.21		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorooctanoic acid (PFOA)	<0.72		1.7	0.72	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorodecanoic acid (PFDA)	<0.26		1.7	0.26	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluoroundecanoic acid (PFUnA)	<0.93		1.7	0.93	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorododecanoic acid (PFDoA)	<0.46		1.7	0.46	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.7	1.1	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorotetradecanoic acid (PFTeA)	<0.62		1.7	0.62	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.75		1.7	0.75	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.79		1.7	0.79	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorobutanesulfonic acid (PFBS)	<0.17		1.7	0.17	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluoropentanesulfonic acid (PFPeS)	<0.25		1.7	0.25	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorohexanesulfonic acid (PFHxS)	<0.48		1.7	0.48	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorooctanesulfonic acid (PFOS)	<0.46		1.7	0.46	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorononanesulfonic acid (PFNS)	<0.31		1.7	0.31	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorododecanesulfonic acid (PFDoS)	<0.82		1.7	0.82	ng/L		05/24/21 19:19	05/29/21 07:20	1
Perfluorooctanesulfonamide (FOSA)	<0.83		1.7	0.83	ng/L		05/24/21 19:19	05/29/21 07:20	1
NEtFOSA	<0.73		1.7	0.73	ng/L		05/24/21 19:19	05/29/21 07:20	1
NMeFOSA	<0.36		1.7	0.36	ng/L		05/24/21 19:19	05/29/21 07:20	1
NMeFOSAA	<1.0		4.2	1.0	ng/L		05/24/21 19:19	05/29/21 07:20	1
NEtFOSAA	<1.1		4.2	1.1	ng/L		05/24/21 19:19	05/29/21 07:20	1
NMeFOSE	<1.2		3.4	1.2	ng/L		05/24/21 19:19	05/29/21 07:20	1
NEtFOSE	<0.72		1.7	0.72	ng/L		05/24/21 19:19	05/29/21 07:20	1
4:2 FTS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:20	1
6:2 FTS	<2.1		4.2	2.1	ng/L		05/24/21 19:19	05/29/21 07:20	1
8:2 FTS	<0.39		1.7	0.39	ng/L		05/24/21 19:19	05/29/21 07:20	1
10:2 FTS	<0.56		1.7	0.56	ng/L		05/24/21 19:19	05/29/21 07:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.34		1.7	0.34	ng/L		05/24/21 19:19	05/29/21 07:20	1
HFPO-DA (GenX)	<1.3		3.4	1.3	ng/L		05/24/21 19:19	05/29/21 07:20	1
9Cl-PF3ONS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:20	1
11Cl-PF3OUdS	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*67*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*
13C5 PFPeA	*45*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*
13C2 PFHxA	*92*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*
13C4 PFHpA	*74*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*
13C4 PFOA	*92*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*
13C5 PFNA	*87*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*
13C2 PFDA	*103*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*
13C2 PFUnA	*92*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:20*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: MW-5 (805)
Lab Sample ID: 320-74044-5
Date Collected: 05/20/21 11:40
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	91		25 - 150	05/24/21 19:19	05/29/21 07:20	1
13C2 PFTeDA	96		25 - 150	05/24/21 19:19	05/29/21 07:20	1
13C2 PFHxDA	106		25 - 150	05/24/21 19:19	05/29/21 07:20	1
13C3 PFBS	71		25 - 150	05/24/21 19:19	05/29/21 07:20	1
18O2 PFHxS	80		25 - 150	05/24/21 19:19	05/29/21 07:20	1
13C4 PFOS	80		25 - 150	05/24/21 19:19	05/29/21 07:20	1
13C8 FOSA	94		10 - 150	05/24/21 19:19	05/29/21 07:20	1
d3-NMeFOSAA	85		25 - 150	05/24/21 19:19	05/29/21 07:20	1
d5-NEtFOSAA	90		25 - 150	05/24/21 19:19	05/29/21 07:20	1
d-N-MeFOSA-M	94		10 - 150	05/24/21 19:19	05/29/21 07:20	1
d-N-EtFOSA-M	79		10 - 150	05/24/21 19:19	05/29/21 07:20	1
d7-N-MeFOSE-M	84		10 - 150	05/24/21 19:19	05/29/21 07:20	1
d9-N-EtFOSE-M	73		10 - 150	05/24/21 19:19	05/29/21 07:20	1
M2-4:2 FTS	92		25 - 150	05/24/21 19:19	05/29/21 07:20	1
M2-6:2 FTS	86		25 - 150	05/24/21 19:19	05/29/21 07:20	1
M2-8:2 FTS	106		25 - 150	05/24/21 19:19	05/29/21 07:20	1
13C3 HFPO-DA	78		25 - 150	05/24/21 19:19	05/29/21 07:20	1
13C2 10:2 FTS	100		25 - 150	05/24/21 19:19	05/29/21 07:20	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-7 (811)
Date Collected: 05/20/21 02:25
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-6
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**7.5**		4.3	2.1	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluoropentanoic acid (PFPeA)	**5.8**		1.7	0.42	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorohexanoic acid (PFHxA)	**7.2**		1.7	0.50	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluoroheptanoic acid (PFHpA)	**6.1**		1.7	0.22	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorooctanoic acid (PFOA)	**29**		1.7	0.74	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorodecanoic acid (PFDA)	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluoroundecanoic acid (PFUnA)	<0.95		1.7	0.95	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorododecanoic acid (PFDoA)	<0.48		1.7	0.48	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.7	1.1	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorotetradecanoic acid (PFTeA)	<0.63		1.7	0.63	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.77		1.7	0.77	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.81		1.7	0.81	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorobutanesulfonic acid (PFBS)	**1.4**	**J**	1.7	0.17	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluoropentanesulfonic acid (PFPeS)	**1.1**	**J**	1.7	0.26	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorohexanesulfonic acid (PFHxS)	**3.9**		1.7	0.49	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.50**	**J**	1.7	0.16	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorooctanesulfonic acid (PFOS)	**14**		1.7	0.47	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorononanesulfonic acid (PFNS)	<0.32		1.7	0.32	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorodecanesulfonic acid (PFDS)	<0.28		1.7	0.28	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorododecanesulfonic acid (PFDoS)	<0.84		1.7	0.84	ng/L		05/24/21 19:19	05/29/21 07:29	1
Perfluorooctanesulfonamide (FOSA)	<0.85		1.7	0.85	ng/L		05/24/21 19:19	05/29/21 07:29	1
NEtFOSA	<0.75		1.7	0.75	ng/L		05/24/21 19:19	05/29/21 07:29	1
NMeFOSA	<0.37		1.7	0.37	ng/L		05/24/21 19:19	05/29/21 07:29	1
NMeFOSAA	<1.0		4.3	1.0	ng/L		05/24/21 19:19	05/29/21 07:29	1
NEtFOSAA	<1.1		4.3	1.1	ng/L		05/24/21 19:19	05/29/21 07:29	1
NMeFOSE	<1.2		3.5	1.2	ng/L		05/24/21 19:19	05/29/21 07:29	1
NEtFOSE	<0.74		1.7	0.74	ng/L		05/24/21 19:19	05/29/21 07:29	1
4:2 FTS	<0.21		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:29	1
6:2 FTS	<2.2		4.3	2.2	ng/L		05/24/21 19:19	05/29/21 07:29	1
8:2 FTS	<0.40		1.7	0.40	ng/L		05/24/21 19:19	05/29/21 07:29	1
10:2 FTS	<0.58		1.7	0.58	ng/L		05/24/21 19:19	05/29/21 07:29	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.35		1.7	0.35	ng/L		05/24/21 19:19	05/29/21 07:29	1
HFPO-DA (GenX)	<1.3		3.5	1.3	ng/L		05/24/21 19:19	05/29/21 07:29	1
9Cl-PF3ONS	<0.21		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:29	1
11Cl-PF3OUdS	<0.28		1.7	0.28	ng/L		05/24/21 19:19	05/29/21 07:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*49*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:29*	*1*
13C5 PFPeA	*32*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:29*	*1*
13C2 PFHxA	*77*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:29*	*1*
13C4 PFHpA	*64*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:29*	*1*
13C4 PFOA	*82*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:29*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: MW-7 (811)
Lab Sample ID: 320-74044-6
Date Collected: 05/20/21 02:25
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	79		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C2 PFDA	101		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C2 PFUnA	88		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C2 PFDoA	82		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C2 PFTeDA	97		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C2 PFHxDA	127		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C3 PFBS	65		25 - 150	05/24/21 19:19	05/29/21 07:29	1
18O2 PFHxS	73		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C4 PFOS	84		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C8 FOSA	94		10 - 150	05/24/21 19:19	05/29/21 07:29	1
d3-NMeFOSAA	87		25 - 150	05/24/21 19:19	05/29/21 07:29	1
d5-NEtFOSAA	81		25 - 150	05/24/21 19:19	05/29/21 07:29	1
d-N-MeFOSA-M	82		10 - 150	05/24/21 19:19	05/29/21 07:29	1
d-N-EtFOSA-M	76		10 - 150	05/24/21 19:19	05/29/21 07:29	1
d7-N-MeFOSE-M	69		10 - 150	05/24/21 19:19	05/29/21 07:29	1
d9-N-EtFOSE-M	64		10 - 150	05/24/21 19:19	05/29/21 07:29	1
M2-4:2 FTS	102		25 - 150	05/24/21 19:19	05/29/21 07:29	1
M2-6:2 FTS	111		25 - 150	05/24/21 19:19	05/29/21 07:29	1
M2-8:2 FTS	112		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C3 HFPO-DA	60		25 - 150	05/24/21 19:19	05/29/21 07:29	1
13C2 10:2 FTS	101		25 - 150	05/24/21 19:19	05/29/21 07:29	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: PZ-7SR (902)

