



June 10, 2021

Peter Rice, P.E., Director  
Portsmouth Public Works  
680 Peaverly Hill Road  
Portsmouth, NH 03801

**Re: Portsmouth Recreation Fields – Turf Information  
CMA # 1119**

Dear Peter:

Attached to this letter, please find all the product information and testing results related to the synthetic turf for the newly installed recreation field. This information includes:

- **Attachment A** – Product submittals (product data for the components of the turf field reviewed prior to installation)
- **Attachment B** – PFAS test results
- **Attachment C** – Gmax Testing (impact testing)

Should you have any questions, please do not hesitate to call.

Very truly yours,  
CMA ENGINEERS, INC.

Philip A. Corbet, P.E.  
Project Manager

Enc.

*Attachment A*  
Product Submittals

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# SUBMITTAL FOR

Multi-Purpose Recreation Fields & Regional Stormwater Treatment System Project  
Portsmouth, NH

**Product:** Synthetic Turf Field – Shop Drawings

**Date of Initial Submission:** 10/7/2020  
**Date of Resubmission:** 11/23/2020

**Specification/Item #:** 02790 – 1.02A7

**Subcontractor/Supplier/Manufacturer:** FieldTurf

PLEASE MARK BELOW WITH REVIEW & ACTION STAMP.

<i>QUIRK CONSTRUCTION CORP.</i>			
Job #	<u>000771</u>	Submittal #	<u>02790-02r1</u>
Date:	<u>11/23/2020</u>	Checked by:	<u>JW</u>

-Colors approved by Weston & Sampson

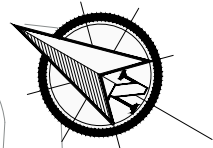
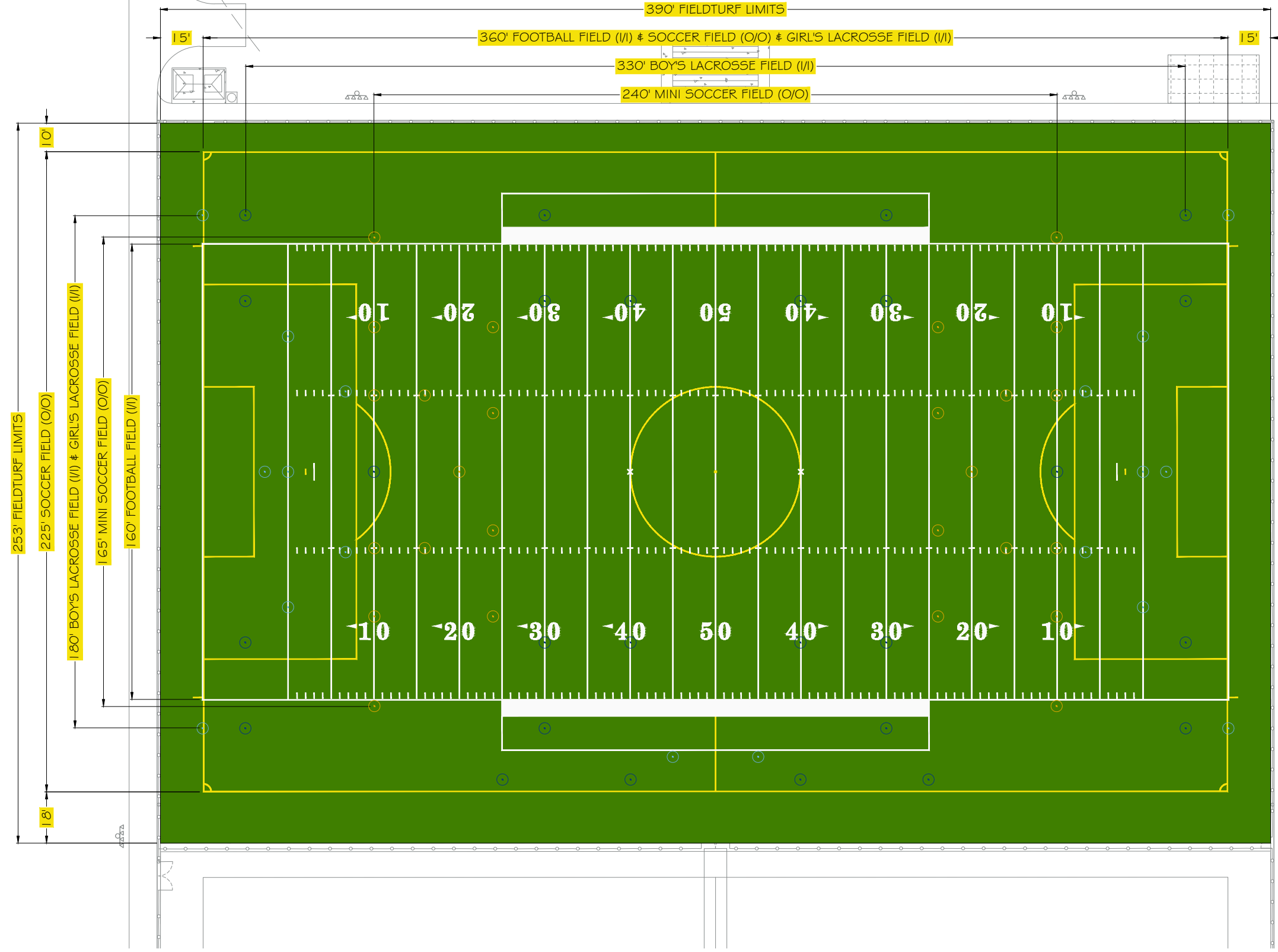
<b>SUBMITTAL REVIEW</b>			
1 <input type="checkbox"/> FURNISH AS SUBMITTED	3 <input type="checkbox"/> REVISE AND RESUBMIT		
2 <input checked="" type="checkbox"/> FURNISH AS NOTED	4 <input type="checkbox"/> REJECTED		
This submittal has been reviewed for general conformance with the plans and specifications for this project. Corrections, comments and/or clarifications noted to relieve the contractor from coordinating and correlating all dimensions and quantities, selections of construction techniques, coordinating the work of its forces and the other trades, and performance of the work in a safe and satisfactory manner.			
<b>WESTON &amp; SAMPSON ENGINEERS, INC.</b>			
Date	<u>12-01-2020</u>	By	<u>[Signature]</u>

# CITY OF PORTSMOUTH

## PORTSMOUTH, NH







DRAWN BY:	M. H.
CHECKED BY:	J. B.
SCALE:	1"=40'
TOTAL FIELD AREA:	98,670 sq.ft.
PERIMETER:	1,286 In.ft.

**CITY OF PORTSMOUTH  
PORTSMOUTH, NH**

DATE: NOVEMBER 19, 2020    ISSUE: SUBMITTAL    SHEET: 1/7 FIELD LAYOUT

APPROVED BY: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

PRINTED NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

**SPORT COLORS:**

	FOOTBALL COMPLETE COLOR NAME: WHITE PANTONE COLOR NUMBER: WHITE		BOYS LACROSSE TICK MARKS COMPLETE COLOR NAME: REFLEX BLUE PANTONE COLOR NUMBER: RFXC
	SOCCER COMPLETE COLOR NAME: CANARY YELLOW PANTONE COLOR NUMBER: 136C		GIRL'S LACROSSE TICK MARKS COMPLETE COLOR NAME: LAGOON BLUE PANTONE COLOR NUMBER: 292C
	MINI SOCCER TICK MARKS COMPLETE COLOR NAME: MUSTARD PANTONE COLOR NUMBER: 124C		

**LEGEND:**  
 FIELD/SUMMER GREEN FIELDTURF  
 98,670 sq.ft.

**FIELD LAYOUT NOTES (sports are in order of dominance):**

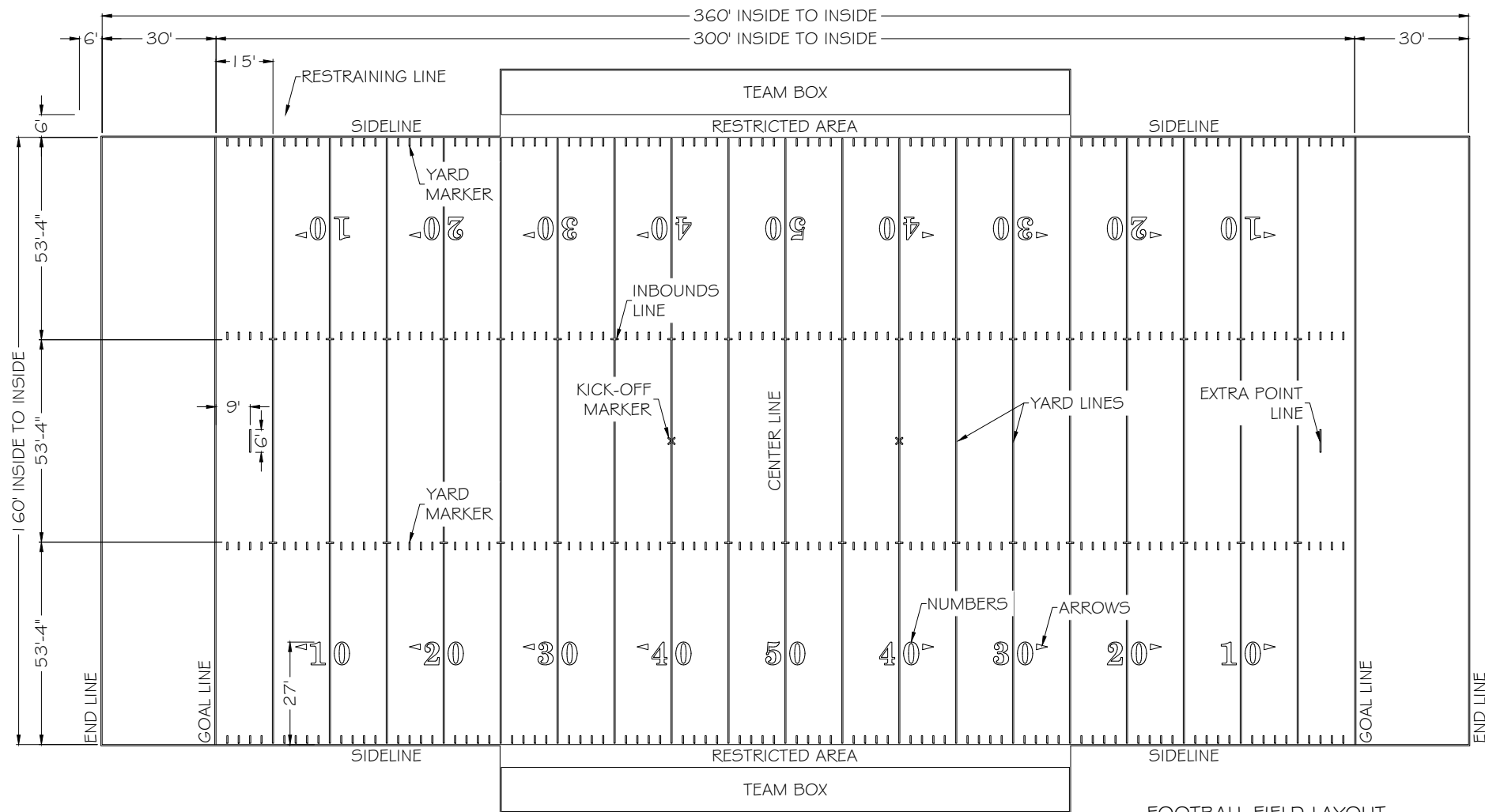
1. FOOTBALL MARKINGS ARE 4" WHITE NFHS STANDARDS.
2. SOCCER MARKINGS ARE 4" CANARY YELLOW NFHS STANDARDS.
3. MINI SOCCER TICK MARKS ARE 4" MUSTARD U-12 STANDARDS.
4. BOYS LACROSSE TICK MARKS ARE 4" REFLEX BLUE NFHS STANDARDS.
5. GIRL'S LACROSSE TICK MARKS ARE 4" LAGOON BLUE NFHS STANDARDS.

FIELD DOMINANCY IS ONLY WITHIN THE FOOTBALL FIELD OF PLAY.

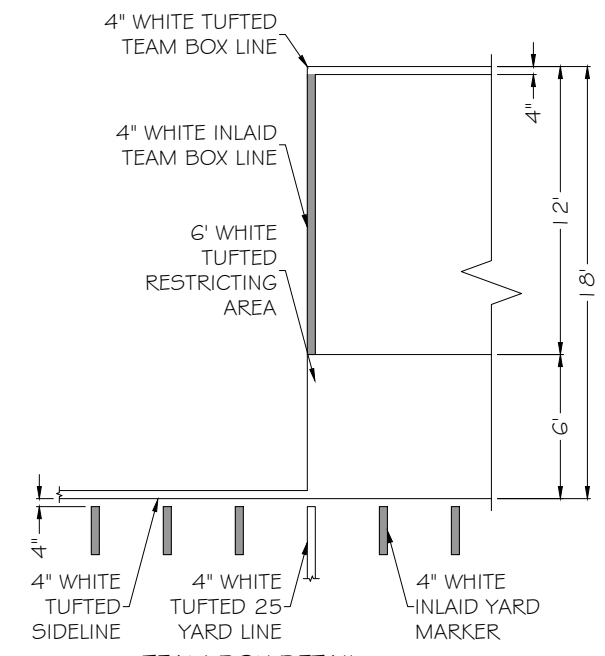
COLOR DASHED CIRCLES ARE TO INDICATE PLACEMENT OF THE 4" X 4" INLAID TICK MARKS.

ALL DIMENSIONS TO BE VERIFIED BEFORE ANY CONSTRUCTION BEGINS.

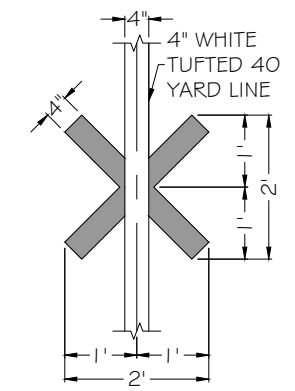
**NFHS STANDARDS**



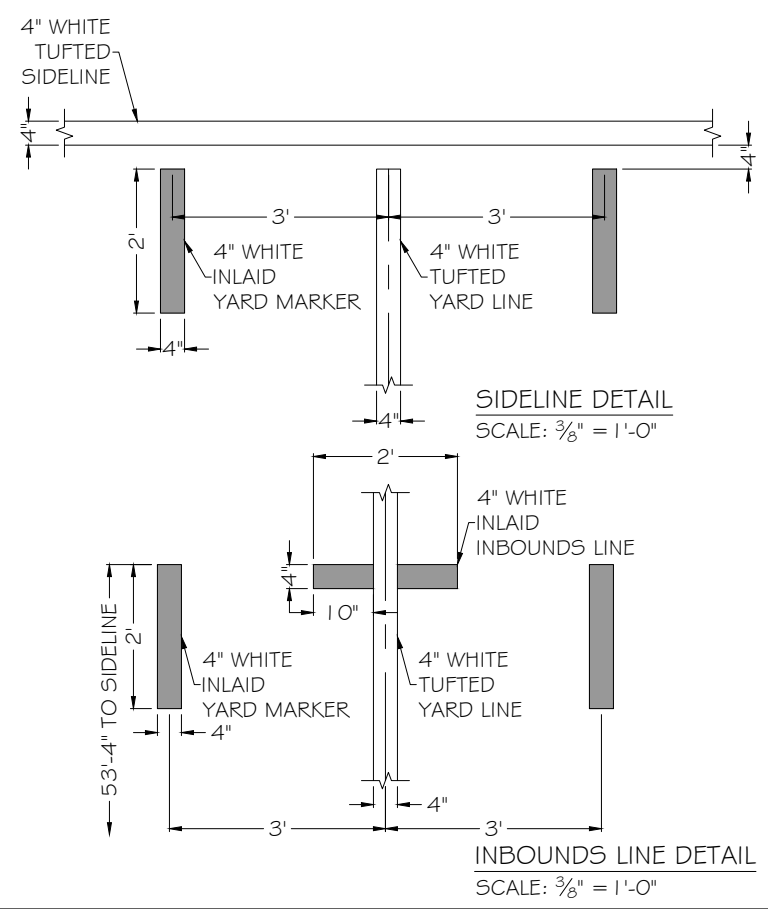
FOOTBALL FIELD LAYOUT  
SCALE: 1" = 40'-0"



TEAM BOX DETAIL  
SCALE: 1/8" = 1'-0"

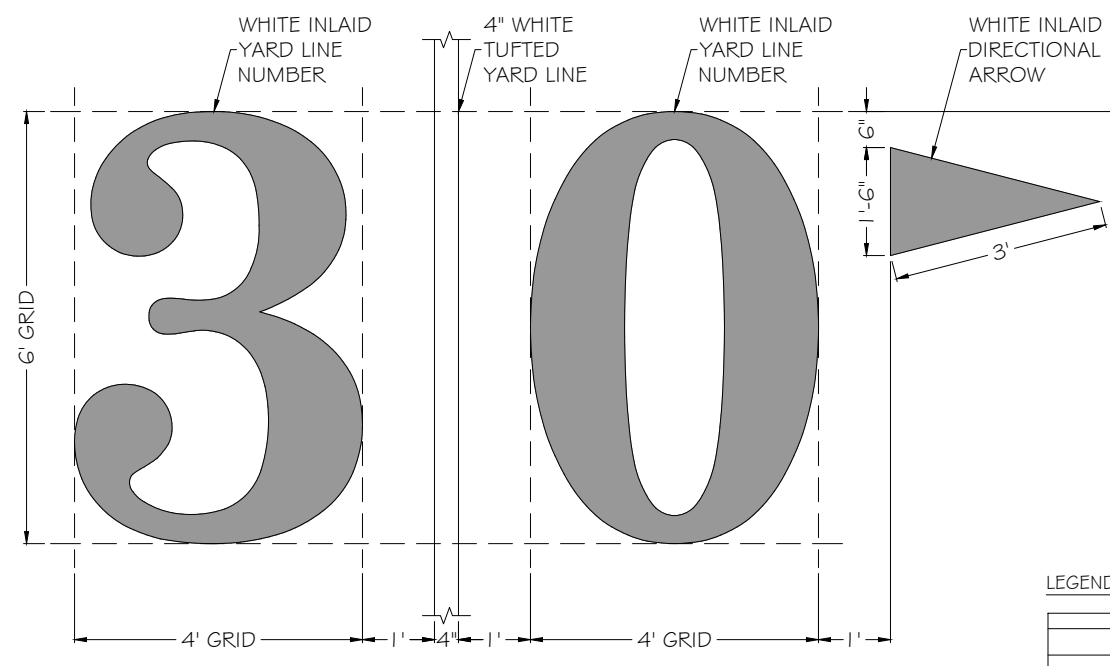


KICK-OFF MARKER  
SCALE: 3/8" = 1'-0"

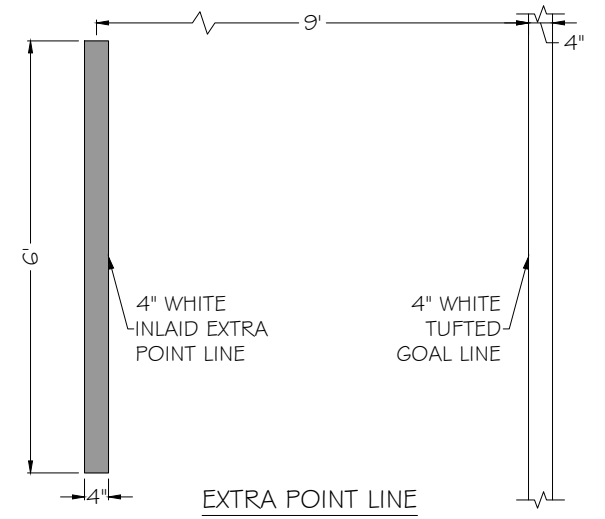


SIDELINE DETAIL  
SCALE: 3/8" = 1'-0"

INBOUNDS LINE DETAIL  
SCALE: 3/8" = 1'-0"



YARD LINE NUMBER  
CENTURY SCHOOLBOOK FONT  
SCALE: 3/8" = 1'-0"



EXTRA POINT LINE  
SCALE: 3/8" = 1'-0"

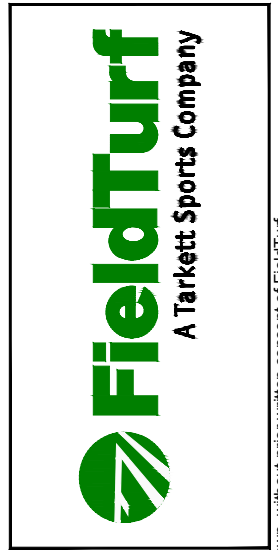
- LEGEND:
- TUFTED WHITE LINE (INDICATED ON DETAILS ONLY)
  - INLAID WHITE LINE (INDICATED ON DETAILS ONLY)

FOOTBALL LAYOUT NOTES:

SIDELINES, END LINES, GOAL LINES, YARD LINES AND RESTRAINING LINES ARE TUFTED WHITE LINES.

INBOUNDS LINES, SHORT YARD LINE MARKERS, KICK-OFF MARKERS, EXTRA POINT LINE MARKERS AND ALL OTHER FIELD MARKINGS ARE TO BE WHITE INLAID TURF.

DRAWN BY:	M. H.
CHECKED BY:	J. B.
SCALE:	AS SHOWN

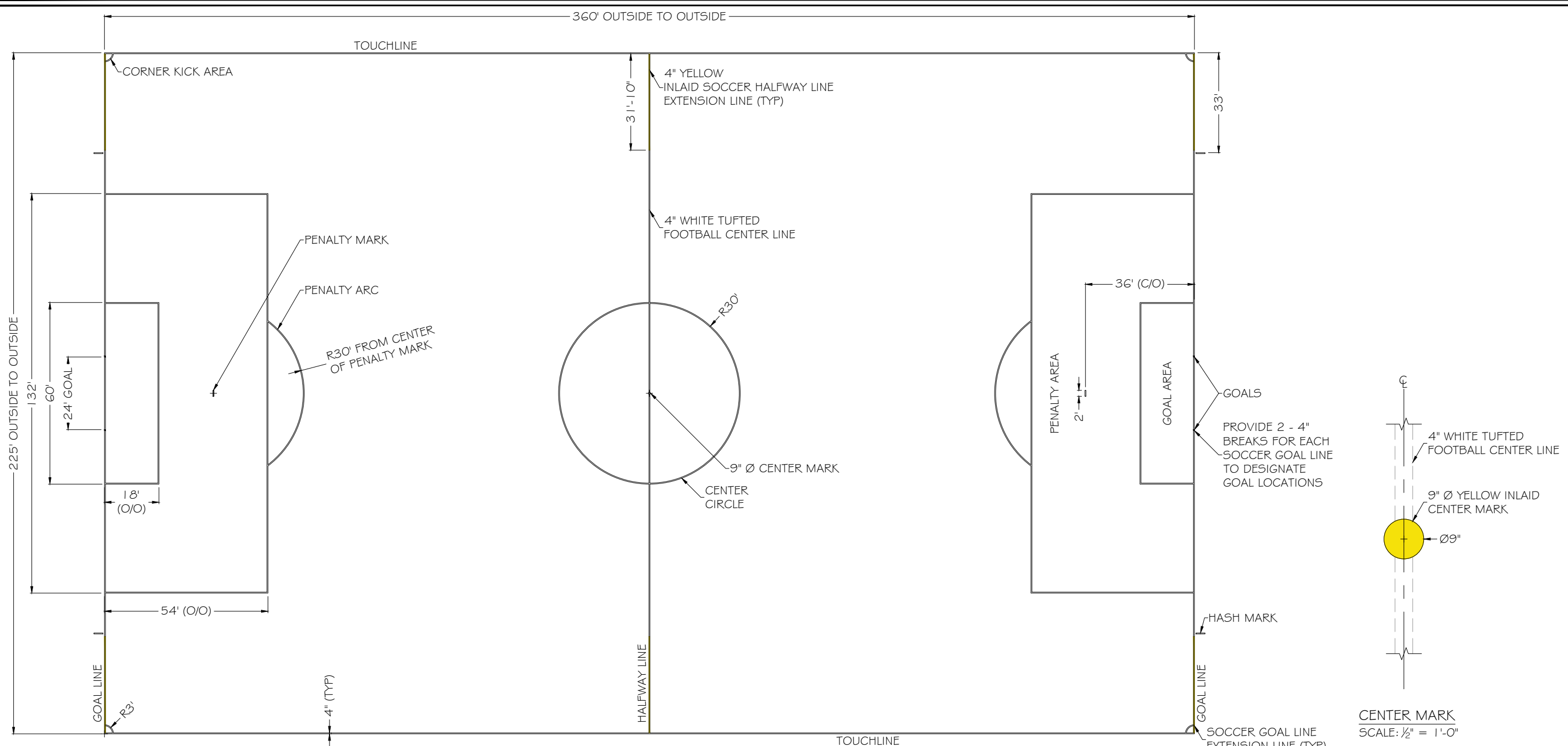


**CITY OF PORTSMOUTH  
PORTSMOUTH, NH**

**NFHS STANDARDS**

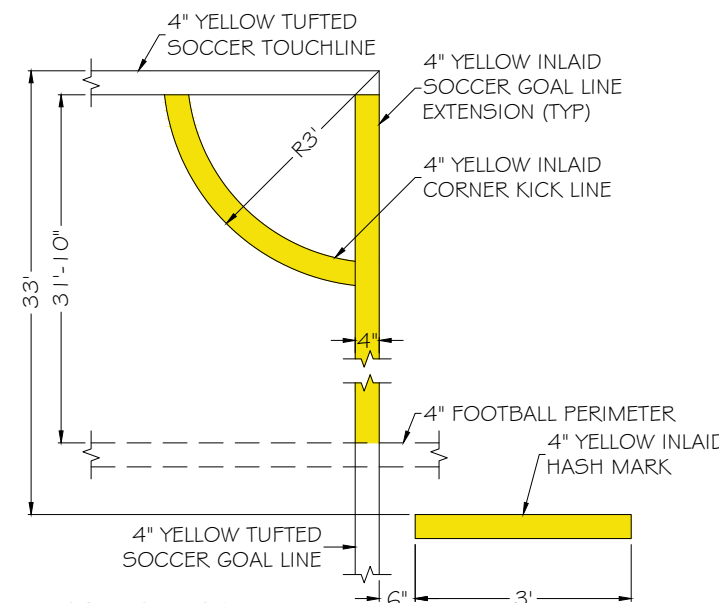
DATE: NOVEMBER 19, 2020  
ISSUE: SUBMITTAL  
SHEET: 2/7 FOOTBALL MARKINGS

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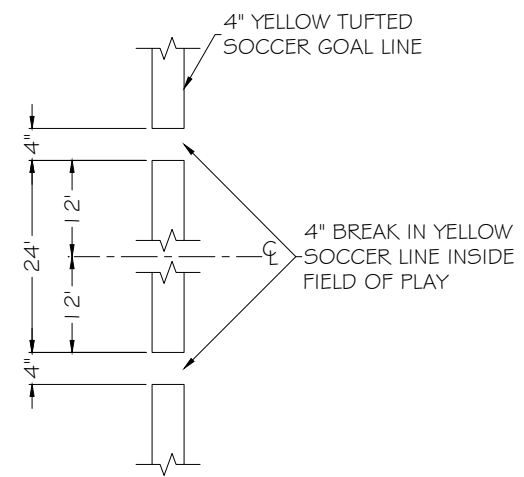


**SOCCER FIELD LAYOUT**  
SCALE: 1" = 35'-0"

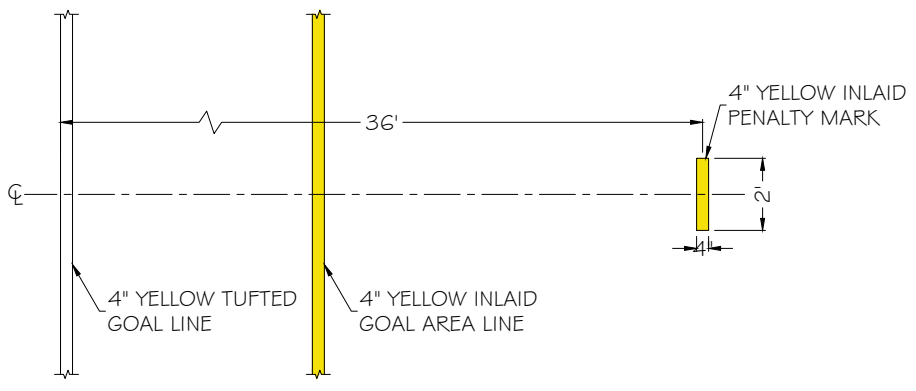
**CENTER MARK**  
SCALE: 1/2" = 1'-0"



**CORNER KICK**  
SCALE: 3/8" = 1'-0"



**GOAL LOCATION**  
SCALE: 1/2" = 1'-0"



**PENALTY MARK**  
SCALE: 3/16" = 1'-0"

**LEGEND:**

- TUFTED YELLOW LINE (INDICATED ON DETAILS ONLY)
- INLAID YELLOW LINE (INDICATED ON DETAILS ONLY)

**SOCCER LAYOUT NOTES:**

TOUCHLINES AND GOAL LINES ARE TUFTED YELLOW LINES.

THE SOCCER GOAL AREA, PENALTY AREA, PENALTY MARK, PENALTY ARC, MIDFIELD CIRCLE, CENTER MARK, CORNER KICK LINE, HASH MARK AND EXTENSION LINES ARE TO BE YELLOW INLAID TURF.

USE THE FOOTBALL 4" WHITE TUFTED CENTER LINE AS THE SOCCER HALFWAY LINE.

**NFHS STANDARDS**

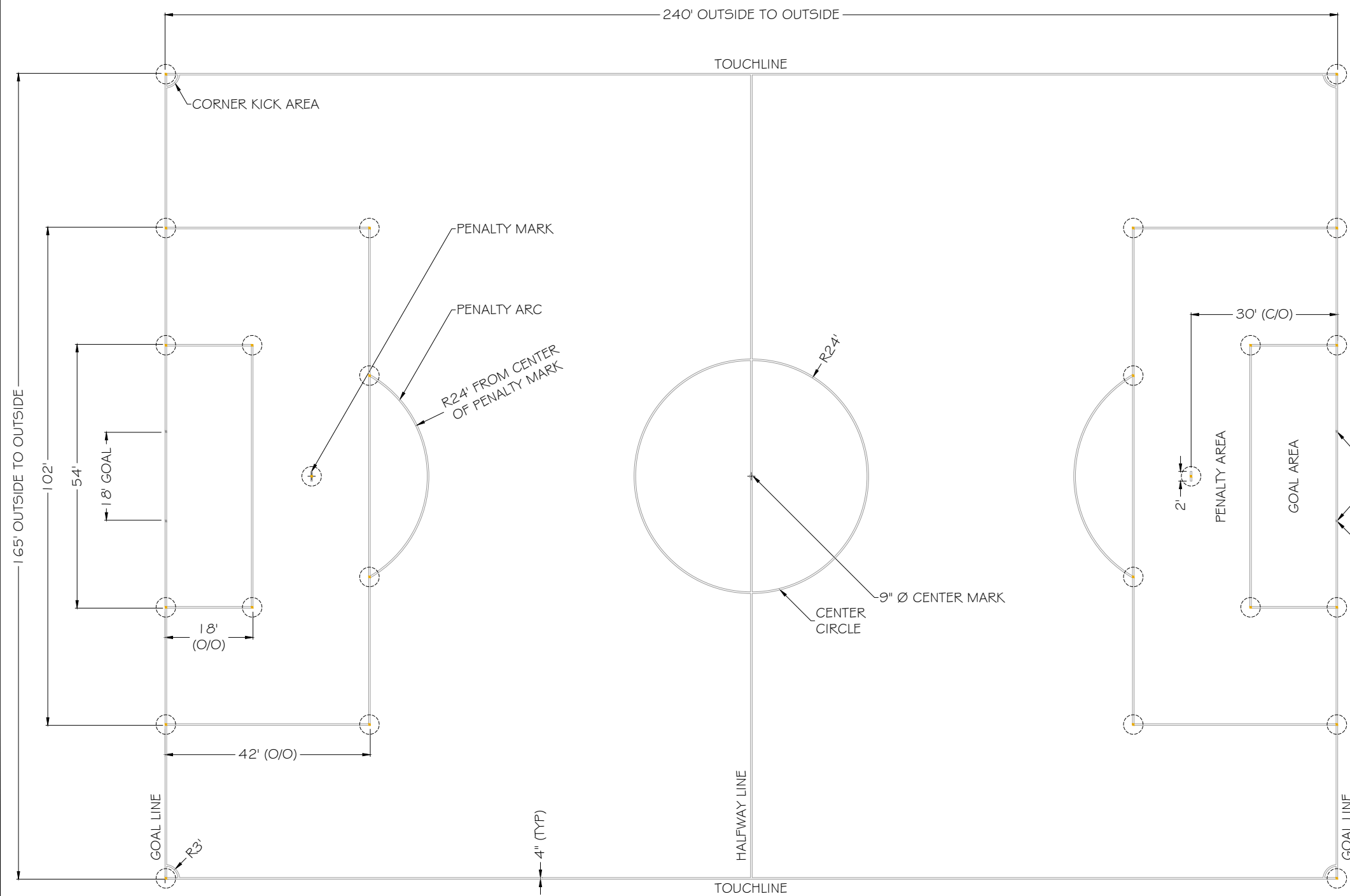
DRAWN BY:	M. H.
CHECKED BY:	J. B.
SCALE:	AS SHOWN



**CITY OF PORTSMOUTH  
PORTSMOUTH, NH**

DATE: NOVEMBER 19, 2020	ISSUE: SUBMITTAL	SHEET: 3/7 SOCCER MARKINGS
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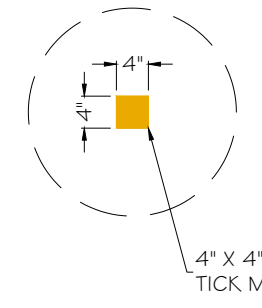
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U-12 SOCCER FIELD LAYOUT  
SCALE: 1" = 25'-0"

LEGEND:  
 INLAID MUSTARD LINE (INDICATED ON DETAILS ONLY)

U-12 SOCCER LAYOUT NOTES:  
 DASHED CIRCLES ARE TO INDICATE PLACEMENT OF THE 4" X 4" INLAID TICK MARKS.  
 THE REST OF THE MARKINGS ARE TO BE PAINTED IN BY OTHERS.



TICK MARK  
SCALE: 1/2" = 1'-0"

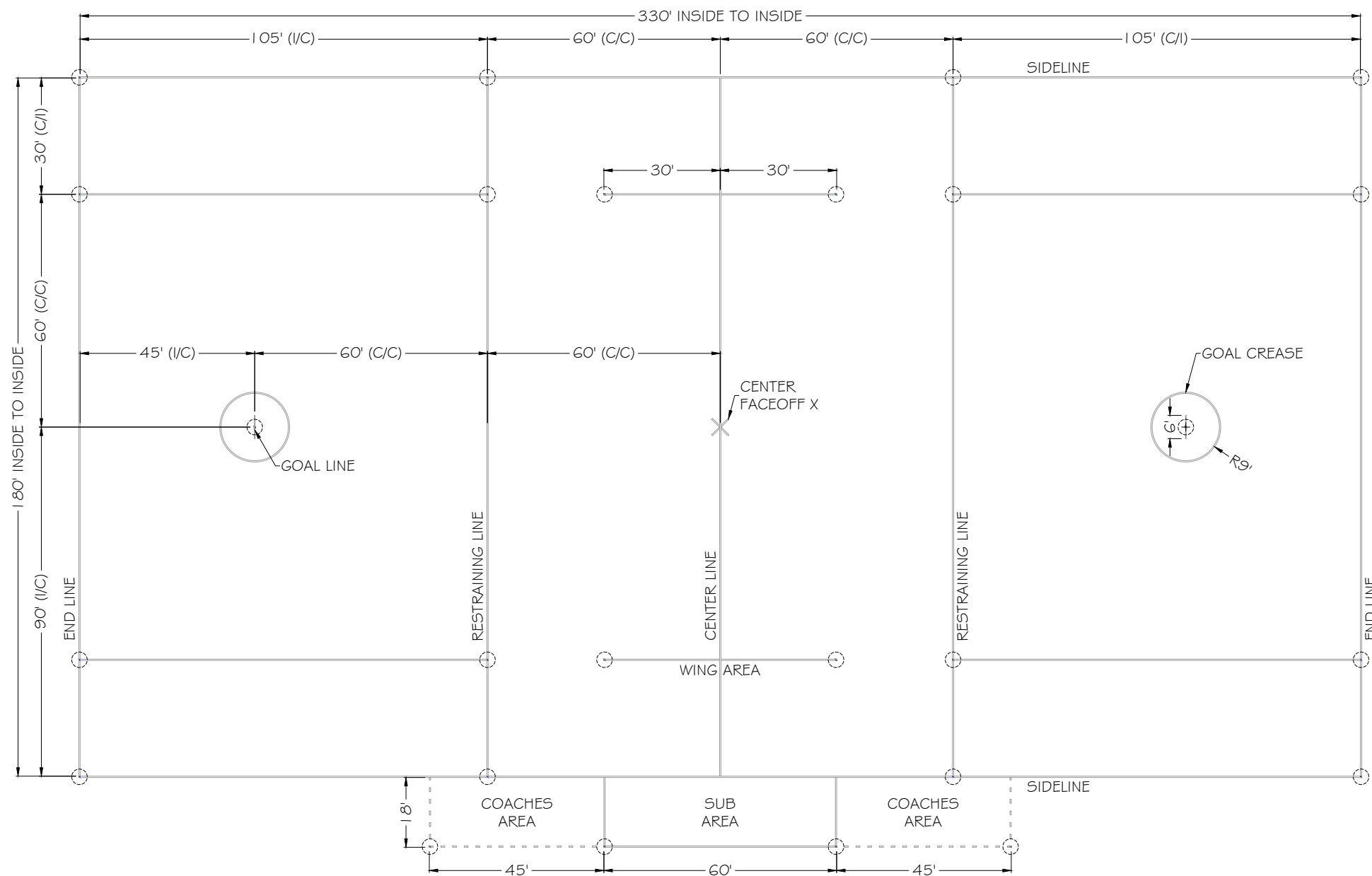
DRAWN BY:	M. H.
CHECKED BY:	J. B.
SCALE:	AS SHOWN



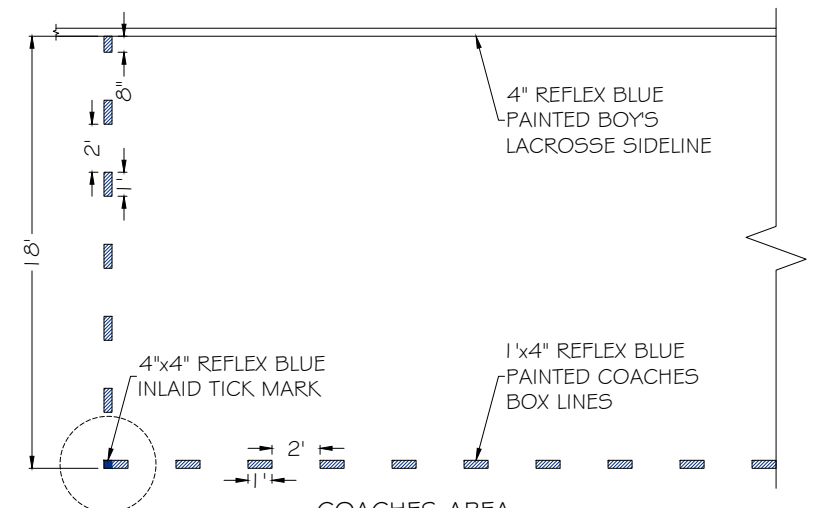
**CITY OF PORTSMOUTH  
PORTSMOUTH, NH**

DATE: NOVEMBER 19, 2020	SHEET: 4/7 MINI SOCCER TICK MARKS
ISSUE: SUBMITTAL	

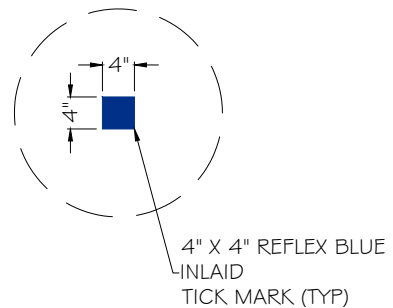
Scale is only accurate when this drawing is printed on 11" X 17" paper. All Rights Reserved. Confidential Information: No portion of these drawings may be disclosed, used, reproduced, modified or shown, without prior written consent of FieldTurf.



**BOYS LACROSSE FIELD LAYOUT**  
SCALE: 1" = 35'-0"





**COACHES AREA**  
SCALE: 1/8" = 1'-0"



**TICK MARK**  
SCALE: 1/2" = 1'-0"

**LEGEND:**

-  INLAID REFLEX BLUE LINE (INDICATED ON DETAILS ONLY)
-  PAINTED REFLEX BLUE LINE (INDICATED ON DETAILS ONLY)

**BOYS LACROSSE LAYOUT NOTES:**

- DASHED CIRCLES ARE TO INDICATE PLACEMENT OF THE 4" X 4" INLAID TICK MARKS.
- USE THE FOOTBALL 4" WHITE TUFTED CENTER LINE AND 30 YARD LINES FOR THE BOYS LACROSSE CENTER LINE AND RESTRAINING LINES
- ALL LINES ARE 4" WIDE EXCEPT FOR THE GOAL LINE SHALL BE 2" WIDE.
- THE REST OF THE MARKINGS ARE TO BE PAINTED IN BY OTHERS.

**NFHS STANDARDS**

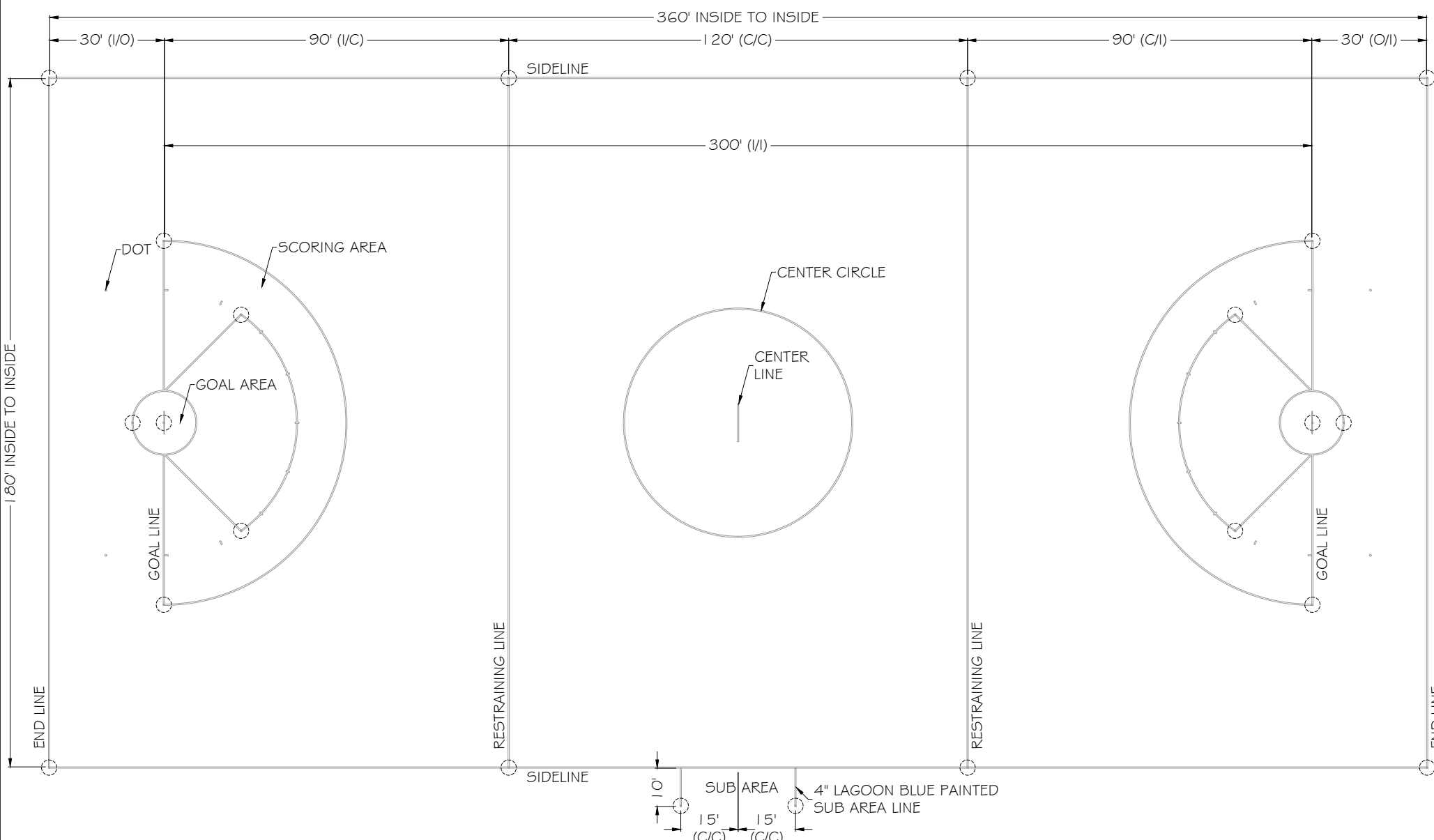
DRAWN BY:	M. H.
CHECKED BY:	J. B.
SCALE:	AS SHOWN



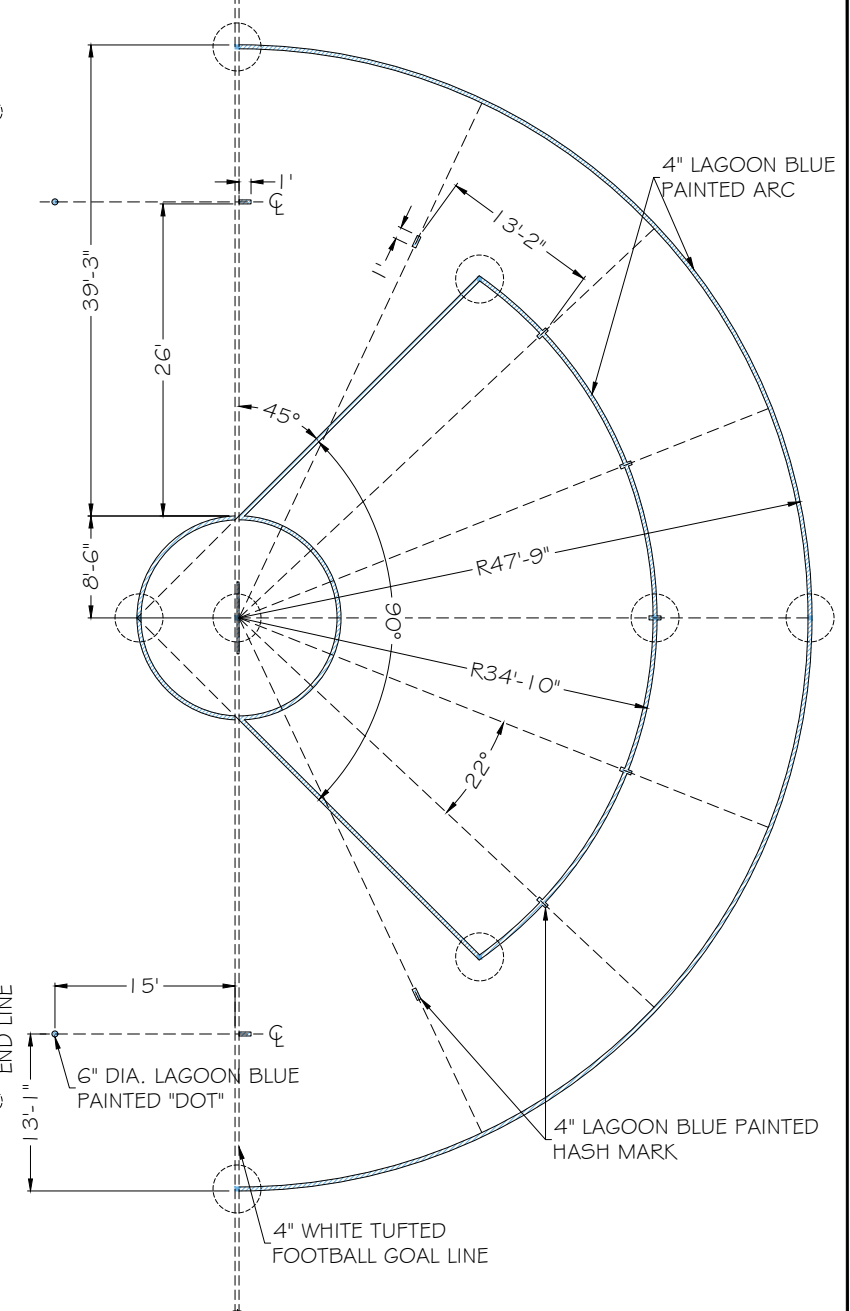
**CITY OF PORTSMOUTH  
PORTSMOUTH, NH**

DATE: NOVEMBER 19, 2020	ISSUE: SUBMITTAL	SHEET: 5/7 BOYS LACROSSE MARKINGS
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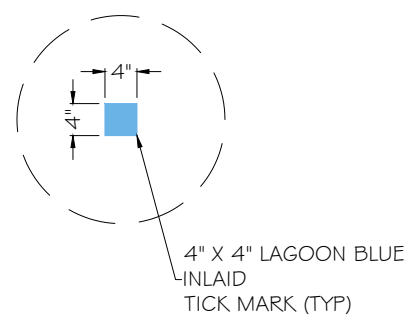
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GIRL'S LACROSSE FIELD LAYOUT  
SCALE: 1" = 35'-0"



SCORING AREA  
SCALE: 1/8" = 1'-0"



TICK MARK  
SCALE: 1/2" = 1'-0"

LEGEND:

	INLAID LAGOON BLUE LINE (INDICATED ON DETAILS ONLY)
	PAINTED LAGOON BLUE LINE (INDICATED ON DETAILS ONLY)

GIRL'S LACROSSE LAYOUT NOTES:

DASHED CIRCLES ARE TO INDICATE PLACEMENT OF THE 4" X 4" INLAID TICK MARKS.

USE THE FOOTBALL 4" WHITE TUFTED END LINES AND 30 YARD LINES FOR THE GIRL'S LACROSSE END LINES AND RESTRAINING LINES.

ALL LINES ARE 4" WIDE EXCEPT FOR THE GOAL LINE SHALL BE 2" WIDE.

THE REST OF THE MARKINGS ARE TO BE PAINTED IN BY OTHERS.

**NFHS STANDARDS**

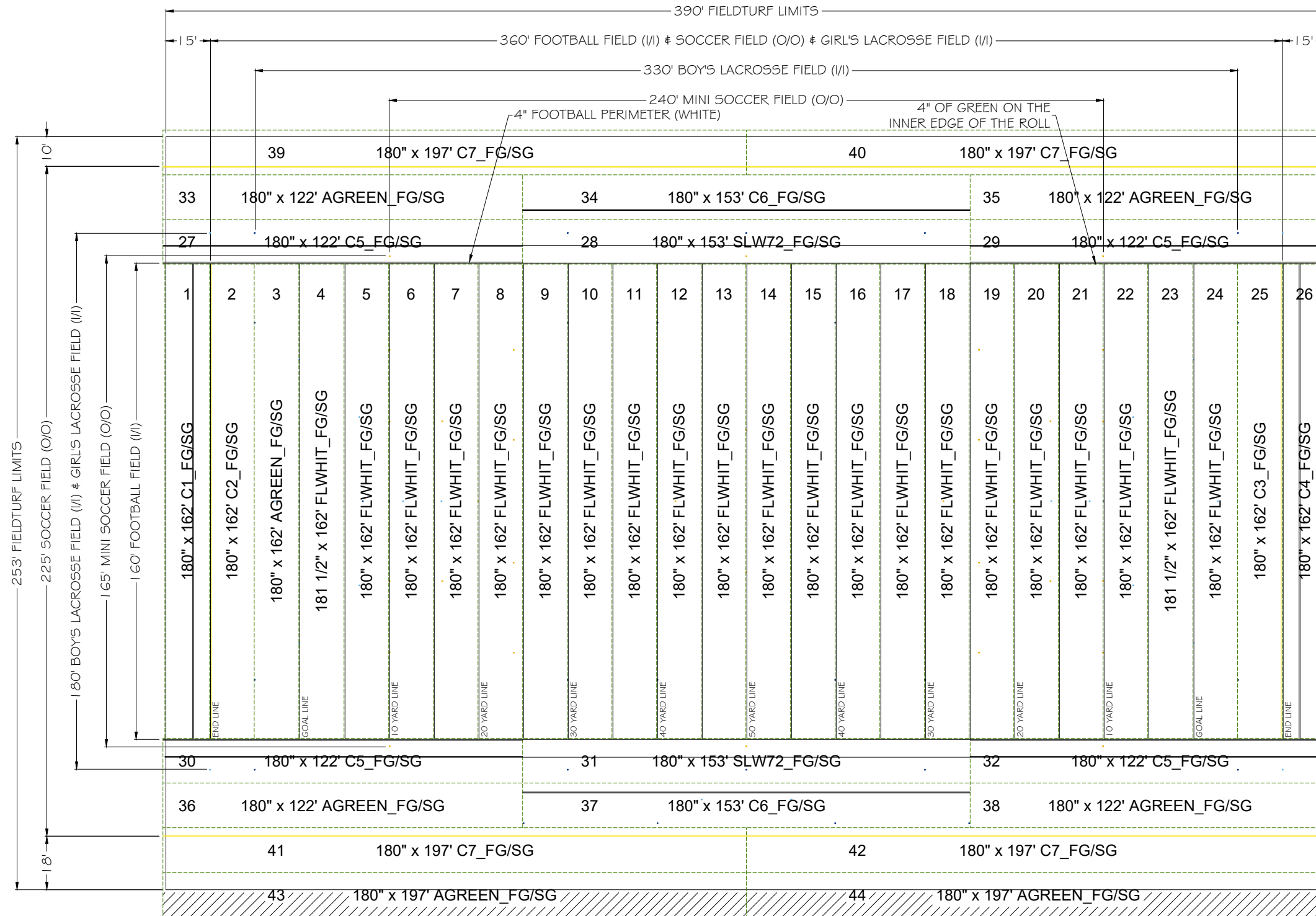
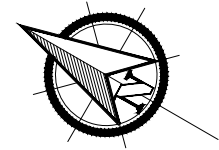
DRAWN BY:	M. H.
CHECKED BY:	J. B.
SCALE:	AS SHOWN
Scale is only accurate when this drawing is printed on 11" X 17" paper.	

CITY OF PORTSMOUTH  
PORTSMOUTH, NH

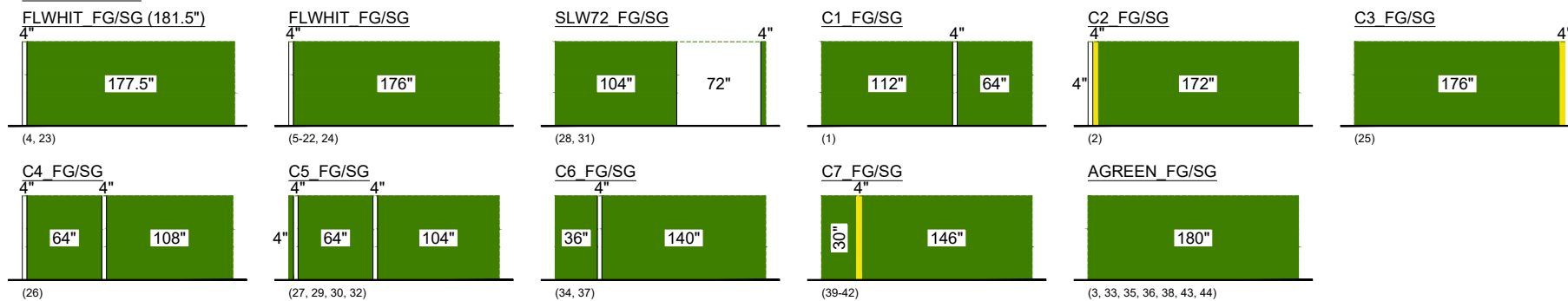
DATE: NOVEMBER 19, 2020  
ISSUE: SUBMITTAL  
SHEET: 6/7 GIRL'S LACROSSE MARKINGS

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**ROLL LEGEND:**



**INSTALLATIONS NOTES:**

- ROLLS (SEAMS) ARE SHOWN IN DASHED LINES.
- FIELD EDGE AND SPORTS LINES ARE SHOWN IN CONTINUOUS LINES.
- ROLLS #2 & #26 HAVE THE FOOTBALL END LINES.
- ROLLS #4 & #24 HAVE THE FOOTBALL GOAL LINES.
- ROLLS #27 TO #32 HAVE THE FOOTBALL SIDELINES.
- ROLLS #2 & #25 HAVE THE SOCCER GOAL LINES.
- ROLLS #39 TO #42 HAVE THE SOCCER TOUCHLINES.
- THE FOOTBALL SIDELINE ROLLS HAVE 4" OF GREEN ON THE FIELD SIDE OF THE ROLLS.
- THE INSTALLATION OF THE ROLLS SHOULD START FROM THE 50-YARD LINE (ROLL #13/14).
- USE THE LEGEND FOR PLACEMENT OF EXCESS ROLLS.



DRAWN BY:	M. H.
CHECKED BY:	J. B.
SCALE:	1"=40'
TOTAL FIELD AREA:	98,670 sq.ft.
TOTAL TURF MANUF'D:	104,771 sq.ft.
TOTAL EXTRA TURF:	6.2 %



**CITY OF PORTSMOUTH  
PORTSMOUTH, NH**

DATE: NOVEMBER 19, 2020    ISSUE: SUBMITTAL    SHEET: 777 ROLL LAYOUT

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# FULL SUBMITTAL FIELDTURF - DRAFTER CHECKLIST

PROJECT NAME	CITY OF PORTSMOUTH		
COMPANY	FIELDTURF		
STATE	NH		
TYPE OF FIELD	HIGH SCHOOL		
TEMPLATE	NFHS		
PRODUCT 1	FIELDTURF VERTEX 2" / FTVT-50		
PRODUCT 2	NONE		
PRODUCT 3	NONE		
SPORT	COLOR	STANDARD	COMMENTS
FOOTBALL	WHITE	NFHS	
SOCCER	CANARY YELLOW	NFHS	Confirm all colors with owner.
SOCCER TICK MARKS	MUSTARD	U-12	
BOY'S LACROSSE TICK MARKS	REFLEX BLUE	NFHS	
GIRL'S LACROSSE TICK MARKS	LAGOON BLUE	NFHS	
LOGO COLORS			
ADDITIONAL INFO			
			NOVEMBER 19, 2020





# SUBMITTAL FOR

Multi-Purpose Recreation Fields & Regional Stormwater Treatment System Project  
Portsmouth, NH

**Product:** Synthetic Grass Infill System – Product Data

**Date of Initial Submission:** 10/7/2020  
**Date of Resubmission:** 11/23/2020

**Specification/Item #:** 02790

**Subcontractor/Supplier/Manufacturer:** Fieldturf

PLEASE MARK BELOW WITH REVIEW & ACTION STAMP.

- 1.02F4 – Synthetic Grass & Certified Test Results
- 2.02B8 – Safeshell Infill
- Testing data provided is from a similar installation/project.
- Samples submitted separately

<i>QUIRK CONSTRUCTION CORP.</i>			
Job #	<u>000771</u>	Submittal #	<u>02790-03r1</u>
Date:	<u>11/23/2020</u>	Checked by:	<u>JW</u>

Testing update specific to Portsmouth shall be provided following the installation of the turf.

**SUBMITTAL REVIEW**

1  FURNISH AS SUBMITTED    3  REVISE AND RESUBMIT  
2  FURNISH AS NOTED    4  REJECTED

This submittal has been reviewed for general conformance with the plans and specifications for this project. Corrections, comments and/or clarifications noted herein do not relieve the contractor from coordinating and correlating all dimensions and quantities, selections of construction techniques, coordinating the work of its forces and the other trades, and performance of the work in a safe and satisfactory manner.

**WESTON & SAMPSON ENGINEERS, INC.**

Date 12-01-2020 By *G. J. [Signature]*

**TECHNICAL PRODUCT SPECIFICATION**

**VERTEX**



**MONOFILAMENT/SLIT-FILM 2"**

PROPERTY	VALUE	UNITS	METHOD
Product Stock Code	FTVT-50-4620		
Pile Yarn Type	UV-resistant polyethylene		n/a
Yarn Structure 1	Ridged Monofilament		n/a
Yarn Denier 1	12000	Denier	D1577
Tape Thickness 1	360	Microns	
Yarn Structure 2	Slit-Film		
Yarn Denier 2	5000	Denier	D1577
Tape Thickness 2	100+	Microns	
Pile Height	<b>OK</b> 2	inches	D5823
Pile Weight	<b>OK</b> 44	oz/yd <sup>2</sup>	D5848
Primary Backing Weight	7+	oz/yd <sup>2</sup>	D5848
Secondary Backing Weight (Perforated)	<b>OK</b> 20	oz/yd <sup>2</sup>	D5848
Total Carpet Weight	<b>OK</b> 71	oz/yd <sup>2</sup>	D5848
Stitch Gauge	3/4 inch centers		D5793
Tuft Bind	8+	lbs/force	D1335
Grab Tear Length	>200	lbs/force	D5034
Grab Tear Width	>200	lbs/force	D5034
Pill Burn Test	Pass		D2859
Impact Attenuation (Gmax)	<200	gmax	F1936
Water Permeability	>40	inch/hour	DIN 18-035
Shockpad	<b>OK</b> PP20	<b>Schmitz Foam Products, ProPlay-Sport 20</b>	

**Issue Date:11/18/2020**

**Disclaimer:** Variation of +/-5% on above listed property values is within normal manufacturing tolerances





## TEST SUMMARY

CLIENT:

<p style="font-size: small;">THE ULTIMATE SURFACE EXPERIENCE</p>	Report Number:	80711R
	Lab Test Number:	3208-3950—3960
	Test Completion Date:	7/31/2020
	Report Date:	7/31/2020
	Page:	1 of 4
	Requested by:	Tanner Holloway

**TEST MATERIAL:**

Material Type:	Synthetic Turf	Date Received:	7/9/2020								
Material Condition:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">EXCELLENT:</td> <td style="width: 25%;">XXX</td> <td style="width: 25%;">GOOD:</td> <td style="width: 25%;">POOR:</td> </tr> <tr> <td style="text-align: center;">REJECTED:</td> <td colspan="3"></td> </tr> </table>	EXCELLENT:	XXX	GOOD:	POOR:	REJECTED:					
EXCELLENT:	XXX	GOOD:	POOR:								
REJECTED:											
Project:	Woodinville Fields Carol Edwards Center – 00016626										
Product ID:	32086-FTVT50-XM7-42-SG, 32085-FTVT50-XM7-42-FG										
Job #	01031526-32086-FTVT50-XM7-42SG, 01031527-FTVT50-XM7-42-FG										
Infill:	Bottom Layer: 4.5 lbs/ft <sup>2</sup> 20/40 Silica Sand, Top Layer: 1.1 lbs/ft <sup>2</sup> Cork/Purefill										
Pad:	Thermagreen SportLite™ 20mm										

**TESTING METHODS REQUESTED:**

<i>Testing Services Inc. was instructed by the client to test for the following...</i>			
Standard:	FTIR	Test Method:	Fourier Transform Spectroscopy, Fiber ID
Standard:	ASTM F1551	Test Method:	Standard Test Method for Comprehensive Characterization of Synthetic Turf Placing Surfaces and Materials, Suffix DIN 18-035, Part 6: Water Permeability of Synthetic Turf Systems and Permeable Bases
Standard:	ASTM D2859	Test Method:	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
Standard:	ASTM D5848	Test Method:	Standard Test Method for Mass Per Unit Area of Pile Yarn Floorcoverings
Standard:	ASTM D5823	Test Method:	Standard Test Method for Tuft Height of Pile Yarn Floorcoverings
Standard:	ASTM D1335	Test Method:	Standard Test Method for Tuft Bind of Pile Yarn Floorcoverings
Standard:	ASTM D5034	Test Method:	Standard Test Method for Breaking Strength of Textile Fabrics (Grabs)

**SAMPLING PLAN:**

Sampling Date:	7/6/2020
<ul style="list-style-type: none"> <li>Specimen sampling is performed in the sampling department at TSI.</li> <li>The sampling size of specimens is determined by the test method requirements.</li> <li>In the event a specific sampling size is not called for, a determination will be made based on previous testing experience, and approved for use by an authorized manager.</li> <li>All samples are subjected to the outside environmental conditions of temperature and relative humidity.</li> <li>Sample requiring pre-determined exposure to specified environmental conditions based on a specific test method, take place in the departments in which they are tested</li> </ul>	

**DEVIATION FROM TEST METHOD:**

State reason for any Deviation from, Additions to, or Exclusions From Test Method.
None

**TEST SUMMARY:**

Ribbon					
TEST METHOD	TEST DESCRIPTION	TEST RESULTS – Lab # 3950 – Rust		Product Minimum Specifications per City of Woodinville Bid	Specification Results
		Slit Film	Monofilament		
FTIR	Yarn Fiber ID	Polyethylene	Polyethylene	Polyethylene	Pass
*Performance					
TEST METHOD	TEST DESCRIPTION	TEST RESULTS – Lab # 3951 – Green		Product Minimum Specifications per City of Woodinville Bid	Specification Results
		Slit Film	Monofilament		
FTIR	Yarn Fiber ID	Polyethylene	Polyethylene	Polyethylene	Pass

**TEST SUMMARY:**

TEST METHOD	TEST DESCRIPTION	TEST RESULTS	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM F1551-09; Suffix 30	Water Permeability	75.4 inches/hour	>20 inches/hour (Turf/Infill only)	Pass
ASTM F1551-09; Suffix 30	Water Permeability	96.3 inches/hour	N/A (Pad only)	N/A

**TEST SUMMARY:**

Construction Analysis				
TEST METHOD	TEST DESCRIPTION	TEST RESULTS Extra Rust Roll, No roll # Lab # 3208-3950	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	76.28 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	51.19 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	17.04 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	14.4 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	212 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	311 lbs/force	200 lbs/force	Exceeds Spec


*7/31 Updated test report to include FTIR results.*

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**817 Showalter Ave**  
**Dalton, GA 30722**  
**(706) 226-1400**  
**tsioffice@optilink.us**

# TEST SUMMARY

CLIENT:

	THE ULTIMATE SURFACE EXPERIENCE	Report Number:	80711
		Lab Test Number:	3208-3950—3960
		Test Completion Date:	7/31/2020
		Report Date:	7/31/2020
		Page:	2 of 4
		Requested by:	Tanner Holloway

**TEST MATERIAL:**

Material Type:	Synthetic Turf	Date Received:	7/9/2020
Material Condition:	EXCELLENT:    XXX    GOOD:    POOR:    REJECTED:		
Project:	Woodinville Fields Carol Edwards Center – 00016626		
Product ID:	32086-FTVT50-XM7-42-SG, 32085-FTVT50-XM7-42-FG		
Job #	01031526-32086-FTVT50-XM7-42SG, 01031527-FTVT50-XM7-42-FG		
Infill:	Bottom Layer: 4.5 lbs/ft <sup>2</sup> 20/40 Silica Sand, Top Layer: 1.1 lbs/ft <sup>2</sup> Cork/Purefill		
Pad:	Thermagreen SportLite™ 20mm		

**TEST SUMMARY:**

**Construction Analysis**

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 6 Lab # 3208-3951	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	69.39 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.08 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	19.25 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	12.4 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	217 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	318 lbs/force	200 lbs/force	Exceeds Spec

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 12 Lab # 3208-3952	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	68.58 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.10 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	18.42 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	13.0 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	208 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	307 lbs/force	200 lbs/force	Exceeds Spec

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 18 Lab # 3208-3953	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	68.72 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.05 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	18.61 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	12.5 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	212 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	291 lbs/force	200 lbs/force	Exceeds Spec


TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 24 Lab # 3208-3954	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	68.59 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.17 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	18.36 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	13.2 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	226 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	312 lbs/force	200 lbs/force	Exceeds Spec

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## TEST SUMMARY

CLIENT:

	<b>Report Number:</b>	80711
	<b>Lab Test Number:</b>	3208-3950—3960
	<b>Test Completion Date:</b>	7/31/2020
	<b>Report Date:</b>	7/31/2020
	<b>Page:</b>	3 of 4
	<b>Requested by:</b>	Tanner Holloway

TEST MATERIAL:

<b>Material Type:</b>	Synthetic Turf			<b>Date Received:</b>	7/9/2020
<b>Material Condition:</b>	<b>EXCELLENT:</b>	<b>XXX</b>	<b>GOOD:</b>	<b>POOR:</b>	<b>REJECTED:</b>
<b>Project:</b>	Woodinville Fields Carol Edwards Center – 00016626				
<b>Product ID:</b>	32086-FTVT50-XM7-42-SG, 32085-FTVT50-XM7-42-FG				
<b>Job #</b>	01031526-32086-FTVT50-XM7-42SG, 01031527-FTVT50-XM7-42-FG				
<b>Infill:</b>	Bottom Layer: 4.5 lbs/ft <sup>2</sup> 20/40 Silica Sand, Top Layer: 1.1 lbs/ft <sup>2</sup> Cork/Purefill				
<b>Pad:</b>	Thermagreen SportLite™ 20mm				

TEST SUMMARY:

### Construction Analysis

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 42 Lab # 3208-3955	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	73.20 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.14 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	23.00 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	13.5 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	249 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	283 lbs/force	200 lbs/force	Exceeds Spec

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 48 Lab # 3208-3956	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	68.91 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.03 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	18.82 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	15.6 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	232 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	293 lbs/force	200 lbs/force	Exceeds Spec

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 54 Lab # 3208-3957	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	69.59 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.16 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	19.37 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	16.4 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	255 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	310 lbs/force	200 lbs/force	Exceeds Spec

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 60 Lab # 3208-3958	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	69.82 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.00 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	19.76 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	15.2 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	265 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	267 lbs/force	200 lbs/force	Exceeds Spec


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# TEST SUMMARY

CLIENT:

	THE ULTIMATE SURFACE EXPERIENCE	Report Number:	80711
		Lab Test Number:	3208-3950—3960
		Test Completion Date:	7/31/2020
		Report Date:	7/31/2020
		Page:	4 of 4
		Requested by:	Tanner Holloway

TEST MATERIAL:

Material Type:	Synthetic Turf	Date Received:	7/9/2020
Material Condition:	EXCELLENT:    XXX    GOOD:	POOR:	REJECTED:
Project:	Woodinville Fields Carol Edwards Center – 00016626		
Product ID:	32086-FTVT50-XM7-42-SG, 32085-FTVT50-XM7-42-FG		
Job #	01031526-32086-FTVT50-XM7-42SG, 01031527-FTVT50-XM7-42-FG		
Infill:	Bottom Layer: 4.5 lbs/ft <sup>2</sup> 20/40 Silica Sand, Top Layer: 1.1 lbs/ft <sup>2</sup> Cork/Purefill		
Pad:	Thermagreen SportLite™ 20mm		

TEST SUMMARY:

### Construction Analysis

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 66 Lab # 3208-3959	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	68.89 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.05 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	18.78 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	15.3 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	243 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	286 lbs/force	200 lbs/force	Exceeds Spec

TEST METHOD	TEST DESCRIPTION	TEST RESULTS Roll # 78 Lab # 3208-3960	Product Minimum Specifications per City of Woodinville Bid	Specification Results
ASTM D5848-20	Total Product Weight	69.64 oz/yd <sup>2</sup>	>63 oz/yd <sup>2</sup>	Exceeds Spec
ASTM D5848-20	Pile Yarn Weight	42.11 oz/yd <sup>2</sup>	38-46 oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Primary Backing Weight	8.06 oz/yd <sup>2</sup>	7.0+ oz/yd <sup>2</sup>	Pass
ASTM D5848-20	Secondary Backing Weight	19.47 oz/yd <sup>2</sup>	16.0+ oz/yd <sup>2</sup>	Pass
ASTM D5823-19	Average Pile Height	2.0"	2.0"	Pass
ASTM D1335-17e1	Average Tuft Bind Strength	15.1 lbs/force	8.0 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Length)	245 lbs/force	200 lbs/force	Exceeds Spec
ASTM D5034-09(2017)	Average Grab Tear Strength (Width)	278 lbs/force	200 lbs/force	Exceeds Spec

**Uncertainty:**

We undertake all assignments for our clients on a best effort basis. Our findings and judgments are based on the information to us using the latest test methods available. TSI can only ensure the test results for the specific items tested. Unless otherwise noted in the deviations sections of this report, all tests are performed in compliance with stated test method.

Test Report Approval:



100108-0

Erle Miles, III, Lab Director Testing Services Inc.

TSI Accreditation:

Our laboratory is accredited by the US Dept. of Commerce, National Institute of Standards and Technology: ISO/IEC 17025:2005. Our code # is: NVLAP 100108-0. TSI is a certified independent testing laboratory by the Synthetic Turf Council

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## SAFESHELL TECHNICAL DATA SUMMARY

Safeshell is a natural infill crafted from 100% USA-Grown, allergen-free walnut shells.

### PHYSICAL PROPERTIES

	Bulk Density	Size Range	Specific Gravity	Allergen Level	Micro-Deval ASTM D6928-10	Absorption ASTM C127	Swell % ASTM D4546	Roundness	Sphericity
<b>Safeshell</b>	44 lbs/ft <sup>3</sup> (705 kg/m <sup>3</sup> )	8-20 (2.38mm - 0.841mm)	1.3	<2.4ppm	2.1%	21.3%	0.00%	0.6+	0.6+

Packaging: 2,000lb (907kg) supersacks. Also available in 25lb (11.4kg) bags, 60 bags per pallet.

**100% PERCENT GROWN AND PROCESSED IN THE UNITED STATES.**

### ENVIRONMENTAL PERFORMANCE\*

Heavy Metal Analysis			Carcinogenic Review	Flammability	Surface Temperature In same turf, heated for 3 hours		
ASTM F3188 (US Heavy Metal Test)	EN71-3 (EU Toy Standard)	CAM17 (California Title 22 Metals)	California Prop 65	PILL BURN	Wet Safeshell	Dry Safeshell	Dry SBR
PASS	PASS	PASS	PASS	PASS	113°F (30% cooler than SBR)	146°F (10% cooler than SBR)	162°F

### PERFORMANCE

#### Recommended System Performance Data

**Turf:** Monofilament / slit film 1.75" | 46oz face weight

**Infill:** 5.0lbs± Round Sand | 1.5lbs± Safeshell

**Pad:** ProPlay 23, Brock SP14+

**Performance Data\*** (as reported by SportsLabs Report No 91900/1988)

	Force Reduction (%)	Vertical Deformation (mm)	Energy Restitution (%)	355A "Flat" Gmax	Critical Fall Height (m)	Rotational Resistance (Nm)	Ball Rebound (m)	Infiltration (in/hr)	Abrasion Index
Score:	60	6.2	36	115	1.5	36	0.95	87	24
Desired Range:	57-68	4-11	<35	85-125	≥1.3	27-48	0.6-1.0	≥14	

Test results above were conducted with ProPlay 23 over concrete.

\* Formal results for these tests are available upon request.

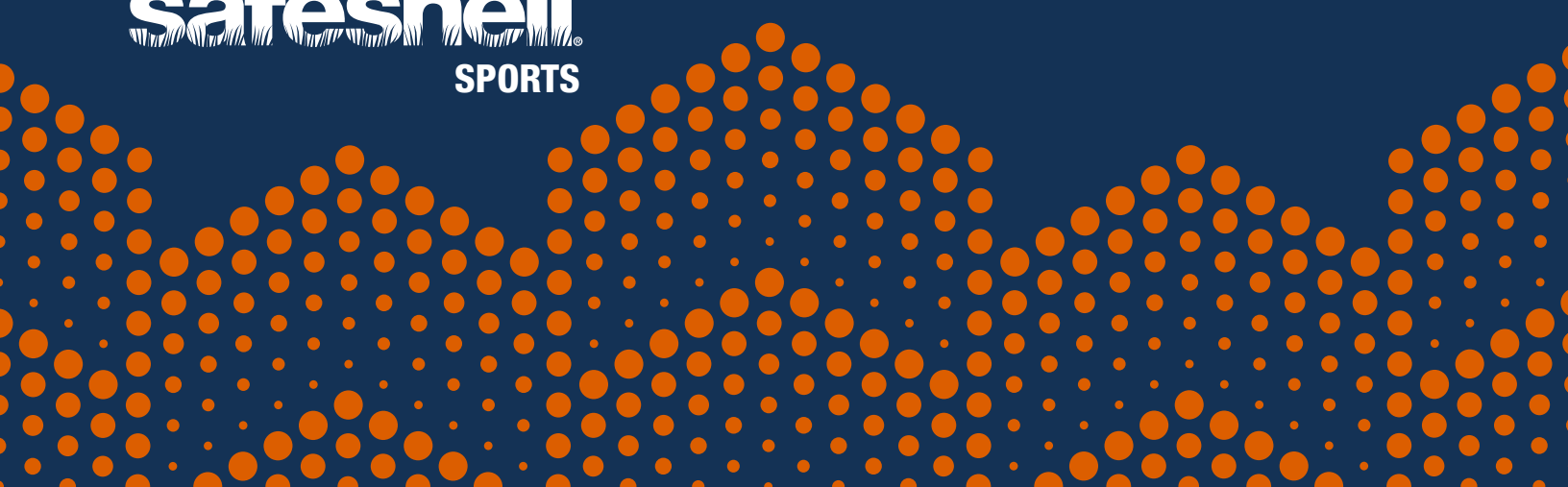


*USGreentech*

# EVERYTHING YOU LOVE ABOUT A NATURAL INFILL.

Without the hassle.

**safeshell**<sup>®</sup>  
SPORTS





# A NATURAL PRODUCT That's Also Low Maintenance



“ In the first six months, Safeshell has lived up to our expectations as being low-maintenance, durable, and safe. ”

-Keith Estey, The Wheeler School

Safeshell® is the low maintenance organic infill option made of 100% USA-grown walnut shells. Through a patent-pending process, the residual allergens from the nut are thoroughly removed from Safeshell. Safeshell excels at reducing surface heat, creating a firm and fast surface, and ensures peace of mind for all.

## Benefits



**Low maintenance.** Unlike other organic infills, Safeshell stays in place, doesn't breakdown and doesn't change in hot or wet climates. The round shape of each grain helps resist compaction. It doesn't float and plays the same wet or dry.

**Naturally durable.** The most durable natural infill, Safeshell is made from one of the most dense nut shells on the planet so you won't have to worry about this product breaking down. It doesn't float which means there will be limited migration of the product and it will stay in place. With the 8-year warranty and limited top-off required, you'll be able to always depend on Safeshell.

**Cooler temperatures.** Safeshell excels at evaporative cooling - the key to a cooler playing surface. Safeshell absorbs water with minimal expansion and then releases it slowly over time to help keep surfaces from heating up too quickly. No water? That's okay, even dry, Safeshell plays cooler than crumb rubber.

**Safe.** We use a chemical-free process that eliminates residual allergens which remain on the shell after separation of shell from nut. This patent-pending process reduces allergens by 99.9% which is below the FDA limits for allergen-free foods. We partner with an ISO-certified, third-party lab to constantly verify the results.

Safeshell is a 100% natural and domestically-sourced walnut product.



[www.safeshellinfill.com](http://www.safeshellinfill.com)

Contact us today at: 800.548.0402

USGreentech

safeshell®  
SPORTS



# SUBMITTAL FOR

Multi-Purpose Recreation Fields & Regional Stormwater Treatment System Project  
Portsmouth, NH

**Product:** Synthetic Grass Infill System – Quality Assurance

**Date of Initial Submission:** 10/7/2020

**Specification/Item #:** 02790 – 1.02A7

**Subcontractor/Supplier/Manufacturer:** Fieldturf

PLEASE MARK BELOW WITH REVIEW & ACTION STAMP.

- 1.01C – PFAS/PFOS statement
- 1.02A1 – Certified Sports Builder
- 1.02A2-5 – References
- 1.02A6 – Supervisor Certification
- 1.02F6 – Patent & Infringement Letter
- 1.02F7 – Sample Warranty
- 1.02F8 – Turf Lifespan L
- 1.02F9 – Lead Certificati

<i>QUIRK CONSTRUCTION CORP.</i>			
Job #	<u>000771</u>	Submittal #	<u>02790-04</u>
Date:	<u>9/30/2020</u>	Checked by:	<u>JW</u>

**SUBMITTAL REVIEW**

FURNISH AS SUBMITTED   
  REVISE AND RESUBMIT  
 FURNISH AS NOTED       
  REJECTED

This submittal has been reviewed for general conformance with the plans and specifications for this project. Corrections, comments and/or clarifications noted do not relieve the contractor from coordinating and correlating all dimensions and quantities, selections of construction techniques, coordinating the work of its forces and the other trades, and performance of the work in a safe and satisfactory manner.

**WESTON & SAMPSON ENGINEERS, INC.**

Date 11/3/2020 By *[Signature]*



THE ULTIMATE  
SURFACE EXPERIENCE

October 25, 2019

To Whom it May Concern:

We are aware of media reports around the potential presence of trace amounts of PFAS chemicals in some artificial turf fields. In light of these reports, we have worked closely with our supplier of artificial turf filaments to verify that our products do not contain these chemicals. Our supplier has confirmed that their products are free of PFAS, PFOS and fluorine. We care deeply about the safety of our surfaces and those who use them and we will continue to vigilantly monitor our products to ensure that they remain free of these substances.

Regards,

Darren Gill  
Senior Vice-President of Marketing & Innovation





# AMERICAN SPORTS BUILDERS ASSOCIATION

*Through Its Certification Board  
Has Conferred Upon*

## Eric Rice

*The Designation*

### ***CERTIFIED FIELD BUILDER - Synthetic Turf***



FOR EFFORTS TO RAISE THE PROFESSIONAL STANDARDS OF FIELD CONSTRUCTION AND FOR HAVING SUCCESSFULLY FULFILLED THE CONDITIONS OF ELIGIBILITY AND PASSED THE REQUIRED EXAMINATION.