Date Collected: 05/20/21 01:50
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-7

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**5.6**		4.3	2.1	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluoropentanoic acid (PFPeA)	**11**		1.7	0.42	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorohexanoic acid (PFHxA)	**11**		1.7	0.50	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluoroheptanoic acid (PFHpA)	**6.3**		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorooctanoic acid (PFOA)	**19**		1.7	0.73	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorodecanoic acid (PFDA)	**0.63**	**J**	1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluoroundecanoic acid (PFUnA)	<0.94		1.7	0.94	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorododecanoic acid (PFDoA)	<0.47		1.7	0.47	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.7	1.1	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorotetradecanoic acid (PFTeA)	<0.62		1.7	0.62	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.76		1.7	0.76	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.80		1.7	0.80	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorobutanesulfonic acid (PFBS)	**2.3**		1.7	0.17	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluoropentanesulfonic acid (PFPeS)	**1.4**	**J**	1.7	0.26	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorohexanesulfonic acid (PFHxS)	**3.1**		1.7	0.49	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorooctanesulfonic acid (PFOS)	**3.3**		1.7	0.46	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorononanesulfonic acid (PFNS)	<0.32		1.7	0.32	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorododecanesulfonic acid (PFDoS)	<0.83		1.7	0.83	ng/L		05/24/21 19:19	05/29/21 07:39	1
Perfluorooctanesulfonamide (FOSA)	<0.84		1.7	0.84	ng/L		05/24/21 19:19	05/29/21 07:39	1
NEtFOSA	<0.74		1.7	0.74	ng/L		05/24/21 19:19	05/29/21 07:39	1
NMeFOSA	<0.37		1.7	0.37	ng/L		05/24/21 19:19	05/29/21 07:39	1
NMeFOSAA	<1.0		4.3	1.0	ng/L		05/24/21 19:19	05/29/21 07:39	1
NEtFOSAA	<1.1		4.3	1.1	ng/L		05/24/21 19:19	05/29/21 07:39	1
NMeFOSE	<1.2		3.4	1.2	ng/L		05/24/21 19:19	05/29/21 07:39	1
NEtFOSE	<0.73		1.7	0.73	ng/L		05/24/21 19:19	05/29/21 07:39	1
4:2 FTS	<0.21		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:39	1
6:2 FTS	<2.1		4.3	2.1	ng/L		05/24/21 19:19	05/29/21 07:39	1
8:2 FTS	<0.39		1.7	0.39	ng/L		05/24/21 19:19	05/29/21 07:39	1
10:2 FTS	<0.57		1.7	0.57	ng/L		05/24/21 19:19	05/29/21 07:39	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.34		1.7	0.34	ng/L		05/24/21 19:19	05/29/21 07:39	1
HFPO-DA (GenX)	<1.3		3.4	1.3	ng/L		05/24/21 19:19	05/29/21 07:39	1
9Cl-PF3ONS	<0.21		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:39	1
11Cl-PF3OUdS	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*67*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:39*	*1*
13C5 PFPeA	*40*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:39*	*1*
13C2 PFHxA	*89*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:39*	*1*
13C4 PFHpA	*73*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:39*	*1*
13C4 PFOA	*90*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:39*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: PZ-7SR (902)
Lab Sample ID: 320-74044-7
Date Collected: 05/20/21 01:50
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	81		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C2 PFDA	96		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C2 PFUnA	95		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C2 PFDoA	81		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C2 PFTeDA	100		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C2 PFHxDA	121		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C3 PFBS	73		25 - 150	05/24/21 19:19	05/29/21 07:39	1
18O2 PFHxS	82		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C4 PFOS	90		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C8 FOSA	100		10 - 150	05/24/21 19:19	05/29/21 07:39	1
d3-NMeFOSAA	86		25 - 150	05/24/21 19:19	05/29/21 07:39	1
d5-NEtFOSAA	86		25 - 150	05/24/21 19:19	05/29/21 07:39	1
d-N-MeFOSA-M	80		10 - 150	05/24/21 19:19	05/29/21 07:39	1
d-N-EtFOSA-M	74		10 - 150	05/24/21 19:19	05/29/21 07:39	1
d7-N-MeFOSE-M	64		10 - 150	05/24/21 19:19	05/29/21 07:39	1
d9-N-EtFOSE-M	60		10 - 150	05/24/21 19:19	05/29/21 07:39	1
M2-4:2 FTS	94		25 - 150	05/24/21 19:19	05/29/21 07:39	1
M2-6:2 FTS	88		25 - 150	05/24/21 19:19	05/29/21 07:39	1
M2-8:2 FTS	103		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C3 HFPO-DA	77		25 - 150	05/24/21 19:19	05/29/21 07:39	1
13C2 10:2 FTS	91		25 - 150	05/24/21 19:19	05/29/21 07:39	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-5 (805) Duplicate

Date Collected: 05/20/21 11:40
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-8

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.0		4.3	2.0	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluoropentanoic acid (PFPeA)	<0.42		1.7	0.42	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorohexanoic acid (PFHxA)	<0.49		1.7	0.49	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluoroheptanoic acid (PFHpA)	<0.21		1.7	0.21	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorooctanoic acid (PFOA)	<0.73		1.7	0.73	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorodecanoic acid (PFDA)	<0.26		1.7	0.26	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluoroundecanoic acid (PFUnA)	<0.94		1.7	0.94	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorododecanoic acid (PFDoA)	<0.47		1.7	0.47	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.7	1.1	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorotetradecanoic acid (PFTeA)	<0.62		1.7	0.62	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.76		1.7	0.76	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.80		1.7	0.80	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorobutanesulfonic acid (PFBS)	<0.17		1.7	0.17	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluoropentanesulfonic acid (PFPeS)	<0.26		1.7	0.26	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorohexanesulfonic acid (PFHxS)	<0.49		1.7	0.49	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorooctanesulfonic acid (PFOS)	<0.46		1.7	0.46	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorononanesulfonic acid (PFNS)	<0.32		1.7	0.32	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorododecanesulfonic acid (PFDoS)	<0.83		1.7	0.83	ng/L		05/24/21 19:19	05/29/21 07:48	1
Perfluorooctanesulfonamide (FOSA)	<0.84		1.7	0.84	ng/L		05/24/21 19:19	05/29/21 07:48	1
NEtFOSA	<0.74		1.7	0.74	ng/L		05/24/21 19:19	05/29/21 07:48	1
NMeFOSA	<0.37		1.7	0.37	ng/L		05/24/21 19:19	05/29/21 07:48	1
NMeFOSAA	<1.0		4.3	1.0	ng/L		05/24/21 19:19	05/29/21 07:48	1
NEtFOSAA	<1.1		4.3	1.1	ng/L		05/24/21 19:19	05/29/21 07:48	1
NMeFOSE	<1.2		3.4	1.2	ng/L		05/24/21 19:19	05/29/21 07:48	1
NEtFOSE	<0.73		1.7	0.73	ng/L		05/24/21 19:19	05/29/21 07:48	1
4:2 FTS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:48	1
6:2 FTS	<2.1		4.3	2.1	ng/L		05/24/21 19:19	05/29/21 07:48	1
8:2 FTS	<0.39		1.7	0.39	ng/L		05/24/21 19:19	05/29/21 07:48	1
10:2 FTS	<0.57		1.7	0.57	ng/L		05/24/21 19:19	05/29/21 07:48	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.34		1.7	0.34	ng/L		05/24/21 19:19	05/29/21 07:48	1
HFPO-DA (GenX)	<1.3		3.4	1.3	ng/L		05/24/21 19:19	05/29/21 07:48	1
9Cl-PF3ONS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	05/29/21 07:48	1
11Cl-PF3OUdS	<0.27		1.7	0.27	ng/L		05/24/21 19:19	05/29/21 07:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*52*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*
13C5 PFPeA	*34*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*
13C2 PFHxA	*71*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*
13C4 PFHpA	*66*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*
13C4 PFOA	*70*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*
13C5 PFNA	*71*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*
13C2 PFDA	*87*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*
13C2 PFUnA	*77*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:48*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-5 (805) Duplicate
Date Collected: 05/20/21 11:40
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-8
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	71		25 - 150	05/24/21 19:19	05/29/21 07:48	1
13C2 PFTeDA	79		25 - 150	05/24/21 19:19	05/29/21 07:48	1
13C2 PFHxDA	88		25 - 150	05/24/21 19:19	05/29/21 07:48	1
13C3 PFBS	51		25 - 150	05/24/21 19:19	05/29/21 07:48	1
18O2 PFHxS	65		25 - 150	05/24/21 19:19	05/29/21 07:48	1
13C4 PFOS	76		25 - 150	05/24/21 19:19	05/29/21 07:48	1
13C8 FOSA	76		10 - 150	05/24/21 19:19	05/29/21 07:48	1
d3-NMeFOSAA	72		25 - 150	05/24/21 19:19	05/29/21 07:48	1
d5-NEtFOSAA	74		25 - 150	05/24/21 19:19	05/29/21 07:48	1
d-N-MeFOSA-M	69		10 - 150	05/24/21 19:19	05/29/21 07:48	1
d-N-EtFOSA-M	64		10 - 150	05/24/21 19:19	05/29/21 07:48	1
d7-N-MeFOSE-M	66		10 - 150	05/24/21 19:19	05/29/21 07:48	1
d9-N-EtFOSE-M	61		10 - 150	05/24/21 19:19	05/29/21 07:48	1
M2-4:2 FTS	60		25 - 150	05/24/21 19:19	05/29/21 07:48	1
M2-6:2 FTS	72		25 - 150	05/24/21 19:19	05/29/21 07:48	1
M2-8:2 FTS	90		25 - 150	05/24/21 19:19	05/29/21 07:48	1
13C3 HFPO-DA	66		25 - 150	05/24/21 19:19	05/29/21 07:48	1
13C2 10:2 FTS	82		25 - 150	05/24/21 19:19	05/29/21 07:48	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: Field Blank

Date Collected: 05/20/21 09:00
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-9