*In witness whereof we have set our hands on this* 7th *day of* December, 2017

*Certification expires:* December 31, 2020

\_\_\_\_\_  
Executive Director

Jan D. Costello  
\_\_\_\_\_  
Certification Chairman

# THE TRUSTED CHOICE IN THE IVY LEAGUE



**CHANGE THE GAME**





**CENTRAL CONNECTICUT STATE UNIVERSITY**  
New Britain, CT



**UNIVERSITY OF CONNECTICUT**  
Mansfield, CT



**FAIRFIELD UNIVERSITY**  
Fairfield, CT



**QUINNIPIAC UNIVERSITY**  
Hamden, CT



**SACRED HEART UNIVERSITY**  
Fairfield, CT



**YALE UNIVERSITY**  
New Haven, CT

# CONNECTICUT PROJECTS



## EASTERN CONNECTICUT UNIVERSITY

WINDHAM, CT  
XT  
INSTALLED 2018  
PROJECT: \$537,000

LORI RUNKSMEIER  
(860) 465-5091  
RUNKSMEIERL@EASTERNCT.EDU



## NORWALK HIGH SCHOOL

NORWALK, CT  
REVOLUTION 360  
INSTALLED 2018  
PROJECT: \$375,000

KEN HUGHES  
(203) 505-5681  
KHUGHES@NORWALKCT.ORG



## CITY OF WEST HAVEN

WEST HAVEN, CT  
VERTEX  
INSTALLED 2018  
PROJECT: \$595,000

KEN CARNEY  
(203) 937-6400  
KENC@BAYBROOKREMODELERS.COM



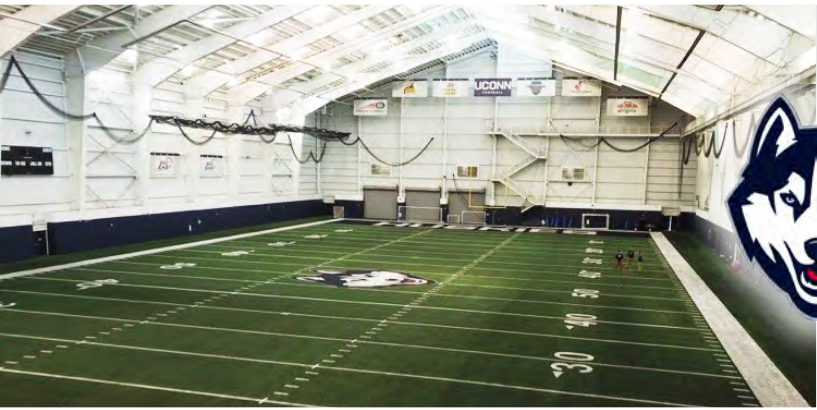
## TRUMBULL HIGH SCHOOL

TRUMBULL, CT  
VERTEX PRIME  
INSTALLED 2017  
PROJECT: \$1,135,404

MIKE KING  
(203) 452-4557  
KINGM@TRUMBULLPS.ORG



# CONNECTICUT PROJECTS



## UNIVERSITY OF CONNECTICUT

MANSFIELD, CT  
REVOLUTION 360  
INSTALLED 2017  
PROJECT: \$450,000

EVAN FEINGLASS  
(860) 486-1258  
EVAN.FEINGLASS@UCONN.EDU



## GLASTONBURY HIGH SCHOOL

GLASTONBURY, CT  
REVOLUTION 360  
INSTALLED 2017  
PROJECT: \$567,000.00

RICHARD JOHNSON  
(860) 652-7500  
RICHARD.JOHNSON@GLASTONBURY-CT.GOV



## DARIEN HIGH SCHOOL

DARIEN, CT  
CLASSIC HD & TRACK  
INSTALLED 2017  
PROJECT \$625,000.00

MIKE LYNCH  
(203) 868-8211  
MLYNCH@DARIENPS.ORG



## DARIEN HIGH SCHOOL

DARIEN, CT  
CLASSIC HD  
PROJECT \$600,000

CHRIS MANFREDONIA  
(203) 655-3981 ex. 2263



# GENERAL CONTRACTING - NE



## EASTERN CONNECTICUT UNIVERSITY

WINDHAM, CT  
XT  
INSTALLED 2018  
PROJECT: \$537,000

LORI RUNKSMEIER  
(860) 465-5091  
RUNKSMEIERL@EASTERNCT.EDU



## NORWALK HIGH SCHOOL

NORWALK, CT  
REVOLUTION 360  
INSTALLED 2018  
PROJECT: \$375,000

KEN HUGHES  
(203) 505-5681  
KHUGHES@NORWALKCT.ORG



## CITY OF WEST HAVEN

WEST HAVEN, CT  
VERTEX  
INSTALLED 2018  
PROJECT: \$595,000

KEN CARNEY  
(203) 937-6400  
KENC@BAYBROOKREMODELERS.COM



## KINGSWOOD OXFORD

WEST HARTFORD, CT  
VERTEX PRIME  
INSTALLED 2018  
PROJECT: \$600,000

LARRY MARCIANO  
(860) 310-7042  
MARCIANO.L@KINGSWOODOXFORD.ORG



# GENERAL CONTRACTING - NE



## TOWN OF WEST HARTFORD

WOLCOTT TENNIS COURTS  
WEST HARTFORD, CT  
TENNIS  
INSTALLED 2018  
PROJECT: \$469,650

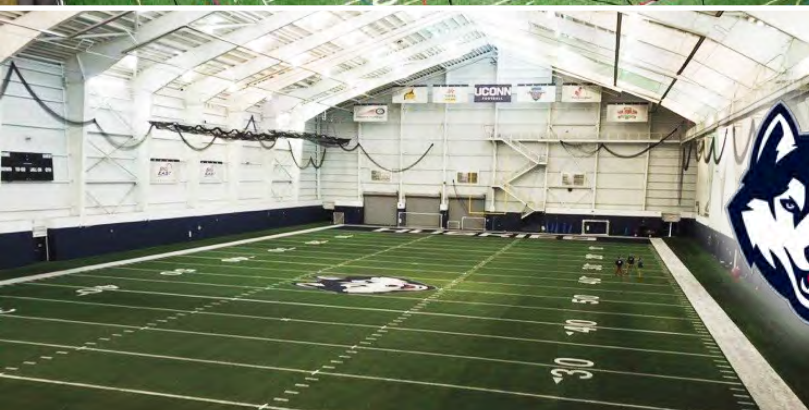
HELEN RUBINO-TURCO  
(860) 561-7510  
HELEN.RUBINO-TURCO@WESTHARTFORDCT.GOV



## TRUMBULL HIGH SCHOOL

TRUMBULL, CT  
VERTEX PRIME  
INSTALLED 2017  
PROJECT: \$1,135,404

MIKE KING  
(203) 452-4557  
KINGM@TRUMBULLPS.ORG



## UNIVERSITY OF CONNECTICUT

MANSFIELD, CT  
REVOLUTION 360  
INSTALLED 2017  
PROJECT: \$450,000

EVAN FEINGLASS  
(860) 486-1258  
EVAN.FEINGLASS@UCONN.EDU



## CONARD HIGH SCHOOL

WEST HARTFORD, CT  
VERTEX  
INSTALLED 2017  
PROJECT: \$379,000

JASON SIEGAL  
(860) 929-5041  
JASON\_SIEGAL@WHPS.ORG



# GENERAL CONTRACTING - NE



## **SALVE REGINA UNIVERSITY**

NEWPORT, RI  
CLASSIC HD  
INSTALLED 2017



## **ATLANTIS CHARTER SCHOOL**

FALL RIVER, MA  
REVOLUTION 360  
INSTALLED 2017



## **GLASTONBURY HIGH SCHOOL**

GLASTONBURY, CT  
REVOLUTION 360  
INSTALLED 2017  
PROJECT: \$567,000.00

RICHARD JOHNSON  
(860) 652-7500  
RICHARD.JOHNSON@GLASTONBURY-CT.GOV



## **DARIEN HIGH SCHOOL**

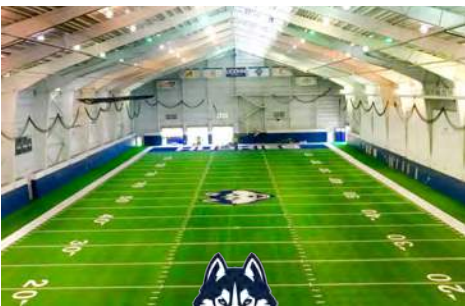
DARIEN, CT  
CLASSIC HD & TRACK  
INSTALLED 2017  
PROJECT \$625,000.00

MIKE LYNCH  
(203) 868-8211  
MLYNCH@DARIENPS.ORG



# FEATURED PROJECTS

## CONNECTICUT COOPERATIVE PURCHASING



**UNIVERSITY OF CONNECTICUT**  
Mansfield, CT



**DARIEN HIGH SCHOOL**  
Darien, CT



**DARIEN HIGH SCHOOL - BASEBALL**  
Darien, CT



**TRUMBULL HIGH SCHOOL**  
Trumbull, CT



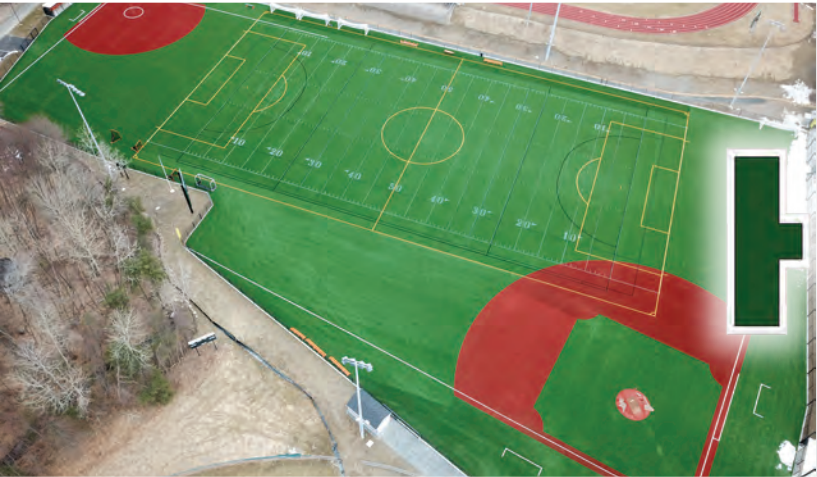
**GLASTONBURY HIGH SCHOOL**  
Glastonbury, CT



**NORWALK HIGH SCHOOL**  
Norwalk, CT



**MASSACHUSETTS CO-OP PROJECTS**



**HOPKINTON  
HIGH SCHOOL**

HOPKINTON, MA



**LINCOLN SUDBURY  
HIGH SCHOOL**

SUDBURY, MA



**OAKMONT REGIONAL  
HIGH SCHOOL**

OAKMONT, MA





**MASSACHUSETTS CO-OP PROJECTS**



**WESTERN NEW  
ENGLAND UNIVERSITY**

SPRINGFIELD, MA



**WALPOLE  
HIGH SCHOOL**

WALPOLE, MA



**WHITTIER REGIONAL  
VOCATIONAL TECHNICAL  
HIGH SCHOOL**

HAVERHILL, MA







## New England Patriots – Gillette Stadium



**Project Name:** Gillette Stadium

**Installation Date:** 2017

**Product:** FieldTurf Vertex Core 2.5"

**Size:** 93,200 SQ FT.

**Location:** Foxborough, MA

**Consultant:** Jon Bengtson

jonb@gillettestadium.com

# 508-549-0225

### Project Details

Removal and disposal, base regrade and supply and installation of new synthetic turf system with logo, sports markings and end zone letters.



# CASE STUDY



## Yale University



**Project Name:** Yale University Bowl Football Field

**Installation Date:** 2017 to 2019

**Product:** FieldTurf Classic 2"

**Size:** 39,351 SQ.FT

**Location:** New Haven, CT

**Consultant:** Darosa Sports Construction Inc.

# 850-644-1079

**Project Value at Award:** \$472,094.00

### Project Details

Supply and installation of new synthetic turf system on the Football, Baseball and Softball Fields. Center Logo and Endzones also installed by FieldTurf.





## Harvard University



**HARVARD**  
UNIVERSITY

**Project Name:** Harvard University

**Installation Date:** 2015

**Product:** FieldTurf Vertex Prime 2" (FTVTP50)

**Size:** 111,279 SQ. FT

**Location:** Boston, MA

**Consultant:** R.A.D Sports

**Project Value at Award:** \$502,010.85

### Project Details

Supply and installation of new synthetic turf system with Football markings and Center logo.



## Dartmouth College – Baseball Field

**Project Name:** Dartmouth College  
**Installation Date:** 2016  
**Product:** FieldTurf Vertex 2.25" (FTVT-57)  
**Size:** 86,534 SQ. FT.  
**Location:** Hanover, NH  
**Consultant:** *Clark Companies*  
**Project Value at Award:** \$ 442,791.00



### Project Details

Supply and installation of new synthetic turf system with logo and Football markings.





## Northeastern University



**Project Name:** Northeastern University

**Installation Date:** 2018

**Product:** FieldTurf Vertex 2" (FTVT50-XM7)

**Size:** 158,153 SQ. FT. Total Both Fields

**Location:** Boston, MA

**Consultant:** Bond Brothers

**Project Value at Award:** Total Both Fields \$980,082.00

### Project Details

Supply and installation of new synthetic turf system with logo, sports markings and logos.

## MEET YOUR TEAM

### ► Jeffrey Keniston

Installation Superintendent

Tel: 207-939-0352

Email: [Jeffrey.keniston@fieldturf.com](mailto:Jeffrey.keniston@fieldturf.com)

Education: Southern Maine Community College - Horticulture



### EXPERIENCE

#### 2009 - Present:

Installation Superintendent  
FieldTurf

### SKILLS

- Construction, project management
- Powerhouse communicator
- Timeline, risk and budget management
- OSHA Safety regulations
- Infrastructure improvement
- Strategic construction planning

### CERTIFICATIONS

Massachusetts Hoisting License

### FEATURED INSTALLATIONS

- Gillette Stadium
- Yale University
- University of Rhode Island
- Harvard University
- Bowling Green State University
- Shepherd University
- Bowie State University
- Stevenson University
- George Washington University
- East Lyme High School

PROJECTS  
PER YEAR

**15**

LARGEST PROJECT

**7 FIELDS**







A Tarkett Sports Company

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# INSTALLER CERTIFICATION

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City of Portsmouth

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▲  
IS AN APPROVED AND AUTHORIZED INSTALLER OF FIELDTURF PRODUCTS.  
THEY'RE CERTIFIED BY FIELDTURF TO INSTALL  
THE SYNTHETIC TURF FIELD(S) AT

▲  
East Coast Installation (ECI)

---

A handwritten signature in blue ink, appearing to read "D. J. ...", written over a horizontal line. A small green triangle is positioned below the signature.

SIGNED

# FieldTurf Patent Declaration



City of Portsmouth  
Portsmouth, NH

FieldTurf USA, Inc.  
7445 Côte-de-Liesse Road  
Suite 200  
Montreal, Quebec H4T 1G2  
P: 800-724-2969  
F: 514-340-9374

REF. *1119 Portsmouth Multi-Purpose Recreation Fields*

*9/29/2020*

SUBJECT Patent Declaration

To Whom It May Concern:

This letter serves to confirm that FieldTurf's artificial in-filled grass products do not violate any competitor's patents currently in force or pending.

FieldTurf currently holds the following patents in the United States of America:

- Patent #6,551,689 Resilient Granular Top Surface Layer;
- Patent #5,958,527 Process Of Laying Synthetic Grass;
- Patent #6,338,885 Synthetic Turf; and
- Patent #6.723, 412 B2 Dimensional relationship patent associated with pile height, gauge & depth of infill.

For further information or any other product questions please contact our marketing department at [info@fieldturf.com](mailto:info@fieldturf.com) or 1-800-724-2969.

Best Regards,

FieldTurf USA, Inc.

*Darren Gill*  
Senior Vice-President



### **Manufacturer's Limited Warranty**

FieldTurf warrants that if **FieldTurf (product code)** (Product) for multi-sport use synthetic turf proves to be defective in material or installation workmanship, therefore, resulting in premature wear, during normal and ordinary use of the Product for the sporting activities provided herein or for any other uses for which FieldTurf has provided its written authorization, within **eight (8) years** from the date of completion of installation as indicated in this Warranty, FieldTurf shall either repair or replace the affected area of the Product in accordance with the terms of this Warranty. FieldTurf's sole liability under this Warranty shall be limited to either repair or replacement of the affected area of the Product, at its sole discretion, and FieldTurf shall have no other obligations or liabilities with respect to defects of the Product. FieldTurf will, at FieldTurf's option, either repair or replace the affected area to the extent required to meet the Warranty period, but no cash refunds will be made. This Warranty shall commence upon the date of completion indicated in this Warranty. The accompanying Warranty service will not come into effect unless and until FieldTurf's Certificate of Completion is sent for validation to the corporate office of FieldTurf indicated herein within thirty (30) days of the date of completion or Purchaser's first use, whichever occurs first. In all cases, the Warranty shall be deemed to commence upon the date of completion indicated in this Warranty. The acceptance form of the terms and conditions contained in FieldTurf's Maintenance Guidelines must also be provided to FieldTurf's corporate office within thirty (30) days of completion of installation. This Warranty is limited to the remedies of repair or replacement, which shall constitute the exclusive remedies available under this Warranty; all other remedies or recourses which might otherwise be available are hereby waived by the Purchaser. FieldTurf will have no other obligations or liability for damages arising out of or in connection with the use or performance of the Product, including, but without limitation, damages for personal injury and/or economic losses. This Warranty shall not come into effect, and FieldTurf shall have no obligations under this Warranty, unless and until FieldTurf is paid in full for the Product to be warranted hereunder.

**Field Markings:** Soccer

### **Other Exclusions**

**EXCEPT AS EXPRESSLY SET FORTH IN THE MANUFACTURER'S LIMITED WARRANTY ABOVE, FIELDTURF DISCLAIMS ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, IN FACT OR IN LAW, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**THIS WARRANTY SHALL BECOME NULL AND VOID IF THE PURCHASER FAILS TO MAINTAIN THE FIELD IN ACCORDANCE WITH THE FIELDTURF MAINTENANCE GUIDELINES AND SCHEDULE PROVIDED BY FIELDTURF THEREIN. ALL MAINTENANCE SHALL BE PERFORMED BY FIELDTURF-TRAINED AND/OR FIELDTURF-AUTHORIZED MAINTENANCE PERSONNEL ONLY.**

Furthermore, this Manufacturer's Limited Warranty **does not cover:**

1. Any damage resulting, directly or indirectly, from *force majeure*, accident, misuse, intentional and unintentional abuse, infill displacement, neglect; or from usage, unintentional or otherwise, that cannot reasonably be considered as normal play or ordinary use of the Product. For purposes of this Warranty, normal play and ordinary use shall mean usage up to 3,000 hours per year of regular play and utilization for the sporting activities provided herein; normal play and ordinary use also includes a reasonable number of users or participants, but does not include repetitive marching, repetitive training or high-intensity drills on the same part of the field, especially in the areas including, but not limited to, home plate, pitcher's mound, base areas, base paths, soccer penalty mark/spot areas, goal areas, sideline areas and lacrosse crease areas, all of which require frequent maintenance in accordance with FieldTurf Maintenance Guidelines and which may require regular replacement. This Warranty is expressly conditioned upon the Customer completing and submitting the FieldTurf Maintenance Log provided in FieldTurf's Maintenance Guidelines.







**Manufacturer's Limited Warranty**

2. Damage resulting from failure to maintain the Product in accordance with FieldTurf's Maintenance Guidelines provided to the Purchaser. The Purchaser shall keep a log of all maintenance performed on the Product and supply FieldTurf with a copy upon request.
3. Damage resulting from repair, attempted repair and/or maintenance by anyone other than FieldTurf, an authorized FieldTurf distributor or an authorized FieldTurf maintainer.
4. Damage due to causes which include, but are not limited to, the application of chemicals and/or cleaning agents, adhesive backing, dirt, traffic, negligence, vandalism, fire, flood, windstorm, animals, improper care and Acts of God.
5. Failure and/or improper design of the base; depression of the soil, subsurface or other matter upon which the base or Product rests; and any and all resulting damage to the Product arising therefrom.
6. FieldTurf does not warrant the percolation rate, long term planarity and/or compaction of the base which the product is installed. **FIELDTURF DISCLAIMS ALL WARRANTIES AS TO THE BASE, EXPRESS OR IMPLIED, AND ANY AND ALL RESULTING DAMAGE TO THE PRODUCT ARISING THEREFROM.**
7. Damage resulting from the use of improper footwear such as long-spiked track shoes, regular and repeated use of steel cleats, and flat-soled shoes. Standard molded soccer or football cleats are recommended.

All synthetic turf is subject to normal wear and tear, which does not constitute a manufacturing defect and is not covered by this Warranty. In addition to the other factors listed in this Warranty and without limitation, the extent of the wear and tear depends on the construction of synthetic turf (fiber face weight, stitch rate, fiber pile height and gauge, infill components and maintenance of the field) and the intensity of use of the synthetic turf. The Product will be stable to light fading with the maximum fading of the Product during the Warranty period not to exceed fifteen percent (15%) of color loss annually based upon an acceptable grey scale. This Warranty does not cover slight variations or gradations of color within the Product and/or face distortion. Normal behavior of the fiber and infill with respect to the wear pattern of a field is more fully explained in the "Field Settling" document, provided in the FieldTurf After-Sales Service Package.

FieldTurf disclaims all liability for incidental and consequential damages for breach of any express or implied warranty, including any implied warranty of merchantability, with respect to the Product. In the event that the Product be used for purposes other than the sporting activities provided herein or for any other uses for which FieldTurf has provided its written authorization, FieldTurf shall not be responsible for damages resulting therefrom and, therefore, this Warranty, as well as any and all applicable legal warranties, shall become **null and void** as Purchaser understands that FieldTurf has tested the Product for use in connection with the said sporting activities and/or uses, and that it may not have tested the Product for other such uses. Any Product repairs or replacements performed under the terms of this Warranty shall not extend the term of this Warranty.

Name of Purchaser:  
Date of Completion:  
Location:  
Address:  
State:  
Tel:  
Signature:  
Date:

Sporting Activities: Multi-Sport Use  
Installed by: FieldTurf USA, Inc.  
City:  
Zip:  
Fax/email:  
Name : |  
Reference:

*Disclaimer. The information in this document is subject to change without notice and should not be construed as a commitment by FieldTurf USA, Inc. FieldTurf assumes no responsibility for any errors that may appear in this document.*

**This warranty is insured by a third party.**

For more information please contact Customer Service at FieldTurf at the number listed below.  
7445 Côte-de-Liesse Road Suite 200, Montreal, QC, Canada H4T 1G2 • Toll Free: 1-800-724-2969 •



# Product Lifespan



City of Portsmouth  
Portsmouth, NH

FieldTurf USA, Inc.  
7445 Côte-de-Liesse Road  
Suite 200  
Montreal, Quebec H4T 1G2  
P: 800-724-2969  
F: 514-340-9374

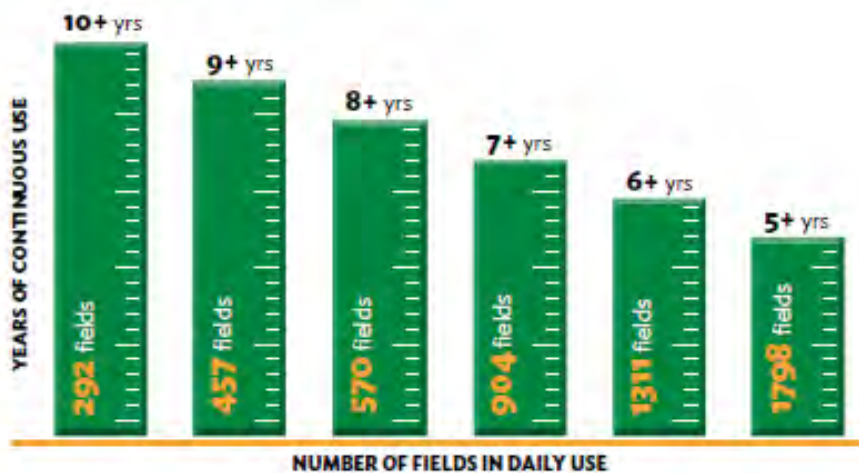
REF. 1119 Portsmouth Multi-Purpose Recreation Fields

9/29/2020

## Longevity - for a better investment

Since its inception, FieldTurf has proven to be the most durable and longest-lasting synthetic turf system in the marketplace, having installed more fields that are currently 8 years or older than all other competitor installations combined.

The FieldTurf system is not just marketing spin. It has been carefully engineered by athletes for athletes, to not only perform at the highest levels, but to do so for longer than any other turf product.



# Lead Certification



City of Portsmouth  
Portsmouth, NH

FieldTurf USA, Inc.  
7445 Côte-de-Liesse Road  
Suite 200  
Montreal, Quebec H4T 1G2  
P: 800-724-2969  
F: 514-340-9374

REF. *1119 Portsmouth Multi-Purpose Recreation Fields*

*9/29/2020*

SUBJECT Lead Certification

To Whom It May Concern:

This letter serves to confirm that both FieldTurf's artificial grass products and infill material contain less than 50 ppm of lead.

For further information or any other product questions please contact our marketing department at [info@fieldturf.com](mailto:info@fieldturf.com) or 1-800-724-2969.

Best Regards,

FieldTurf USA, Inc.



*Darren Gill*  
Senior Vice-President





# SUBMITTAL FOR

Multi-Purpose Recreation Fields & Regional Stormwater Treatment System Project  
Portsmouth, NH

**Product:** Shock Pad

**Date of Initial Submission:** 10/7/2020

**Specification/Item #:** 02790 - 2.01D

**Subcontractor/Supplier/Manufacturer:** Schmitz

PLEASE MARK BELOW WITH REVIEW & ACTION STAMP.

- Product Data
- Performance Testing
- Toxicology Report
- PFAs Analysis
- Statement of Sustainability
- Sample Warranty
- Reference List

<i>QUIRK CONSTRUCTION CORP.</i>			
Job #	<u>000771</u>	Submittal #	<u>02790-05</u>
Date:	<u>10/7/2020</u>	Checked by:	<u>JW</u>

**SUBMITTAL REVIEW**

1  FURNISH AS SUBMITTED    3  REVISE AND RESUBMIT  
2  FURNISH AS NOTED        4  REJECTED

This submittal has been reviewed for general conformance with the plans and specifications for this project. Corrections, comments and/or clarifications noted do not relieve the contractor from coordinating and correlating all dimensions and quantities, selections of construction techniques, coordinating the work of its forces and the other trades, and performance of the work in a safe and satisfactory manner.

**WESTON & SAMPSON ENGINEERS, INC.**

Date 11/3/2020 By *[Signature]*

### GENERAL INFORMATION



Artificial turf system with ProPlay<sup>®</sup>-Sport shock pad



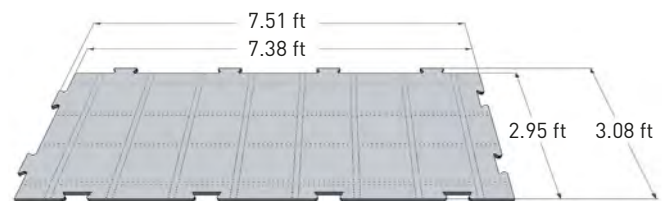
Puzzle shaped ProPlay<sup>®</sup> sheets with expansion slots

### Product description

**ProPlay<sup>®</sup>-Sport** is a top performance shock and drainage pad, and the perfect basis of design for high-quality synthetic turf systems being utilized for sports fields, multi-use, and play areas.

ProPlay<sup>®</sup>-Sport is made of thermal bonded (closed-cell) cross-linked polyethylene foam (XPE). This foam originates from production remnants and overruns and contains no contaminants.

**ProPlay<sup>®</sup>-Sport20** is designed as a sport technical layer for synthetic turf sports fields. The product performs in all weather conditions and is renowned for its excellent water permeability. If desired it can be delivered with in-plane drainage channels (ProPlay<sup>®</sup>-Sport20D), offering superior lateral drainage when the artificial grass system is to be installed on an impermeable subbase.



Dimensions ProPlay<sup>®</sup>-Sport sheet

### ENVIRONMENT, HEALTH AND SAFETY CREDENTIALS

ProPlay<sup>®</sup> can be safely used for any artificial grass system. The products do not contain any harmful substances, like heavy metals or polycyclic aromatic hydrocarbons (PAH's), in concentrations that pose a risk for the environment and/or human health.

ProPlay<sup>®</sup>-Sport complies with:

- The state of California's Code of Regulations (CCR):
  - Title 22 'Social Security' – Division 4.5 'Environmental Health Standards for the Management of Hazardous Waste'.
  - Title 27 'Environmental Protection' - Division 4 'Office of Environmental Health Hazard Assessment' - Chapter 1 'Safe Drinking Water and Toxic Enforcement Act of 1986' (Proposition 65).

- The European Community:
  - Regulation No 1272/2008 of the European Parliament and of the Council on Classification, Labelling and Packaging of substances and mixtures (CLP).
  - Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- Toxicology requirements from ESTC (ESTO) Shock pad Working Group's 'Performance Guide for Shock pad'

### TECHNICAL DATA

Physical characteristics	Tolerance	ProPlay <sup>®</sup> Value	Unit	Standard
Thickness at 0.3 psi load	+/- 0.04	0.79	in	EN-ISO 9863-1
Mass per unit area	+/- 0.06	0.61	lb/ft <sup>2</sup>	EN-ISO 9864

\* As modified by Schmitz Foam Products

Strength characteristics	ProPlay <sup>®</sup> Value	Unit	Standard
Tensile strength	38	psi	ASTM D 3575 (EN 12230)
Compressive at 25% deflection	12	psi	ASTM D 3575
• Thickness after 72 hour recovery	0.79	in	-
Compressive at 50% deflection	49	psi	ASTM D 3575
• Thickness after 72 hour recovery	0.79	in	-

Field performance characteristics	ProPlay <sup>®</sup> Value	Unit	Standard
Impact attenuation (Gmax) in the field*	80-110	-	ASTM F 1936 / F 355-A

\* Results will vary depending on the system and subbase.

Performance characteristics	ProPlay <sup>®</sup> Value	Unit	Standard
Water flow rate under 2 in (51 mm) hydraulic head	15	gpm/ft <sup>2</sup>	ASTM D 4491 (EN ISO 11058)
• (resulting) Water permeability by permittivity	5.9	gpm/ft <sup>2</sup>	ASTM D 4491 (EN ISO 11058)
In-plane water flow rate at 0.3 psi (2 kPa) load and 0.005 hydraulic gradient (0.5% slope)	0.05	gpm/ft	ASTM D 4716 (EN ISO 12958)
• (resulting) Hydraulic transmissivity [θ]	10	gpm/ft	ASTM D 4716 (EN ISO 12958)
Thermal conductivity [λ 10]	0.03	BTU/h.ft.°F	ASTM C 177 (EN 12667)
• (resulting) Thermal resistance [R-value]	2.3	h.ft <sup>2</sup> .°F/BTU	ASTM C 177 (EN 12667)



### INSTALLATION DISCLAIMER

- Installation of ProPlay<sup>®</sup>-Sport must be done under the code of good workmanship. Schmitz Foam Products B.V. does not accept any liability for the design, or construction of any facilities, or actions of any parties employed, as a result of, or in connection with, any information provided in this document.
- It is recommended that the subbase is designed and approved by an architect or civil engineer, based on the geotechnical and meteorological conditions of the site and any (local) restrictions to the drainage discharge.
- Although ProPlay<sup>®</sup>-Sport can be installed on any kind of subbase, as long as the construction itself is strong enough to hold installation and maintenance equipment, it is advised that the subbase has a minimum undrained shear strength of at least 1044 lbf/ft<sup>2</sup> (BS 1377, part 7) or a minimum California Bearing Ratio of 5% (BS 1377, part 4) or equivalent.
- The planarity of the sub base surface should be within 0.8 inch under a 9.8 foot straight edge.
- When a ProPlay<sup>®</sup>-Sport "D" variant (for lateral drainage) is applied, the slope of the surface of the subbase should be at least 0.5%, although 1.0% is better. When the surface of the subbase can rinse out, it is recommended to use a liner (foil or geotextile).
- It shall be noted that ProPlay<sup>®</sup>-Sport - like any other foam shock pad - will expand/contract under the influence of changes of temperature; to prevent unnecessary shrinkage after completion of the installation, the ProPlay<sup>®</sup>-Sport recommended installation method must be used in its entirety!
- The textile of the ProPlay<sup>®</sup>-Sport should not be exposed to UV-radiation (i.e. daylight) for more than 1 month.
- It is advised to install the synthetic turf within 1 week after installation of the ProPlay<sup>®</sup>-Sport.
- The synthetic turf shall not be glued (or in any other way be attached) to the ProPlay<sup>®</sup>-Sport, since the ProPlay<sup>®</sup>-Sport needs to be able to expand/contract without any hampering.
- It is strongly recommended to stabilize the synthetic turf with at least 3.1 lbs/ft<sup>2</sup> of sand, or (preferably) to use a turf with a fiberglass reinforced backing.
- In any case, it is advised to fix the turf to the perimeter of the field (according to the guidelines of the turf supplier).
- During installation of the ProPlay<sup>®</sup>-Sport or after installation (when installing and filling the synthetic turf) it is allowed to drive over the ProPlay<sup>®</sup>-Sport with installation equipment/machines. The load (per tyre) of the installation equipment shall be less than 40 psi for short time frames (e.g. driving over the surface). Vehicles that are temporarily parked on the surface should have a load of less than 20 psi per tyre.

### GENERAL DISCLAIMER

- This ProPlay<sup>®</sup> product data sheet provides general product properties and is not related to specific sportfield and playground installation regulations. Relevant ProPlay<sup>®</sup> shock pad installation instructions can be found in the ProPlay<sup>®</sup> installation recommendation guide. Please note there are separate installation manual for ProPlay<sup>®</sup>-Sport and ProPlay<sup>®</sup> for Playgrounds products.
- The given information is based on (independent) measurements and (where possible) based on average values measured over a long and representative period. Additional information can be made available upon request.
- Great attention to the accuracy of this document was taken during its compilation. This publication supersedes and replaces all previous datasheets. Schmitz Foam Products B.V. cannot, however, guarantee the total accuracy of the information included. If you have any doubts or further questions please do not hesitate to contact us by phone 517-781-6620.

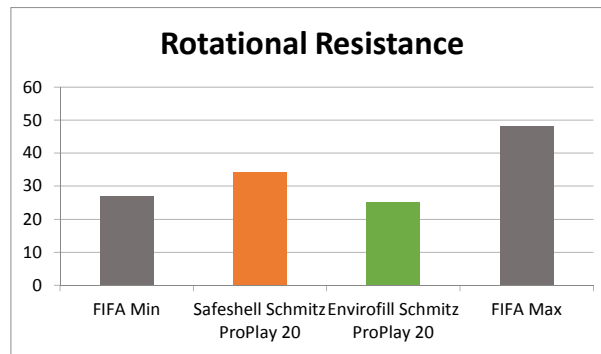
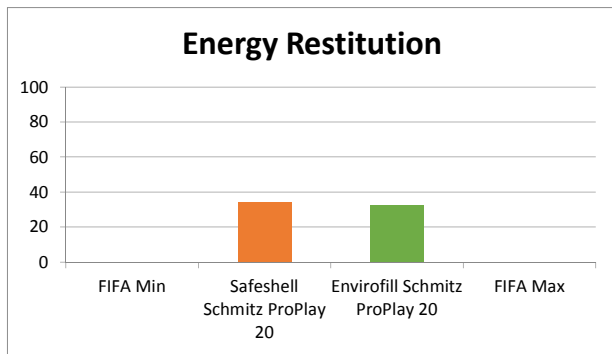
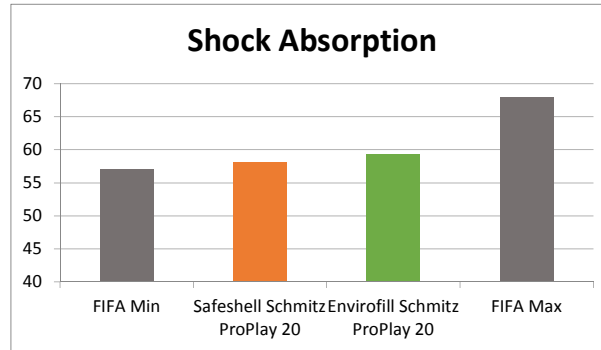
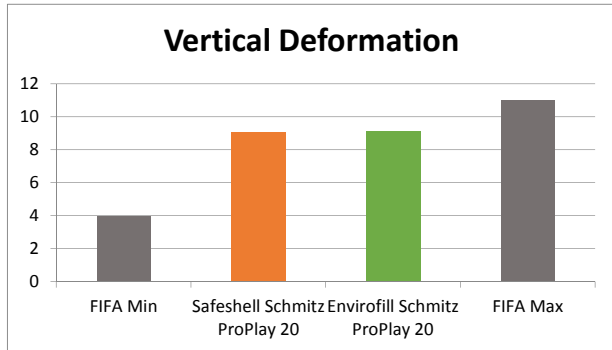
Schmitz Foam Products LLC is the global supplier of ProPlay<sup>®</sup>, the perfect shock and drainage pad for high-quality artificial grass systems in sports and playgrounds.



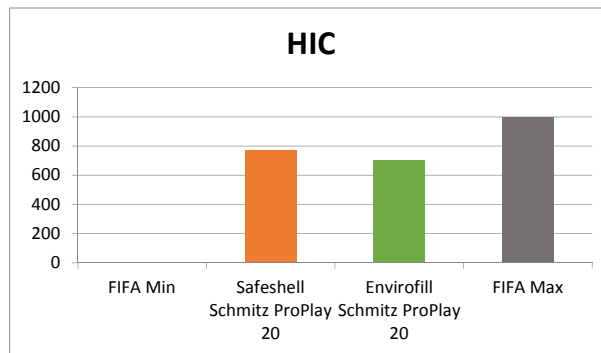
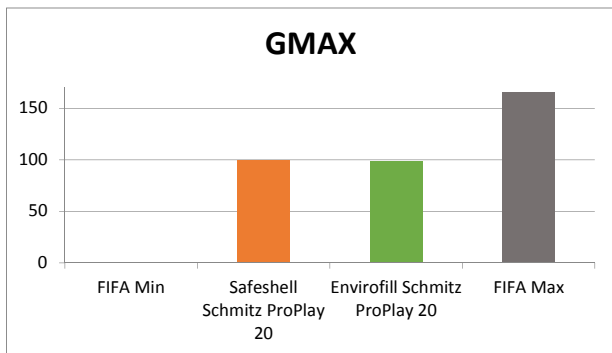
Schmitz Foam Products LLC  
188, Treat Ave  
Coldwater MI 49036  
T: 517-781-6620 • sales@proplayus.com

Carpell Surfaces - 1.75" mono fiber, 5 lbs round 16/30 sand with 1.5 lbs Safeshell (~32mm infill depth) compared to 7.5 lbs Envirofill per SF (~32mm infill depth)

	Vertical Deformation	Shock Absorption	Energy Restitution	Rotational Resistance	GMAX	HIC
FIFA Min	4	57		27		
Safeshell Schmitz ProPlay 20	9	58	34	34	100	769
Envirofill Schmitz ProPlay 20	9	59	32	25	99	698
FIFA Max	11	68		48	165	1000



\*No FIFA range set for Energy Restitution



# LABORATORY TESTING TOXICOLOGY ANALYSIS



## Project Information

<b>Project Name</b>	Schmitz Foam Shockpad Toxicology Analysis	
<b>Client Information</b>	Schmitz Foam Products, LLC 188 Treat Avenue Coldwater, MI 49036	
<b>Report Date</b>	April 16, 2020	
<b>Job No.</b>	95517/5891	
<b>Report Status</b>	Final	
<b>Prepared by</b>	Megan Illsley Laboratory Director	
<b>Checked by</b>	Jeffrey Gentile Operations Director	

*Notes:*

1. This report has been prepared by Firefly Sports Testing with all reasonable skill, care and diligence within the terms of the contract with the Client and within the limitations of the resources devoted to it.
2. This report is confidential to the Client and Firefly Sports Testing accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.
3. This report shall not be used for engineering or contractual purposes unless signed by the Author and the Checker and unless the report status is "Final."

## Standard:

Test Type	Test Method	Test Description
Shockpad Toxicology	EPA 6010B	Synthetic Precipitation Leachate Procedure (SPLP) (EPA SW-846 Method 1312) extraction tests utilizing EPA 6010B analysis method designed to simulate 100 years of acid rain exposure.

## Requirements:

The limits detailed are taken from the US Drinking Water Standards with the rationale that if the leachate from the shockpad products is safe to drink, it would not be harmful to the environment surrounding the synthetic turf fields where it is installed. Results are expressed as a sample detection limit-based result - the value at which an instrument can accurately measure an analyte at a specific concentration.





# LABORATORY TESTING TOXICOLOGY ANALYSIS



## Results Table:

Component	Test Method	Result (mg/L)	Limits (mg/L)	Pass/Fail
Arsenic	EPA 6010B	< 0.01	0.010	Pass
Barium	EPA 6010B	< 0.5	2.000	Pass
Cadmium	EPA 6010B	< 0.005	0.005	Pass
Chromium	EPA 6010B	< 0.01	0.100	Pass
Lead	EPA 6010B	< 0.01	0.015	Pass
Mercury	EPA 7470	< 0.0002	0.002	Pass
Selenium	EPA 6010B	< 0.05	0.050	Pass
Silver	EPA 6010B	< 0.01	0.100	Pass

## Sample Photo:



End of Report



Unit D5 • 78 Londonderry Tpk • Hooksett • New Hampshire • 03106  
Telephone: (603) 715-5453 • E-Mail: Info@fireflysportstesting.com



# LABORATORY TESTING PFAS ANALYSIS



## Project Information

<b>Project Name</b>	ProPlay20 PFAS Analysis – EPA 537.1 Modified		
<b>Client Information</b>	Schmitz Foam Products, LLC 188 Treat Avenue Coldwater, MI 49036		
<b>Date</b>	5/28/2020	<b>Sample Received Date</b>	5/15/2020
<b>Report Status</b>	Final	<b>Job No.</b>	95702/6073
<b>Prepared by</b>	Megan Illsley Laboratory Director		
<b>Checked by</b>	Jeffrey Gentile Director of Operations		

*Notes:*

1. This report has been prepared by Firefly Sports Testing with all reasonable skill, care and diligence within the terms of the contract with the Client and within the limitations of the resources devoted to it.
2. This report is confidential to the Client and Firefly Sports Testing accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.
3. This report shall not be used for engineering or contractual purposes unless signed by the Author and the Checker and unless the report status is "Final."
4. These samples were subcontracted for analysis. All results and corresponding information can be found in the enclosed report from the subcontract laboratory.

## Summary

Firefly Sports Testing has commissioned Bureau Veritas to perform laboratory testing for the following characteristics listed below.

Analyses	Laboratory Method	Analytical Method
PFAS in soil by SPE/LCMS (1)	CAM SOP-00894	EPA 537.1 Modified

Complete results can be found in the subsequent sections of this report.