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.0		4.2	2.0	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluoropentanoic acid (PFPeA)	<0.41		1.7	0.41	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorohexanoic acid (PFHxA)	<0.49		1.7	0.49	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluoroheptanoic acid (PFHpA)	<0.21		1.7	0.21	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorooctanoic acid (PFOA)	<0.71		1.7	0.71	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorononanoic acid (PFNA)	<0.23		1.7	0.23	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorodecanoic acid (PFDA)	<0.26		1.7	0.26	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluoroundecanoic acid (PFUnA)	<0.92		1.7	0.92	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorododecanoic acid (PFDoA)	<0.46		1.7	0.46	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.7	1.1	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorotetradecanoic acid (PFTeA)	<0.61		1.7	0.61	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.75		1.7	0.75	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.79		1.7	0.79	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorobutanesulfonic acid (PFBS)	<0.17		1.7	0.17	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluoropentanesulfonic acid (PFPeS)	<0.25		1.7	0.25	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorohexanesulfonic acid (PFHxS)	<0.48		1.7	0.48	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorooctanesulfonic acid (PFOS)	<0.45		1.7	0.45	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorononanesulfonic acid (PFNS)	<0.31		1.7	0.31	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorodecanesulfonic acid (PFDS)	<0.27		1.7	0.27	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorododecanesulfonic acid (PFDoS)	<0.81		1.7	0.81	ng/L		05/24/21 19:19	06/01/21 16:09	1
Perfluorooctanesulfonamide (FOSA)	<0.82		1.7	0.82	ng/L		05/24/21 19:19	06/01/21 16:09	1
NEtFOSA	<0.73		1.7	0.73	ng/L		05/24/21 19:19	06/01/21 16:09	1
NMeFOSA	<0.36		1.7	0.36	ng/L		05/24/21 19:19	06/01/21 16:09	1
NMeFOSAA	<1.0		4.2	1.0	ng/L		05/24/21 19:19	06/01/21 16:09	1
NEtFOSAA	<1.1		4.2	1.1	ng/L		05/24/21 19:19	06/01/21 16:09	1
NMeFOSE	<1.2		3.3	1.2	ng/L		05/24/21 19:19	06/01/21 16:09	1
NEtFOSE	<0.71		1.7	0.71	ng/L		05/24/21 19:19	06/01/21 16:09	1
4:2 FTS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	06/01/21 16:09	1
6:2 FTS	<2.1		4.2	2.1	ng/L		05/24/21 19:19	06/01/21 16:09	1
8:2 FTS	<0.39		1.7	0.39	ng/L		05/24/21 19:19	06/01/21 16:09	1
10:2 FTS	<0.56		1.7	0.56	ng/L		05/24/21 19:19	06/01/21 16:09	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.33		1.7	0.33	ng/L		05/24/21 19:19	06/01/21 16:09	1
HFPO-DA (GenX)	<1.3		3.3	1.3	ng/L		05/24/21 19:19	06/01/21 16:09	1
9Cl-PF3ONS	<0.20		1.7	0.20	ng/L		05/24/21 19:19	06/01/21 16:09	1
11Cl-PF3OUdS	<0.27		1.7	0.27	ng/L		05/24/21 19:19	06/01/21 16:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*90*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*
13C5 PFPeA	*82*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*
13C2 PFHxA	*91*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*
13C4 PFHpA	*103*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*
13C4 PFOA	*86*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*
13C5 PFNA	*95*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*
13C2 PFDA	*98*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*
13C2 PFUnA	*91*		*25 - 150*	*05/24/21 19:19*	*06/01/21 16:09*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: Field Blank
Lab Sample ID: 320-74044-9
Date Collected: 05/20/21 09:00
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	97		25 - 150	05/24/21 19:19	06/01/21 16:09	1
13C2 PFTeDA	90		25 - 150	05/24/21 19:19	06/01/21 16:09	1
13C2 PFHxDA	84		25 - 150	05/24/21 19:19	06/01/21 16:09	1
13C3 PFBS	81		25 - 150	05/24/21 19:19	06/01/21 16:09	1
18O2 PFHxS	90		25 - 150	05/24/21 19:19	06/01/21 16:09	1
13C4 PFOS	75		25 - 150	05/24/21 19:19	06/01/21 16:09	1
13C8 FOSA	82		10 - 150	05/24/21 19:19	06/01/21 16:09	1
d3-NMeFOSAA	95		25 - 150	05/24/21 19:19	06/01/21 16:09	1
d5-NEtFOSAA	100		25 - 150	05/24/21 19:19	06/01/21 16:09	1
d-N-MeFOSA-M	78		10 - 150	05/24/21 19:19	06/01/21 16:09	1
d-N-EtFOSA-M	69		10 - 150	05/24/21 19:19	06/01/21 16:09	1
d7-N-MeFOSE-M	94		10 - 150	05/24/21 19:19	06/01/21 16:09	1
d9-N-EtFOSE-M	77		10 - 150	05/24/21 19:19	06/01/21 16:09	1
M2-4:2 FTS	96		25 - 150	05/24/21 19:19	06/01/21 16:09	1
M2-6:2 FTS	97		25 - 150	05/24/21 19:19	06/01/21 16:09	1
M2-8:2 FTS	105		25 - 150	05/24/21 19:19	06/01/21 16:09	1
13C3 HFPO-DA	86		25 - 150	05/24/21 19:19	06/01/21 16:09	1
13C2 10:2 FTS	122		25 - 150	05/24/21 19:19	06/01/21 16:09	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-1S (806)

Date Collected: 05/20/21 12:25
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-10

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**11**		4.1	2.0	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluoropentanoic acid (PFPeA)	**19**		1.6	0.40	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorohexanoic acid (PFHxA)	**21**		1.6	0.48	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluoroheptanoic acid (PFHpA)	**12**		1.6	0.21	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorooctanoic acid (PFOA)	**43**		1.6	0.70	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorononanoic acid (PFNA)	<0.22		1.6	0.22	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorodecanoic acid (PFDA)	<0.25		1.6	0.25	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluoroundecanoic acid (PFUnA)	<0.90		1.6	0.90	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorododecanoic acid (PFDoA)	<0.45		1.6	0.45	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorotridecanoic acid (PFTrDA)	<1.1		1.6	1.1	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorotetradecanoic acid (PFTeA)	<0.60		1.6	0.60	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.73		1.6	0.73	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.77		1.6	0.77	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorobutanesulfonic acid (PFBS)	**3.6**		1.6	0.16	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluoropentanesulfonic acid (PFPeS)	**2.5**		1.6	0.25	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorohexanesulfonic acid (PFHxS)	**6.4**		1.6	0.47	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.35**	**J**	1.6	0.16	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorooctanesulfonic acid (PFOS)	**5.2**	**I**	1.6	0.44	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorononanesulfonic acid (PFNS)	<0.30		1.6	0.30	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorodecanesulfonic acid (PFDS)	<0.26		1.6	0.26	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorododecanesulfonic acid (PFDoS)	<0.80		1.6	0.80	ng/L		05/24/21 19:19	05/29/21 07:57	1
Perfluorooctanesulfonamide (FOSA)	<0.81		1.6	0.81	ng/L		05/24/21 19:19	05/29/21 07:57	1
NEtFOSA	<0.71		1.6	0.71	ng/L		05/24/21 19:19	05/29/21 07:57	1
NMeFOSA	<0.35		1.6	0.35	ng/L		05/24/21 19:19	05/29/21 07:57	1
NMeFOSAA	<0.99		4.1	0.99	ng/L		05/24/21 19:19	05/29/21 07:57	1
NEtFOSAA	<1.1		4.1	1.1	ng/L		05/24/21 19:19	05/29/21 07:57	1
NMeFOSE	<1.2		3.3	1.2	ng/L		05/24/21 19:19	05/29/21 07:57	1
NEtFOSE	<0.70		1.6	0.70	ng/L		05/24/21 19:19	05/29/21 07:57	1
4:2 FTS	<0.20		1.6	0.20	ng/L		05/24/21 19:19	05/29/21 07:57	1
6:2 FTS	<2.1		4.1	2.1	ng/L		05/24/21 19:19	05/29/21 07:57	1
8:2 FTS	<0.38		1.6	0.38	ng/L		05/24/21 19:19	05/29/21 07:57	1
10:2 FTS	<0.55		1.6	0.55	ng/L		05/24/21 19:19	05/29/21 07:57	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.33		1.6	0.33	ng/L		05/24/21 19:19	05/29/21 07:57	1
HFPO-DA (GenX)	<1.2		3.3	1.2	ng/L		05/24/21 19:19	05/29/21 07:57	1
9Cl-PF3ONS	<0.20		1.6	0.20	ng/L		05/24/21 19:19	05/29/21 07:57	1
11Cl-PF3OUdS	<0.26		1.6	0.26	ng/L		05/24/21 19:19	05/29/21 07:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*54*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:57*	*1*
13C5 PFPeA	*36*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:57*	*1*
13C2 PFHxA	*81*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:57*	*1*
13C4 PFHpA	*66*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:57*	*1*
13C4 PFOA	*86*		*25 - 150*	*05/24/21 19:19*	*05/29/21 07:57*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Client Sample ID: MW-1S (806)
Lab Sample ID: 320-74044-10
Date Collected: 05/20/21 12:25
Matrix: Water
Date Received: 05/21/21 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	76		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C2 PFDA	92		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C2 PFUnA	79		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C2 PFDoA	76		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C2 PFTeDA	84		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C2 PFHxDA	117		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C3 PFBS	59		25 - 150	05/24/21 19:19	05/29/21 07:57	1
18O2 PFHxS	73		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C4 PFOS	78		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C8 FOSA	86		10 - 150	05/24/21 19:19	05/29/21 07:57	1
d3-NMeFOSAA	78		25 - 150	05/24/21 19:19	05/29/21 07:57	1
d5-NEtFOSAA	77		25 - 150	05/24/21 19:19	05/29/21 07:57	1
d-N-MeFOSA-M	73		10 - 150	05/24/21 19:19	05/29/21 07:57	1
d-N-EtFOSA-M	67		10 - 150	05/24/21 19:19	05/29/21 07:57	1
d7-N-MeFOSE-M	64		10 - 150	05/24/21 19:19	05/29/21 07:57	1
d9-N-EtFOSE-M	63		10 - 150	05/24/21 19:19	05/29/21 07:57	1
M2-4:2 FTS	93		25 - 150	05/24/21 19:19	05/29/21 07:57	1
M2-6:2 FTS	93		25 - 150	05/24/21 19:19	05/29/21 07:57	1
M2-8:2 FTS	91		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C3 HFPO-DA	66		25 - 150	05/24/21 19:19	05/29/21 07:57	1
13C2 10:2 FTS	81		25 - 150	05/24/21 19:19	05/29/21 07:57	1