Unit D5•78 Londonderry Tpk•Hooksett•NH•03106  
(603) 715-5453 • info@fireflysportstesting.com





Your C.O.C. #: na

**Attention: Megan Illsley**

Firefly Sports Testing  
78 Londonderry Tpk.  
Unit D5  
Hooksett, NH  
USA 03106

**Report Date: 2020/05/22**  
Report #: R6182632  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C0C0490**

**Received: 2020/05/16, 11:20**

Sample Matrix: Solid  
# Samples Received: 1

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Analytical Method</b>
PFAS in soil by SPE/LCMS (1)	1	2020/05/20	2020/05/21	CAM SOP-00894	EPA 537 m

**Remarks:**  
Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.





Your C.O.C. #: na

**Attention: Megan Illsley**

Firefly Sports Testing  
78 Londonderry Tpk.  
Unit D5  
Hooksett, NH  
USA 03106

**Report Date: 2020/05/22**  
Report #: R6182632  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BV LABS JOB #: C0C0490**

**Received: 2020/05/16, 11:20**

Encryption Key

Stephanie Pollen  
Project Manager  
22 May 2020 15:07:54

Please direct all questions regarding this Certificate of Analysis to your Project Manager.  
Stephanie Pollen, Project Manager  
Email: Stephanie.Pollen@bvlabs.com  
Phone# (905)817-5830

=====

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



**PERFLUOROALKYL SUBSTANCES (SOLID)**

BV Labs ID		MQQ744	MQQ744			
Sampling Date						
COC Number		na	na			
	UNITS	SCHMITE FOAM SAMPLE@PROPLAY 20	SCHMITE FOAM SAMPLE@PROPLAY 20 Lab-Dup	RDL	MDL	QC Batch
<b>Perfluorinated Compounds</b>						
Perfluorohexanoic acid (PFHxA)	ug/kg	ND	ND	1.0	0.14	6731906
Perfluoroheptanoic acid (PFHpA)	ug/kg	ND	ND	1.0	0.18	6731906
Perfluorooctanoic acid (PFOA)	ug/kg	ND	ND	1.0	0.16	6731906
Perfluorononanoic acid (PFNA)	ug/kg	ND	ND	1.0	0.15	6731906
Perfluorodecanoic acid (PFDA)	ug/kg	ND	ND	1.0	0.31	6731906
Perfluoroundecanoic acid (PFUnA)	ug/kg	ND	ND	1.0	0.15	6731906
Perfluorododecanoic acid (PFDoA)	ug/kg	ND	ND	1.0	0.19	6731906
Perfluorotridecanoic acid (PFTRDA)	ug/kg	ND	ND	1.0	0.17	6731906
Perfluorotetradecanoic acid (PFTEDA)	ug/kg	ND	ND	1.0	0.15	6731906
Perfluorobutanesulfonic acid (PFBS)	ug/kg	ND	ND	1.0	0.14	6731906
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	ND	ND	1.0	0.14	6731906
Perfluorooctanesulfonic acid (PFOS)	ug/kg	ND	ND	1.0	0.21	6731906
EtFOSAA	ug/kg	ND	ND	1.0	0.32	6731906
MeFOSAA	ug/kg	ND	ND	1.0	0.30	6731906
Hexafluoropropyleneoxide dimer acid	ug/kg	ND	ND	1.0	0.33	6731906
4,8-Dioxa-3H-perfluorononanoic acid	ug/kg	ND	ND	1.0	0.20	6731906
9Cl-PF3ONS (F-53B Major)	ug/kg	ND	ND	1.0	0.19	6731906
11Cl-PF3OuD (F-53B Minor)	ug/kg	ND	ND	1.0	0.20	6731906
<b>Surrogate Recovery (%)</b>						
13C2-Perfluorodecanoic acid	%	114	102	N/A	N/A	6731906
13C2-Perfluorododecanoic acid	%	113	97	N/A	N/A	6731906
13C2-Perfluorohexanoic acid	%	113	99	N/A	N/A	6731906
13C2-perfluorotetradecanoic acid	%	113	102	N/A	N/A	6731906
13C2-Perfluoroundecanoic acid	%	109	95	N/A	N/A	6731906
13C3-HFPO-DA	%	100	90	N/A	N/A	6731906
13C3-Perfluorobutanesulfonic acid	%	105	93	N/A	N/A	6731906
13C4-Perfluoroheptanoic acid	%	111	98	N/A	N/A	6731906
13C4-Perfluorooctanesulfonic acid	%	103	92	N/A	N/A	6731906
13C4-Perfluorooctanoic acid	%	111	99	N/A	N/A	6731906
13C5-Perfluorononanoic acid	%	113	101	N/A	N/A	6731906
18O2-Perfluorohexanesulfonic acid	%	101	92	N/A	N/A	6731906
D3-MeFOSAA	%	114	104	N/A	N/A	6731906
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate ND = Not detected N/A = Not Applicable						



**PERFLUOROALKYL SUBSTANCES (SOLID)**

BV Labs ID		MQQ744	MQQ744			
Sampling Date						
COC Number		na	na			
	UNITS	SCHMITE FOAM SAMPLE@PROPLAY 20	SCHMITE FOAM SAMPLE@PROPLAY 20 Lab-Dup	RDL	MDL	QC Batch
D5-EtFOSAA	%	112	98	N/A	N/A	6731906
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable						





**TEST SUMMARY**

**BV Labs ID:** MQQ744  
**Sample ID:** SCHMITE FOAM SAMPLE@PROPLAY 20  
**Matrix:** Solid

**Collected:**  
**Shipped:**  
**Received:** 2020/05/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PFAS in soil by SPE/LCMS	LCMS	6731906	2020/05/20	2020/05/21	Patrick Yu Peng Li

**BV Labs ID:** MQQ744 Dup  
**Sample ID:** SCHMITE FOAM SAMPLE@PROPLAY 20  
**Matrix:** Solid

**Collected:**  
**Shipped:**  
**Received:** 2020/05/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PFAS in soil by SPE/LCMS	LCMS	6731906	2020/05/20	2020/05/21	Patrick Yu Peng Li



BUREAU  
VERITAS

BV Labs Job #: COC0490

Report Date: 2020/05/22

Firefly Sports Testing

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	22.2°C
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**Results relate only to the items tested.**



BUREAU  
VERITAS

BV Labs Job #: C0C0490

Report Date: 2020/05/22

### QUALITY ASSURANCE REPORT

Firefly Sports Testing

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6731906	13C2-Perfluorodecanoic acid	2020/05/21	96	50 - 150	95	50 - 150	97	%		
6731906	13C2-Perfluorododecanoic acid	2020/05/21	92	50 - 150	93	50 - 150	97	%		
6731906	13C2-Perfluorohexanoic acid	2020/05/21	92	50 - 150	95	50 - 150	105	%		
6731906	13C2-perfluorotetradecanoic acid	2020/05/21	96	50 - 150	93	50 - 150	98	%		
6731906	13C2-Perfluoroundecanoic acid	2020/05/21	96	50 - 150	96	50 - 150	95	%		
6731906	13C3-HFPO-DA	2020/05/21	87	50 - 150	88	50 - 150	99	%		
6731906	13C3-Perfluorobutanesulfonic acid	2020/05/21	81	50 - 150	91	50 - 150	95	%		
6731906	13C4-Perfluoroheptanoic acid	2020/05/21	90	50 - 150	94	50 - 150	101	%		
6731906	13C4-Perfluorooctanesulfonic acid	2020/05/21	88	50 - 150	89	50 - 150	92	%		
6731906	13C4-Perfluorooctanoic acid	2020/05/21	91	50 - 150	95	50 - 150	102	%		
6731906	13C5-Perfluorononanoic acid	2020/05/21	96	50 - 150	96	50 - 150	101	%		
6731906	18O2-Perfluorohexanesulfonic acid	2020/05/21	86	50 - 150	89	50 - 150	94	%		
6731906	D3-MeFOSAA	2020/05/21	101	50 - 150	102	50 - 150	103	%		
6731906	D5-EtFOSAA	2020/05/21	97	50 - 150	97	50 - 150	94	%		
6731906	11Cl-PF3OUdS (F-53B Minor)	2020/05/21	91	70 - 130	86	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	4,8-Dioxa-3H-perfluorononanoic acid	2020/05/21	101	70 - 130	93	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	9Cl-PF3ONS (F-53B Major)	2020/05/21	96	70 - 130	93	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	EtFOSAA	2020/05/21	104	70 - 130	95	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Hexafluoropropyleneoxide dimer acid	2020/05/21	97	70 - 130	92	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	MeFOSAA	2020/05/21	104	70 - 130	94	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorobutanesulfonic acid (PFBS)	2020/05/21	108	70 - 130	94	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorodecanoic acid (PFDA)	2020/05/21	109	70 - 130	96	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorododecanoic acid (PFDoA)	2020/05/21	110	70 - 130	100	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluoroheptanoic acid (PFHpA)	2020/05/21	105	70 - 130	97	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorohexanesulfonic acid (PFHxS)	2020/05/21	104	70 - 130	93	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorohexanoic acid (PFHxA)	2020/05/21	104	70 - 130	93	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorononanoic acid (PFNA)	2020/05/21	106	70 - 130	96	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorooctanesulfonic acid (PFOS)	2020/05/21	104	70 - 130	97	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorooctanoic acid (PFOA)	2020/05/21	101	70 - 130	92	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorotetradecanoic acid (PFTEDA)	2020/05/21	100	70 - 130	91	70 - 130	ND, RDL=1.0	ug/kg	NC	30
6731906	Perfluorotridecanoic acid (PFTTDA)	2020/05/21	99	70 - 130	93	70 - 130	ND, RDL=1.0	ug/kg	NC	30





BUREAU  
VERITAS

BV Labs Job #: C0C0490

Report Date: 2020/05/22

Firefly Sports Testing

### QUALITY ASSURANCE REPORT(CONT'D)

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6731906	Perfluoroundecanoic acid (PFUnA)	2020/05/21	102	70 - 130	93	70 - 130	ND, RDL=1.0	ug/kg	NC	30
<p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference &lt;= 2x RDL).</p>										



BV Labs Job #: COC0490  
Report Date: 2020/05/22

Firefly Sports Testing

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

A handwritten signature in black ink, appearing to read 'Sin Chii Chia', written over a horizontal line.

Sin Chii Chia, Scientific Services

---

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



April 5, 2020

Schmitz Foam Products  
188 Treat Ave.  
Coldwater, MI 49036  
517-781-6620

re: Statement of Sustainability

To Whom it Concerns:

Environmental awareness is a major focus for Schmitz Foam Products.

Since 1990 all Schmitz ProPlay® products have been manufactured from 100% recycled closed cell cross linked polyethylene foam remnants. These remnants are collected from foam manufacturers and fabricators in many different industries, serving to keep them out of the traditional waste stream of landfills and incinerators.

All Schmitz ProPlay® products can be collected and 100% recycled at the end of their useful lifespan into the same or similar products.

An overview of our processes can be found at [www.xperecycling.com](http://www.xperecycling.com).

Sincerely,

*Allen Hubbard*

Allen Hubbard  
National Sales Manager  
Schmitz Foam Products  
413-575-7993  
[a.hubbard@schmitzfoam.com](mailto:a.hubbard@schmitzfoam.com)



# Certificate

## Limited Product and Performance Warranty for ProPlay-Sport

The logo features the word "Pro" in white text on a yellow square background, followed by the word "Play" in black text on a white background.

**ProPlay**

by Schmitz Foam Products

**Part 1.**

Schmitz Foam Products ("Schmitz") warrants to the owner of the sports field or fields, at which the ProPlay-Sport product ("Products") have been originally installed, ("Owner") that the Products are warranted against warping, breaking, tearing and splitting under normal and proper use as an underlayment for an artificial turf sports surface and shall be free from defects in material and workmanship for a period of twenty-five (25) years after the date of installation ("Warranty Period").

Schmitz also warrants that the Products will continue to act as a shock absorbing and draining layer during the Warranty Period, as long as the Products are not subjected to compressive stresses in excess of 40 psi or 25 N/cm<sup>2</sup> for short time frames (e.g. installation and/or maintenance equipment driving over the surface) and 20 psi or 12½ N/cm<sup>2</sup> for longer time frames (e.g. installation and/or maintenance equipment parked on the surface).

Schmitz also warrants that the average force reduction of the Products will stay within 10% *relative* (as per Advanced Artificial Athlete) and that the rain water infiltration rate (as per EN 12616) will be at least 1,800 mm per hour, during the Warranty Period.

Schmitz also warrants that the impact attenuation of the field will stay below 165 [Gmax] *if the field is tested below 120 [Gmax] at installation* (as per ASTM F355 A-missile), and that the shock absorption of the field will stay above 50% *if the field is tested above 60% at installation* (as per Advanced Artificial Athlete or EN 14808), during the warranty period of the artificial turf, when properly installed and maintained.

Schmitz will indemnify, defend (with counsel of Schmitz's choice or Schmitz's insurance carrier's choice) and hold harmless the owner against any loss, liability or claim arising from breach of the warranty, to the extent set forth below. If Schmitz determines that any Products do not conform to this Warranty, Schmitz shall deliver to the Owner new Products to replace the non-conforming Products. Schmitz will arrange for installation of such Products, including the temporary removal and repair or replacement of the artificial turf and infill over the affected area. Schmitz shall have reasonable discretion as to whether to repair or make replacement of the artificial turf. Owner shall give Schmitz reasonable advance notice of replacement of the entire turf surface (for reasons other than breach of Schmitz's Warranty) so that a Schmitz representative will be present at the time of turf replacement to inspect the Products for lack of damage which would void the Warranty. The Warranty will not continue in effect after turf replacement if such notice is not given.

**Restrictions**

This Limited Product Warranty ("Warranty") shall be effective only if (1) the Owner signs and returns this warranty to Schmitz within thirty (30) days of installation of the Products; (2) the Owner gives Schmitz written notice of a claim under this Warranty within thirty (30) days after the Owner discovers, or should have discovered the existence of the condition that gives rise to the claim, and (3) Schmitz has been provided the opportunity to inspect the Products (in place as originally installed) subject to a claim, within ten (10) days after the written notice set forth under (2) above.

**Exclusions**

This Warranty shall not apply to any Products which have once been installed and thereafter removed to a new location.

Notwithstanding anything to the contrary in this Warranty, any damage or defect resulting in whole or in part from any of the following causes is NOT covered by this Warranty:

1. Normal wear and tear;
2. Improper handling or use of Products after delivery to the job site, including, but not limited to imposition of excessive compressive stresses or warping, breaking, tearing and splitting or improper cutting of Products during the installation process;
3. Improper or inadequate site preparation including, without limitation improper or inadequate base material, improper or inadequate base material grading or compaction; improper material usage in perimeter drain collectors; or improper design or installation of drainage facilities or field edging that would impede drainage;
4. Improper installation of Products, including, without limitation, failure to comply with Schmitz's installation instructions;
5. Floods, fires, winds, lightning, accident, vandalism, terrorism, war, malicious mischief, or other causes outside the control of Schmitz;
6. Improper use or protection after installation, including, without limitation, imposition of excessive compressive stresses or cutting of Products by any cause after installation;
7. Soil expansion or contraction, subsidence, shifting, compression, erosion or any other condition related to the soil, base or subsurface upon which the Products are installed;
8. Improper installation, maintenance, repair or replacement of the field's artificial turf system;
9. Extended exposure of the Products to sunlight or other source of ultraviolet light;
10. Schmitz makes no warranty regarding the drainage of the field as a system, and shall not be responsible for the drainage of the field unless the ProPlay-Sport product is the cause of a non-draining system.



**Disclaimer**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, CONCERNING THE PURCHASE, USE OR CONDITION OF ANY PRODUCTS, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUALITY OR CONFORMITY WITH ANY DESCRIPTION OR SAMPLE. EXCEPT AS SET FORTH IN THIS WARRANTY, ALL WARRANTIES, REPRESENTATIONS, CONDITIONS AND OTHER TERMS IMPLIED BY LAW ARE EXCLUDED TO THE FULLEST EXTENT PERMITTED BY LAW.

**Limitation of Damages**

OWNER'S EXCLUSIVE REMEDY FOR ANY AND ALL LIABILITIES, LOSSES, DAMAGES, COSTS AND EXPENSES ARISING OUT OF OR IN CONNECTION WITH THE PURCHASE, USE OR CONDITION OF ANY PRODUCTS, INCLUDING, WITHOUT LIMITATION, ANY BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE OR STRICT LIABILITY, OR ANY ALLEGATION THEREOF, SHALL BE LIMITED TO REPLACEMENT OF THE PRODUCTS FOR WHICH A CLAIM IS MADE AND PROVED AND REPAIR OR REPLACEMENT OF OVERLYING ARTIFICIAL TURF. IN NO EVENT SHALL SCHMITZ BE LIABLE FOR ANY PUNITIVE, SPECIAL, CONSEQUENTIAL, INCIDENTAL OR INDIRECT LOSSES OR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE PURCHASE, USE OR CONDITION OF ANY PRODUCTS, INCLUDING, BUT NOT LIMITED TO, LOSS OF USE OF ANY PLAYING FIELD.

No person other than the Owner and Schmitz shall have any rights to enforce any term of this Warranty. Schmitz shall be permitted to assign any obligations and limitations under this Warranty, without the prior consent of Owner, to any purchaser of substantially all of the assets of Schmitz or to any financially responsible party in connection therewith.

If Owner is located in North America and/or the Products were supplied by Schmitz Foam Products LLC this Warranty will be governed by the laws of the State of New York and all disputes or claims arising out of or related to this Warranty or the contract or contracts related to the sale and/or installation of the Products shall be resolved by arbitration pursuant to the rules and procedures of the Construction Industry Division of the American Arbitration Association under its Construction Industry Arbitration Rules, and judgment on the award rendered by the arbitrator(s) may be entered by any court having jurisdiction thereof. Place of arbitration will be New York, New York.

If Owner is located outside of North America and the Products were supplied by Schmitz Foam Products B.V., this Warranty will be governed by the laws of The Netherlands and all disputes or claims arising out of or related to this Warranty or the contract or contracts related to the sale and/or installation of the Products shall be resolved by in accordance with the Arbitration Rules of the Netherlands Arbitration Institute and judgment on the award rendered by the arbitrator(s) may be entered by any court having jurisdiction thereof. The proceedings shall be conducted in the English language and the place of Arbitration will be Rotterdam, The Netherlands.

In the event of the arbitration (or litigation) of any dispute, the prevailing party on any claim shall be paid the prevailing party's reasonable attorney's fees, expert witness fees, and other costs associated with the particular claim.

Company (Owner) .....

Contact name .....

Date .....

Place .....

Signature .....

**Part 2.**

PROJECT	
project name	
street	
zip code	
city	
state	
country	
SCHMITZ FOAM PRODUCTS CUSTOMER	
company name	
street	
zip code	
city	
state	
country	
contact person	
name	
phone	
email	
PROPLAY-SPORT INSTALLER	
company name	
street	
zip code	
city	
state	
country	
contact person	
name	
phone	
email	

MAIN CONTRACTOR	
company name	
street	
zip code	
city	
state	
country	
contact person	
name	
phone	
email	
OWNER	
company name	
street	
zip code	
city	
state	
country	
contact person	
name	
phone	
email	
USE	
sport(s) (type)	



**CONSTRUCTION DETAILS****sub-base**

construction:  
(permeable or impermeable, with or without liner, ...)

material(s):

date of start of installation:

date of end of installation:

**ProPlay-Sport**

type:

installed amount:

date of start of installation:

date of end of installation:

**artificial turf**

brand & type:

pile height:

date of start of installation:

date of end of installation:

**infill**

type(s):

weight per unit area (or filled height):  
per type

date of start of installation:

date of end of installation:

<b>test results</b>
add lab test results (if available) !
add field test results (if available) !

comments:

Company (Customer) .....

Contact name .....

Date .....

Place .....

Signature .....

# ProPlay<sup>®</sup>

by Schmitz Foam Products



## ProPlay<sup>®</sup>-Sport

Reference Book USA and Canada





# US Reference List

Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
Asphalt Green NYC	NYC	NY	US	2019	multi sport	90,589	ProPlay-Sport20
Coastal FC	Surrey	BC	CA	2019	soccer	33,745	ProPlay-Sport23D
Albion Riverside Park	Los Angeles	CA	US	2019	soccer	75,393	ProPlay-Sport23D
Kirkwood High School MO	Meriden	KS	US	2019	multi sport	95,553	ProPlay-Sport20
King Louie Sports	Louisville	KY	US	2019	multi sport	16,132	ProPlay-Sport20
Carbondale High School	Carbondale	IL	US	2019	multi sport	96,794	ProPlay-Sport20
Bartlesville OK	Bartlesville	OK	US	2019	multi sport	95,553	ProPlay-Sport20D
GJ Fire Soccer Club	Grand Junction	CO	US	2019	soccer	15,131	ProPlay-Sport20
Smith River Playground	Axton	VA	US	2019	playground	9,144	ProPlay-25
Gallup High School Practice Field	Gallup	NM	US	2019	multisport	74,021	ProPlay-Sport23D
Chase Bank Field- AZ Diamondbacks	Phoenix	AZ	US	2019	baseball	107,962	ProPlay-Sport20
Lincoln Rec Center	Cincinnati	OH	US	2019	multi sport	8,687	ProPlay-Sport20
LA Galaxy Salvation	Los Angeles	CA	US	2019	soccer	28,019	ProPlay-Sport20
Crossroads Church	Parker	CO	US	2019	multipurpose	3,048	ProPlay-EcoSport
Stevenson School	Pebble Beach	CA	US	2019	multi sport	85,016	ProPlay-Sport20D
Bronxville Union Free High School	Bronxville	NY	US	2019	multi sport	106,721	ProPlay-Sport20
Scheu Family YMCA of Upland	Upland	CA	US	2019	multi sport	12,845	ProPlay-Sport20
Centennial Montessori School	Englewood	CO	US	2019	multipurpose	1,372	ProPlay-MP
Soccer Central	Franklin	TN	US	2019	soccer	356,718	ProPlay-Sport20D
Louisburg High School KS	Louisburg	KS	US	2019	multi sport	100,582	ProPlay-EcoSport
Maple Ridge	Vancouver	BC	CA	2019	soccer	202,514	ProPlay-Sport23D
Linden Park	Brooklyn	NY	US	2019	soccer	79,682	ProPlay-Sport20
Day of Service 5 sided soccer	Covington	KY	US	2019	soccer	4,964	ProPlay-Sport20
West Orange Stark High School	West Orange	TX	US	2019	football	88,390	ProPlay-EcoSport
Michelle Obama Athletic Complex	Chicago	IL	US	2019	multi sport	121,286	ProPlay-Sport23D
Jack Bulik Park Adaptive Field	Fontana	CA	US	2019	baseball	20,682	ProPlay-Sport23D
Gardner High School Watkins Field	Gardner	MA	US	2019	multi sport	81,053	ProPlay-Sport23D
Kankakee Valley High School	Wheatfield	IN	US	2019	multi sport	105,916	ProPlay-EcoSport
Steadman Hawkins	Englewood	CO	US	2019	multi purpose	18,331	ProPlay-EcoSport
Portage Football	Portage	MI	US	2019	Football	99,842	ProPlay-Sport23D
Caito Field	North Scituate	RI	US	2019	multi sport	92,527	ProPlay-Sport23D
Rivergreen Playground	Everett	MA	US	2019	multipurpose	80,770	ProPlay-EcoSport
US Bank Stadium MN	Minneapolis	MN	US	2019	Football	138,986	ProPlay-Sport20
Plainfield High School IN	Plainfield	SC	US	2019	multi sport	96,010	ProPlay-EcoSport
George Rogers Clark High School	Winchester	KY	US	2019	multi sport	82,403	ProPlay-EcoSport
Hambley Indoor KY	Pikeville	KY	US	2019	multi sport	11,974	ProPlay-Sport23
Portage Soccer	Portage	MI	US	2019	soccer	94,356	ProPlay-Sport23D
Kellogsville High School MI	Grand Rapids	MI	US	2019	multi sport	95,553	ProPlay-Sport20
Veterans Memorial Stadium	Erie	IL	US	2019	multi sport	11,169	ProPlay-Sport20
Cypress Hill	Brooklyn	NY	US	2019	soccer	129,058	ProPlay-Sport20
Astoria Park	Astoria	NY	US	2019	soccer	90,611	ProPlay-Sport20
Santa Teresa High School	San Jose	CA	US	2019	multi sport	87,280	ProPlay-Sport20D
Ann Arbor Pioneer	Ann Arbor	MI	US	2019	multi sport	86,866	ProPlay-Sport20D



# US Reference List

Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
Tallmadge High School 2019	Tallmadge	OH	US	2019	multi sport	80,770	ProPlay-EcoSport
Carrol High School OH	Dayton	OH	US	2019	multi sport	93,071	ProPlay-Sport20
Ann Arbor Skyline	Ann Arbor	MI	US	2019	multi sport	94,312	ProPlay-Sport20D
Cal Mum CSD	Caledonia	NY	US	2019	multi sport	106,678	ProPlay-Sport23D
Livonia Stevenson High School	Livonia	MI	US	2019	multi sport	91,830	ProPlay-Sport20
University School OH	Hunting Valley	OH	US	2019	multi sport	105,154	ProPlay-EcoSport
Royal Oak Schools	Royal Oak	MI	US	2019	football	93,071	ProPlay-Sport20D
Queens Univ Tindall	Kingston	ON	CA	2019	multi sport	91,133	ProPlay-Sport23D
Holly Park	Surrey	BC	CA	2019	soccer	167,637	ProPlay-Sport23D
Livonia Franklin	Livonia	MI	US	2019	multi sport	93,071	ProPlay-Sport23
City Line Park	Brooklyn	NY	US	2019	multi sport	8,708	ProPlay-Sport23D
Cypress Hill	Brooklyn	NY	US	2019	multi sport	1,524	ProPlay-Sport20
Spalding University	Lexington	KY	US	2019	soccer	96,794	ProPlay-Sport20
Susquehannock High School E/W	Glen Rock	PA	US	2019	multi sport	162,564	ProPlay-Sport20
PWC-Woodbridge High School	Woodbridge	VA	US	2019	multi sport	97,970	ProPlay-Sport23D
Unity High School	Tolono	IL	US	2019	multi sport	105,480	ProPlay-Sport20
West Kelowna BC	West Kelowna	BC	CA	2019	soccer	39,710	ProPlay-Sport20
JimTown High School	Elkhart	IN	US	2019	multi sport	95,553	ProPlay-Sport23
Shaw-Bristol PA Eco	Bristol	PA	US	2019	football	88,390	ProPlay-EcoSport
FH Collins	Yukon	NWT	CA	2019	multi sport	101,235	ProPlay-Sport23D
St James Academy KS	Lenexa	KS	US	2019	football	104,240	ProPlay-Sport20
Mt Vernon IN	Mount Vernon	IN	US	2019	football	82,294	ProPlay-EcoSport
Dearborn High School Main	Dearborn	MI	US	2019	multi sport	94,312	ProPlay-Sport20
Simon Kenton High School KY	Independence	KY	US	2019	multi sport	79,421	ProPlay-Sport23
PWC-SJHigh School	Manassas	VA	US	2019	multi sport	97,970	ProPlay-Sport23D
Cook Stadium	Terre Haute	IN	US	2019	football	90,350	ProPlay-Sport23
Bill Crothers Soccer	Granby	QC	CA	2019	soccer	85,429	ProPlay-Sport20
Spalding field 2	Louisville	KY	US	2019	soccer	95,553	ProPlay-Sport20
Brookville High School OH	Brookville	OH	US	2019	multi sport	97,970	ProPlay-EcoSport
Horse Arena	Auburn	NY	US	2019	equestrian	4,354	ProPlay-Sport23D
Dearborn High School Practice	Dearborn	MI	US	2019	multi sport	49,398	ProPlay-Sport20
VB court Dallas TX	Heath	TX	US	2019	volleyball	3,723	ProPlay-Sport20
Wyoming High School MI	Wyoming	MI	US	2019	multi sport	126,490	ProPlay-EcoSport
Kroc Center - Dayton	Dayton	OH	US	2019	multi sport	93,071	ProPlay-Sport20
Heath High School OH	Louisville	KY	US	2019	multi sport	79,464	ProPlay-Sport20
Witter Rugby Field	Berkely	CA	US	2019	rugby	115,822	ProPlay-EcoSport
UBC Warren	Vancouver	BC	CA	2019	soccer	104,501	ProPlay-Sport23D
Plummers Xtra Field	Edwardsville	IL	US	2019	baseball	48,767	ProPlay-EcoSport
MET LIFE STADIUM	East Rutherford	NJ	US	2019	multipurpose	4,964	ProPlay-Sport20
DeFazio and Memorial Fields	Needham	MA	US	2019	multi sport	276,731	ProPlay-Sport20D
Hugh Boyd Park	Richmond	BC	CA	2019	soccer	234,539	ProPlay-Sport20
Schlegel Park	Granby	QC	CA	2019	multi sport	147,673	ProPlay-Sport20
Ontario Project	Etobicoke	ON	CA	2019	Multi sport	91,830	ProPlay-Sport20D



Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
Jacksonville Pulaski High School	Jacksonville	AR	US	2019	multi sport	102,324	ProPlay-Sport23D
Sherbrooke University	Sherbrooke	QC	CA	2019	multi sport	21,096	ProPlay-Sport20
College Brebeuf	Toronto	ON	CA	2019	multi sport	21,096	ProPlay-Sport20
Macinnes	Langley	BC	CA	2019	multi sport	9,797	ProPlay-Sport23D
ESPN Orlando FL	Kissimmee	FL	US	2019	multi purpose	13,650	ProPlay-Sport20
Willoughby fields	Langley	BC	CA	2019	multi sport	97,534	ProPlay-EcoSport
Barnstable 23D	Hyannis	MA	US	2019	multi sport	133,892	ProPlay-Sport23D
Palmyra MO	Palmyra	MO	US	2019	playground	3,483	ProPlay-55
Palisades DC	Washington	DC	US	2019	multisport	40,276	ProPlay-Sport23
Plummer Sports Park	Edwardsville	IL	US	2019	soccer	306,492	ProPlay-EcoSport
Urban Soccer Park	Boise	ID	US	2019	soccer	34,834	ProPlay-Sport23D
Volleyball Court	Sherwood	OR	US	2019	volleyball	4,964	ProPlay-Sport20
Bill Crothers Football	Granby	QC	CA	2019	soccer	106,025	ProPlay-Sport20
Hollis Brookline High School	Hollis	NH	US	2019	multi sport	100,517	ProPlay-Sport20D
Daycare	Springfield	MA	US	2019	rooftop playground	3,375	ProPlay-35
SAUGERTIES NY	Saugerties	NY	US	2019	Equestrian	9,797	ProPlay-Sport23D
Rue du Tricentenaire	L'Ange Gardien	QC	CA	2019	soccer	79,421	ProPlay-Sport20
Buenos Aires	Ascuncion		PY	2019	soccer	92,527	ProPlay-Sport23D
Goshen High School	Goshen	OH	US	2018	multi sport	78,441	ProPlay-Sport20
DeAnza College	Cupertino	CA	US	2018	football	9,797	ProPlay-Sport23D
Merkley Park	Maple Ridge	BC	CA	2018	soccer	85,495	ProPlay-Sport23D
John Handley High School- Handley Bowl	Winchester	VA	US	2018	multi sport	92,004	ProPlay-EcoSport
Bill Crothers Secondary School	Markham	ON	CA	2018	multi sport	75,088	ProPlay-Sport23
Bloomington High School	Bloomington	IL	US	2018	multi sport	78,005	ProPlay-Sport20
Adelphi University	Montville	NJ	US	2018	multi sport	105,480	ProPlay-Sport20
Thayer Academy	Newark	NJ	US	2018	field hockey	41,387	ProPlay-Sport23D
Minnesota Vikings Headquarters	Eagan	MN	US	2018	recreation	3,723	ProPlay-Sport20D
Southborough 9/11	Southborough	MA	US	2018	multi sport	83,622	ProPlay-Sport23D
Sea Girt Elem.	Sea Girt	NJ	US	2018	multi sport	9,296	ProPlay-Sport20D
Miracle League Field	St Petersburg	FL	US	2018	baseball	17,417	ProPlay-Sport23D
Castle Academy	Castle Rock	CO	US	2018	multi sport	12,214	ProPlay-EcoSport
CHCA Day of Service	Newtown	OH	US	2018	soccer	3,266	ProPlay-Sport23D
Libertyville Soccer	Libertyville	IL	US	2018	Soccer	142,273	ProPlay-Sport20
Crenshaw High School	Los Angeles	CA	US	2018	multi sport	89,392	ProPlay-Sport23D
Portage High School Football	Portage	MI	US	2018	football	98,405	ProPlay-Sport23D
Roy Wilkins Park	Jamaica	NY	US	2018	multi sport	88,499	ProPlay-Sport20
Jacobi Hospital Play Area	Bronx	NY	US	2018	playground	4,311	ProPlay-25
Parc MultiSports 1	St Jerome	QC	CA	2018	multi sport	12,192	ProPlay-55
Portage High School	Portage	MI	US	2018	soccer	98,470	ProPlay-Sport23D
Winchester High School- Ciarcia Field	Winchester	MA	US	2018	multi sport	122,767	ProPlay-Sport23D
Pingree School	Hamilton	MA	US	2018	soccer	91,569	ProPlay-Sport23D



Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
Westminster College Dumke Field	Salt Lake City	UT	US	2018	multi sport	101,692	ProPlay-EcoSport
Bellarmine U	Louisville	KY	US	2018	multi sport	86,866	ProPlay-Sport20
Sacred Heart	San Francisco	CA	US	2018	multi sport	31,568	ProPlay-Sport23D
Proj. Burnaby/Surrey	Burnaby	BC	CA	2018	multi sport	134,980	ProPlay-Sport23D
Tipp City Stadium	Tipp City	OH	US	2018	multi sport	82,294	ProPlay-EcoSport
Williston Northampton	Easthampton	MA	US	2018	multi sport	97,665	ProPlay-EcoSport
Brandeis University	Waltham	MA	US	2018	soccer	86,736	ProPlay-Sport20D
McCarren Park	Brooklyn	NY	US	2018	soccer	107,919	ProPlay-Sport20
Beaver Creek High School	Dayton	OH	US	2018	multi sport	78,441	ProPlay-Sport20
Trent University	Peterborough	ON	CA	2018	multi sport	119,131	ProPlay-Sport20
Lincoln High School	Stockton	CA	US	2018	multi sport	87,019	ProPlay-Sport20D
Columbus North High School	Columbus	IN	US	2018	multi sport	94,268	ProPlay-EcoSport
Westerville C High School	Westerville	OH	US	2018	multi sport	83,426	ProPlay-Sport20
Skagit Valley	Mt Vernon	WA	US	2018	soccer	97,534	ProPlay-EcoSport
Miami Trace High School	Washington Court House	OH	US	2018	multi sport	71,256	ProPlay-Sport20
Steamboat Springs High School	Steamboat Springs	CO	US	2018	multi sport	91,569	ProPlay-MP
Eckersall Stadium	Chicago	IL	US	2018	football	76,307	ProPlay-Sport23
East Cooper Regional	Mt Pleasant	SC	US	2018	multi sport	88,390	ProPlay-EcoSport
Boston College High School Stadium	Dorchester	MA	US	2018	multi sport	80,662	ProPlay-Sport23D
Lockport Football	Lockport	NY	US	2018	football	77,069	ProPlay-EcoSport
Ossining CSD	Ossining	NY	US	2018	multi sport	118,129	ProPlay-EcoSport
Crossroads Juvenile Ctr	Brooklyn	NY	US	2018	multipurpose	936	ProPlay-55
Howell High School	Howell	MI	US	2018	multi sport	100,386	ProPlay-Sport23D
South Bend CS- School Field	South Bend	IN	US	2018	multi sport	87,933	ProPlay-EcoSport
Lincoln USD	Santa Ana	CA	US	2018	multi sport	3,723	ProPlay-Sport20D
Columbus East High School	Columbus	IN	US	2018	multi sport	101,083	ProPlay-EcoSport
Frank Principe Park	Maspeth	NY	US	2018	multi sport	154,400	ProPlay-Sport20
Cascade High School	Clayton	IN	US	2018	multi sport	91,025	ProPlay-EcoSport
Boulder City	Boulder City	NV	US	2018	multi sport	76,612	ProPlay-Sport20D
The Harker School	San Jose	CA	US	2018	multi sport	79,464	ProPlay-Sport23D
Thomas Star King MS	Los Angeles	CA	US	2018	multi sport	70,865	ProPlay-Sport23D
Livonia Churchill High School Larry Joiner Field	Livonia	MI	US	2018	multi sport	96,859	ProPlay-Sport20
East Central High School	St Leon	OH	US	2018	multi sport	94,878	ProPlay-EcoSport
North Colonie CSD_ Arthur Walker Field	Latham	NY	US	2018	multi sport	78,615	ProPlay-EcoSport
Sherwood Forest Park	Burlington	ON	CA	2018	soccer	81,903	ProPlay-Sport20
Bloom High School- Sarff Field	Chicago Heights	IL	US	2018	multi sport	95,205	ProPlay-EcoSport
Franklin Community	Indianapolis	IN	US	2018	multi sport	99,058	ProPlay-EcoSport
Coopersville High School	Coopersville	MI	US	2018	multi sport	83,514	ProPlay-Sport23D
Maddox Elementary	Englewood	CO	US	2018	multipurpose	4,115	ProPlay-MP
MSU IM	East Lansing	MI	US	2018	multipurpose	16,132	ProPlay-Sport20
Project Langley (I)	Langley	BC	CA	2018	soccer	85,342	ProPlay-EcoSport



# US Reference List

Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
Newark High School	Newark	NY	US	2018	multi sport	183,508	ProPlay-EcoSport
Kewaskum High School	Kewaskum	WI	US	2018	multi sport	92,026	ProPlay-Sport20
Fishers High School	Fishers	IN	US	2018	multi sport	99,058	ProPlay-EcoSport
Hamilton SE High School	Fishers	IN	US	2018	multi sport	89,914	ProPlay-EcoSport
Upper Arlington	Upper Arlington	OH	US	2018	multi sport	84,907	ProPlay-Sport23
Port Byron	Port Byron	NY	US	2018	multi sport	112,469	ProPlay-EcoSport
LA Valley CC	Valley Glen	CA	US	2018	football	101,627	ProPlay-Sport20D
BYU Idaho	Rexburg	ID	US	2018	multi sport	93,506	ProPlay-Sport20D
Hood River High School	Hood River	OR	US	2018	multi sport	92,897	ProPlay-EcoSport
Surrey City Fields	Surrey	BC	CA	2018	soccer	108,855	ProPlay-Sport23D
Tozer Elementary	Windsor	CO	US	2018	multi purpose	18,636	ProPlay-Sport20D
Shelton High School Finn Stadium	Shelton	CT	US	2018	multi sport	99,515	ProPlay-Sport23D
Steinmetz College	Chicago	IL	US	2018	multi sport	93,528	ProPlay-Sport23
Haverford School	Haverford	PA	US	2018	multi sport	99,276	ProPlay-Sport20D
Ladue Horton Watkins	Ladue	MO	US	2018	football	107,745	ProPlay-EcoSport
North Branch High School	North Branch	MN	US	2018	multi sport	91,961	ProPlay-EcoSport
Estadio Santos de Guapiles	Guapiles		CR	2018	soccer	89,348	ProPlay-Sport20D
Mississagua Courtney	Mississagua	ON	CA	2018	multi sport	102,999	ProPlay-Sport20
Watkins Glen Stadium	Watkins Glen	NY	US	2018	multi sport	94,486	ProPlay-EcoSport
Gaylord MI	Gaylord	MI	US	2018	multi sport	98,187	ProPlay-EcoSport
Pearl River High School	Pearl River	NY	US	2018	multi sport	82,730	ProPlay-Sport20
Infinity Park	Glendale	CO	US	2018	rugby	96,903	ProPlay-Sport20
Tyngsborough High School	Tyngsborough, MA	MA	US	2018	multi sport	80,553	ProPlay-Sport23D
Hillside Knoll Trail	Needham	MA	US	2018	multipurpose	9,797	ProPlay-Sport23D
Hillcrest Baptist	New Albany	MS	US	2018	playground	1,350	ProPlay-35
Project Terrebonne	Terrebonne	QC	CA	2018	multi sport	79,421	ProPlay-Sport20
Cairo Playground Pad	Cairo	MO	US	2018	playground	14,804	ProPlay-35
Whistler	Whistler	BC	CA	2018	soccer	101,235	ProPlay-Sport23D
Pagosa Elementary	Englewood	CO	US	2018	multipurpose	2,177	ProPlay-Sport23D
Joy of the People	Minneapolis	MN	US	2018	soccer	12,409	ProPlay-Sport20
Project Peru			Py	2018	soccer	246,948	ProPlay-Sport20
Gotsch Elementary	St. Louis	MO	US	2018	playground	5,486	ProPlay-25
Surrey City Fields	Surrey	BC	CA	2018	soccer	7,620	ProPlay-Sport23D
Weaver High School	Hartford	CT	US	2018	multi sport	96,881	ProPlay-Sport23D
Proj. Mississauga II	Mississauga	ON	CA	2018	multi sport	200,598	ProPlay-Sport20
Homeless World Cup	Mexico City		MX	2018	soccer	20,574	ProPlay-EcoSport
WPI Softball infield	Worcester	MA	US	2018	softball	9,797	ProPlay-EcoSport
Loma Vista School	Chico	CA	US	2018	playground	6,967	ProPlay-55
Tiverton Longplex	Tiverton	RI	US	2018	multi sport	42,519	ProPlay-EcoSport
Monash University	Melbourne		AU	2018	multi sport	297,827	ProPlay-Sport20
Randalls Island	New York City	NY	US	2018	multi sport	172,492	ProPlay-Sport20
Ossining Middle School	Ossining	NY	US	2018	multi sport	88,107	ProPlay-EcoSport
Loveland High School Ohio	Loveland	OH	US	2018	multi sport	86,866	ProPlay-Sport20



# US Reference List

Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
BYU Hawaii	Laie	HI	US	2018	multi purpose	29,783	ProPlay-Sport20
Newtown Barge Park	Brooklyn	NY	US	2018	soccer	28,651	ProPlay-Sport20
Sports Force Parks	Vicksburg	MS	US	2018	multi sport	34,834	ProPlay-Sport23D
James lick High School	San Jose	CA	US	2018	multi sport	91,003	ProPlay-Sport20D
Adelphi University NY	Montville	NJ	US	2018	multi sport	101,758	ProPlay-Sport23D
Yerba Buena High School	San Jose	CA	US	2018	multi sport	98,122	ProPlay-Sport20D
Salt River Fields- AZ Diamondbacks	Scottsdale	AZ	US	2018	baseball	99,276	ProPlay-Sport20
Eastside USD Piedmont	San Jose	CA	US	2018	multi sport	85,081	ProPlay-Sport20D
Eastside USD Andrew Hills	San Jose	CA	US	2018	multi sport	99,733	ProPlay-Sport20D
EastSide USD Oak Grove	San Jose	CA	US	2018	multi sport	100,190	ProPlay-Sport20D
Andrew Jackson Youth Police Camp	Mt. Juliet	TN	US	2017		14,032	ProPlay-Sport20
Bronxville UFSD	Bronxville	NY	US	2017		82,028	ProPlay-Sport23D
Como High School	Minneapolis	MN	US	2017		90,074	ProPlay-EcoSport
Freedom High School	Woodbridge	VA	US	2017		72,561	ProPlay-Sport23D
Harlem RBI Patterson Park	New York City	NY	US	2017		40,236	ProPlay-Sport20D
Hope College	Holland	MI	US	2017		104,937	ProPlay-Sport20
Merrimack College	North Andover	MA	US	2017		90,395	ProPlay-Sport20
Merrimack College	North Andover	MA	US	2017		91,245	ProPlay-Sport23D
Mississauga- 4 Fields	Mississauga	ON	US	2017		321,426	ProPlay-Sport20
Mt. San Jacinto College	San Jacinto	CA	US	2017		120,000	ProPlay-EcoSport
Portage High School	Portage	MI	US	2017		93,100	ProPlay-Sport23D
Sydney Hutchinson Park Challenger Field	Walker	LA	US	2017		11,900	ProPlay-Sport23D
Thayer Academy	Braintree	MA	US	2017		77,063	ProPlay-EcoSport
TitleTown District-Lambeau Field	Green Bay	WI	US	2017		3,270	ProPlay-Sport23D
Andover High School	Andover	MA	US	2016		92,634	
Beachwood High School	Beachwood	OH	US	2016		78,469	
College Hall	Wayne	NJ	US	2016		95,885	
CPP Sports Park	Sandusky	OH	US	2016		2,424	
Greenwich High School	Greenwich	CT	US	2016		95,799	
Ipswich High School	Ipswich	MA	US	2016		8,511	
Irondale High School Stadium	New Brighton	MN	US	2016		99,179	
Irvington MS/High School	Irvington	NY	US	2016		80,557	
Laytonia Recreational Park	Gaithersburg	MD	US	2016		102,159	ProPlay 23D
McCarthy Field	Salt Lake City	UT	US	2016		88,124	
Mission Park	Spokane	WA	US	2016		14,168	ProPlay 23D
Nyack Stadium Field	Nyack	NY	US	2016		90,190	
Oregon Episcopal School	Portland	OR	US	2016		61,912	
Oyster River High School	Durham	NH	US	2016		92,613	
Paul Kolbert Playground	New York City	NY	US	2016		14,058	
Souhegan High School	Amherst	NH	US	2016		80,869	
Stevens Field	Olympia	WA	US	2016		14,369	ProPlay 20
Tantasqua School District	Fiskdale	MA	US	2016		8,328	



Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
Tantasqua School District	Fiskdale	MA	US	2016		88,361	
Thayer Academy	Braintree	MA	US	2016		158,025	
Umass - Dartmouth Cressy Field	N. Dartmouth	MA	US	2016		92,763	
Battle Mountain Junior High School	Battle Mountain	NV	US	2015		83,173	
Danbury High School	Danbury	CT	US	2015		187,152	
Foothill De Anza Football	Los Altos Hills	CA	US	2015		97,413	
John Ferraro Athletic field	Los Angeles	CA	US	2015		23,799	
Mounds View High School	Arden Hills	MN	US	2015		105,293	
New York High School	New York	NY	US	2015		12,174	
Providence College Anderson Field	Providence	RI	US	2015		100,535	
Providence College Glay Field	Providence	RI	US	2015		27,717	
Providence College II	Providence	RI	US	2015		110,901	
RAB @ Central Parks	Fremont	CA	US	2015		179,757	
Westside Middle School	Danbury	CT	US	2015		83,173	
Woodlands Township II	The Woodlands	TX	US	2015		279,636	
Clover High School	Clover	SC	US	2014		80,719	
Clover High School	Clover	SC	US	2014		183,417	
Saginaw valley State University	Saginaw	MI	US	2014		55,692	
Town Centre Park	Port Coquitlam	BC	CA	2014		148,542	
University of Colorado	Colorado Springs	CO	US	2014		85,121	
Boise	Boise	ID	US	2013		1,938	
City of Merced-McNamara Park	Merced	CA	US	2013		122,655	
Connors Park	San Marcos	CA	US	2013		74,981	
Dixie Canyon Community	Sherman Oaks	CA	US	2013		8,611	
Manhattan Beach	Los Angeles	CA	US	2013		7,539	
Providence College	Providence	RI	US	2013		101,644	
Richmond Kickers	Richmond	VA	US	2013		109,006	
Tatum Eagles	Tatum	TX	US	2013		28,341	
U.S. Army Garrison	Fort Huachuca	AZ	US	2013		17,782	
Bush Terminal	New York	NY	US	2012		161	
De Anza College	Cupertino	CA	US	2012		86,639	
Escondido Sports Center	Escondido	CA	US	2012		2,001	
Soundview Service Co	New York	NY	US	2012		80,998	
South Region High School #7	Los Angeles	CA	US	2012		8,102	
Woodlands Township	The Woodlands	TX	US	2012		545,268	
Carson Senior High School	Carson	CA	US	2011		79,448	
Chelsea Park, Manhattan	New York	NY	US	2011		48,674	
Corlears Hook Park Manhattan	New York	NY	US	2011		36,253	
El Oso Park	Gilbert	AZ	US	2011		15,995	
Garfield Park - Google	Mountain View	CA	US	2011		46,209	
Greenfield Sports Academy	Memphis	TN	US	2011		9,741	
LAUSD#15 SR High School	San Pedro	CA	US	2011		105,024	
El Camino Real High School	Woodland Hills	CA	US	2010		97,673	

# US Reference List

Project Name	City	State	Country	Year	Application	F <sup>2</sup>	Product
I.I. Nelson Field	Austin	TX	US	2007		86,111	
Malone Stadium	Monroe	LA	US	2007		100,702	
Michael-Ann Russel Jewish Centre	Miami	FL	US	2007		72,613	
Belton High School	Belton	TX	US	2005		86,111	
Harding University	Searcy	AR	US	2005		86,111	
Tatum Eagles	Tatum	TX	US	2005		86,111	



**ProPlay**<sup>®</sup>  
by Schmitz Foam Products



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*Attachment B*  
PFAS Test Results

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June 7, 2021

Peter Rice, P.E., Director  
Portsmouth Public Works  
680 Peeverly Hill Road  
Portsmouth, NH 03801

**Re: Portsmouth Recreation Fields – PFAS testing  
CMA # 1119**

Dear Peter:

Attached is a memorandum from Marie Rudiman of Weston and Sampson describing the testing results of a sample of artificial turf from the new installation at the recreational fields for per- and polyfluoroalkyl substances (PFAS).