Isotope Dilution Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
320-74044-1	MW-1 (801)	75	48	83	75	89	89	98	91
320-74044-2	MW-2 (802)	71	59	90	80	93	83	90	83
320-74044-3	MW-3 (803)	59	47	71	68	74	70	73	70
320-74044-4	MW-4 (804)	60	36	94	71	98	85	111	105
320-74044-5	MW-5 (805)	67	45	92	74	92	87	103	92
320-74044-6	MW-7 (811)	49	32	77	64	82	79	101	88
320-74044-7	PZ-7SR (902)	67	40	89	73	90	81	96	95
320-74044-8	MW-5 (805) Duplicate	52	34	71	66	70	71	87	77
320-74044-9	Field Blank	90	82	91	103	86	95	98	91
320-74044-10	MW-1S (806)	54	36	81	66	86	76	92	79
LCS 320-492285/2-A	Lab Control Sample	96	85	92	105	104	105	101	87
LCSD 320-492285/3-A	Lab Control Sample Dup	101	93	96	103	105	110	104	96
MB 320-492285/1-A	Method Blank	93	91	96	104	101	102	104	94

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	PFHxDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (10-150)	d3NMFOS (25-150)
320-74044-1	MW-1 (801)	83	96	125	77	81	83	89	84
320-74044-2	MW-2 (802)	79	91	114	81	83	81	89	84
320-74044-3	MW-3 (803)	59	60	57	62	67	64	69	64
320-74044-4	MW-4 (804)	107	122	141	71	86	94	105	96
320-74044-5	MW-5 (805)	91	96	106	71	80	80	94	85
320-74044-6	MW-7 (811)	82	97	127	65	73	84	94	87
320-74044-7	PZ-7SR (902)	81	100	121	73	82	90	100	86
320-74044-8	MW-5 (805) Duplicate	71	79	88	51	65	76	76	72
320-74044-9	Field Blank	97	90	84	81	90	75	82	95
320-74044-10	MW-1S (806)	76	84	117	59	73	78	86	78
LCS 320-492285/2-A	Lab Control Sample	103	88	86	94	108	103	96	100
LCSD 320-492285/3-A	Lab Control Sample Dup	107	89	83	96	102	102	99	105
MB 320-492285/1-A	Method Blank	104	85	86	91	98	99	109	106

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	d5NEFOS (25-150)	dMeFOSA (10-150)	dEtFOSA (10-150)	NMFM (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)
320-74044-1	MW-1 (801)	82	79	74	75	71	119	121	127
320-74044-2	MW-2 (802)	82	74	69	73	66	80	83	87
320-74044-3	MW-3 (803)	60	56	49	52	43	59	65	75
320-74044-4	MW-4 (804)	94	105	96	85	86	118	144	141
320-74044-5	MW-5 (805)	90	94	79	84	73	92	86	106
320-74044-6	MW-7 (811)	81	82	76	69	64	102	111	112
320-74044-7	PZ-7SR (902)	86	80	74	64	60	94	88	103
320-74044-8	MW-5 (805) Duplicate	74	69	64	66	61	60	72	90
320-74044-9	Field Blank	100	78	69	94	77	96	97	105
320-74044-10	MW-1S (806)	77	73	67	64	63	93	93	91
LCS 320-492285/2-A	Lab Control Sample	93	78	75	91	83	97	122	97
LCSD 320-492285/3-A	Lab Control Sample Dup	105	87	83	101	88	105	122	95
MB 320-492285/1-A	Method Blank	100	85	79	96	78	102	118	119

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HFPODA (25-150)	M102FTS (25-150)
320-74044-1	MW-1 (801)	79	96

Isotope Dilution Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water
Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	HFPODA (25-150)	M102FTS (25-150)								
320-74044-2	MW-2 (802)	88	88								
320-74044-3	MW-3 (803)	69	70								
320-74044-4	MW-4 (804)	80	119								
320-74044-5	MW-5 (805)	78	100								
320-74044-6	MW-7 (811)	60	101								
320-74044-7	PZ-7SR (902)	77	91								
320-74044-8	MW-5 (805) Duplicate	66	82								
320-74044-9	Field Blank	86	122								
320-74044-10	MW-1S (806)	66	81								
LCS 320-492285/2-A	Lab Control Sample	87	102								
LCSD 320-492285/3-A	Lab Control Sample Dup	98	109								
MB 320-492285/1-A	Method Blank	92	124								

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
PFHxDA = 13C2 PFHxDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
PFOSA = 13C8 FOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
dMeFOSA = d-N-MeFOSA-M
dEtFOSA = d-N-EtFOSA-M
NMFM = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
HFPODA = 13C3 HFPO-DA
M102FTS = 13C2 10:2 FTS

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-492285/1-A
Matrix: Water
Analysis Batch: 493237

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 492285

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<2.4		5.0	2.4	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluoropentanoic acid (PFPeA)	<0.49		2.0	0.49	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorohexanoic acid (PFHxA)	<0.58		2.0	0.58	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluoroheptanoic acid (PFHpA)	<0.25		2.0	0.25	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorooctanoic acid (PFOA)	<0.85		2.0	0.85	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorononanoic acid (PFNA)	<0.27		2.0	0.27	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	0.31	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluoroundecanoic acid (PFUnA)	<1.1		2.0	1.1	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorododecanoic acid (PFDoA)	<0.55		2.0	0.55	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorotridecanoic acid (PFTrDA)	<1.3		2.0	1.3	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorotetradecanoic acid (PFTeA)	<0.73		2.0	0.73	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.89		2.0	0.89	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.94		2.0	0.94	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorobutanesulfonic acid (PFBS)	<0.20		2.0	0.20	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluoropentanesulfonic acid (PFPeS)	<0.30		2.0	0.30	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorohexanesulfonic acid (PFHxS)	<0.57		2.0	0.57	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.19		2.0	0.19	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorooctanesulfonic acid (PFOS)	<0.54		2.0	0.54	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorononanesulfonic acid (PFNS)	<0.37		2.0	0.37	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorodecanesulfonic acid (PFDS)	<0.32		2.0	0.32	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorododecanesulfonic acid (PFDoS)	<0.97		2.0	0.97	ng/L		05/24/21 19:19	05/27/21 09:57	1
Perfluorooctanesulfonamide (FOSA)	<0.98		2.0	0.98	ng/L		05/24/21 19:19	05/27/21 09:57	1
NEtFOSA	<0.87		2.0	0.87	ng/L		05/24/21 19:19	05/27/21 09:57	1
NMeFOSA	<0.43		2.0	0.43	ng/L		05/24/21 19:19	05/27/21 09:57	1
NMeFOSAA	<1.2		5.0	1.2	ng/L		05/24/21 19:19	05/27/21 09:57	1
NEtFOSAA	<1.3		5.0	1.3	ng/L		05/24/21 19:19	05/27/21 09:57	1
NMeFOSE	<1.4		4.0	1.4	ng/L		05/24/21 19:19	05/27/21 09:57	1
NEtFOSE	<0.85		2.0	0.85	ng/L		05/24/21 19:19	05/27/21 09:57	1
4:2 FTS	<0.24		2.0	0.24	ng/L		05/24/21 19:19	05/27/21 09:57	1
6:2 FTS	<2.5		5.0	2.5	ng/L		05/24/21 19:19	05/27/21 09:57	1
8:2 FTS	<0.46		2.0	0.46	ng/L		05/24/21 19:19	05/27/21 09:57	1
10:2 FTS	<0.67		2.0	0.67	ng/L		05/24/21 19:19	05/27/21 09:57	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.40		2.0	0.40	ng/L		05/24/21 19:19	05/27/21 09:57	1
HFPO-DA (GenX)	<1.5		4.0	1.5	ng/L		05/24/21 19:19	05/27/21 09:57	1
9Cl-PF3ONS	<0.24		2.0	0.24	ng/L		05/24/21 19:19	05/27/21 09:57	1
11Cl-PF3OUdS	<0.32		2.0	0.32	ng/L		05/24/21 19:19	05/27/21 09:57	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*93*		*25 - 150*	*05/24/21 19:19*	*05/27/21 09:57*	*1*
13C5 PFPeA	*91*		*25 - 150*	*05/24/21 19:19*	*05/27/21 09:57*	*1*
13C2 PFHxA	*96*		*25 - 150*	*05/24/21 19:19*	*05/27/21 09:57*	*1*
13C4 PFHpA	*104*		*25 - 150*	*05/24/21 19:19*	*05/27/21 09:57*	*1*
13C4 PFOA	*101*		*25 - 150*	*05/24/21 19:19*	*05/27/21 09:57*	*1*
13C5 PFNA	*102*		*25 - 150*	*05/24/21 19:19*	*05/27/21 09:57*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-492285/1-A
Matrix: Water
Analysis Batch: 493237

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 492285

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	104		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C2 PFUnA	94		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C2 PFDoA	104		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C2 PFTeDA	85		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C2 PFHxDA	86		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C3 PFBS	91		25 - 150	05/24/21 19:19	05/27/21 09:57	1
18O2 PFHxS	98		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C4 PFOS	99		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C8 FOSA	109		10 - 150	05/24/21 19:19	05/27/21 09:57	1
d3-NMeFOSAA	106		25 - 150	05/24/21 19:19	05/27/21 09:57	1
d5-NEtFOSAA	100		25 - 150	05/24/21 19:19	05/27/21 09:57	1
d-N-MeFOSA-M	85		10 - 150	05/24/21 19:19	05/27/21 09:57	1
d-N-EtFOSA-M	79		10 - 150	05/24/21 19:19	05/27/21 09:57	1
d7-N-MeFOSE-M	96		10 - 150	05/24/21 19:19	05/27/21 09:57	1
d9-N-EtFOSE-M	78		10 - 150	05/24/21 19:19	05/27/21 09:57	1
M2-4:2 FTS	102		25 - 150	05/24/21 19:19	05/27/21 09:57	1
M2-6:2 FTS	118		25 - 150	05/24/21 19:19	05/27/21 09:57	1
M2-8:2 FTS	119		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C3 HFPO-DA	92		25 - 150	05/24/21 19:19	05/27/21 09:57	1
13C2 10:2 FTS	124		25 - 150	05/24/21 19:19	05/27/21 09:57	1

Lab Sample ID: LCS 320-492285/2-A
Matrix: Water
Analysis Batch: 493237

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 492285

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	39.6		ng/L		99	60 - 135
Perfluoropentanoic acid (PFPeA)	40.0	46.5		ng/L		116	60 - 135
Perfluorohexanoic acid (PFHxA)	40.0	42.0		ng/L		105	60 - 135
Perfluoroheptanoic acid (PFHpA)	40.0	42.9		ng/L		107	60 - 135
Perfluorooctanoic acid (PFOA)	40.0	41.5		ng/L		104	60 - 135
Perfluorononanoic acid (PFNA)	40.0	41.5		ng/L		104	60 - 135
Perfluorodecanoic acid (PFDA)	40.0	41.3		ng/L		103	60 - 135
Perfluoroundecanoic acid (PFUnA)	40.0	44.9		ng/L		112	60 - 135
Perfluorododecanoic acid (PFDoA)	40.0	40.5		ng/L		101	60 - 135
Perfluorotridecanoic acid (PFTrDA)	40.0	40.1		ng/L		100	60 - 135
Perfluorotetradecanoic acid (PFTeA)	40.0	41.4		ng/L		103	60 - 135
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	41.4		ng/L		103	60 - 135
Perfluoro-n-octadecanoic acid (PFODA)	40.0	52.2		ng/L		130	60 - 135
Perfluorobutanesulfonic acid (PFBS)	35.4	37.0		ng/L		105	60 - 135
Perfluoropentanesulfonic acid (PFPeS)	37.5	42.6		ng/L		114	60 - 135
Perfluorohexanesulfonic acid (PFHxS)	36.4	39.3		ng/L		108	60 - 135

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-492285/2-A
Matrix: Water
Analysis Batch: 493237

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 492285

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	41.5		ng/L		109	60 - 135
Perfluorooctanesulfonic acid (PFOS)	37.1	38.2		ng/L		103	60 - 135
Perfluorononanesulfonic acid (PFNS)	38.4	38.4		ng/L		100	60 - 135
Perfluorodecanesulfonic acid (PFDS)	38.6	36.6		ng/L		95	60 - 135
Perfluorododecanesulfonic acid (PFDoS)	38.7	33.8		ng/L		87	60 - 135
Perfluorooctanesulfonamide (FOSA)	40.0	40.8		ng/L		102	60 - 135
NEtFOSA	40.0	43.4		ng/L		108	60 - 135
NMeFOSA	40.0	39.5		ng/L		99	60 - 135
NMeFOSAA	40.0	38.9		ng/L		97	60 - 135
NEtFOSAA	40.0	40.8		ng/L		102	60 - 135
NMeFOSE	40.0	37.0		ng/L		92	60 - 135
NEtFOSE	40.0	42.7		ng/L		107	60 - 135
4:2 FTS	37.4	39.0		ng/L		104	60 - 135
6:2 FTS	37.9	37.4		ng/L		99	60 - 135
8:2 FTS	38.3	39.8		ng/L		104	60 - 135
10:2 FTS	38.6	38.3		ng/L		99	60 - 135
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	35.7		ng/L		95	60 - 135
HFPO-DA (GenX)	40.0	44.1		ng/L		110	60 - 135
9Cl-PF3ONS	37.3	36.2		ng/L		97	60 - 135
11Cl-PF3OUdS	37.7	31.6		ng/L		84	60 - 135