The Portsmouth turf sample did not have any PFAS detected. As such, the results are very favorable.

The test was of a solid sample of the turf, which is subject to leaching liquid designed to extract PFAS if it is present and available, which is in turn measured for presence of PFAS. This is the standard method for assessing whether PFAS compounds are present in solids.

There are laboratory quality control procedures that use surrogates that reported detectable PFAS. These are not samples of Portsmouth turf. They are substances with known PFAS to confirm that the laboratory equipment is functioning satisfactorily and should detect PFAS. Again, the results are not from Portsmouth turf.

Summarizing again, the results from Portsmouth turf indicate that no PFAS were detected.

Should you have any questions, please do not hesitate to call.

Very truly yours,  
CMA ENGINEERS, INC.

William A. Straub, P.E., P.G.  
Vice President

Enc.



June 7, 2021

Mr. Phillip Corbett  
CMA Engineers  
35 Bow St.  
Portsmouth, NH 03801

Cc: Mr. Peter Rice  
Director of Public Works  
680 Peaverly Hill Rd  
Portsmouth, NH 03801

Re: PFAS Documentation, Synthetic Turf  
Portsmouth, NH installation

Dear Mr. Corbett:

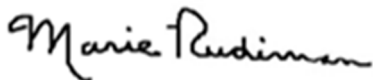
Weston & Sampson Engineers, Inc. (Weston & Sampson) has prepared this letter to document that the synthetic turf contractor, FieldTurf, has fulfilled our requirements to document that the synthetic turf installed for the City of Portsmouth, New Hampshire, Recreation Field Complex does not contain poly and perfluorinated alkyl substances (PFAS). To document that there is no PFAS in the synthetic turf that we recommend for installation, Weston & Sampson requires that the vendor provide a statement indicating they do not use any PFAS compounds within or in the manufacture of their carpets/turf as well as provide the appropriate laboratory testing of the components of the synthetic turf system. The contractor FieldTurf has provided this information and met all our requirements.

In addition, a sample of the synthetic turf to be installed was collected and submitted to an accredited laboratory for PFAS testing. All PFAS compounds were Not Detected (ND) above method detection limits. This testing confirms that there is no PFAS in the synthetic turf.

If you have any questions or comments regarding this letter or need any additional information, please do not hesitate to contact our office at 617-412-4480.

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.



Marie Rudiman  
Senior Risk Assessor/Toxicologist

# DAVID TETER CONSULTING

April 23, 2021

Ms. Sacha DeRubeis  
Project Manager  
FieldTurf  
7445 Côte-de-Liesse Road Suite 200  
Montreal Quebec H4T 1G2  
Canada

## RE: PFAS Testing Results for FieldTurf Vertex Carpet

Dear Ms. DeRubeis:

### EXECUTIVE SUMMARY

A sample of FieldTurf Vertex carpet was analyzed for total per- and polyfluoroalkyl substances (PFAS) using EPA Method 537 Modified. PFAS was not detected in the samples. This result confirms the results of previous analysis performed in December 2019 that PFAS was not detected in FieldTurf Vertex carpet.

### SAMPLING AND RESULTS

In April 2021, FieldTurf submitted a sample of Vertex carpet to ALS Environmental (CA ELAP #2795) of Kelso, Washington under chain of custody procedures. The sample was analyzed for PFAS using EPA Method 537.1M (Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction (SPE) and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), Modified). The results for total PFAS are presented in Table 1. PFAS was not detected in the sample of Vertex carpet.

### CLOSING

If you have any questions or require additional information, please do not hesitate to contact me at (415) 889-8875 or at david@davidteterconsulting.com.

Sincerely,



David Teter, PhD, PE  
Principal Engineer  
David Teter Consulting

Attachments  
Table 1 PFAS Results for FieldTurf Vertex Carpet  
Laboratory Report

TABLE 1 - Total PFAS results for FieldTurf Vertex Synthetic Turf Carpet by EPA Method 537(M). All results are in parts per billion.

Analyte Class	Analyte Name	FieldTurf Vertex
Perfluoroalkane Sulfonic Acids	Perfluorobutane sulfonic acid (PFBS)	< 0.22 U
	Perfluoropentane sulfonic acid (PFPeS)	< 0.17 U
	Perfluorohexane sulfonic acid (PFHxS)	< 0.30 U
	Perfluoroheptane sulfonic acid (PFHpS)	< 0.062 U
	Perfluorooctane sulfonic acid (PFOS)	< 0.13 U
	Perfluorononane sulfonic acid (PFNS)	< 0.16 U
	Perfluorodecane sulfonic acid (PFDS)	< 0.17 U
Perfluoroalkane Carboxylic Acids	Perfluorobutanoic acid (PFBA)	< 0.39 U
	Perfluoropentanoic acid (PFPeA)	< 0.21 U
	Perfluorohexanoic acid (PFHxA)	< 0.31 U
	Perfluoroheptanoic acid (PFHpA)	< 0.19 U
	Perfluorooctanoic acid (PFOA)	< 0.13 U
	Perfluorononanoic acid (PFNA)	< 0.33 U
	Perfluorodecanoic acid (PFDA)	< 0.26 U
	Perfluoroundecanoic acid (PFUnDA)	< 0.18 U
	Perfluorododecanoic acid (PFDoDA)	< 0.27 U
	Perfluorotridecanoic acid (PFTrDA)	< 0.21 U
Perfluorotetradecanoic acid (PFTeDA)	< 0.18 U	
Perfluoroalkyl Sulfonamides	Perfluorooctane sulfonamide (FOSA)	< 0.067 U
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	< 0.073 U
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	< 0.11 U
	N-Methyl perfluorooctane sulfonamidoethanol	< 0.054 U
	N-Ethyl perfluorooctane sulfonamidoethanol	< 0.088 U
	N-Methyl perfluorooctane sulfonamidoacetic acid	< 0.27 U
N-Ethyl perfluorooctane sulfonamidoacetic acid	< 0.20 U	
(n:2) Fluorotelomer Sulfonic Acids	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	< 0.088 U
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	< 0.15 U
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	< 0.029 U
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	< 0.036 U
Perfluoroalkyl Ether Carboxylic Acids	Hexafluoropropylene oxide dimer acid (HFPO-DA)	< 0.042 U

Notes and Abbreviations

PFAS: Per- and Polyfluoroalkyl Substances

U: Not Detected Above the MDL (the MRL is equivalent to the MDL for this method)





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ALS Environmental  
ALS Group USA, Corp  
1317 South 13th Avenue  
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F : +1 360 636 1068  
[www.alsglobal.com](http://www.alsglobal.com)

April 23, 2021

**Analytical Report for Service Request No: K2104028**

David Teter  
David Teter Consulting, LLC  
1662 Clay Street  
San Francisco, CA 94109

**RE: City of Portsmouth / 88008029**

Dear David,

Enclosed are the results of the sample(s) submitted to our laboratory April 16, 2021  
For your reference, these analyses have been assigned our service request number **K2104028**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at [howard.holmes@alsglobal.com](mailto:howard.holmes@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Howard Holmes  
Project Manager



---

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Raw Data

Per and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.



**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Received:** 04/16/2021

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

#### Sample Receipt:

One misc. solid sample was received for analysis at ALS Environmental on 04/16/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

#### Organic LC:

Method PFC/537M, 04/21/2021: The upper control criterion was exceeded for one or more surrogates in Method Blank KQ2106020-04. No target analytes were detected in the Method Blank. Since the apparent problem equates to a high bias, the data quality was not significantly affected. No further corrective action was appropriate.

Method PFC/537M, 04/21/2021: The upper control criterion was exceeded for one or more surrogates in sample Vertex Dual-Fiber 2.25". No target analytes were detected in the sample. The error associated with an elevated recovery equated to a high bias. The quality of the sample data was not significantly affected. No further corrective action was appropriate.

Method PFC/537M, 04/21/2021: The upper control criterion was exceeded for one or more analytes in Laboratory Control Sample (LCS) KQ2106020-03. The analytes in question was/were not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Method PFC/537M, 04/21/2021: The control criteria were exceeded for one or more surrogates in Batch QC MS KQ2106020-01, DMS KQ2106020-02, and LCS KQ2106020-03. The associated matrix spike recoveries of target compounds were in control, indicating the analysis was in control. The surrogate outlier was flagged accordingly. No further corrective action was appropriate.

Method PFC/537M, 04/21/2021: The upper control criterion was exceeded for the following analytes in Matrix Spike (MS) KQ2106020-01 and Matrix Spike Duplicate (MSD) KQ2106020-02: N-Methyl perfluorooctane sulfonamidoethanol and N-Ethyl perfluorooctane sulfonamidoethanol. The analytes in question were not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Approved by



Date

04/23/2021



# Chain of Custody

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



VZ104028



ALS Environmental  
 1317 South 13th Ave  
 Kelso, WA 98626  
 (Tel) 360.577.7222  
 (Fax) 360.636.1068

**Chain of Custody Form**

Page 1 of 1

<b>Customer Information</b>		<b>ALS Project Manager:</b>				<b>ALS Work Order #:</b>	
<b>Project Information</b>		<b>Parameter/Method Request for Analysis</b>					
Purchase Order	Project Name	City of Portsmouth				A	PFAS by LC/MS/MS - PFC/537M
Work Order	Project Number	8000029				B	
Company Name	Bill To Company	David Teter Consulting				C	
Send Report To	Invoice Attn.					D	
Address	Address	1169 Pacific Avenue				E	
City/State/Zip	City/State/Zip	San Francisco, CA 94133				F	
Phone	Phone	(505) 504-2192				G	
Fax	Email	david@davidteterconsulting.com				H	
e-Mail Address	david@davidteterconsulting.com				I		
							J

No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	vertex dual-fiber 2.25"	4/12/2021		Other	-	-	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign Josh Bolling	Shipment Method: FedEX	Required Turnaround Time: (Check Box) ASAP	Results Due Date: 04/16/21 if possible
---	---------------------------	---	---

Relinquished by: <i>Josh Bolling</i>	Date: 4/14/21	Time: 3:18 PM	Received by: <i>[Signature]</i>	Date: 4/16/21	Time: 0950	Notes: Reference Quote #47395		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Date:	Time:	ALS Cooler ID	Cooler Temp	QC Package: (Check Box Below)

Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):
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Preservative Key: 1-HCl 2-HNO<sub>3</sub> 3-H<sub>2</sub>SO<sub>4</sub> 4-NaOH 5-Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 6-NaHSO<sub>4</sub> 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.

### Cooler Receipt and Preservation Form

PM HHH

Client David teter Service Request K21  
 Received: 4/11/12 Opened: 4/11/12 By: BR Unloaded: 4/11/12 By: BR

04028

1. Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
  2. Samples were received in: (circle)  Cooler  Box  Envelope  Other \_\_\_\_\_ NA
  3. Were custody seals on coolers?  NA  Y  N If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact?  Y  N If present, were they signed and dated?  Y  N
  4. Was a Temperature Blank present in cooler?  NA  Y  N If yes, notate the temperature in the appropriate column below:  
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp"
  5. Were samples received within the method specified temperature ranges?  NA  Y  N  
 If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM.  NA  Y  N
- If applicable, tissue samples were received:  Frozen  Partially Thawed  Thawed

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with 'X'	PM Notified if out of temp	Tracking Number NA	Filed
						949564718089	

6. Packing material:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves \_\_\_\_\_
7. Were custody papers properly filled out (ink, signed, etc.)?  NA  Y  N
8. Were samples received in good condition (unbroken)  NA  Y  N
9. Were all sample labels complete (ie, analysis, preservation, etc.)?  NA  Y  N
10. Did all sample labels and tags agree with custody papers?  NA  Y  N
11. Were appropriate bottles/containers and volumes received for the tests indicated?  NA  Y  N
12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below  NA  Y  N
13. Were VOA vials received without headspace? Indicate in the table below.  NA  Y  N
14. Was C12/Res negative?  NA  Y  N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	initials	Time

Notes, Discrepancies, Resolutions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# Per and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

Analytical Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** 04/12/21  
**Date Received:** 04/16/21 09:50

**Sample Name:** Vertex Dual-Fiber 2.25"  
**Lab Code:** K2104028-001

**Units:** ng/g  
**Basis:** As Received

**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

Analyte Name	Result	LOQ	MDL	Dil.	Date Analyzed	Date Extracted	Q
<b>Perfluoroalkyl Sulfonic Acids (PFASs)</b>							
Perfluorobutane sulfonic acid (PFBS)	ND U	0.71	0.22	1	04/21/21 17:01	4/14/21	
Perfluoropentane sulfonic acid (PFPeS)	ND U	0.71	0.17	1	04/21/21 17:01	4/14/21	
Perfluorohexane sulfonic acid (PFHxS)	ND U	0.73	0.30	1	04/21/21 17:01	4/14/21	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	0.71	0.062	1	04/21/21 17:01	4/14/21	
Perfluorooctane sulfonic acid (PFOS)	ND U	0.71	0.13	1	04/21/21 17:01	4/14/21	
Perfluorononane sulfonic acid (PFNS)	ND U	0.71	0.16	1	04/21/21 17:01	4/14/21	
Perfluorodecane sulfonic acid (PFDS)	ND U	0.71	0.17	1	04/21/21 17:01	4/14/21	
<b>Perfluoroalkyl Carboxylic Acids (PFCAs)</b>							
Perfluorobutanoic acid (PFBA)	ND U	0.80	0.39	1	04/21/21 17:01	4/14/21	
Perfluoropentanoic acid (PFPeA)	ND U	0.80	0.21	1	04/21/21 17:01	4/14/21	
Perfluorohexanoic acid (PFHxA)	ND U	0.80	0.31	1	04/21/21 17:01	4/14/21	
Perfluoroheptanoic acid (PFHpA)	ND U	0.71	0.19	1	04/21/21 17:01	4/14/21	
Perfluorooctanoic acid (PFOA)	ND U	0.71	0.13	1	04/21/21 17:01	4/14/21	
Perfluorononanoic acid (PFNA)	ND U	0.80	0.33	1	04/21/21 17:01	4/14/21	
Perfluorodecanoic acid (PFDA)	ND U	0.80	0.26	1	04/21/21 17:01	4/14/21	
Perfluoroundecanoic acid (PFUnDA)	ND U	0.71	0.18	1	04/21/21 17:01	4/14/21	
Perfluorododecanoic acid (PFDoDA)	ND U	0.80	0.27	1	04/21/21 17:01	4/14/21	
Perfluorotridecanoic acid (PFTriDA)	ND U	0.80	0.21	1	04/21/21 17:01	4/14/21	*
Perfluorotetradecanoic acid (PFTeDA)	ND U	0.71	0.18	1	04/21/21 17:01	4/14/21	
<b>Perfluoroalkyl Sulfonamido Substances</b>							
Perfluorooctane sulfonamide (FOSA)	ND U	0.71	0.067	1	04/21/21 17:01	4/14/21	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	0.71	0.073	1	04/21/21 17:01	4/14/21	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	0.71	0.11	1	04/21/21 17:01	4/14/21	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	0.71	0.054	1	04/21/21 17:01	4/14/21	*
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	0.71	0.088	1	04/21/21 17:01	4/14/21	*
N-Methyl perfluorooctane sulfonamidoacetic acid	ND U	0.80	0.27	1	04/21/21 17:01	4/14/21	
N-Ethyl perfluorooctane sulfonamidoacetic acid	ND U	0.71	0.20	1	04/21/21 17:01	4/14/21	
<b>n:2 Fluorotelomer Sulfonic Acids (n:2 FTSAs)</b>							
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND U	0.71	0.088	1	04/21/21 17:01	4/14/21	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	0.71	0.15	1	04/21/21 17:01	4/14/21	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	0.71	0.029	1	04/21/21 17:01	4/14/21	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND U	0.71	0.036	1	04/21/21 17:01	4/14/21	



**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** 04/12/21  
**Date Received:** 04/16/21 09:50

**Sample Name:** Vertex Dual-Fiber 2.25"  
**Lab Code:** K2104028-001

**Units:** ng/g  
**Basis:** As Received

**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

Analyte Name	Result	LOQ	MDL	Dil.	Date Analyzed	Date Extracted	Q
<b>Perfluoroalkyl Ether Carboxylic Acids (PFECAs)</b>							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND U	0.71	0.042	1	04/21/21 17:01	4/14/21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C3-PFBS	124	33 - 109	04/21/21 17:01	*
18O2-PFHxS	136	36 - 120	04/21/21 17:01	*
13C4-PFOS	137	32 - 130	04/21/21 17:01	*
13C4-PFBA	168	34 - 116	04/21/21 17:01	*
13C5-PFPeA	156	39 - 133	04/21/21 17:01	*
13C2-PFHxA	166	32 - 136	04/21/21 17:01	*
13C4-PFHpA	145	36 - 133	04/21/21 17:01	*
13C4-PFOA	128	31 - 134	04/21/21 17:01	*
13C5-PFNA	174	27 - 133	04/21/21 17:01	*
13C2-PFDA	169	30 - 137	04/21/21 17:01	*
13C2-PFUnDA	141	32 - 146	04/21/21 17:01	*
13C2-PFDoDA	171	36 - 136	04/21/21 17:01	*
13C2-PFTeDA	185	39 - 138	04/21/21 17:01	*
13C8-FOSA	156	40 - 132	04/21/21 17:01	*
D3-MeFOSA	153	51 - 132	04/21/21 17:01	*
D5-EtFOSA	154	49 - 123	04/21/21 17:01	*
D7-MeFOSE	117	53 - 125	04/21/21 17:01	*
D9-EtFOSE	90	45 - 121	04/21/21 17:01	*
D3-MeFOSAA	212	20 - 154	04/21/21 17:01	*
D5-EtFOSAA	162	29 - 153	04/21/21 17:01	*
13C2-4:2 FTS	129	18 - 127	04/21/21 17:01	*
13C2-6:2 FTS	292	30 - 140	04/21/21 17:01	*
13C2-8:2 FTS	234	9 - 171	04/21/21 17:01	*
13C3-HFPO-DA	162	33 - 130	04/21/21 17:01	*

Analytical Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Batch QC  
**Lab Code:** K2103455-002

**Units:** ng/g  
**Basis:** As Received

**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

Analyte Name	Result	LOQ	MDL	Dil.	Date Analyzed	Date Extracted	Q
<b>Perfluoroalkyl Sulfonic Acids (PFASs)</b>							
Perfluorobutane sulfonic acid (PFBS)	ND U	0.97	0.22	1	04/21/21 16:50	4/14/21	
Perfluoropentane sulfonic acid (PFPeS)	ND U	0.97	0.17	1	04/21/21 16:50	4/14/21	
Perfluorohexane sulfonic acid (PFHxS)	ND U	0.97	0.30	1	04/21/21 16:50	4/14/21	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	0.97	0.062	1	04/21/21 16:50	4/14/21	
Perfluorooctane sulfonic acid (PFOS)	<b>0.17 J</b>	0.97	0.13	1	04/21/21 16:50	4/14/21	
Perfluorononane sulfonic acid (PFNS)	ND U	0.97	0.16	1	04/21/21 16:50	4/14/21	
Perfluorodecane sulfonic acid (PFDS)	ND U	0.97	0.17	1	04/21/21 16:50	4/14/21	
<b>Perfluoroalkyl Carboxylic Acids (PFCAs)</b>							
Perfluorobutanoic acid (PFBA)	ND U	0.97	0.39	1	04/21/21 16:50	4/14/21	
Perfluoropentanoic acid (PFPeA)	ND U	0.97	0.21	1	04/21/21 16:50	4/14/21	
Perfluorohexanoic acid (PFHxA)	<b>0.35 J</b>	0.97	0.31	1	04/21/21 16:50	4/14/21	
Perfluoroheptanoic acid (PFHpA)	ND U	0.97	0.19	1	04/21/21 16:50	4/14/21	
Perfluorooctanoic acid (PFOA)	<b>0.16 J</b>	0.97	0.13	1	04/21/21 16:50	4/14/21	
Perfluorononanoic acid (PFNA)	ND U	0.97	0.33	1	04/21/21 16:50	4/14/21	
Perfluorodecanoic acid (PFDA)	ND U	0.97	0.26	1	04/21/21 16:50	4/14/21	
Perfluoroundecanoic acid (PFUnDA)	ND U	0.97	0.18	1	04/21/21 16:50	4/14/21	
Perfluorododecanoic acid (PFDoDA)	ND U	0.97	0.27	1	04/21/21 16:50	4/14/21	
Perfluorotridecanoic acid (PFTriDA)	ND U	0.97	0.21	1	04/21/21 16:50	4/14/21	
Perfluorotetradecanoic acid (PFTeDA)	ND U	0.97	0.18	1	04/21/21 16:50	4/14/21	
<b>Perfluoroalkyl Sulfonamido Substances</b>							
Perfluorooctane sulfonamide (FOSA)	<b>0.50 J</b>	0.97	0.067	1	04/21/21 16:50	4/14/21	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	<b>0.30 J</b>	0.97	0.073	1	04/21/21 16:50	4/14/21	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	0.97	0.11	1	04/21/21 16:50	4/14/21	
N-Methyl perfluorooctane sulfonamidoethanol	<b>2.0</b>	0.97	0.054	1	04/21/21 16:50	4/14/21	
N-Ethyl perfluorooctane sulfonamidoethanol	<b>0.13 J</b>	0.97	0.088	1	04/21/21 16:50	4/14/21	
N-Methyl perfluorooctane sulfonamidoacetic acid	ND U	0.97	0.27	1	04/21/21 16:50	4/14/21	
N-Ethyl perfluorooctane sulfonamidoacetic acid	ND U	0.97	0.20	1	04/21/21 16:50	4/14/21	
<b>n:2 Fluorotelomer Sulfonic Acids (n:2 FTSAs)</b>							
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND U	0.97	0.088	1	04/21/21 16:50	4/14/21	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	0.97	0.15	1	04/21/21 16:50	4/14/21	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	0.97	0.029	1	04/21/21 16:50	4/14/21	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND U	0.97	0.036	1	04/21/21 16:50	4/14/21	

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Batch QC  
**Lab Code:** K2103455-002

**Units:** ng/g  
**Basis:** As Received

**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

Analyte Name	Result	LOQ	MDL	Dil.	Date Analyzed	Date Extracted	Q
<b>Perfluoroalkyl Ether Carboxylic Acids (PFECAs)</b>							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND U	0.97	0.042	1	04/21/21 16:50	4/14/21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C3-PFBS	55	33 - 109	04/21/21 16:50	
18O2-PFHxS	69	36 - 120	04/21/21 16:50	
13C4-PFOS	68	32 - 130	04/21/21 16:50	
13C4-PFBA	88	34 - 116	04/21/21 16:50	
13C5-PFPeA	68	39 - 133	04/21/21 16:50	
13C2-PFHxA	83	32 - 136	04/21/21 16:50	
13C4-PFHpA	78	36 - 133	04/21/21 16:50	
13C4-PFOA	78	31 - 134	04/21/21 16:50	
13C5-PFNA	94	27 - 133	04/21/21 16:50	
13C2-PFDA	88	30 - 137	04/21/21 16:50	
13C2-PFUnDA	101	32 - 146	04/21/21 16:50	
13C2-PFDoDA	88	36 - 136	04/21/21 16:50	
13C2-PFTeDA	71	39 - 138	04/21/21 16:50	
13C8-FOSA	81	40 - 132	04/21/21 16:50	
D3-MeFOSA	79	51 - 132	04/21/21 16:50	
D5-EtFOSA	75	49 - 123	04/21/21 16:50	
D7-MeFOSE	53	53 - 125	04/21/21 16:50	
D9-EtFOSE	59	45 - 121	04/21/21 16:50	
D3-MeFOSAA	98	20 - 154	04/21/21 16:50	
D5-EtFOSAA	97	29 - 153	04/21/21 16:50	
13C2-4:2 FTS	92	18 - 127	04/21/21 16:50	
13C2-6:2 FTS	151	30 - 140	04/21/21 16:50	*
13C2-8:2 FTS	96	9 - 171	04/21/21 16:50	
13C3-HFPO-DA	73	33 - 130	04/21/21 16:50	

Analytical Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2106020-04

**Units:** ng/g  
**Basis:** As Received

**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

Analyte Name	Result	LOQ	MDL	Dil.	Date Analyzed	Date Extracted	Q
<b>Perfluoroalkyl Sulfonic Acids (PFASs)</b>							
Perfluorobutane sulfonic acid (PFBS)	ND U	1.0	0.22	1	04/21/21 16:18	4/14/21	
Perfluoropentane sulfonic acid (PFPeS)	ND U	1.0	0.17	1	04/21/21 16:18	4/14/21	
Perfluorohexane sulfonic acid (PFHxS)	ND U	1.0	0.30	1	04/21/21 16:18	4/14/21	
Perfluoroheptane sulfonic acid (PFHpS)	ND U	1.0	0.062	1	04/21/21 16:18	4/14/21	
Perfluorooctane sulfonic acid (PFOS)	ND U	1.0	0.13	1	04/21/21 16:18	4/14/21	
Perfluorononane sulfonic acid (PFNS)	ND U	1.0	0.16	1	04/21/21 16:18	4/14/21	
Perfluorodecane sulfonic acid (PFDS)	ND U	1.0	0.17	1	04/21/21 16:18	4/14/21	
<b>Perfluoroalkyl Carboxylic Acids (PFCAs)</b>							
Perfluorobutanoic acid (PFBA)	ND U	1.0	0.39	1	04/21/21 16:18	4/14/21	
Perfluoropentanoic acid (PFPeA)	ND U	1.0	0.21	1	04/21/21 16:18	4/14/21	
Perfluorohexanoic acid (PFHxA)	ND U	1.0	0.31	1	04/21/21 16:18	4/14/21	
Perfluoroheptanoic acid (PFHpA)	ND U	1.0	0.19	1	04/21/21 16:18	4/14/21	
Perfluorooctanoic acid (PFOA)	ND U	1.0	0.13	1	04/21/21 16:18	4/14/21	
Perfluorononanoic acid (PFNA)	ND U	1.0	0.33	1	04/21/21 16:18	4/14/21	
Perfluorodecanoic acid (PFDA)	ND U	1.0	0.26	1	04/21/21 16:18	4/14/21	
Perfluoroundecanoic acid (PFUnDA)	ND U	1.0	0.18	1	04/21/21 16:18	4/14/21	
Perfluorododecanoic acid (PFDoDA)	ND U	1.0	0.27	1	04/21/21 16:18	4/14/21	
Perfluorotridecanoic acid (PFTriDA)	ND U	1.0	0.21	1	04/21/21 16:18	4/14/21	
Perfluorotetradecanoic acid (PFTeDA)	ND U	1.0	0.18	1	04/21/21 16:18	4/14/21	
<b>Perfluoroalkyl Sulfonamido Substances</b>							
Perfluorooctane sulfonamide (FOSA)	ND U	1.0	0.067	1	04/21/21 16:18	4/14/21	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ND U	1.0	0.073	1	04/21/21 16:18	4/14/21	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	1.0	0.11	1	04/21/21 16:18	4/14/21	
N-Methyl perfluorooctane sulfonamidoethanol	ND U	1.0	0.054	1	04/21/21 16:18	4/14/21	
N-Ethyl perfluorooctane sulfonamidoethanol	ND U	1.0	0.088	1	04/21/21 16:18	4/14/21	
N-Methyl perfluorooctane sulfonamidoacetic acid	ND U	1.0	0.27	1	04/21/21 16:18	4/14/21	
N-Ethyl perfluorooctane sulfonamidoacetic acid	ND U	1.0	0.20	1	04/21/21 16:18	4/14/21	
<b>n:2 Fluorotelomer Sulfonic Acids (n:2 FTSAs)</b>							
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND U	1.0	0.088	1	04/21/21 16:18	4/14/21	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	1.0	0.15	1	04/21/21 16:18	4/14/21	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	1.0	0.029	1	04/21/21 16:18	4/14/21	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND U	1.0	0.036	1	04/21/21 16:18	4/14/21	



**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2106020-04

**Units:** ng/g  
**Basis:** As Received

**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

Analyte Name	Result	LOQ	MDL	Dil.	Date Analyzed	Date Extracted	Q
<b>Perfluoroalkyl Ether Carboxylic Acids (PFECAs)</b>							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND U	1.0	0.042	1	04/21/21 16:18	4/14/21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
13C3-PFBS	108	33 - 109	04/21/21 16:18	
18O2-PFHxS	155	36 - 120	04/21/21 16:18	*
13C4-PFOS	139	32 - 130	04/21/21 16:18	*
13C4-PFBA	140	34 - 116	04/21/21 16:18	*
13C5-PFPeA	123	39 - 133	04/21/21 16:18	
13C2-PFHxA	150	32 - 136	04/21/21 16:18	*
13C4-PFHpA	164	36 - 133	04/21/21 16:18	*
13C4-PFOA	144	31 - 134	04/21/21 16:18	*
13C5-PFNA	144	27 - 133	04/21/21 16:18	*
13C2-PFDA	142	30 - 137	04/21/21 16:18	*
13C2-PFUnDA	141	32 - 146	04/21/21 16:18	
13C2-PFDoDA	133	36 - 136	04/21/21 16:18	
13C2-PFTeDA	124	39 - 138	04/21/21 16:18	
13C8-FOSA	149	40 - 132	04/21/21 16:18	*
D3-MeFOSA	149	51 - 132	04/21/21 16:18	*
D5-EtFOSA	144	49 - 123	04/21/21 16:18	*
D7-MeFOSE	111	53 - 125	04/21/21 16:18	
D9-EtFOSE	115	45 - 121	04/21/21 16:18	
D3-MeFOSAA	145	20 - 154	04/21/21 16:18	
D5-EtFOSAA	120	29 - 153	04/21/21 16:18	
13C2-4:2 FTS	113	18 - 127	04/21/21 16:18	
13C2-6:2 FTS	135	30 - 140	04/21/21 16:18	
13C2-8:2 FTS	147	9 - 171	04/21/21 16:18	
13C3-HFPO-DA	156	33 - 130	04/21/21 16:18	*

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028

**SURROGATE RECOVERY SUMMARY**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Extraction Method:** ALS SOP

Surrogate	Control Limits	Batch QC	Vertex Dual-Fiber 2.25"	Method Blank
		K2103455-002	K2104028-001	KQ2106020-04
13C3-PFBS	33-109	55	124*	108
18O2-PFHxS	36-120	69	136*	155*
13C4-PFOS	32-130	68	137*	139*
13C4-PFBA	34-116	88	168*	140*
13C5-PFPeA	39-133	68	156*	123
13C2-PFHxA	32-136	83	166*	150*
13C4-PFHpA	36-133	78	145*	164*
13C4-PFOA	31-134	78	128	144*
13C5-PFNA	27-133	94	174*	144*
13C2-PFDA	30-137	88	169*	142*
13C2-PFUnDA	32-146	101	141	141
13C2-PFDoDA	36-136	88	171*	133
13C2-PFTeDA	39-138	71	185*	124
13C8-FOSA	40-132	81	156*	149*
D3-MeFOSA	51-132	79	153*	149*
D5-EtFOSA	49-123	75	154*	144*
D7-MeFOSE	53-125	53	117	111
D9-EtFOSE	45-121	59	90	115
D3-MeFOSAA	20-154	98	212*	145
D5-EtFOSAA	29-153	97	162*	120
13C2-4:2 FTS	18-127	92	129*	113
13C2-6:2 FTS	30-140	151*	292*	135
13C2-8:2 FTS	9-171	96	234*	147
13C3-HFPO-DA	33-130	73	162*	156*

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not acceptable.

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028

**SURROGATE RECOVERY SUMMARY**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Extraction Method:** ALS SOP

Surrogate	Control Limits	Lab Control Sample	Batch QC	Batch QC
		KQ2106020-03	KQ2106020-01	KQ2106020-02
13C3-PFBS	33-109	98	77	83
18O2-PFHxS	36-120	120	105	105
13C4-PFOS	32-130	125	88	95
13C4-PFBA	34-116	125*	114	119*
13C5-PFPeA	39-133	108	93	103
13C2-PFHxA	32-136	140*	121	116
13C4-PFHpA	36-133	116	107	130
13C4-PFOA	31-134	133	98	104
13C5-PFNA	27-133	131	116	127
13C2-PFDA	30-137	129	107	116
13C2-PFUnDA	32-146	122	122	137
13C2-PFDoDA	36-136	128	115	123
13C2-PFTeDA	39-138	112	99	119
13C8-FOSA	40-132	129	103	119
D3-MeFOSA	51-132	131	108	117
D5-EtFOSA	49-123	132*	104	108
D7-MeFOSE	53-125	102	73	78
D9-EtFOSE	45-121	108	83	83
D3-MeFOSAA	20-154	120	139	172*
D5-EtFOSAA	29-153	115	139	160*
13C2-4:2 FTS	18-127	88	101	126
13C2-6:2 FTS	30-140	122	230*	244*
13C2-8:2 FTS	9-171	126	127	151
13C3-HFPO-DA	33-130	140*	112	117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not acceptable.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029

**Service Request:** K2104028  
**Date Analyzed:** 04/21/21 12:23

**Internal Standard Area and RT SUMMARY**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**File ID:** J:\LCMS06\Data\210421\_B2\210421\_019  
**Instrument ID:** K-LCMS-06  
**Analysis Method:** PFC/537M

**Lab Code:** KQ2106600-01  
**Analysis Lot:** 720740  
**Signal ID:** 1

	13C7-PFUnDA	
	Area	RT
<b>Result ==&gt;</b>	7,085,487	5.105
<b>Upper Limit ==&gt;</b>	14,170,974	6.11
<b>Lower Limit ==&gt;</b>	3,542,744	4.11

**Associated Analyses**

Continuing Calibration Blank	KQ2106600-02	4916347	5.114
Method Blank	KQ2106020-04	4020283	5.111
Lab Control Sample	KQ2106020-03	4299893	5.107
Batch QC	K2103455-002	7585589	5.111
Vertex Dual-Fiber 2.25"	K2104028-001	3772273	5.109
Batch QCMS	KQ2106020-01	5605412	5.115
Batch QCDMS	KQ2106020-02	5328311	5.112



**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** N/A  
**Date Received:** N/A  
**Date Analyzed:** 04/21/21  
**Date Extracted:** 04/14/21

**Duplicate Matrix Spike Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Sample Name:** Batch QC  
**Lab Code:** K2103455-002  
**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

**Units:** ng/g  
**Basis:** As Received

Analyte Name	Sample Result	Matrix Spike KQ2106020-01			Duplicate Matrix Spike KQ2106020-02			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Perfluorobutane sulfonic acid (PFBS)	ND U	7.45	6.49	115	7.11	6.19	115	48-148	5	50
Perfluoropentane sulfonic acid (PFPeS)	ND U	8.59	6.89	125	9.07	6.57	138	81-165	5	50
Perfluorohexane sulfonic acid (PFHxS)	ND U	6.77	6.68	101	7.65	6.37	120	75-142	12	50
Perfluoroheptane sulfonic acid (PFHpS)	ND U	6.64	6.98	95	6.80	6.66	102	69-173	2	50
Perfluorooctane sulfonic acid (PFOS)	0.17 J	7.74	6.80	111	7.05	6.49	106	72-141	9	50
Perfluorononane sulfonic acid (PFNS)	ND U	8.68	7.04	123	7.87	6.71	117	64-152	10	50
Perfluorodecane sulfonic acid (PFDS)	ND U	8.57	7.06	121	7.43	6.73	110	83-152	14	50
Perfluorobutanoic acid (PFBA)	ND U	8.34	7.32	114	8.35	6.98	120	29-179	<1	50
Perfluoropentanoic acid (PFPeA)	ND U	8.01	7.32	109	7.57	6.98	108	64-131	6	50
Perfluorohexanoic acid (PFHxA)	0.35 J	7.43	7.32	97	7.27	6.98	99	68-148	2	50
Perfluoroheptanoic acid (PFHpA)	ND U	8.50	7.32	116	7.73	6.98	111	73-136	9	50
Perfluorooctanoic acid (PFOA)	0.16 J	7.56	7.32	101	7.26	6.98	102	77-151	4	50
Perfluorononanoic acid (PFNA)	ND U	8.39	7.32	115	8.37	6.98	120	63-160	<1	50
Perfluorodecanoic acid (PFDA)	ND U	7.74	7.32	106	7.58	6.98	109	73-142	2	50
Perfluoroundecanoic acid (PFUnDA)	ND U	7.89	7.32	108	7.49	6.98	107	69-147	5	50
Perfluorododecanoic acid (PFDoDA)	ND U	8.61	7.32	118	8.49	6.98	122	69-150	1	50
Perfluorotridecanoic acid (PFTrDA)	ND U	8.11	7.32	111	6.65	6.98	95	63-134	20	50
Perfluorotetradecanoic acid (PFTeDA)	ND U	8.39	7.32	115	7.96	6.98	114	70-143	5	50
Perfluorooctane sulfonamide (FOSA)	0.50 J	7.92	7.32	101	7.38	6.98	99	63-138	7	50
N-Methyl perfluorooctane sulfonamide (MeFOSA)	0.30 J	8.01	7.32	105	7.92	6.98	109	75-136	1	50
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	ND U	7.56	7.32	103	7.18	6.98	103	72-142	5	50
N-Methyl perfluorooctane sulfonamidoethanol	2.0	11.7	7.32	132	12.0	6.98	143 *	62-141	3	50
N-Ethyl perfluorooctane sulfonamidoethanol	0.13 J	10.5	7.32	141 *	9.97	6.98	141 *	70-137	5	50
N-Methyl perfluorooctane sulfonamidoacetic acid	ND U	7.89	7.32	108	7.37	6.98	106	69-162	7	50
N-Ethyl perfluorooctane sulfonamidoacetic acid	ND U	8.76	7.32	120	7.62	6.98	109	57-159	14	50

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Collected:** N/A  
**Date Received:** N/A  
**Date Analyzed:** 04/21/21  
**Date Extracted:** 04/14/21

**Duplicate Matrix Spike Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Sample Name:** Batch QC  
**Lab Code:** K2103455-002  
**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

**Units:** ng/g  
**Basis:** As Received

Analyte Name	Sample Result	Matrix Spike KQ2106020-01			Duplicate Matrix Spike KQ2106020-02			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND U	7.91	6.86	115	7.51	6.54	115	10-182	5	50
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ND U	8.23	6.96	118	8.05	6.64	121	69-147	2	50
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND U	7.37	7.03	105	7.36	6.70	110	66-141	<1	50
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND U	7.26	7.07	103	6.80	6.74	101	66-152	7	50
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND U	7.11	7.32	97	6.40	6.98	92	62-138	10	50

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Analyzed:** 04/21/21  
**Date Extracted:** 04/14/21

**Lab Control Sample Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**Prep Method:** ALS SOP

**Units:** ng/g  
**Basis:** As Received  
**Analysis Lot:** 720740

**Lab Control Sample**  
**KQ2106020-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	9.02	7.73	117	66-152
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	10.2	7.50	137	10-182
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	10.2	7.61	134	69-147
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10.0	7.68	130	66-141
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.91	8.00	111	62-138
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	9.48	8.00	118	72-142
N-Ethyl perfluorooctane sulfonamidoacetic acid	9.90	8.00	124	57-159
N-Ethyl perfluorooctane sulfonamidoethanol	11.2	8.00	140 *	70-137
N-Methyl perfluorooctane sulfonamide (MeFOSA)	9.81	8.00	123	75-136
N-Methyl perfluorooctane sulfonamidoacetic acid	11.7	8.00	147	69-162
N-Methyl perfluorooctane sulfonamidoethanol	12.6	8.00	157 *	62-141
Perfluorobutane sulfonic acid (PFBS)	9.22	7.10	130	48-148
Perfluorobutanoic acid (PFBA)	10.3	8.00	129	29-179
Perfluorodecane sulfonic acid (PFDS)	9.72	7.72	126	83-152
Perfluorodecanoic acid (PFDA)	9.69	8.00	121	73-142
Perfluorododecanoic acid (PFDoDA)	11.0	8.00	137	69-150
Perfluoroheptane sulfonic acid (PFHpS)	10.9	7.63	143	69-173
Perfluoroheptanoic acid (PFHpA)	9.55	8.00	119	73-136
Perfluorohexane sulfonic acid (PFHxS)	9.40	7.30	129	75-142
Perfluorohexanoic acid (PFHxA)	9.15	8.00	114	68-148
Perfluorononane sulfonic acid (PFNS)	10.2	7.69	132	64-152
Perfluorononanoic acid (PFNA)	10.5	8.00	131	63-160
Perfluorooctane sulfonamide (FOSA)	9.11	8.00	114	63-138
Perfluorooctane sulfonic acid (PFOS)	9.18	7.43	124	72-141
Perfluorooctanoic acid (PFOA)	9.32	8.00	117	77-151
Perfluoropentane sulfonic acid (PFPeS)	9.95	7.53	132	81-165
Perfluoropentanoic acid (PFPeA)	10.0	8.00	125	64-131
Perfluorotetradecanoic acid (PFTeDA)	10.9	8.00	136	70-143
Perfluorotridecanoic acid (PFTrDA)	11.1	8.00	139 *	63-134
Perfluoroundecanoic acid (PFUnDA)	10.4	8.00	130	69-147





**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:** K2104028  
**Date Analyzed:** 04/21/21 16:29  
**Date Extracted:** 04/14/21

**Lab Control Sample Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Sample Name:** Lab Control Sample      **Instrument ID:** K-LCMS-06  
**Lab Code:** KQ2106020-03      **File ID:** J:\LCMS06\Data\210421\_B2\210421\_028  
**Analysis Method:** PFC/537M      **Analysis Lot:** 720740  
**Prep Method:** ALS SOP      **Extraction Lot:** 377476

This Lab Control Sample applies to the following analyses.

<b>Sample Name</b>	<b>Lab Code</b>	<b>File ID</b>	<b>Date Analyzed</b>
Method Blank	KQ2106020-04	J:\LCMS06\Data\210421_B2\210421_027	04/21/21 16:18
Batch QC	K2103455-002	J:\LCMS06\Data\210421_B2\210421_030	04/21/21 16:50
Vertex Dual-Fiber 2.25"	K2104028-001	J:\LCMS06\Data\210421_B2\210421_031	04/21/21 17:01
Batch QCMS	KQ2106020-01	J:\LCMS06\Data\210421_B2\210421_032	04/21/21 17:11
Batch QCDMS	KQ2106020-02	J:\LCMS06\Data\210421_B2\210421_033	04/21/21 17:22

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth

**Service Request:** K2104028  
**Calibration Date:** 4/13/2021

**Initial Calibration Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Calibration ID:** KC2100210  
**Instrument ID:** K-LCMS-06

**Signal ID:** 1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC2100210-01	PFC ICAL 0.05 PPB	210413_033	04/13/2021 17:29
02	KC2100210-02	PFC ICAL 0.1 PPB	210413_034	04/13/2021 17:39
03	KC2100210-03	PFC ICAL 0.5 PPB	210413_035	04/13/2021 17:50
04	KC2100210-04	PFC ICAL 1.0 PPB	210413_036	04/13/2021 18:00
05	KC2100210-05	PFC ICAL 5.0 PPB	210413_037	04/13/2021 18:11
06	KC2100210-06	PFC ICAL 10 PPB	210413_038	04/13/2021 18:21
07	KC2100210-07	PFC ICAL 15 PPB	210413_040	04/13/2021 18:42

**Analyte**

**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0483	0.7435	02	0.0966	0.6864	03	0.4831	0.7099	04	0.9662	0.6872
05	4.8310	0.6691	06	9.6619	0.691	07	14.4929	0.6179			

**13C2-4:2 FTS**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.1802	02	5.0000	0.201	03	5.0000	0.1874	04	5.0000	0.1662
05	5.0000	0.1931	06	5.0000	0.2015	07	5.0000	0.2108			

**13C2-6:2 FTS**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.1052	02	5.0000	0.1102	03	5.0000	0.1039	04	5.0000	0.1015
05	5.0000	0.09598	06	5.0000	0.1007	07	5.0000	0.102			

**13C2-8:2 FTS**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.04943	02	5.0000	0.05113	03	5.0000	0.05005	04	5.0000	0.04881
05	5.0000	0.05053	06	5.0000	0.04997	07	5.0000	0.05351			

**13C2-PFDA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.588	02	5.0000	0.5832	03	5.0000	0.5558	04	5.0000	0.543
05	5.0000	0.5462	06	5.0000	0.5348	07	5.0000	0.5423			

**13C2-PFDoDA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.7947	02	5.0000	0.7333	03	5.0000	0.7126	04	5.0000	0.694
05	5.0000	0.7093	06	5.0000	0.7457	07	5.0000	0.7416			

**13C2-PFHxA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	1.205	02	5.0000	1.147	03	5.0000	1.074	04	5.0000	1.107
05	5.0000	1.079	06	5.0000	1.076	07	5.0000	1.14			

**13C2-PFTeDA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.4957	02	5.0000	0.4937	03	5.0000	0.4703	04	5.0000	0.453

Client: David Teter Consulting, LLC  
Project: City of Portsmouth

Service Request: K2104028  
Calibration Date: 4/13/2021

**Initial Calibration Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

Calibration ID: KC2100210  
Instrument ID: K-LCMS-06

Signal ID: 1

**Analyte**

**13C2-PFTeDA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
05	5.0000	0.4694	06	5.0000	0.4795	07	5.0000	0.4904			

**13C2-PFUnDA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.6979	02	5.0000	0.7147	03	5.0000	0.6777	04	5.0000	0.6613
05	5.0000	0.6796	06	5.0000	0.6691	07	5.0000	0.6758			

**13C3-HFPO-DA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.3294	02	5.0000	0.3531	03	5.0000	0.3308	04	5.0000	0.2896
05	5.0000	0.3237	06	5.0000	0.3303	07	5.0000	0.3711			

**13C3-PFBS**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.178	02	5.0000	0.169	03	5.0000	0.1603	04	5.0000	0.1519
05	5.0000	0.1575	06	5.0000	0.1602	07	5.0000	0.1829			

**13C4-PFBA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.6378	02	5.0000	0.6214	03	5.0000	0.5833	04	5.0000	0.5422
05	5.0000	0.507	06	5.0000	0.5223	07	5.0000	0.6645			

**13C4-PFHpA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	1.091	02	5.0000	1.18	03	5.0000	1.069	04	5.0000	1.072
05	5.0000	1.068	06	5.0000	1.079	07	5.0000	1.075			

**13C4-PFOA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	1.065	02	5.0000	1.055	03	5.0000	0.9767	04	5.0000	0.9955
05	5.0000	0.9823	06	5.0000	0.9802	07	5.0000	0.98			

**13C4-PFOS**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.1291	02	5.0000	0.1257	03	5.0000	0.1181	04	5.0000	0.1135
05	5.0000	0.1149	06	5.0000	0.1174	07	5.0000	0.1381			

**13C5-PFNA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.8256	02	5.0000	0.9096	03	5.0000	0.8556	04	5.0000	0.7766
05	5.0000	0.8343	06	5.0000	0.8277	07	5.0000	0.8774			

**13C5-PFPeA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.5452	02	5.0000	0.5346	03	5.0000	0.5039	04	5.0000	0.4761
05	5.0000	0.4897	06	5.0000	0.5083	07	5.0000	0.5604			

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth

**Service Request:** K2104028  
**Calibration Date:** 4/13/2021

**Initial Calibration Summary**  
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**13C8-FOSA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.3984	02	5.0000	0.3799	03	5.0000	0.3583	04	5.0000	0.3497
05	5.0000	0.3649	06	5.0000	0.3698	07	5.0000	0.4226			

**18O2-PFHxS**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.08888	02	5.0000	0.08067	03	5.0000	0.07449	04	5.0000	0.08903
05	5.0000	0.07771	06	5.0000	0.08078	07	5.0000	0.08342			

**4:2 Fluorotelomer sulfonic acid (4:2 FTS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	0.0937	1.189	03	0.4686	1.205	04	0.9372	1.09	05	4.6861	1.077
06	9.3722	0.9911	07	14.0583	0.9884						

**6:2 Fluorotelomer sulfonic acid (6:2 FTS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0476	1.452	02	0.0951	1.2	03	0.4756	1.269	04	0.9512	1.243
05	4.7558	1.227	06	9.5117	1.101	07	14.2676	1.069			

**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0480	1.324	02	0.0960	1.262	03	0.4800	1.204	04	0.9600	1.216
05	4.8002	1.151	06	9.6005	1.111	07	14.4007	0.978			

**D3-MeFOSA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.09721	02	5.0000	0.09816	03	5.0000	0.09207	04	5.0000	0.08712
05	5.0000	0.08672	06	5.0000	0.091	07	5.0000	0.1048			

**D3-MeFOSAA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.06419	02	5.0000	0.06104	03	5.0000	0.05839	04	5.0000	0.05437
05	5.0000	0.05783	06	5.0000	0.06218	07	5.0000	0.06564			

**D5-EtFOSA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.1304	02	5.0000	0.1281	03	5.0000	0.1212	04	5.0000	0.1129
05	5.0000	0.1148	06	5.0000	0.1188	07	5.0000	0.1354			

**D5-EtFOSAA**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.06443	02	5.0000	0.06172	03	5.0000	0.05561	04	5.0000	0.05467
05	5.0000	0.05973	06	5.0000	0.05905	07	5.0000	0.06075			

**D7-MeFOSE**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.09235	02	5.0000	0.08918	03	5.0000	0.0859	04	5.0000	0.08089
05	5.0000	0.08031	06	5.0000	0.08389	07	5.0000	0.09626			



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**Initial Calibration Summary**  
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**Calibration ID:** KC2100210  
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**Analyte**

<b>D9-EtFOSE</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5.0000	0.1013	02	5.0000	0.09835	03	5.0000	0.09294	04	5.0000	0.09012
05	5.0000	0.09064	06	5.0000	0.09588	07	5.0000	0.1071			

<b>Hexafluoropropylene oxide dimer acid (HFPO-DA)</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	0.8765	02	0.1000	0.9081	03	0.5000	0.8724	04	1.0000	0.8981
05	5.0000	0.843	06	10.0000	0.843	07	15.0000	0.8207			

<b>N-Ethyl perfluorooctane sulfonamide (EtFOSA)</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	0.3506	02	0.1000	0.3618	03	0.5000	0.2542	04	1.0000	0.245
05	5.0000	0.2488	06	10.0000	0.2462	07	15.0000	0.2407			

<b>N-Ethyl perfluorooctane sulfonamidoacetic acid</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	0.1000	1.042	03	0.5000	0.8381	04	1.0000	0.8407	05	5.0000	0.7983
06	10.0000	0.8108	07	15.0000	0.8323						

<b>N-Ethyl perfluorooctane sulfonamidoethanol</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	2.59	02	0.1000	2.404	03	0.5000	2.351	04	1.0000	2.205
05	5.0000	2.206	06	10.0000	2.163	07	15.0000	2.138			

<b>N-Methyl perfluorooctane sulfonamide (MeFOSA)</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.659	02	0.1000	1.457	03	0.5000	1.558	04	1.0000	1.553
05	5.0000	1.56	06	10.0000	1.534	07	15.0000	1.502			

<b>N-Methyl perfluorooctane sulfonamidoacetic acid</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	0.1000	0.5718	03	0.5000	0.8772	04	1.0000	0.8484	05	5.0000	0.9702
06	10.0000	0.8665	07	15.0000	0.8681						

<b>N-Methyl perfluorooctane sulfonamidoethanol</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	2.311	02	0.1000	2.401	03	0.5000	2.394	04	1.0000	2.335
05	5.0000	2.384	06	10.0000	2.322	07	15.0000	2.233			

<b>Perfluorobutane sulfonic acid (PFBS)</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0444	1.568	02	0.0887	1.536	03	0.4437	1.434	04	0.8874	1.379
05	4.4369	1.346	06	8.8737	1.385	07	13.3106	1.348			

<b>Perfluorobutanoic acid (PFBA)</b>											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.121	02	0.1000	1.149	03	0.5000	1.094	04	1.0000	1.017
05	5.0000	1.053	06	10.0000	1.066	07	15.0000	1.054			

**Client:** David Teter Consulting, LLC  
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**Service Request:** K2104028  
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**Initial Calibration Summary**  
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**Analyte**

**Perfluorodecane sulfonic acid (PFDS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0482	1.081	02	0.0965	1.059	03	0.4823	1.025	04	0.9647	0.9853
05	4.8233	1.006	06	9.6467	1.001	07	14.4700	0.9287			

**Perfluorodecanoic acid (PFDA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.297	02	0.1000	1.287	03	0.5000	1.251	04	1.0000	1.221
05	5.0000	1.218	06	10.0000	1.252	07	15.0000	1.273			

**Perfluorododecanoic acid (PFDoDA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	0.803	02	0.1000	0.7477	03	0.5000	0.8836	04	1.0000	0.8362
05	5.0000	0.7948	06	10.0000	0.7939	07	15.0000	0.8168			

**Perfluoroheptane sulfonic acid (PFHPS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0477	1.821	02	0.0953	2.258	03	0.4767	2.264	04	0.9534	1.805
05	4.7672	2.11	06	9.5344	2.076	07	14.3016	2.217			

**Perfluoroheptanoic acid (PFHpA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.148	02	0.1000	1.096	03	0.5000	1.024	04	1.0000	0.9104
05	5.0000	0.9179	06	10.0000	0.9606	07	15.0000	0.934			

**Perfluorohexane sulfonic acid (PFHxS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0457	2.431	02	0.0913	2.124	03	0.4565	1.851	04	0.9131	1.515
05	4.5654	1.636	06	9.1308	1.681	07	13.6961	1.64			

**Perfluorohexanoic acid (PFHxA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.188	02	0.1000	1.107	03	0.5000	1.02	04	1.0000	0.958
05	5.0000	0.9792	06	10.0000	1.002	07	15.0000	0.996			

**Perfluorononane sulfonic acid (PFNS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0481	0.5773	02	0.0962	0.844	03	0.4808	0.7593	04	0.9616	0.7327
05	4.8079	0.7379	06	9.6158	0.7424	07	14.4237	0.6713			

**Perfluorononanoic acid (PFNA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.076	02	0.1000	1.038	03	0.5000	1.035	04	1.0000	0.9972
05	5.0000	0.9559	06	10.0000	0.9979	07	15.0000	0.9656			

**Perfluorooctane sulfonamide (FOSA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.263	02	0.1000	1.323	03	0.5000	1.3	04	1.0000	1.281
05	5.0000	1.291	06	10.0000	1.281	07	15.0000	1.263			

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**Analyte**

**Perfluorooctane sulfonic acid (PFOS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0465	0.9221	02	0.0929	0.8411	03	0.4646	0.8665	04	0.9292	0.7975
05	4.6461	0.7976	06	9.2923	0.8084	07	13.9385	0.7662			

**Perfluorooctanoic acid (PFOA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.423	02	0.1000	1.321	03	0.5000	1.327	04	1.0000	1.258
05	5.0000	1.315	06	10.0000	1.354	07	15.0000	1.35			

**Perfluoropentane sulfonic acid (PFPeS)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0470	0.7238	02	0.0941	0.6451	03	0.4705	0.6718	04	0.9409	0.6543
05	4.7046	0.6454	06	9.4092	0.6734	07	14.1138	0.6456			

**Perfluoropentanoic acid (PFPeA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	3.138	02	0.1000	2.652	03	0.5000	2.185	04	1.0000	2.048
05	5.0000	2.021	06	10.0000	2.035	07	15.0000	2.039			

**Perfluorotetradecanoic acid (PFTeDA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.289	02	0.1000	1.202	03	0.5000	1.091	04	1.0000	1.051
05	5.0000	1.059	06	10.0000	1.068	07	15.0000	1.051			

**Perfluorotridecanoic acid (PFTrDA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.258	02	0.1000	1.288	03	0.5000	1.343	04	1.0000	1.332
05	5.0000	1.271	06	10.0000	1.27	07	15.0000	1.308			

**Perfluoroundecanoic acid (PFUnDA)**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.0500	1.189	02	0.1000	1.137	03	0.5000	1.138	04	1.0000	1.105
05	5.0000	1.114	06	10.0000	1.168	07	15.0000	1.169			

Client: David Teter Consulting, LLC  
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**Initial Calibration Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

Calibration ID: KC2100210  
Instrument ID: K-LCMS-06

Signal ID: 1

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	TRG	Average RF	% RSD	5.6	20	0.6864	
13C2-4:2 FTS	SURR	Average RF	% RSD	7.8	20	0.1915	
13C2-6:2 FTS	SURR	Average RF	% RSD	4.3	20	0.1028	
13C2-8:2 FTS	SURR	Average RF	% RSD	3.0	20	0.05049	
13C2-PFDA	SURR	Average RF	% RSD	3.8	20	0.5562	
13C2-PFDoDA	SURR	Average RF	% RSD	4.5	20	0.733	
13C2-PFHxA	SURR	Average RF	% RSD	4.4	20	1.118	
13C2-PFTeDA	SURR	Average RF	% RSD	3.3	20	0.4789	
13C2-PFUnDA	SURR	Average RF	% RSD	2.7	20	0.6823	
13C3-HFPO-DA	SURR	Average RF	% RSD	7.6	20	0.3326	
13C3-PFBS	SURR	Average RF	% RSD	6.9	20	0.1657	
13C4-PFBA	SURR	Average RF	% RSD	10.5	20	0.5826	
13C4-PFHpA	SURR	Average RF	% RSD	3.7	20	1.091	
13C4-PFOA	SURR	Average RF	% RSD	3.8	20	1.005	
13C4-PFOS	SURR	Average RF	% RSD	7.3	20	0.1224	
13C5-PFNA	SURR	Average RF	% RSD	5.0	20	0.8438	
13C5-PFPeA	SURR	Average RF	% RSD	5.9	20	0.5169	
13C8-FOSA	SURR	Average RF	% RSD	6.7	20	0.3777	
18O2-PFHxS	SURR	Average RF	% RSD	6.6	20	0.08214	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	TRG	Average RF	% RSD	8.5	20	1.09	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	TRG	Average RF	% RSD	10.2	20	1.223	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	TRG	Average RF	% RSD	9.5	20	1.178	
D3-MeFOSA	SURR	Average RF	% RSD	7.0	20	0.09386	
D3-MeFOSAA	SURR	Average RF	% RSD	6.5	20	0.06052	
D5-EtFOSA	SURR	Average RF	% RSD	6.8	20	0.1231	
D5-EtFOSAA	SURR	Average RF	% RSD	5.7	20	0.05942	
D7-MeFOSE	SURR	Average RF	% RSD	6.8	20	0.08697	
D9-EtFOSE	SURR	Average RF	% RSD	6.4	20	0.09662	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	TRG	Average RF	% RSD	3.7	20	0.866	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	TRG	Linear	R2	0.9997	0.99	0.2782	
N-Ethyl perfluorooctane sulfonamidoacetic acid	TRG	Average RF	% RSD	10.5	20	0.8603	



**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth

**Service Request:** K2104028  
**Calibration Date:** 4/13/2021

**Initial Calibration Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Calibration ID:** KC2100210  
**Instrument ID:** K-LCMS-06

**Signal ID:** 1

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
N-Ethyl perfluorooctane sulfonamidoethanol	TRG	Average RF	% RSD	7.1	20	2.294	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	TRG	Average RF	% RSD	4.0	20	1.546	
N-Methyl perfluorooctane sulfonamidoacetic acid	TRG	Linear	R2	0.9979	0.99	0.8337	
N-Methyl perfluorooctane sulfonamidoethanol	TRG	Average RF	% RSD	2.5	20	2.34	
Perfluorobutane sulfonic acid (PFBS)	TRG	Average RF	% RSD	6.3	20	1.428	
Perfluorobutanoic acid (PFBA)	TRG	Average RF	% RSD	4.2	20	1.079	
Perfluorodecane sulfonic acid (PFDS)	TRG	Average RF	% RSD	4.9	20	1.012	
Perfluorodecanoic acid (PFDA)	TRG	Average RF	% RSD	2.5	20	1.257	
Perfluorododecanoic acid (PFDoDA)	TRG	Average RF	% RSD	5.2	20	0.8109	
Perfluoroheptane sulfonic acid (PFHpS)	TRG	Average RF	% RSD	9.4	20	2.079	
Perfluoroheptanoic acid (PFHpA)	TRG	Average RF	% RSD	9.4	20	0.9988	
Perfluorohexane sulfonic acid (PFHxS)	TRG	Linear	R2	0.9994	0.99	1.84	
Perfluorohexanoic acid (PFHxA)	TRG	Average RF	% RSD	7.9	20	1.036	
Perfluorononane sulfonic acid (PFNS)	TRG	Average RF	% RSD	11.4	20	0.7236	
Perfluorononanoic acid (PFNA)	TRG	Average RF	% RSD	4.2	20	1.009	
Perfluorooctane sulfonamide (FOSA)	TRG	Average RF	% RSD	1.6	20	1.286	
Perfluorooctane sulfonic acid (PFOS)	TRG	Average RF	% RSD	6.3	20	0.8285	
Perfluorooctanoic acid (PFOA)	TRG	Average RF	% RSD	3.7	20	1.335	
Perfluoropentane sulfonic acid (PFPeS)	TRG	Average RF	% RSD	4.3	20	0.6656	
Perfluoropentanoic acid (PFPeA)	TRG	Linear	R2	1.0000	0.99	2.302	
Perfluorotetradecanoic acid (PFTeDA)	TRG	Average RF	% RSD	8.3	20	1.116	
Perfluorotridecanoic acid (PFTrDA)	TRG	Average RF	% RSD	2.5	20	1.296	
Perfluoroundecanoic acid (PFUnDA)	TRG	Average RF	% RSD	2.7	20	1.146	

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth

**Service Request:** K2104028  
**Calibration Date:** 4/13/2021

**Initial Calibration Verification Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Calibration ID:** KC2100210  
**Instrument ID:** K-LCMS-06

**Signal ID:** 1

#	Lab Code	Sample Name	File Location	Acquisition Date
08	KC2100210-08	PFC ICV 1.0PPB	210413_042	04/13/2021 19:03

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
Perfluorobutane sulfonic acid (PFBS)	0.887	0.854	1.428E0	1.375E0	-3.713	±30	Average RF
Perfluoropentane sulfonic acid (PFPeS)	0.941	0.933	6.656E-1	6.6E-1	-0.846	±30	Average RF
Perfluorohexane sulfonic acid (PFHxS)	0.913	0.950	1.84E0	1.752E0	3.99	±30	Linear
Perfluoroheptane sulfonic acid (PFHpS)	0.953	0.890	2.079E0	1.939E0	-6.697	±30	Average RF
Perfluorooctane sulfonic acid (PFOS)	0.929	0.947	8.285E-1	8.446E-1	1.94	±30	Average RF
Perfluorononane sulfonic acid (PFNS)	0.962	0.970	7.236E-1	7.297E-1	0.842	±30	Average RF
Perfluorodecane sulfonic acid (PFDS)	0.965	0.895	1.012E0	9.387E-1	-7.261	±30	Average RF
Perfluorobutanoic acid (PFBA)	1.00	1.01	1.079E0	1.094E0	1.39	±30	Average RF
Perfluoropentanoic acid (PFPeA)	1.00	1.02	2.302E0	2.132E0	2.26	±30	Linear
Perfluorohexanoic acid (PFHxA)	1.00	0.957	1.036E0	9.914E-1	-4.274	±30	Average RF
Perfluoroheptanoic acid (PFHpA)	1.00	0.968	9.988E-1	9.665E-1	-3.227	±30	Average RF
Perfluorooctanoic acid (PFOA)	1.00	0.991	1.335E0	1.323E0	-0.947	±30	Average RF
Perfluorononanoic acid (PFNA)	1.00	1.02	1.009E0	1.032E0	2.29	±30	Average RF
Perfluorodecanoic acid (PFDA)	1.00	1.01	1.257E0	1.271E0	1.16	±30	Average RF
Perfluoroundecanoic acid (PFUnDA)	1.00	0.993	1.146E0	1.138E0	-0.674	±30	Average RF
Perfluorododecanoic acid (PFDoDA)	1.00	1.06	8.109E-1	8.585E-1	5.87	±30	Average RF
Perfluorotridecanoic acid (PFTTrDA)	1.00	1.06	1.296E0	1.379E0	6.47	±30	Average RF
Perfluorotetradecanoic acid (PFTTeDA)	1.00	1.00	1.116E0	1.116E0	0.038	±30	Average RF
Perfluorooctane sulfonamide (FOSA)	1.00	0.996	1.286E0	1.281E0	-0.408	±30	Average RF
N-Methyl perfluorooctane sulfonamide (MeFOSA)	1.00	0.940	1.546E0	1.454E0	-5.992	±30	Average RF
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	1.00	0.906	2.782E-1	2.275E-1	-9.397	±30	Linear
N-Methyl perfluorooctane sulfonamidoethanol	1.00	0.931	2.34E0	2.18E0	-6.861	±30	Average RF
N-Ethyl perfluorooctane sulfonamidoethanol	1.00	0.918	2.294E0	2.107E0	-8.151	±30	Average RF
N-Methyl perfluorooctane sulfonamidoacetic acid	1.00	1.18	8.337E-1	1.023E0	18.00	±30	Linear
N-Ethyl perfluorooctane sulfonamidoacetic acid	1.00	1.05	8.603E-1	9.006E-1	4.68	±30	Average RF
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.937	0.929	1.09E0	1.08E0	-0.898	±30	Average RF
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.951	0.993	1.223E0	1.276E0	4.35	±30	Average RF
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.960	0.982	1.178E0	1.205E0	2.32	±30	Average RF
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.966	0.915	6.864E-1	6.499E-1	-5.317	±30	Average RF
Hexafluoropropylene oxide dimer acid (HFPO-DA)	1.00	1.04	8.66E-1	9.042E-1	4.41	±30	Average RF

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth

**Service Request:** K2104028  
**Calibration Date:** 4/13/2021

**Initial Calibration Verification Summary**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Calibration ID:** KC2100210  
**Instrument ID:** K-LCMS-06

**Signal ID:** 1

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
13C3-PFBS	5.00	5.11	1.657E-1	1.693E-1	2.20	±30	Average RF
18O2-PFHxS	5.00	4.89	8.214E-2	8.028E-2	-2.261	±30	Average RF
13C4-PFOS	5.00	4.97	1.224E-1	1.218E-1	-0.521	±30	Average RF
13C4-PFBA	5.00	5.21	5.826E-1	6.066E-1	4.12	±30	Average RF
13C5-PFPeA	5.00	4.98	5.169E-1	5.151E-1	-0.346	±30	Average RF
13C2-PFHxA	5.00	5.45	1.118E0	1.219E0	9.01	±30	Average RF
13C4-PFHpA	5.00	5.62	1.091E0	1.225E0	12.36	±30	Average RF
13C4-PFOA	5.00	5.09	1.005E0	1.022E0	1.71	±30	Average RF
13C5-PFNA	5.00	4.91	8.438E-1	8.282E-1	-1.851	±30	Average RF
13C2-PFDA	5.00	4.94	5.562E-1	5.494E-1	-1.227	±30	Average RF
13C2-PFUnDA	5.00	4.86	6.823E-1	6.636E-1	-2.751	±30	Average RF
13C2-PFDoDA	5.00	4.89	7.33E-1	7.168E-1	-2.222	±30	Average RF
13C2-PFTeDA	5.00	4.89	4.789E-1	4.684E-1	-2.196	±30	Average RF
13C8-FOSA	5.00	5.24	3.777E-1	3.958E-1	4.81	±30	Average RF
D3-MeFOSA	5.00	4.92	9.386E-2	9.234E-2	-1.622	±30	Average RF
D5-EtFOSA	5.00	5.02	1.231E-1	1.235E-1	0.341	±30	Average RF
D7-MeFOSE	5.00	5.02	8.697E-2	8.733E-2	0.416	±30	Average RF
D9-EtFOSE	5.00	5.02	9.662E-2	9.708E-2	0.477	±30	Average RF
D3-MeFOSAA	5.00	4.76	6.052E-2	5.766E-2	-4.723	±30	Average RF
D5-EtFOSAA	5.00	4.79	5.942E-2	5.694E-2	-4.184	±30	Average RF
13C2-4:2 FTS	5.00	4.72	1.915E-1	1.807E-1	-5.632	±30	Average RF
13C2-6:2 FTS	5.00	4.92	1.028E-1	1.012E-1	-1.509	±30	Average RF
13C2-8:2 FTS	5.00	4.94	5.049E-2	4.988E-2	-1.204	±30	Average RF
13C3-HFPO-DA	5.00	4.70	3.326E-1	3.126E-1	-5.990	±30	Average RF

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029

**Service Request:** K2104028  
**Date Analyzed:** 04/21/21 12:23

**Continuing Calibration Verification (CCV) Summary  
Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**File ID:** J:\LCMS06\Data\210421\_B2\210421\_019  
**Signal ID:** 1

**Calibration Date:** 4/13/2021  
**Calibration ID:** KC2100210  
**Analysis Lot:** 720740  
**Units:** ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
Perfluorobutane sulfonic acid (PFBS)	0.887	0.884	1.4281	1.422	99.6	NA	±30	Average RF
Perfluoropentane sulfonic acid (PFPeS)	0.941	0.891	0.6656	0.6302	94.7	NA	±30	Average RF
Perfluorohexane sulfonic acid (PFHxS)	0.913	0.920	1.8395	1.6987	101	0.8	±30	Linear
Perfluoroheptane sulfonic acid (PFHpS)	0.953	1.11	2.0787	2.4141	116	NA	±30	Average RF
Perfluorooctane sulfonic acid (PFOS)	0.929	0.961	0.8285	0.8565	103	NA	±30	Average RF
Perfluorononane sulfonic acid (PFNS)	0.962	1.13	0.7236	0.851	118	NA	±30	Average RF
Perfluorodecane sulfonic acid (PFDS)	0.965	1.06	1.0122	1.1109	110	NA	±30	Average RF
Perfluorobutanoic acid (PFBA)	1.00	1.09	1.0792	1.1808	109	NA	±30	Average RF
Perfluoropentanoic acid (PFPeA)	1.00	1.03	2.3024	2.1476	103	3.0	±30	Linear
Perfluorohexanoic acid (PFHxA)	1.00	0.940	1.0356	0.9738	94.0	NA	±30	Average RF
Perfluoroheptanoic acid (PFHpA)	1.00	1.05	0.9988	1.0494	105	NA	±30	Average RF
Perfluorooctanoic acid (PFOA)	1.00	1.01	1.3354	1.3444	101	NA	±30	Average RF
Perfluorononanoic acid (PFNA)	1.00	1.14	1.0094	1.1513	114	NA	±30	Average RF
Perfluorodecanoic acid (PFDA)	1.00	1.06	1.2568	1.331	106	NA	±30	Average RF
Perfluoroundecanoic acid (PFUnDA)	1.00	1.09	1.1456	1.2482	109	NA	±30	Average RF
Perfluorododecanoic acid (PFDoDA)	1.00	1.11	0.8109	0.9012	111	NA	±30	Average RF
Perfluorotridecanoic acid (PFTrDA)	1.00	1.20	1.2956	1.555	120	NA	±30	Average RF
Perfluorotetradecanoic acid (PFTeDA)	1.00	1.13	1.1158	1.2661	113	NA	±30	Average RF
Perfluorooctane sulfonamide (FOSA)	1.00	1.01	1.286	1.2967	101	NA	±30	Average RF
N-Methyl perfluorooctane sulfonamide (MeFOSA)	1.00	1.03	1.5464	1.5867	103	NA	±30	Average RF
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	1.00	1.08	0.2782	0.2703	108	8.2	±30	Linear
N-Methyl perfluorooctane sulfonamidoethanol	1.00	1.30	2.3401	3.0457	130	NA	±30	Average RF
N-Ethyl perfluorooctane sulfonamidoethanol	1.00	1.24	2.294	2.8359	124	NA	±30	Average RF
N-Methyl perfluorooctane sulfonamidoacetic acid	1.00	1.13	0.8337	0.9749	113	12.6	±30	Linear
N-Ethyl perfluorooctane sulfonamidoacetic acid	1.00	1.01	0.8603	0.8663	101	NA	±30	Average RF
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.937	1.07	1.09	1.2445	114	NA	±30	Average RF
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.951	1.01	1.2231	1.3041	107	NA	±30	Average RF
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.960	0.997	1.178	1.2235	104	NA	±30	Average RF

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029

**Service Request:** K2104028  
**Date Analyzed:** 04/21/21 12:23

**Continuing Calibration Verification (CCV) Summary  
Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M  
**File ID:** J:\LCMS06\Data\210421\_B2\210421\_019  
**Signal ID:** 1

**Calibration Date:** 4/13/2021  
**Calibration ID:** KC2100210  
**Analysis Lot:** 720740  
**Units:** ng/mL

<b>10:2 Fluorotelomer sulfonic acid (10:2 FTS)</b>	0.966	0.931	0.6864	0.6614	96.4	NA	±30	Average RF
<b>Hexafluoropropylene oxide dimer acid (HFPO-DA)</b>	1.00	0.959	0.866	0.8305	95.9	NA	±30	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
13C3-PFBS	5.00	4.48	0.1657	0.1486	89.7	NA	±30	Average RF
18O2-PFHxS	5.00	4.52	0.0821	0.0742	90.3	NA	±30	Average RF
13C4-PFOS	5.00	4.41	0.1224	0.108	88.2	NA	±30	Average RF
13C4-PFBA	5.00	4.38	0.5826	0.5099	87.5	NA	±30	Average RF
13C5-PFPeA	5.00	4.72	0.5169	0.4879	94.4	NA	±30	Average RF
13C2-PFHxA	5.00	5.35	1.1181	1.1965	107	NA	±30	Average RF
13C4-PFHpA	5.00	4.21	1.0907	0.9179	84.2	NA	±30	Average RF
13C4-PFOA	5.00	4.65	1.0048	0.9348	93.0	NA	±30	Average RF
13C5-PFNA	5.00	4.71	0.8438	0.7941	94.1	NA	±30	Average RF
13C2-PFDA	5.00	4.53	0.5562	0.5044	90.7	NA	±30	Average RF
13C2-PFUnDA	5.00	4.49	0.6823	0.613	89.8	NA	±30	Average RF
13C2-PFDoDA	5.00	4.19	0.733	0.6137	83.7	NA	±30	Average RF
13C2-PFTeDA	5.00	3.92	0.4789	0.3754	78.4	NA	±30	Average RF
13C8-FOSA	5.00	4.59	0.3777	0.3469	91.9	NA	±30	Average RF
D3-MeFOSA	5.00	4.81	0.0939	0.0904	96.3	NA	±30	Average RF
D5-EtFOSA	5.00	4.49	0.1231	0.1104	89.7	NA	±30	Average RF
D7-MeFOSE	5.00	3.68	0.087	0.0641	73.7	NA	±30	Average RF
D9-EtFOSE	5.00	3.56	0.0966	0.0688	71.2	NA	±30	Average RF
D3-MeFOSAA	5.00	4.25	0.0605	0.0515	85.1	NA	±30	Average RF
D5-EtFOSAA	5.00	3.95	0.0594	0.0469	79.0	NA	±30	Average RF
13C2-4:2 FTS	5.00	3.78	0.1915	0.1448	75.6	NA	±30	Average RF
13C2-6:2 FTS	5.00	4.61	0.1028	0.0948	92.2	NA	±30	Average RF
13C2-8:2 FTS	5.00	4.83	0.0505	0.0487	96.5	NA	±30	Average RF
13C3-HFPO-DA	5.00	4.88	0.3326	0.3247	97.6	NA	±30	Average RF



ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029

**Service Request:**K2104028

**Analysis Run Log**  
**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Analysis Method:** PFC/537M

**Analysis Lot:**720740

**Instrument ID:**K-LCMS-06

<b>Raw Data File</b>	<b>Sample Name</b>	<b>Lab Code</b>	<b>Date Analyzed</b>	<b>Time Analyzed</b>	<b>Q</b>
J:\LCMS06\Data\210421_B2\210421_019	Continuing Calibration Verification	KQ2106600-01	4/21/2021	12:23	
J:\LCMS06\Data\210421_B2\210421_020	Continuing Calibration Blank	KQ2106600-02	4/21/2021	12:33	
J:\LCMS06\Data\210421_B2\210421_027	Method Blank	KQ2106020-04	4/21/2021	16:18	
J:\LCMS06\Data\210421_B2\210421_028	Lab Control Sample	KQ2106020-03	4/21/2021	16:29	
J:\LCMS06\Data\210421_B2\210421_029	ZZZZZZZ	ZZZZZZZ	4/21/2021	16:40	
J:\LCMS06\Data\210421_B2\210421_030	Batch QC	K2103455-002	4/21/2021	16:50	
J:\LCMS06\Data\210421_B2\210421_031	Vertex Dual-Fiber 2.25"	K2104028-001	4/21/2021	17:01	
J:\LCMS06\Data\210421_B2\210421_032	Batch QC MS	KQ2106020-01	4/21/2021	17:11	
J:\LCMS06\Data\210421_B2\210421_033	Batch QC DMS	KQ2106020-02	4/21/2021	17:22	

ALS Group USA, Corp.  
dba ALS Environmental

Prep Summary Report

**Client:** David Teter Consulting, LLC  
**Project:** City of Portsmouth/88008029  
**Sample Matrix:** Misc. Solid

**Service Request:**K2104028

**Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS**

**Prep Method:** ALS SOP  
**Analytical Method:** PFC/537M

**Extraction Lot:** 377476  
**Extraction Date:** 04/14/21 12:00

<b>Sample Name</b>	<b>Lab Code</b>	<b>Date Collected</b>	<b>Date Received</b>	<b>Sample Amount</b>	<b>Final Amount</b>	<b>Percent Solids</b>
Batch QC	K2103455-002	NA	NA	1.036 g	8 mL	
Vertex Dual-Fiber 2.25"	K2104028-001	4/12/21	4/16/21	1.408 g	8 mL	
Matrix Spike	KQ2106020-01MS	NA	NA	1.093 g	8 mL	
Duplicate Matrix Spike	KQ2106020-02DMS	NA	NA	1.146 g	8 mL	
Lab Control Sample	KQ2106020-03LCS	NA	NA	1 g	8 mL	
Method Blank	KQ2106020-04MB	NA	NA	1 g	8 mL	



## Raw Data

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



# Per and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

# Preparation Information Benchsheet

Prep Run#: 377476  
 Team: Organic LC/ASERVICE  
 Number of Copies to make: 2

Prep WorkFlow: OLC\_PFAS\_SON\_S  
 Prep Method: ALS SOP

Status: Sonication  
 Prep Date/Time: 4/14/21 12:00 PM

#	Lab Code	Client ID	B#	Method / Test	Matrix	Amt. Ext. (g)	pH	Int. Vol	Final Vol (mL)	Surr Amt (mL/mL)	Spike Amt (mL)
1	K2103455-001	ERA 90	.01	PFAS/537M / PFAS	Solid	1.079	N/A	N/A	8	20/20	-
2	K2103455-002	BT52	.01	PFAS/537M / PFAS	Solid	1.036					-
3	K2104028-001	Vertex Dual-Fiber 2.25"	.01	PFAS/537M / PFAS	Misc. Solid	1.408					-
4	KQ2106020-01	K2103455-002 MS	.01	PFAS/537M / PFAS	Solid	1.093					40
5	KQ2106020-02	K2103455-002 DMS	.01	PFAS/537M / PFAS	Solid	1.146					↓
6	KQ2106020-03	LCS		PFAS/537M / PFAS	Solid	1					↓
7	KQ2106020-04	MB		PFAS/537M / PFAS	Solid	1					↓

Comments:

Surrogate ID: 20-OLC-03-21A exp: 2/10/26  
 20-OLC-03-20C exp: 2/10/26

APP:db

Spike ID: 20-OLC-03-08-0 exp: 5/24/21

APP:db

Witnessed By: \_\_\_\_\_

Analyst: AS

Assisted By: \_\_\_\_\_



Additional prep information for Perfluorinated Compounds  
by HPLC/MS/MS – SOP: LCP-PFC (rev. 11)

**Soil/Paperboard**

**Service Request** K2103455, K2104028      **Workgroup** VQ2106020

1% Acetic Acid/MeOH Lot # 20-OLC-02-89F

Sonication Start (Time/Date/Initial): 11:10 4/21/21 AS

Sonication Stop (Time/Date/Initial): 14:10 4/21/21 AS

NH4OH lot #: SHBL6742

Envi-Carb lot #:        Centrifuge Used? (K-Sir-Spins-A-Lot):  Yes  No

IS (or IS/MeOH solution) Lot #: 20-OLC-03-20E - exp: 10/1/21 exp: db

Nylon Filter Lot (size)#: 00881103 (0.45 μm)

Extract Storage: OK

Completed(Time/Date/Initial): 14:55 4/21/21 AS

Comments/Observations:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Bench Sheet Review Check List	
<input type="checkbox"/>	Hold Times Met (if no, Reason: _____)
<input type="checkbox"/>	Prep date, dept, method, product code correct in stealth
<input type="checkbox"/>	Spike Information correct
<input type="checkbox"/>	Weights/Volumes and units correct on raw and final bench sheets
<input type="checkbox"/>	Sample IDs have been checked—Bottle numbers appended if required
<input type="checkbox"/>	Names present for: Started by, Completed by, relinquished by, and witnessed by.
<input type="checkbox"/>	Training has been circled
<input type="checkbox"/>	Extract Storage recorded
<input type="checkbox"/>	Additional Prep Sheet completely filled out ( NA or line out Blanks)
<input type="checkbox"/>	All clean-ups have been noted on additional prep sheet
<input type="checkbox"/>	Signed service request with Form V, if applicable, has been attached

# Preparation Information Benchsheet

**Prep Run#:** 377476  
**Team:** Organic LC/ASERVICE  
 Number of Copies to make: 2

**Prep WorkFlow:** OLC\_PFAS\_SON\_S  
**Prep Method:** ALS SOP

**Status:** Prepped  
**Prep Date/Time:** 4/14/21 12:00

#	Lab Code	Client ID	B#	Method / Test	pH	Matrix	Amt. Ext.	Final Vol	Sample Description
1	K2103455-001	ERA 90	.01	PFC/537M/PFAS		Solid	1.079g	8.00mL	LAGUILAR K-Balance-54
2	K2103455-002	BT52	.01	PFC/537M/PFAS		Solid	1.036g	8.00mL	LAGUILAR K-Balance-54
3	K2104028-001	Vertex Dual-Fiber 2.25"	.01	PFC/537M/PFAS		Misc. Solid	1.408g	8.00mL	LAGUILAR K-Balance-55
4	KQ2106020-01	K2103455-002 MS	.01	PFC/537M/PFAS		Solid	1.093g	8.00mL	LAGUILAR K-Balance-54
5	KQ2106020-02	K2103455-002 DMS	.01	PFC/537M/PFAS		Solid	1.146g	8.00mL	LAGUILAR K-Balance-54
6	KQ2106020-03	LCS		PFC/537M/PFAS		Solid	1g	8.00mL	
7	KQ2106020-04	MB		PFC/537M/PFAS		Solid	1g	8.00mL	

## Spiking Solutions

Name: PFC isotopes 2ppm		Inventory ID	215621	Logbook Ref:	20-OLC-03-20C	Expires On:	09/30/2021
K2103455-001	20.00µL	K2104028-001	20.00µL	KQ2106020-01	20.00µL	KQ2106020-02	20.00µL
KQ2106020-04	20.00µL						

Name: PFC Targets 200ppb mix		Inventory ID	216003	Logbook Ref:	20-OLC-03-08-O	Expires On:	05/24/2021
KQ2106020-01	40.00µL	KQ2106020-02	40.00µL				

Name: PFC IS		Inventory ID	216426	Logbook Ref:	20-OLC-03-20E	Expires On:	10/01/2021
K2103455-001	10.00µL	K2104028-001	10.00µL	KQ2106020-01	10.00µL	KQ2106020-02	10.00µL
KQ2106020-04	10.00µL						

Name: PFC Isotopes 2ppm		Inventory ID	216453	Logbook Ref:	20-OLC-03-21A	Expires On:	02/10/2026
K2103455-001	20.00µL	K2104028-001	20.00µL	KQ2106020-01	20.00µL	KQ2106020-02	20.00µL
KQ2106020-04	20.00µL						

## Preparation Steps

Step:	Weight	Sonication	Step:	Final Volume
Started:	4/14/21 12:00	Started:	4/21/21 14:55	4/21/21 14:55
Finished:	4/21/21 10:48	Finished:	4/21/21 14:55	4/21/21 14:55
By:	ASERVICE	By:	ASERVICE	Comments
Comments:		Comments:		

Comments:

# Preparation Information Benchsheet

Prep Run#: 377476  
Team: Organic LC/ASERVICE

Prep WorkFlow: OLC\_PFAS\_SON\_S  
Prep Method: ALS SOP

Status: Prepped  
Prep Date/Time: 4/14/21 12:00

Reviewed By: [Signature] Date: 4-23-21

Chain of Custody

Relinquished By: AS Date: 4/21/21  
Received By: WA Date: 4-22-21

Extracts Examined  
Yes No

# Pre-Prep Information Benchsheet

Prep Run #: 377476

Container Lot No: P7400499

Prep Due Date: Apr-12-2021

#	Lab Code	Bottle	Test Name	Weight	Sample Comments	Test Comments
1	K2103455-001	.01	PFAS : PFC/537M/	1.079g		LAGULAR K-Balance-54
2	K2103455-002	.01	PFAS : PFC/537M/	1.036g		LAGULAR K-Balance-54
3	K2103455-002 MS KQ2106020-01	.01	PFAS : PFC/537M/	1.093g		LAGULAR K-Balance-54
4	K2103455-002 DMS KQ2106020-02	.01	PFAS : PFC/537M/	1.145g		LAGULAR K-Balance-54
5	K2104028-001	.01	PFAS : PFC/537M/	1.408g		LAGULAR K-Balance-55

4/20/21 11:23

Relinquished By: <i>LA</i>	Received By:
Date/Time	Date/Time:

# Pre-Prep Information Benchsheet

Prep Run #: 377476

Container Lot No: P7400499

Prep Due Date: Apr-12-2021

#	Lab Code	Bottle	Test Name	Weight	Sample Comments	Test Comments
1	K2103455-001	.01	PFAS : PFC/537M/	1.079g		LAGUILAR K-Balance-54
2	K2103455-002	.01	PFAS : PFC/537M/	1.036g		LAGUILAR K-Balance-54
3	K2103455-002 MS KQ2106020-01	.01	PFAS : PFC/537M/	1.093g		LAGUILAR K-Balance-54
4	K2103455-002 DMS KQ2106020-02	.01	PFAS : PFC/537M/	1.146g		LAGUILAR K-Balance-54

4/14/21 12:01

Relinquished By:	Date/Time: <span style="font-size: 1.2em; font-family: cursive;">4/14/21 12:01</span>	Received By:	Date/Time:
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# Validation Report

1st *UA* 04/23/21  
2nd *[Signature]* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_030  
**Lab ID:** K2103455-002  
**RunType:** N/A  
**Matrix:** Solid

**Date Acquired:** 4/21/21 16:50  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
Preparation Hold Time	X	
Analytical Hold Time	X	
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Continuing Calibration Recovery	X	
Lab Control Sample Recovery		X
Method Blank	X	
Method Blank Surrogates		X
Internal Standards	X	
Surrogates		X
Std MRL Unsupported by ICAL	X	
Above Highest ICAL Level	X	

## Analyte Exceptions

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
Lab Control Sample Recovery	Perfluorotridecanoic acid (PFTrDA)	139	63	134	High bias, <MRL in Samples
	N-Methyl perfluorooctane sulfonamidoethanol	157	62	141	High bias, <MRL in Samples
	N-Ethyl perfluorooctane sulfonamidoethanol	140	70	137	High bias, <MRL in Samples
	13C4-PFBA	125	34	116	Native in control; <MRL in samples
	13C2-PFHxA	140	32	136	
	D5-EtFOSA	132	49	123	
Method Blank Surrogates	13C3-HFPO-DA	140	33	130	Native <MRL in MB
	18O2-PFHxS	155	36	120	
	13C4-PFOS	139	32	130	
	13C4-PFBA	140	34	116	
	13C2-PFHxA	150	32	136	
	13C4-PFHpA	164	36	133	
	13C4-PFOA	144	31	134	
	13C5-PFNA	144	27	133	
	13C2-PFDA	142	30	137	
	13C8-FOSA	149	40	132	
	D3-MeFOSA	149	51	132	
	D5-EtFOSA	144	49	123	
Surrogates	13C3-HFPO-DA	156	33	130	Narrate high bias, ND
	13C2-6:2 FTS	151	30	140	

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

# Quantitation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

<b>Data File:</b> J:\LCMS06\Data\210421_B2\210421_030	<b>Instrument:</b> K-LCMS-06
<b>Acqu Date:</b> 4/21/21 16:50	<b>Vial:</b> 4
<b>Run Type:</b> N/A	<b>Dilution:</b> 1
<b>Lab ID:</b> K2103455-002	<b>Raw Units:</b> ng/mL

<b>Bottle ID:</b> K2103455-002.01	<b>Tier:</b> II	<b>Matrix:</b> Solid
<b>Prod Code:</b> PFAS	<b>Collect Date:</b> 3/25/21	<b>Receive Date:</b> 4/5/21

<b>Analysis Lot:</b> 720740	<b>Prep Lot:</b> 377476	<b>Report Group:</b> K2103455
<b>Analysis:</b> PFC/537M	<b>Prep Method:</b> ALS SOP	
	<b>Prep Date:</b> 4/14/21	

<b>Title:</b> Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b> KC2100210
	<b>Report List ID:</b> 20091

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.111	+0.01	7585589	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	% Rec	% Rec Criteria	Rpt?
13C3-PFBS	4.017	+0.00	693299	2.7579	55	33 - 109	Y
18O2-PFHxS	4.398	+0.01	429346	3.4454	69	36 - 120	Y
13C4-PFOS	4.730	+0.01	626880	3.3752	68	32 - 130	Y
13C4-PFBA	3.402	+0.01	3878943	4.3883	88	34 - 116	Y
13C5-PFPeA	3.967	+0.05	2661902	3.3944	68	39 - 133	Y
13C2-PFHxA	4.215		7018288	4.1374	83	32 - 136	Y
13C4-PFHpA	4.400	+0.01	6421663	3.8808	78	36 - 133	Y
13C4-PFOA	4.570	+0.00	5976409	3.9203	78	31 - 134	Y
13C5-PFNA	4.745	+0.01	6011603	4.6959	94	27 - 133	Y
13C2-PFDA	4.927	+0.01	3698832	4.3835	88	30 - 137	Y
13C2-PFUnDA	5.111	+0.01	5224741	5.0473	101	32 - 146	Y
13C2-PFDODA	5.288	+0.01	4895619	4.4021	88	36 - 136	Y
13C2-PFTeDA	5.615	+0.01	2583744	3.5564	71	39 - 138	Y
13C8-FOSA	5.237	+0.01	2322433	4.0534	81	40 - 132	Y
D3-MeFOSA	5.632	+0.01	559113	3.9263	79	51 - 132	Y
D5-EtFOSA	5.765	+0.00	704014	3.7708	75	49 - 123	Y
D7-MeFOSE	5.605	+0.01	352864	2.6743	53	53 - 125	Y
D9-EtFOSE	5.733	+0.01	434700	2.9656	59	45 - 121	Y
D3-MeFOSAA	5.029	+0.01	450357	4.9050	98	20 - 154	Y
D5-EtFOSAA	5.127	+0.01	437507	4.8530	97	29 - 153	Y
13C2-4:2 FTS	4.194	+0.01	1342835	4.6226	92	18 - 127	Y
13C2-6:2 FTS	4.559	+0.00	1177676	7.5520	151	30 - 140	Y
13C2-8:2 FTS	4.927	+0.01	367684	4.8000	96	9 - 171	Y
13C3-HFPO-DA	4.284	+0.00	1835560	3.6382	73	33 - 130	Y

U: Undetected at or above MDL  
 J: Analyte detected above MDL, but below MRL  
 B: Hit above MRL also found in Method Blank  
 E: Analyte concentration above high point of ICAL  
 N: Presumptive evidence of compound

D: Result from dilution  
 m: Manual integration performed  
 d: Compound manually deleted  
 NR: Analyte not reported from this analysis

\*: Result fails acceptance criteria  
 #: Acceptance criteria not applicable  
 ?: Insufficient information to determine acceptance  
 e: Result >= MRL, but MRL less than low point of ICAL  
 c: check for co-elution

Printed: 4/23/21 10:05

\\alprews001\starlims\LIMSReps\QuantValidation.rpt

<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_030	<b>Instrument:</b>	K-LCMS06 <i>206</i>	04/23/21
<b>Acqu Date:</b>	4/21/21 16:50	<b>Vial:</b>	4	
<b>Run Type:</b>	N/A	<b>Dilution:</b>	1	
<b>Lab ID:</b>	K2103455-002	<b>Raw Units:</b>	ng/mL	

**Target Compounds**

Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perfluorobutane sulfonic acid (PFBS)	3.979	-0.04	791	0.0040	0.031	U	Y
Perfluoropentane sulfonic acid (PFPeS)	4.237	+0.01	383	0.0042	0.032	U	Y
Perfluorohexane sulfonic acid (PFHxS)	4.401	+0.01	1484	-0.0122	0	U	Y
Perfluoroheptane sulfonic acid (PFHpS)	4.551	-0.01	321	0.0018	0.014	U	Y
Perfluorooctane sulfonic acid (PFOS)	4.730	+0.01	2325	0.0224	0.17	J	Y
Perfluorononane sulfonic acid (PFNS)	4.875	-0.03	231	0.0025	0.019	U	Y
Perfluorodecane sulfonic acid (PFDS)	0		0	0	0	U	Y
Perfluorobutanoic acid (PFBA)	3.404	+0.01	5968	0.0071	0.055	U	Y
Perfluoropentanoic acid (PFPeA)	3.925	+0.00	41037	0.0097	0.075	U	Y
Perfluorohexanoic acid (PFHxA)	4.215		65246	0.0449	0.35	J	Y
Perfluoroheptanoic acid (PFHpA)	4.397	+0.01	22090	0.0172	0.13	U	Y
Perfluorooctanoic acid (PFOA)	4.570	+0.00	33968	0.0213	0.16	J	Y
Perfluorononanoic acid (PFNA)	4.743	+0.00	7553	0.0062	0.048	U	Y
Perfluorodecanoic acid (PFDA)	4.927	+0.01	9499	0.0102	0.079	U	Y
Perfluoroundecanoic acid (PFUnDA)	5.111	+0.01	5516	0.0046	0.036	U	Y
Perfluorododecanoic acid (PFDoDA)	5.290	+0.01	6057	0.0076	0.059	U	Y
Perfluorotridecanoic acid (PFTrDA)	5.455	+0.01	2835	0.0042	0.032	U	Y
Perfluorotetradecanoic acid (PFTeDA)	5.618	+0.01	7475	0.0130	0.10	U	Y
Perfluorooctane sulfonamide (FOSA)	5.236	+0.01	38973	0.0652	0.50	J	Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.634	+0.00	6785	0.0392	0.30	J	Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	5.766	0.00	260	-0.0228	0	U	Y
N-Methyl perfluorooctane sulfonamidoethanol	5.613	+0.01	43382	0.2627	2.0		Y
N-Ethyl perfluorooctane sulfonamidoethanol	5.745	+0.01	3320	0.0166	0.13	J	Y
N-Methyl perfluorooctane sulfonamidoacetic acid	0		0	0	0	U	Y
N-Ethyl perfluorooctane sulfonamidoacetic acid	0		0	0	0	U	Y
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	4.182	-0.01	200	0.0007	0.0054	U	Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.545	-0.01	1459	0.0051	0.039	U	Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.924	+0.01	133	0.0015	0.012	U	Y
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	5.293	+0.00	10	0.0002	0.0015	U	Y
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.267	-0.01	435	0.0014	0.011	U	Y

**Prep Amount:** 1.036 g      **Dilution:** 1  
**Prep Final Amount:** 8.00 mL      **Basis Factor:** 100.00

U: Undetected at or above MDL  
J: Analyte detected above MDL, but below MRL  
B: Hit above MRL also found in Method Blank  
E: Analyte concentration above high point of ICAL  
N: Presumptive evidence of compound  
D: Result from dilution  
m: Manual integration performed  
d: Compound manually deleted  
NR: Analyte not reported from this analysis  
\*: Result fails acceptance criteria  
#: Acceptance criteria not applicable  
?: Insufficient information to determine acceptance  
e: Result >= MRL, but MRL less than low point of ICAL  
c: check for co-elution



210421\_030

Sample ID: K2103455-002  
 Date Acquired: 4/21/2021 4:50:35 PM  
 Acquired by: System Administrator  
 Data File: 210421\_030  
 Vial: 8 | Inj. Volume: 15.000uL | Tray: 3

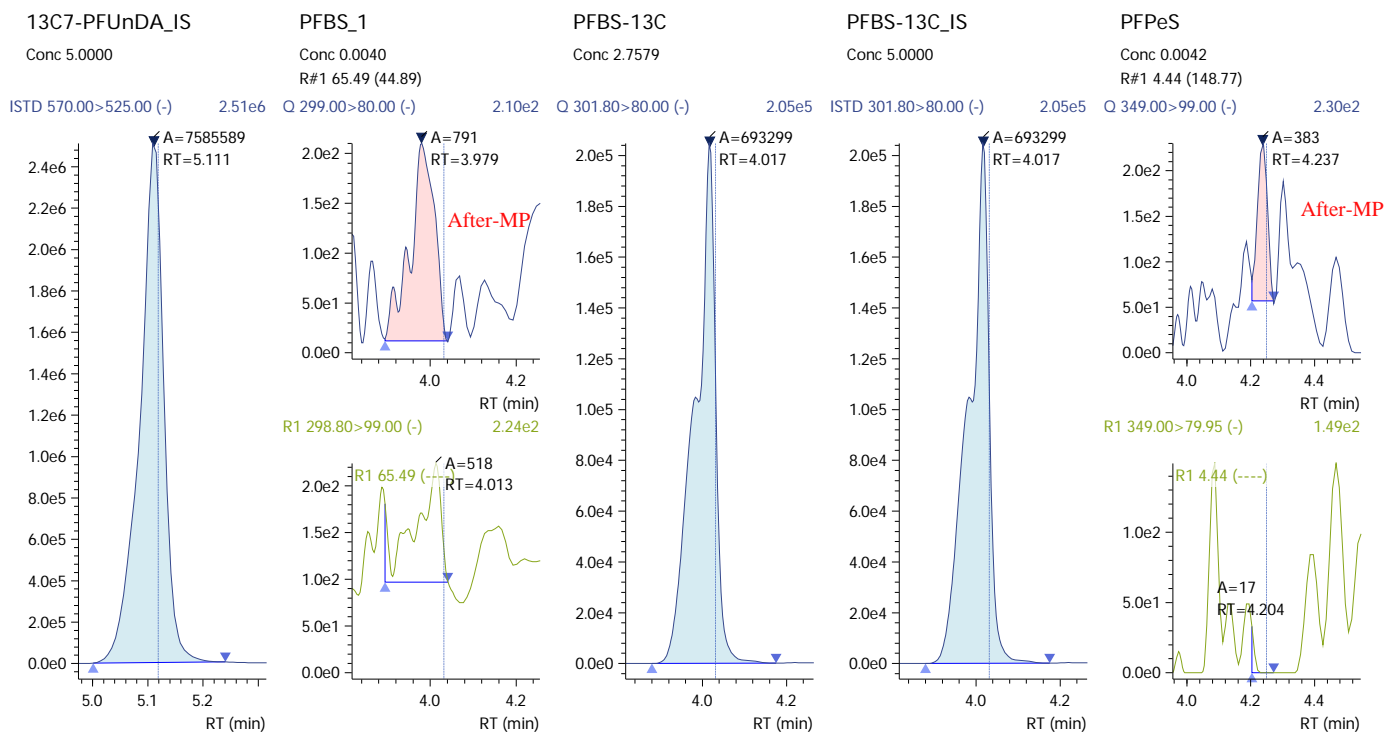
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.111	7585589	7585589	----	----	5.0000	ng/mL
PFBS_1	M	3.979	791	693299	PFBS-13C_IS	----	0.0040	ng/mL
PFBS-13C	Auto	4.017	693299	7585589	13C7-PFUnDA_IS	----	2.7579	ng/mL
PFBS-13C_IS	Auto	4.017	693299	693299	----	----	5.0000	ng/mL
PFPeS	M	4.237	383	693299	PFBS-13C_IS	----	0.0042	ng/mL
PFHxS_1	Auto	4.401	1484	429346	PFHxS-18O_IS	----	-0.0122	ng/mL
PFHxS-18O	Auto	4.398	429346	7585589	13C7-PFUnDA_IS	----	3.4454	ng/mL
PFHxS-18O_IS	Auto	4.398	429346	429346	----	----	5.0000	ng/mL
PFHpS_1	M	4.551	321	429346	PFHxS-18O_IS	----	0.0018	ng/mL
PFOS_1	Auto	4.730	2325	626880	PFOS-13C_IS	----	0.0224	ng/mL
PFOS-13C	Auto	4.730	626880	7585589	13C7-PFUnDA_IS	----	3.3752	ng/mL
PFOS-13C_IS	Auto	4.730	626880	626880	----	----	5.0000	ng/mL
PFNS	M	4.875	231	626880	PFOS-13C_IS	----	0.0025	ng/mL
PFDS_1	ND(W/B)	----	----	626880	PFOS-13C_IS	----	----	ng/mL
PFBA	M	3.404	5968	3878943	PFBA-13C_IS	----	0.0071	ng/mL
PFBA-13C	Auto	3.402	3878943	7585589	13C7-PFUnDA_IS	----	4.3883	ng/mL
PFBA-13C_IS	Auto	3.402	3878943	3878943	----	----	5.0000	ng/mL
PFPeA	Auto	3.925	41037	2661902	PFPeA-13C_IS	----	0.0097	ng/mL
PFPeA-13C	Auto	3.967	2661902	7585589	13C7-PFUnDA_IS	----	3.3944	ng/mL
PFPeA-13C_IS	Auto	3.967	2661902	2661902	----	----	5.0000	ng/mL
PFHxA	M	4.215	65246	7018288	PFHxA-13C_IS	----	0.0449	ng/mL
PFHxA-13C	Auto	4.215	7018288	7585589	13C7-PFUnDA_IS	----	4.1374	ng/mL
PFHxA-13C_IS	Auto	4.215	7018288	7018288	----	----	5.0000	ng/mL
PFHpA	M	4.397	22090	6421663	PFHpA-13C_IS	----	0.0172	ng/mL
PFHpA-13C	Auto	4.400	6421663	7585589	13C7-PFUnDA_IS	----	3.8808	ng/mL
PFHpA-13C_IS	Auto	4.400	6421663	6421663	----	----	5.0000	ng/mL
PFOA	Auto	4.570	33968	5976409	PFOA-13C_IS	----	0.0213	ng/mL
PFOA-13C	Auto	4.570	5976409	7585589	13C7-PFUnDA_IS	----	3.9203	ng/mL
PFOA-13C_IS	Auto	4.570	5976409	5976409	----	----	5.0000	ng/mL
PFNA	Auto	4.743	7553	6011603	PFNA-13C_IS	----	0.0062	ng/mL
PFNA-13C	Auto	4.745	6011603	7585589	13C7-PFUnDA_IS	----	4.6959	ng/mL
PFNA-13C_IS	Auto	4.745	6011603	6011603	----	----	5.0000	ng/mL
PFDA	M	4.927	9499	3698832	PFDA-13C_IS	----	0.0102	ng/mL
PFDA-13C	Auto	4.927	3698832	7585589	13C7-PFUnDA_IS	----	4.3835	ng/mL
PFDA-13C_IS	Auto	4.927	3698832	3698832	----	----	5.0000	ng/mL
PFUnA	M	5.111	5516	5224741	PFUnA-13C_IS	----	0.0046	ng/mL
PFUnA-13C	Auto	5.111	5224741	7585589	13C7-PFUnDA_IS	----	5.0473	ng/mL
PFUnA-13C_IS	Auto	5.111	5224741	5224741	----	----	5.0000	ng/mL
PFDoA	Auto	5.290	6057	4895619	PFDoA-13C_IS	----	0.0076	ng/mL
PFDoA-13C	Auto	5.288	4895619	7585589	13C7-PFUnDA_IS	----	4.4021	ng/mL
PFDoA-13C_IS	Auto	5.288	4895619	4895619	----	----	5.0000	ng/mL
PFTeDA	M	5.455	2835	2583744	PFTeDA-13C_IS	----	0.0042	ng/mL
PFTeDA	M	5.618	7475	2583744	PFTeDA-13C_IS	----	0.0130	ng/mL
PFTeDA-13C	Auto	5.615	2583744	7585589	13C7-PFUnDA_IS	----	3.5564	ng/mL
PFTeDA-13C_IS	Auto	5.615	2583744	2583744	----	----	5.0000	ng/mL
FOSA	Auto	5.236	38973	2322433	FOSA-13C_IS	----	0.0652	ng/mL
FOSA-13C	Auto	5.237	2322433	7585589	13C7-PFUnDA_IS	----	4.0534	ng/mL
FOSA-13C_IS	Auto	5.237	2322433	2322433	----	----	5.0000	ng/mL
N-MeFOSA	M	5.634	6785	559113	N-MeFOSA-d3_IS	----	0.0392	ng/mL
N-MeFOSA-d3	Auto	5.632	559113	7585589	13C7-PFUnDA_IS	----	3.9263	ng/mL
N-MeFOSA-d3_IS	Auto	5.632	559113	559113	----	----	5.0000	ng/mL
N-EtFOSA	M	5.766	260	704014	N-EtFOSA-d9_IS	----	-0.0228	ng/mL
N-EtFOSA-d9	Auto	5.765	704014	7585589	13C7-PFUnDA_IS	----	3.7708	ng/mL
N-EtFOSA-d9_IS	Auto	5.765	704014	704014	----	----	5.0000	ng/mL



### 210421\_030 (continued)

(Table continued from previous page)

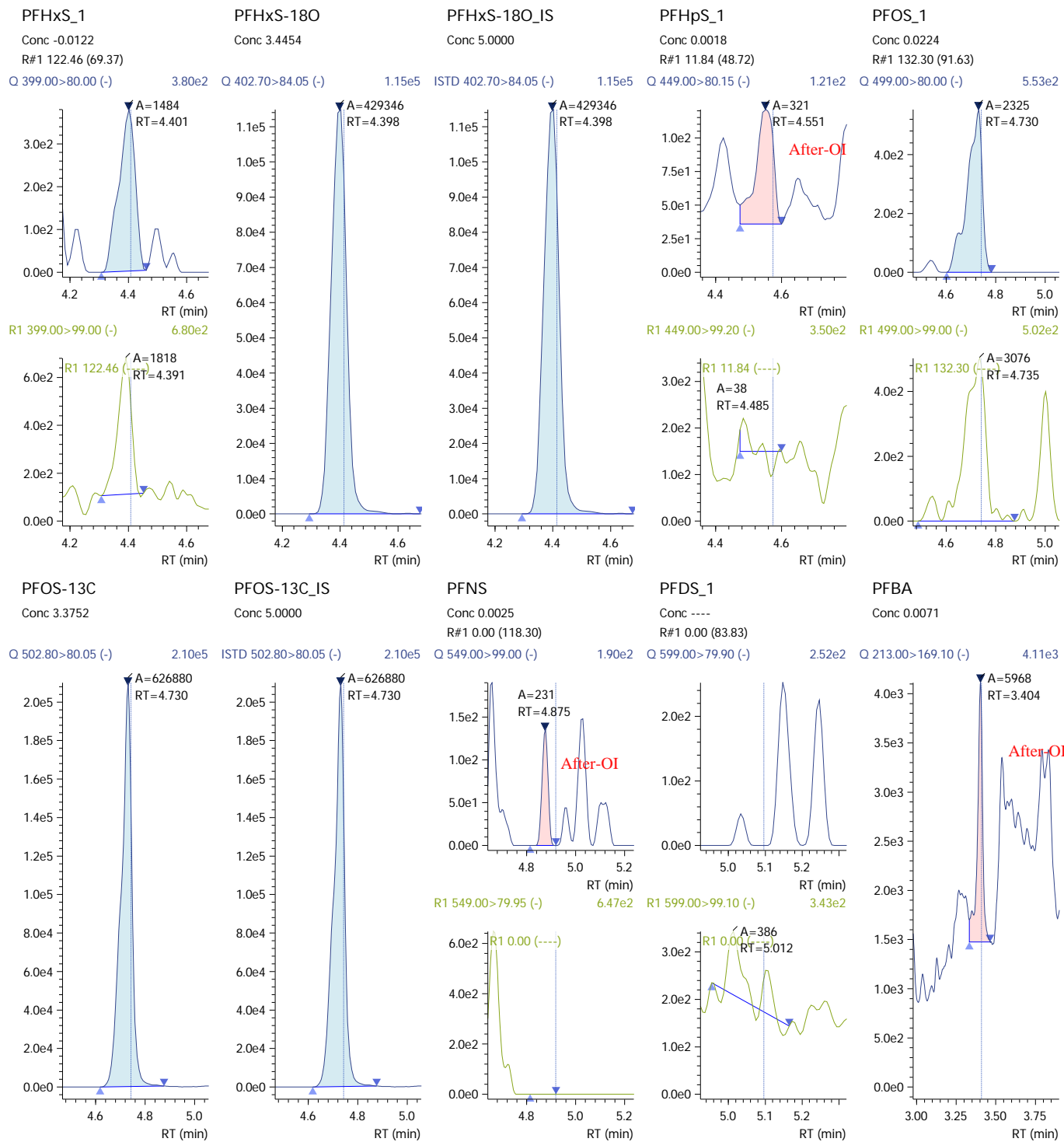
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.613	43382	352864	N-MeFOSE-d7_IS	----	0.2627	ng/mL
N-MeFOSE-d7	Auto	5.605	352864	7585589	13C7-PFUnDA_IS	----	2.6743	ng/mL
N-MeFOSE-d7_IS	Auto	5.605	352864	352864	----	----	5.0000	ng/mL
N-EtFOSE	M	5.745	3320	434700	N-EtFOSE-d9_IS	----	0.0166	ng/mL
N-EtFOSE-d9	Auto	5.733	434700	7585589	13C7-PFUnDA_IS	----	2.9656	ng/mL
N-EtFOSE-d9_IS	Auto	5.733	434700	434700	----	----	5.0000	ng/mL
N-MeFOSAA	ND(W/B)	----	----	450357	N-MeFOSAA-d3_IS	----	----	ng/mL
N-MeFOSAA-d3	Auto	5.029	450357	7585589	13C7-PFUnDA_IS	----	4.9050	ng/mL
N-MeFOSAA-d3_IS	Auto	5.029	450357	450357	----	----	5.0000	ng/mL
N-EtFOSAA	ND(W/B)	----	----	437507	N-EtFOSAA-d5_IS	----	----	ng/mL
N-EtFOSAA-d5	Auto	5.127	437507	7585589	13C7-PFUnDA_IS	----	4.8530	ng/mL
N-EtFOSAA-d5_IS	Auto	5.127	437507	437507	----	----	5.0000	ng/mL
4_2-FTS_1	M	4.182	200	1342835	4_2-FTS-13C_IS	----	0.0007	ng/mL
4_2-FTS-13C	Auto	4.194	1342835	7585589	13C7-PFUnDA_IS	----	4.6226	ng/mL
4_2-FTS-13C_IS	Auto	4.194	1342835	1342835	----	----	5.0000	ng/mL
6_2-FTS_1	M	4.545	1459	1177676	6_2-FTS-13C_IS	----	0.0051	ng/mL
6_2-FTS-13C	Auto	4.559	1177676	7585589	13C7-PFUnDA_IS	----	7.5520	ng/mL
6_2-FTS-13C_IS	Auto	4.559	1177676	1177676	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.924	133	367684	8_2-FTS-13C_IS	----	0.0015	ng/mL
8_2-FTS-13C	Auto	4.927	367684	7585589	13C7-PFUnDA_IS	----	4.8000	ng/mL
8_2-FTS-13C_IS	Auto	4.927	367684	367684	----	----	5.0000	ng/mL
10_2-FTS_1	Auto	5.293	10	367684	8_2-FTS-13C_IS	----	0.0002	ng/mL
HFPO_DA	M	4.267	435	1835560	HFPO_DA-13C_IS	----	0.0014	ng/mL
HFPO_DA-13C	Auto	4.284	1835560	7585589	13C7-PFUnDA_IS	----	3.6382	ng/mL
HFPO_DA-13C_IS	Auto	4.284	1835560	1835560	----	----	5.0000	ng/mL





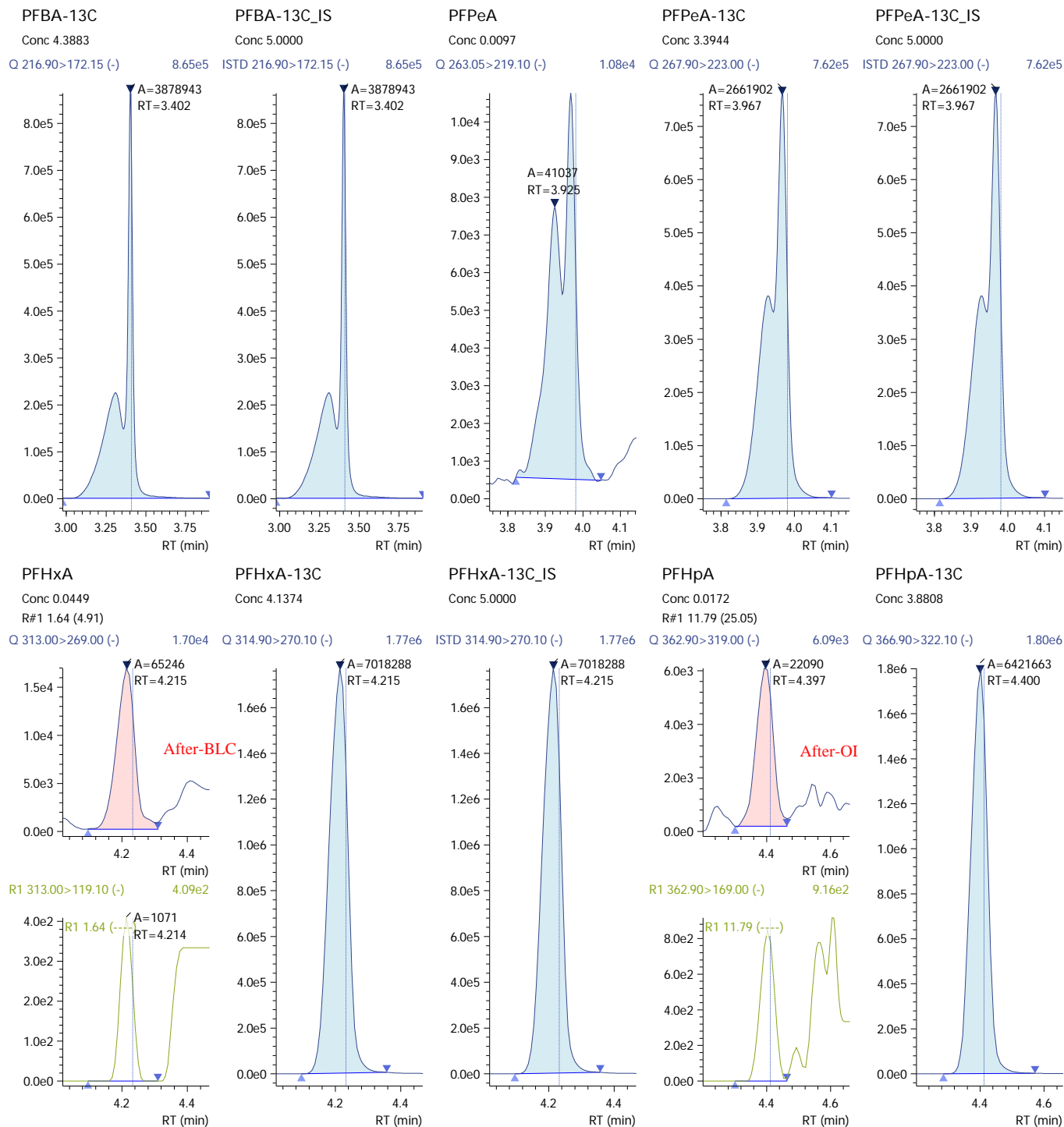


### 210421\_030 (continued)



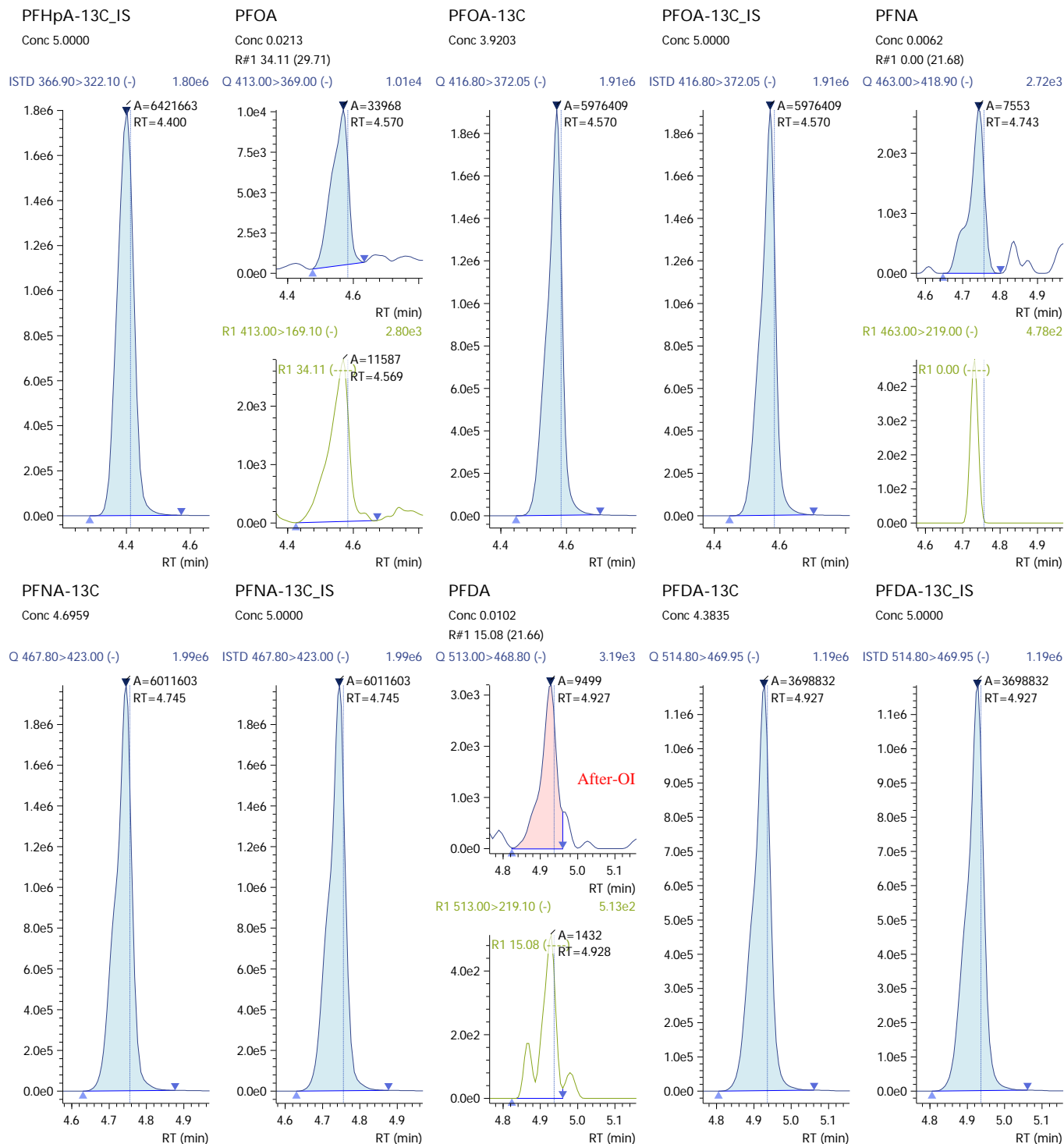


210421\_030 (continued)



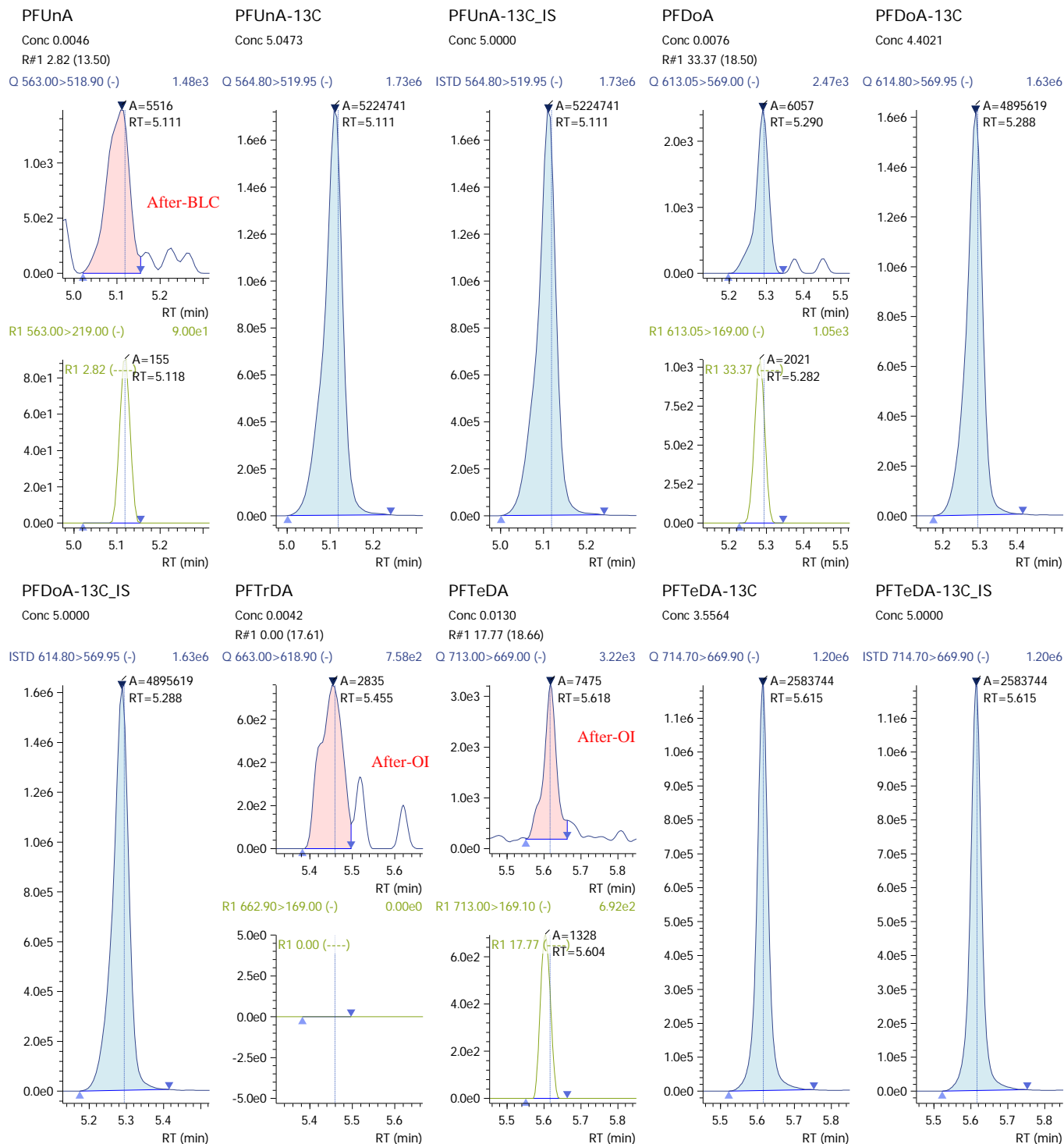


### 210421\_030 (continued)



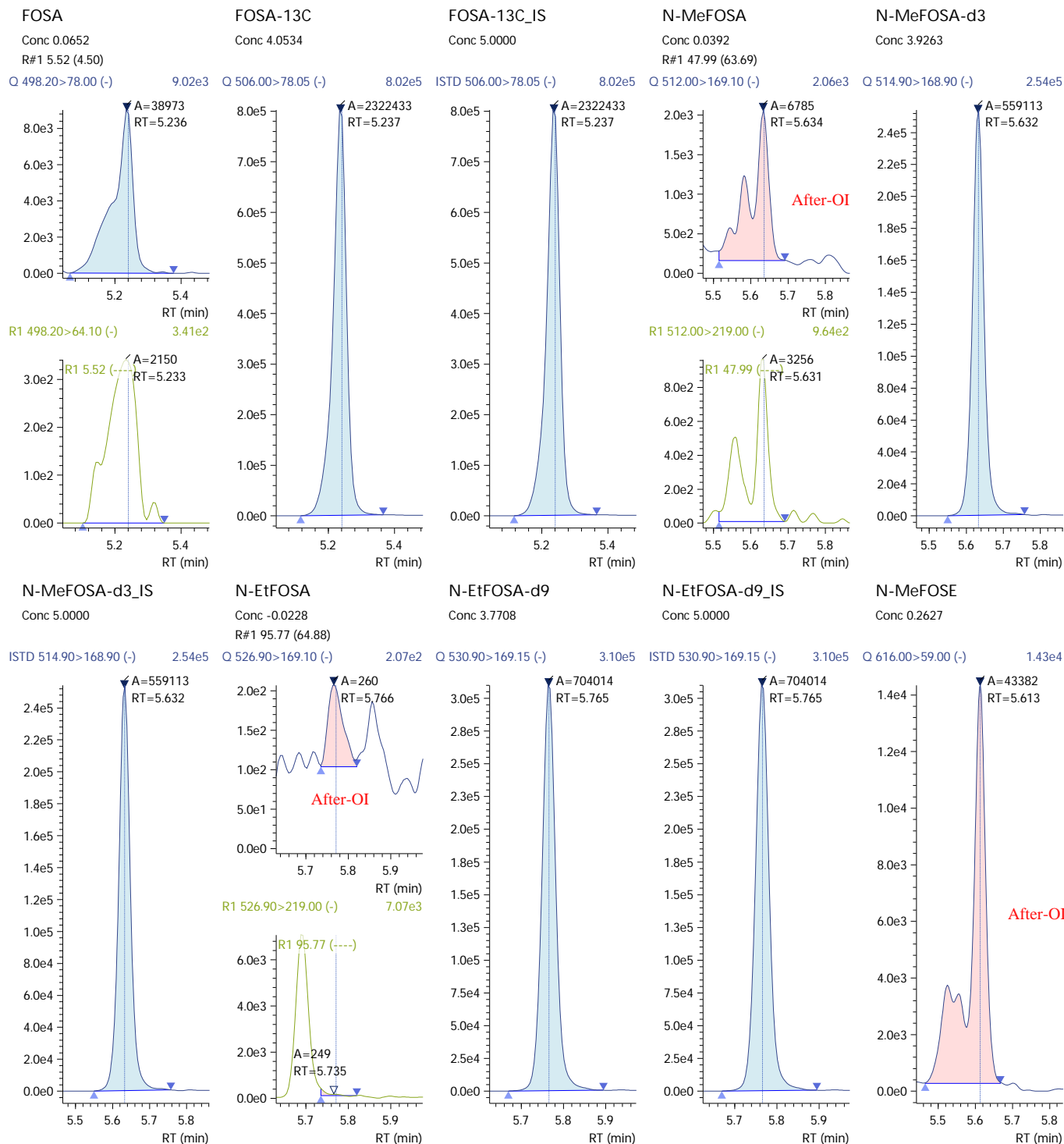


### 210421\_030 (continued)





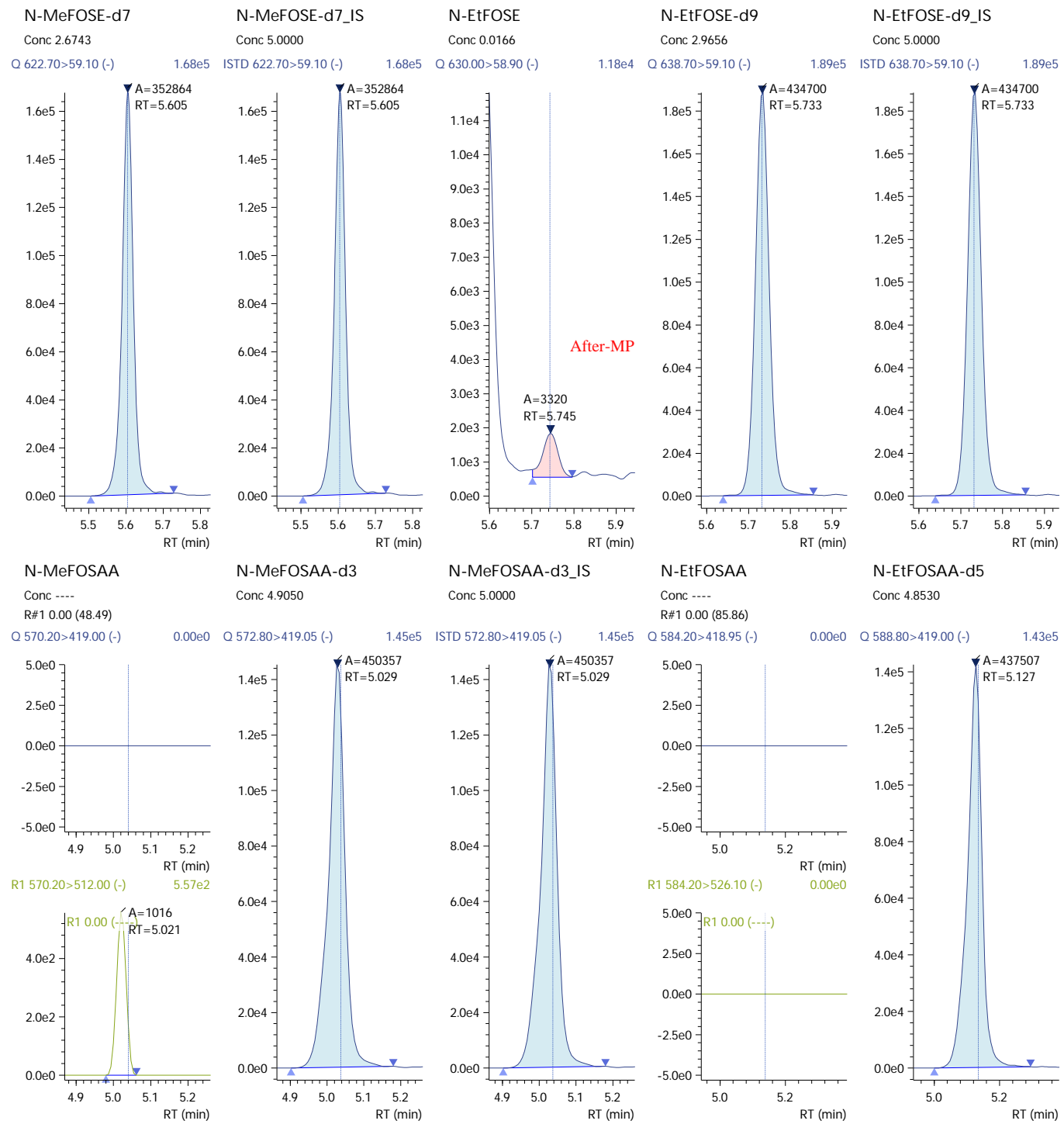
### 210421\_030 (continued)