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*96*		*25 - 150*
13C5 PFPeA	*85*		*25 - 150*
13C2 PFHxA	*92*		*25 - 150*
13C4 PFHpA	*105*		*25 - 150*
13C4 PFOA	*104*		*25 - 150*
13C5 PFNA	*105*		*25 - 150*
13C2 PFDA	*101*		*25 - 150*
13C2 PFUnA	*87*		*25 - 150*
13C2 PFDoA	*103*		*25 - 150*
13C2 PFTeDA	*88*		*25 - 150*
13C2 PFHxDA	*86*		*25 - 150*
13C3 PFBS	*94*		*25 - 150*
18O2 PFHxS	*108*		*25 - 150*
13C4 PFOS	*103*		*25 - 150*
13C8 FOSA	*96*		*10 - 150*
d3-NMeFOSAA	*100*		*25 - 150*
d5-NEtFOSAA	*93*		*25 - 150*
d-N-MeFOSA-M	*78*		*10 - 150*
d-N-EtFOSA-M	*75*		*10 - 150*
d7-N-MeFOSE-M	*91*		*10 - 150*
d9-N-EtFOSE-M	*83*		*10 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-492285/2-A
Matrix: Water
Analysis Batch: 493237

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 492285

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
M2-4:2 FTS	*97*		*25 - 150*
M2-6:2 FTS	*122*		*25 - 150*
M2-8:2 FTS	*97*		*25 - 150*
13C3 HFPO-DA	*87*		*25 - 150*
13C2 10:2 FTS	*102*		*25 - 150*

Lab Sample ID: LCSD 320-492285/3-A
Matrix: Water
Analysis Batch: 493237

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 492285

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)			40.0	40.6		ng/L		102	60 - 135	2	30
Perfluoropentanoic acid (PFPeA)			40.0	45.0		ng/L		113	60 - 135	3	30
Perfluorohexanoic acid (PFHxA)			40.0	41.4		ng/L		103	60 - 135	2	30
Perfluoroheptanoic acid (PFHpA)			40.0	45.5		ng/L		114	60 - 135	6	30
Perfluorooctanoic acid (PFOA)			40.0	43.3		ng/L		108	60 - 135	4	30
Perfluorononanoic acid (PFNA)			40.0	41.5		ng/L		104	60 - 135	0	30
Perfluorodecanoic acid (PFDA)			40.0	38.9		ng/L		97	60 - 135	6	30
Perfluoroundecanoic acid (PFUnA)			40.0	41.9		ng/L		105	60 - 135	7	30
Perfluorododecanoic acid (PFDoA)			40.0	39.3		ng/L		98	60 - 135	3	30
Perfluorotridecanoic acid (PFTrDA)			40.0	41.5		ng/L		104	60 - 135	3	30
Perfluorotetradecanoic acid (PFTeA)			40.0	43.1		ng/L		108	60 - 135	4	30
Perfluoro-n-hexadecanoic acid (PFHxDA)			40.0	43.4		ng/L		108	60 - 135	5	30
Perfluoro-n-octadecanoic acid (PFODA)			40.0	47.5		ng/L		119	60 - 135	9	30
Perfluorobutanesulfonic acid (PFBS)			35.4	37.4		ng/L		106	60 - 135	1	30
Perfluoropentanesulfonic acid (PFPeS)			37.5	43.6		ng/L		116	60 - 135	2	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	38.4		ng/L		105	60 - 135	2	30
Perfluoroheptanesulfonic Acid (PFHpS)			38.1	43.9		ng/L		115	60 - 135	6	30
Perfluorooctanesulfonic acid (PFOS)			37.1	38.8		ng/L		104	60 - 135	1	30
Perfluorononanesulfonic acid (PFNS)			38.4	38.6		ng/L		100	60 - 135	0	30
Perfluorodecanesulfonic acid (PFDS)			38.6	37.4		ng/L		97	60 - 135	2	30
Perfluorododecanesulfonic acid (PFDoS)			38.7	34.9		ng/L		90	60 - 135	3	30
Perfluorooctanesulfonamide (FOSA)			40.0	41.5		ng/L		104	60 - 135	2	30
NEtFOSA			40.0	41.5		ng/L		104	60 - 135	4	30
NMeFOSA			40.0	40.6		ng/L		102	60 - 135	3	30
NMeFOSAA			40.0	42.0		ng/L		105	60 - 135	8	30
NEtFOSAA			40.0	42.1		ng/L		105	60 - 135	3	30
NMeFOSE			40.0	36.0		ng/L		90	60 - 135	3	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-492285/3-A
Matrix: Water
Analysis Batch: 493237

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 492285

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
NEtFOSE			40.0	46.4		ng/L		116	60 - 135	8	30
4:2 FTS			37.4	37.8		ng/L		101	60 - 135	3	30
6:2 FTS			37.9	34.3		ng/L		90	60 - 135	9	30
8:2 FTS			38.3	43.6		ng/L		114	60 - 135	9	30
10:2 FTS			38.6	38.0		ng/L		99	60 - 135	1	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			37.7	38.0		ng/L		101	60 - 135	6	30
HFPO-DA (GenX)			40.0	38.8		ng/L		97	60 - 135	13	30
9Cl-PF3ONS			37.3	35.0		ng/L		94	60 - 135	3	30
11Cl-PF3OUdS			37.7	35.8		ng/L		95	60 - 135	12	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFBA	*101*		*25 - 150*
13C5 PFPeA	*93*		*25 - 150*
13C2 PFHxA	*96*		*25 - 150*
13C4 PFHpA	*103*		*25 - 150*
13C4 PFOA	*105*		*25 - 150*
13C5 PFNA	*110*		*25 - 150*
13C2 PFDA	*104*		*25 - 150*
13C2 PFUnA	*96*		*25 - 150*
13C2 PFDoA	*107*		*25 - 150*
13C2 PFTeDA	*89*		*25 - 150*
13C2 PFHxDA	*83*		*25 - 150*
13C3 PFBS	*96*		*25 - 150*
18O2 PFHxS	*102*		*25 - 150*
13C4 PFOS	*102*		*25 - 150*
13C8 FOSA	*99*		*10 - 150*
d3-NMeFOSAA	*105*		*25 - 150*
d5-NEtFOSAA	*105*		*25 - 150*
d-N-MeFOSA-M	*87*		*10 - 150*
d-N-EtFOSA-M	*83*		*10 - 150*
d7-N-MeFOSE-M	*101*		*10 - 150*
d9-N-EtFOSE-M	*88*		*10 - 150*
M2-4:2 FTS	*105*		*25 - 150*
M2-6:2 FTS	*122*		*25 - 150*
M2-8:2 FTS	*95*		*25 - 150*
13C3 HFPO-DA	*98*		*25 - 150*
13C2 10:2 FTS	*109*		*25 - 150*

LCMS

Prep Batch: 492285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-74044-1	MW-1 (801)	Total/NA	Water	3535	
320-74044-2	MW-2 (802)	Total/NA	Water	3535	
320-74044-3	MW-3 (803)	Total/NA	Water	3535	
320-74044-4	MW-4 (804)	Total/NA	Water	3535	
320-74044-5	MW-5 (805)	Total/NA	Water	3535	
320-74044-6	MW-7 (811)	Total/NA	Water	3535	
320-74044-7	PZ-7SR (902)	Total/NA	Water	3535	
320-74044-8	MW-5 (805) Duplicate	Total/NA	Water	3535	
320-74044-9	Field Blank	Total/NA	Water	3535	
320-74044-10	MW-1S (806)	Total/NA	Water	3535	
MB 320-492285/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-492285/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-492285/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 493237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-492285/1-A	Method Blank	Total/NA	Water	537 (modified)	492285
LCS 320-492285/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	492285
LCSD 320-492285/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	492285

Analysis Batch: 493893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-74044-1	MW-1 (801)	Total/NA	Water	537 (modified)	492285
320-74044-2	MW-2 (802)	Total/NA	Water	537 (modified)	492285
320-74044-3	MW-3 (803)	Total/NA	Water	537 (modified)	492285
320-74044-4	MW-4 (804)	Total/NA	Water	537 (modified)	492285
320-74044-5	MW-5 (805)	Total/NA	Water	537 (modified)	492285
320-74044-6	MW-7 (811)	Total/NA	Water	537 (modified)	492285
320-74044-7	PZ-7SR (902)	Total/NA	Water	537 (modified)	492285
320-74044-8	MW-5 (805) Duplicate	Total/NA	Water	537 (modified)	492285
320-74044-10	MW-1S (806)	Total/NA	Water	537 (modified)	492285

Analysis Batch: 494405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-74044-9	Field Blank	Total/NA	Water	537 (modified)	492285

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: MW-1 (801)
Date Collected: 05/20/21 01:05
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			299.4 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 06:42	K1S	TAL SAC

Client Sample ID: MW-2 (802)
Date Collected: 05/20/21 10:35
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			306 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 06:52	K1S	TAL SAC

Client Sample ID: MW-3 (803)
Date Collected: 05/20/21 09:30
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			297 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 07:01	K1S	TAL SAC

Client Sample ID: MW-4 (804)
Date Collected: 05/20/21 11:00
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			295.2 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 07:10	K1S	TAL SAC

Client Sample ID: MW-5 (805)
Date Collected: 05/20/21 11:40
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			296.6 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 07:20	K1S	TAL SAC

Client Sample ID: MW-7 (811)
Date Collected: 05/20/21 02:25
Date Received: 05/21/21 09:35

Lab Sample ID: 320-74044-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			288.5 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 07:29	K1S	TAL SAC

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Hayward Landfill PFAS Investigation

Job ID: 320-74044-1

Client Sample ID: PZ-7SR (902)

Lab Sample ID: 320-74044-7
Matrix: Water
Date Collected: 05/20/21 01:50
Date Received: 05/21/21 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			292.3 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 07:39	K1S	TAL SAC

Client Sample ID: MW-5 (805) Duplicate

Lab Sample ID: 320-74044-8
Matrix: Water
Date Collected: 05/20/21 11:40
Date Received: 05/21/21 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			293 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 07:48	K1S	TAL SAC

Client Sample ID: Field Blank

Lab Sample ID: 320-74044-9
Matrix: Water
Date Collected: 05/20/21 09:00
Date Received: 05/21/21 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			298.6 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			494405	06/01/21 16:09	D1R	TAL SAC

Client Sample ID: MW-1S (806)

Lab Sample ID: 320-74044-10
Matrix: Water
Date Collected: 05/20/21 12:25
Date Received: 05/21/21 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			304.3 mL	10.00 mL	492285	05/24/21 19:19	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			493893	05/29/21 07:57	K1S	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Laboratory: Eurofins TestAmerica, Sacramento

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	998204680	08-31-21

Method Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 320-74044-1
Project/Site: Hayward Landfill PFAS Investigation

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-74044-1	MW-1 (801)	Water	05/20/21 01:05	05/21/21 09:35	
320-74044-2	MW-2 (802)	Water	05/20/21 10:35	05/21/21 09:35	
320-74044-3	MW-3 (803)	Water	05/20/21 09:30	05/21/21 09:35	
320-74044-4	MW-4 (804)	Water	05/20/21 11:00	05/21/21 09:35	
320-74044-5	MW-5 (805)	Water	05/20/21 11:40	05/21/21 09:35	
320-74044-6	MW-7 (811)	Water	05/20/21 02:25	05/21/21 09:35	
320-74044-7	PZ-7SR (902)	Water	05/20/21 01:50	05/21/21 09:35	
320-74044-8	MW-5 (805) Duplicate	Water	05/20/21 11:40	05/21/21 09:35	
320-74044-9	Field Blank	Water	05/20/21 09:00	05/21/21 09:35	
320-74044-10	MW-1S (806)	Water	05/20/21 12:25	05/21/21 09:35	

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Phone (916) 372-1059

Chain of Custody Record

eurofins

Client Information	Sampler: Mike Rohlik	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 500-91568-40840.2
Client Contact: Mr. Mike Rohlik	Phone:	E-Mail: sandra.fredrick@eurofinset.com	State of Origin: WI	Page: Page 2 of 2
Company: Short Elliott Hendrickson, Inc. dba SEH	PWSID:			Job #:

Address: 10 North Bridge Street	Due Date Requested:	
City: Chippewa Falls	TAT Requested (days):	
State, Zip: WI, 54729-3374	Compliance Project: Δ Yes Δ No	
Phone: 715-720-6200(Tel)	PO #: Purchase Order not required	
Email: mrohlik@sehinc.com / bkent@sehinc.com	WO #:	
Project Name: Hayward Landfill PFAS Investigation	Project #: 50006595	
Site:	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
Other:

320-74044 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA_WI - PFAS, Standard List (36 Analytes)	Total Num	Special Instructions/Note:
			Preservation Code:				N		
D MW-1 (801)	5/20/21	1:05	G	Water			X		
MW-2 (802)	5/20/21	10:35	G	Water			X		
D MW-3 (803)	5/20/21	9:30	G	Water			X		
D MW-4 (804)	5/20/21	11:00	G	Water			X		
D MW-5 (805)	5/20/21	11:40	G	Water			X		
D MW-7 (811)	5/20/21	2:25	G	Water			X		
• PZ-7SR (902)	5/20/21	1:50	G	Water			X		
D ☆ MW-5 (805) Duplicate	5/20/21	11:40	G	Water			X		
Field Blank	5/20/21	9:00	G	OTHER			X		
MW-15 (806) S = sam	5/20/21	12:25	G	Water			X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: Mike Rohlik	Date/Time: 5/20/21	Company: SEH	Received by: [illegible] Simmons
Relinquished by:	Date/Time:	Company:	Received by:
Relinquished by:	Date/Time:	Company:	Received by:

Date/Time	Company
5/21/21 9:35	UTAS

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.: 1445010

Cooler Temperature(s) °C and Other Remarks: 1.8c

• container lists sample 10 as MW-7SR (902). Logged & labeled according to COC. MS 5-21-21
☆ Container lists sample 10 as ~~MW-5~~ MW-5(805) (Dup). Logged and labeled according to COC. MS 5-21-21
MS 5-21-21

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Short Elliott Hendrickson, Inc. dba SEH

Job Number: 320-74044-1

Login Number: 74044
List Number: 1
Creator: Cahill, Nicholas P

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1445010
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	