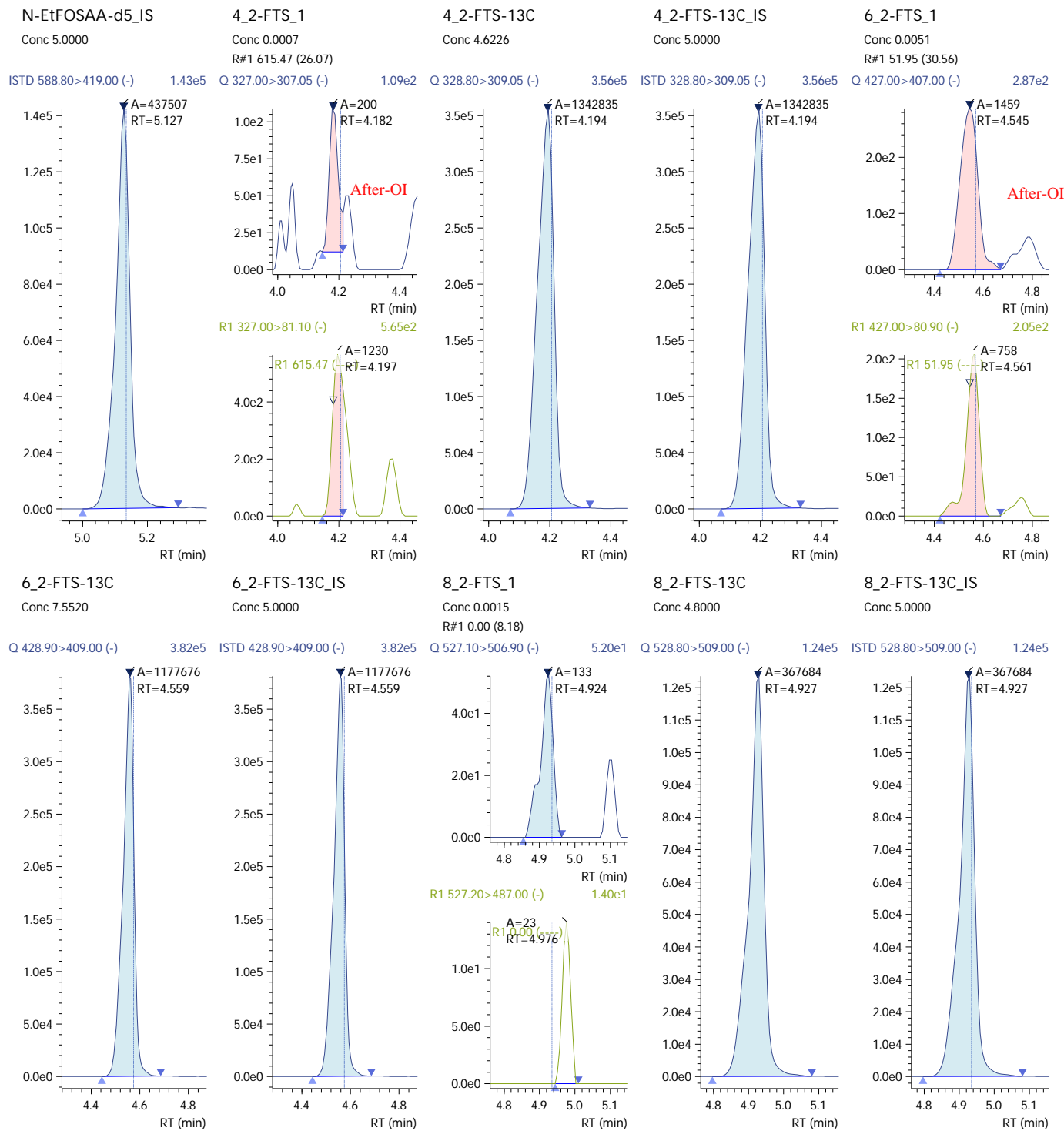


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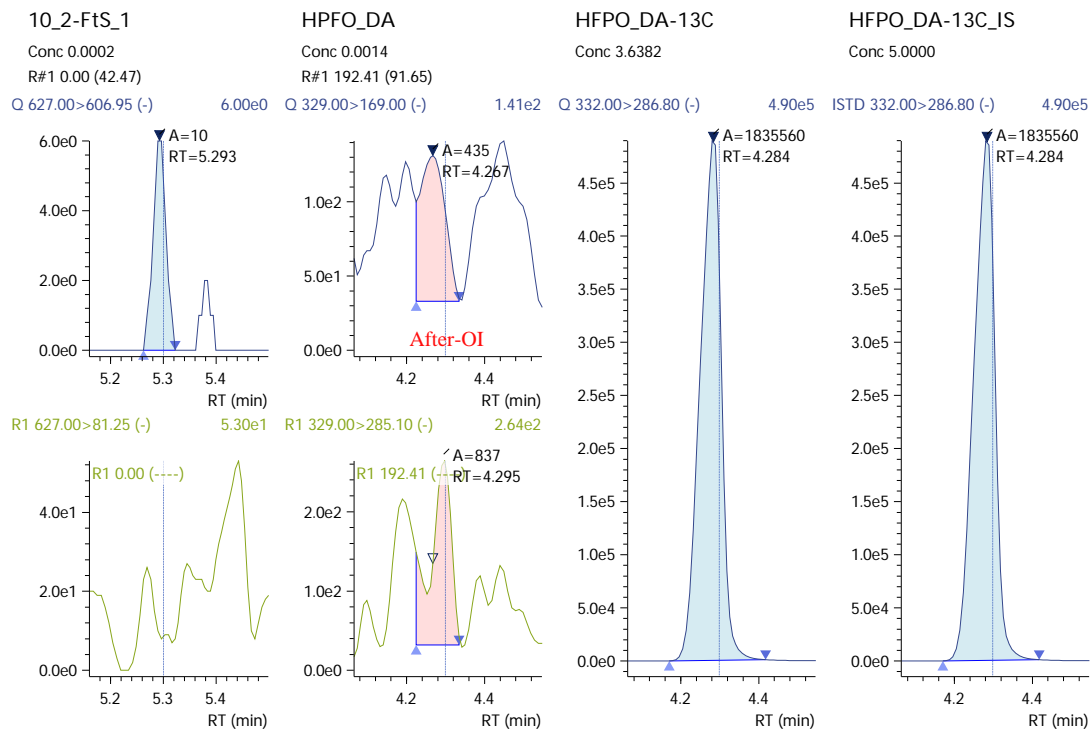


### 210421\_030 (continued)





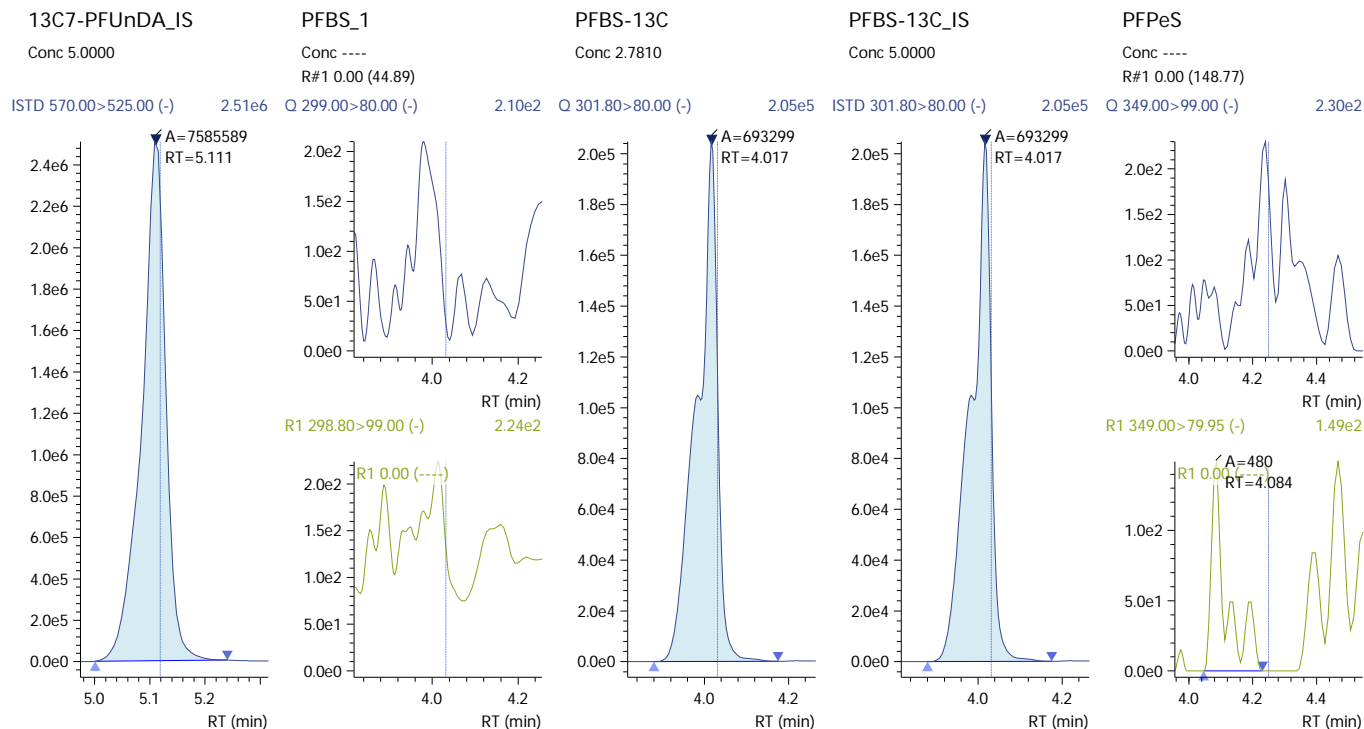
### 210421\_030 (continued)





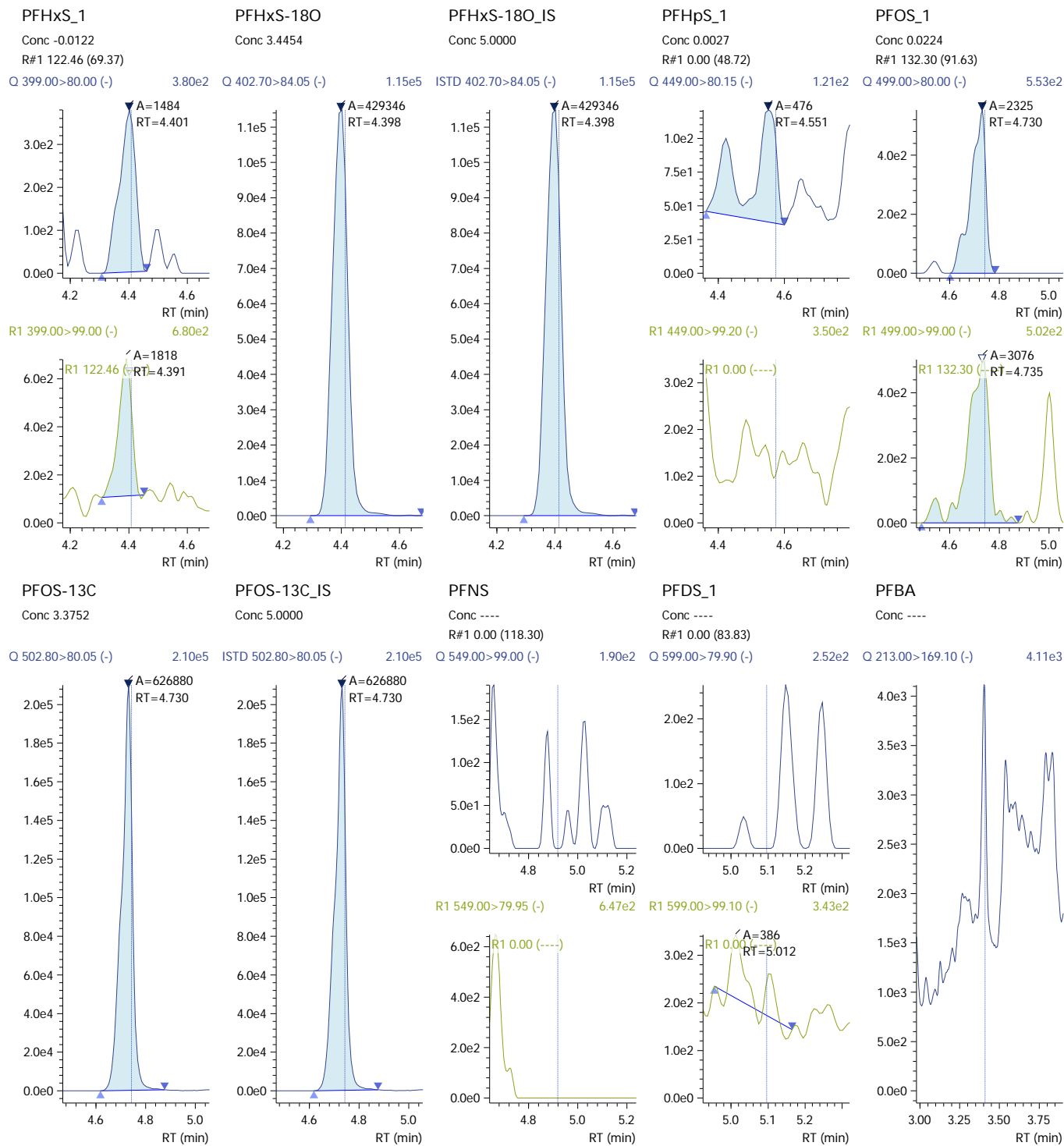
### 210421\_030

Sample ID: K2103455-002  
Date Acquired: 4/21/2021 4:50:35 PM  
Acquired by: System Administrator  
Data File: 210421\_030  
Vial: 8 | Inj. Volume: 15.0000uL | Tray: 3





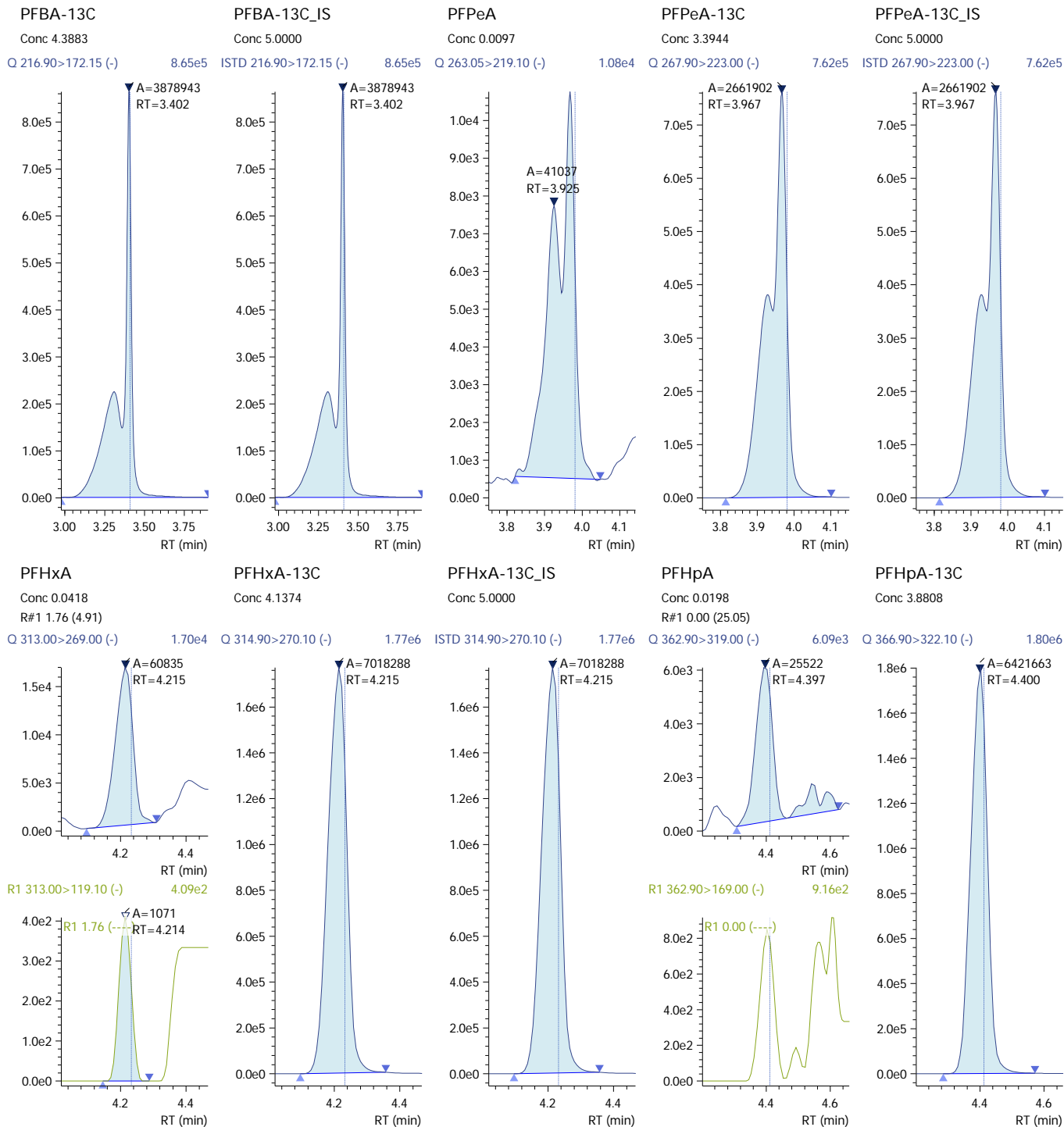
### 210421\_030 (continued)





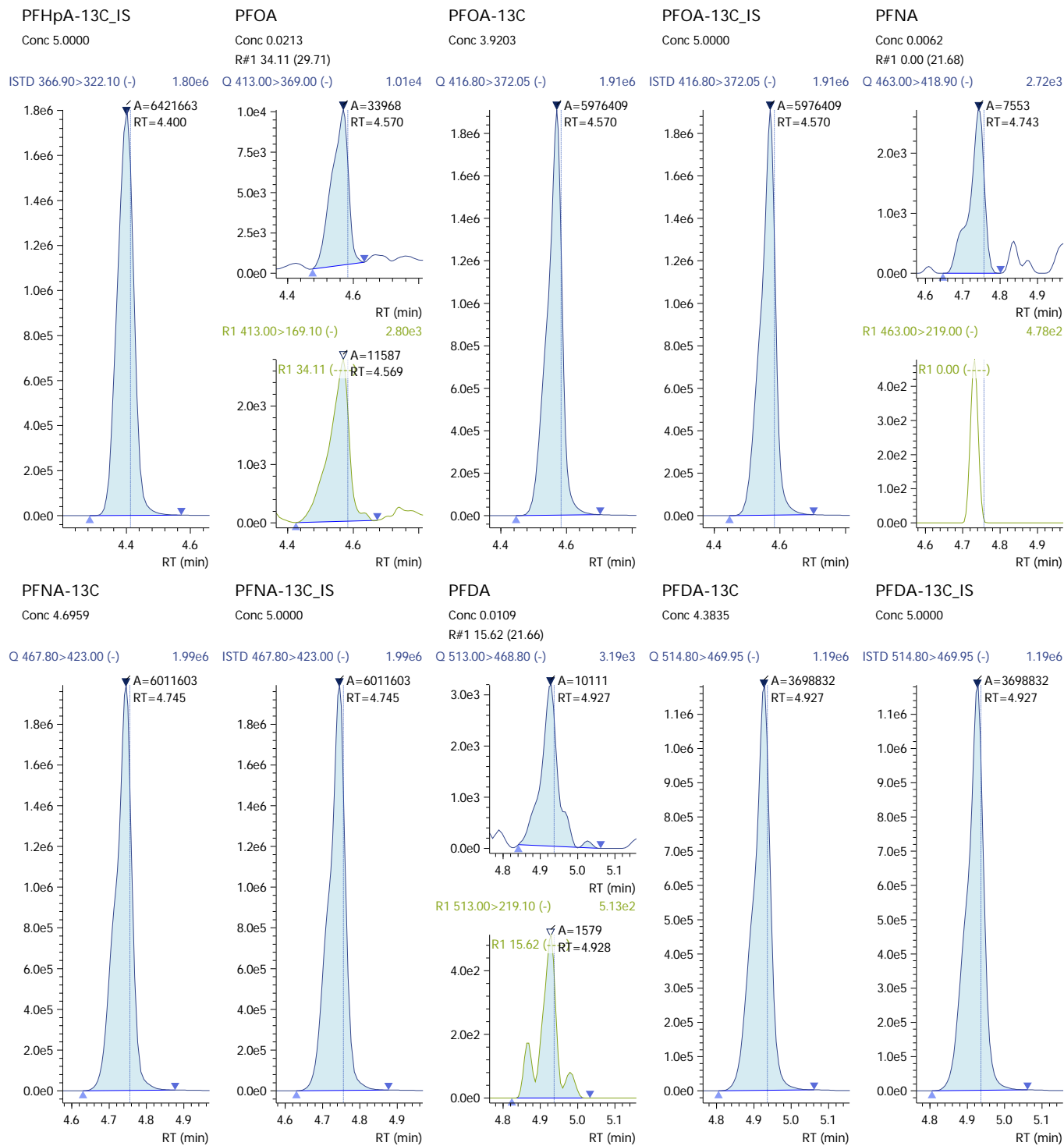


### 210421\_030 (continued)



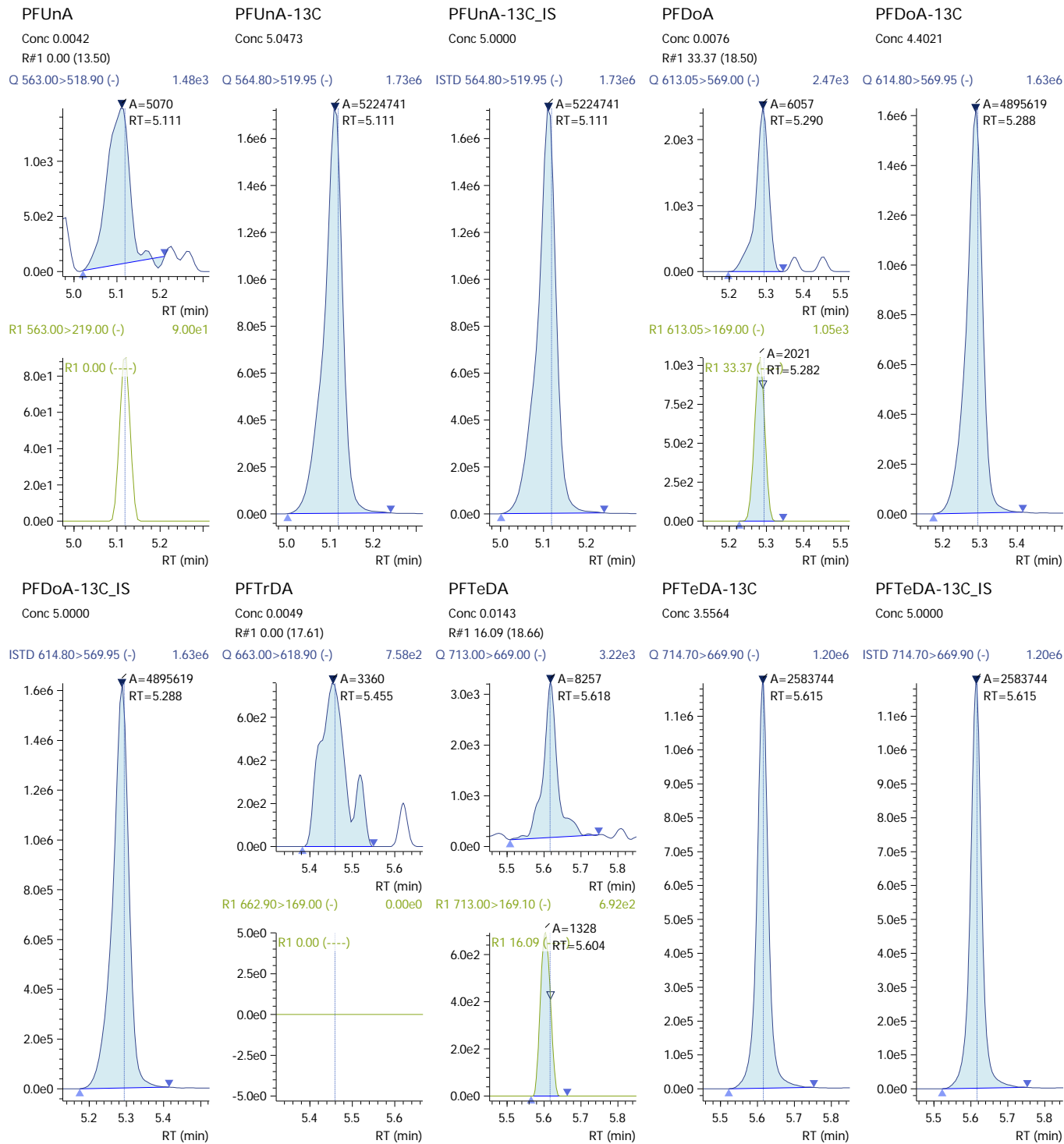


### 210421\_030 (continued)



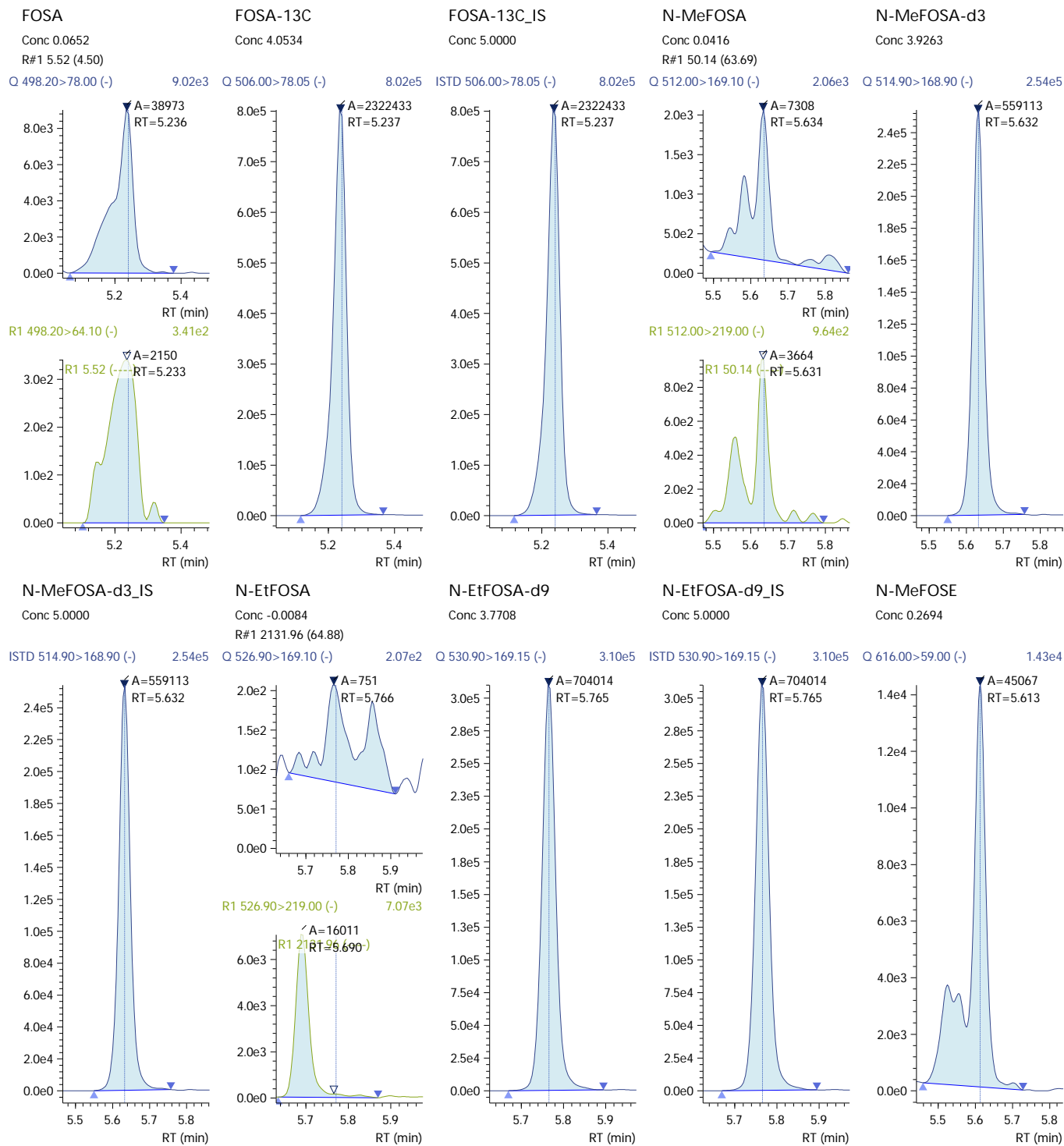


### 210421\_030 (continued)



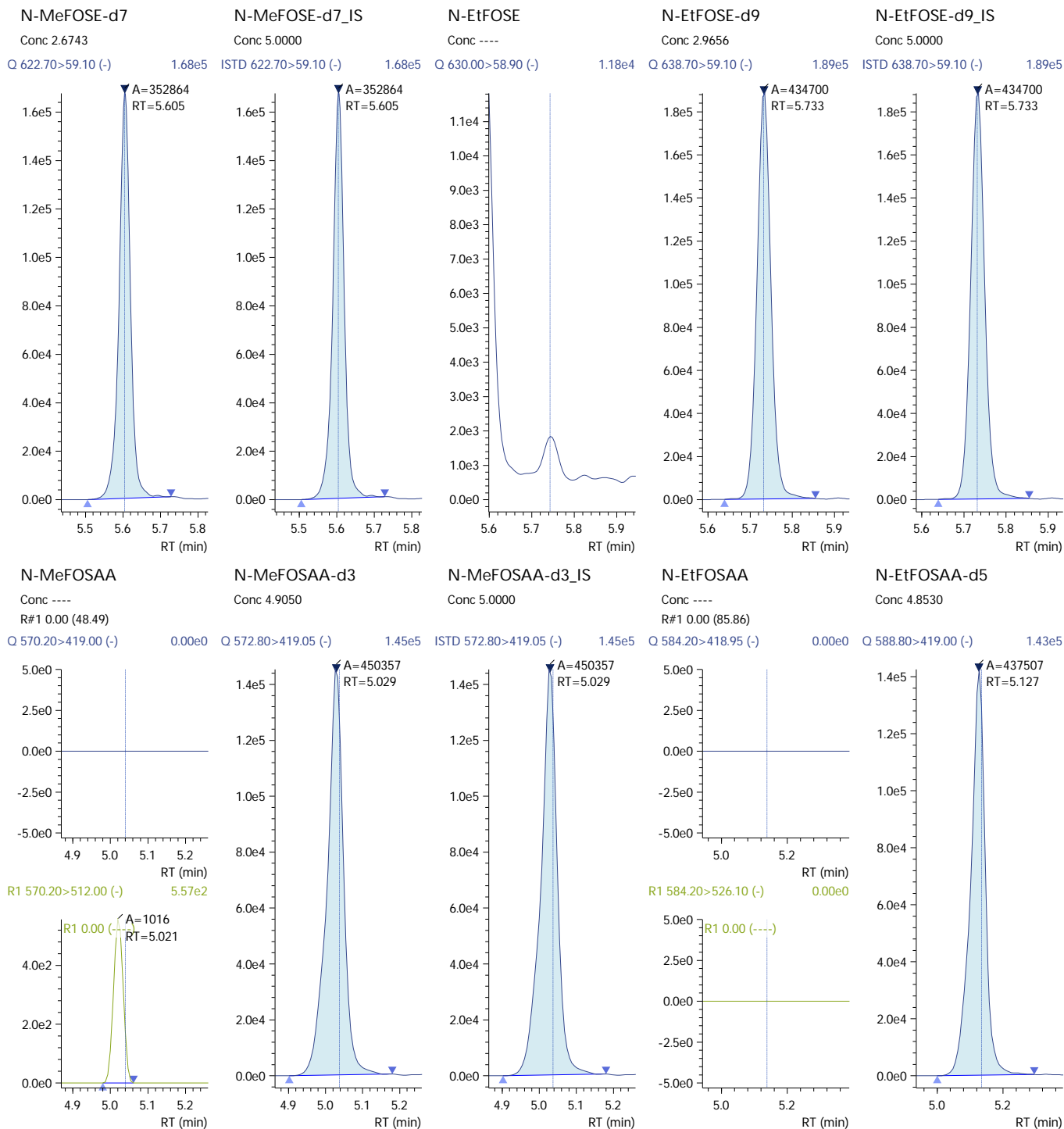


### 210421\_030 (continued)





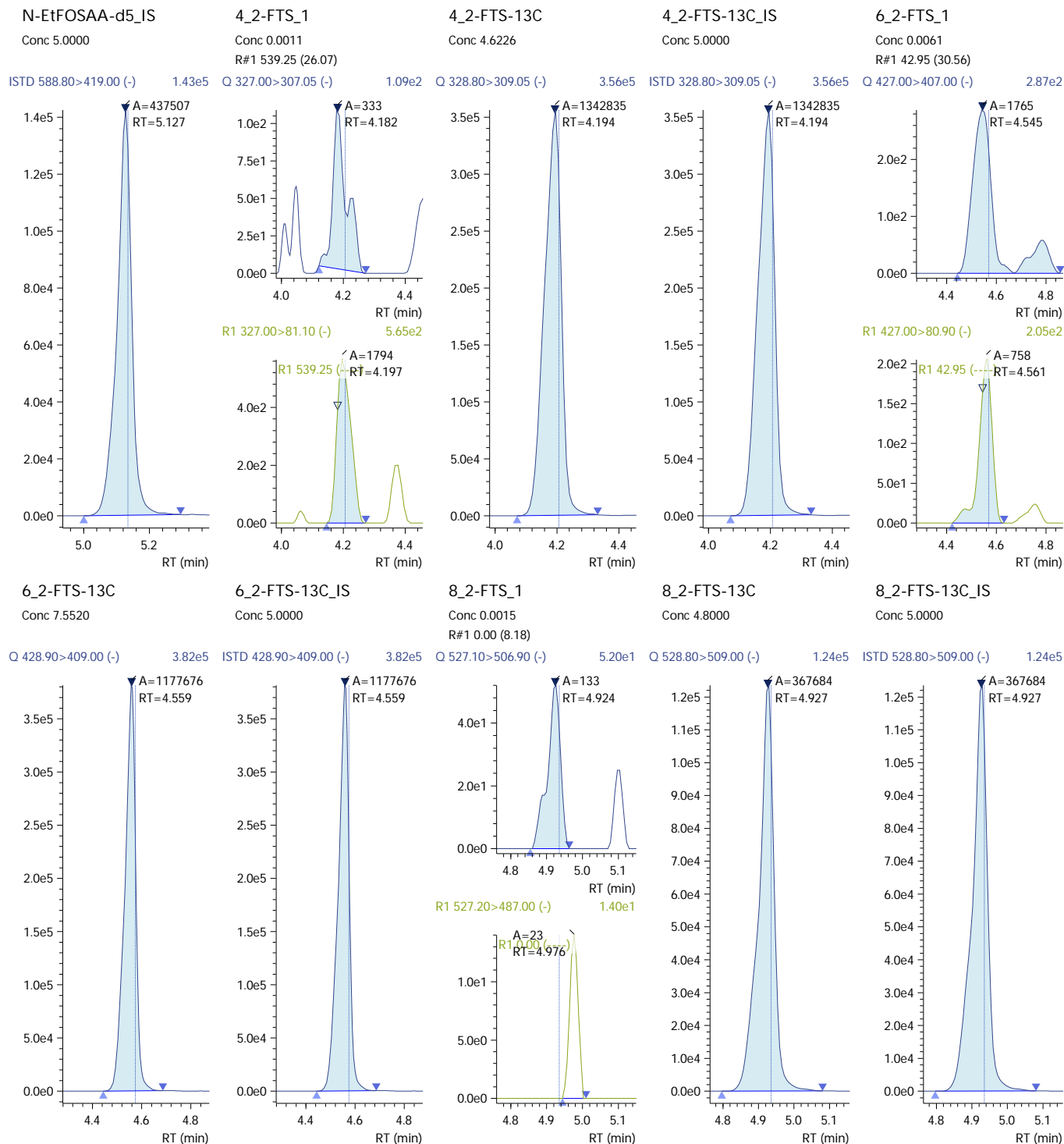
210421\_030 (continued)





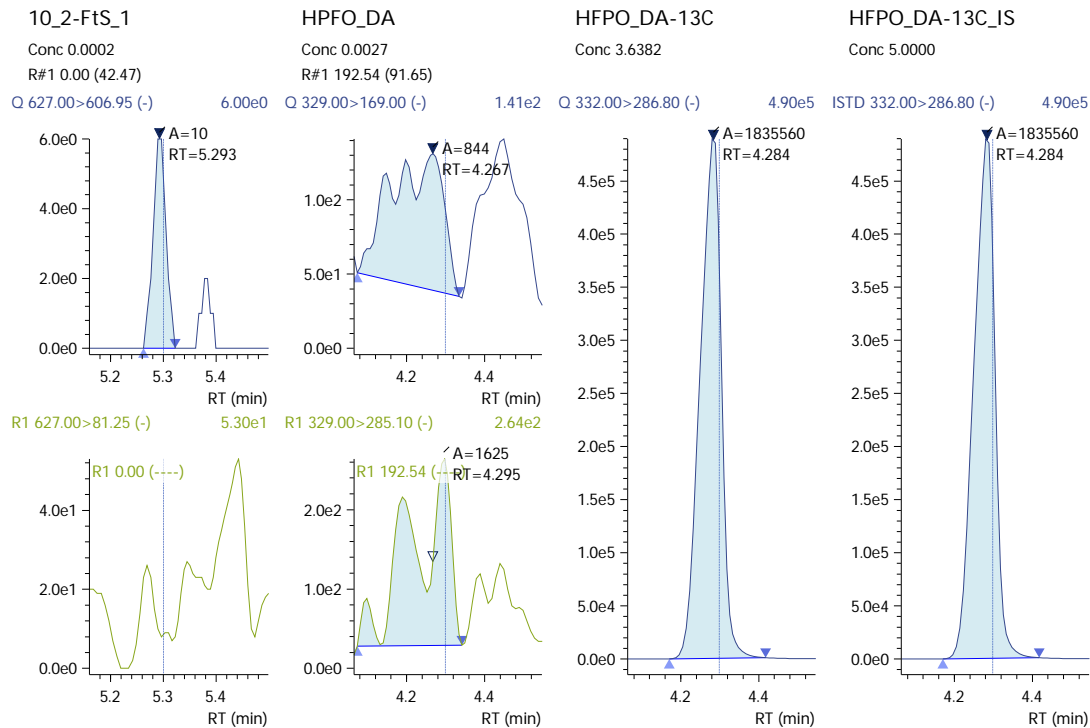


### 210421\_030 (continued)





### 210421\_030 (continued)



# Validation Report

1st *UA* 04/23/21  
2nd *[Signature]* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_031  
**Lab ID:** K2104028-001  
**RunType:** N/A  
**Matrix:** Misc. Solid

**Date Acquired:** 4/21/21 17:01  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
Preparation Hold Time	X	
Analytical Hold Time	X	
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Continuing Calibration Recovery	X	
Lab Control Sample Recovery		X
Method Blank	X	
Method Blank Surrogates		X
Internal Standards	X	
Surrogates		X
Std MRL Unsupported by ICAL	X	
Above Highest ICAL Level	X	

## Analyte Exceptions

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
Lab Control Sample Recovery	Perfluorotridecanoic acid (PFTrDA)	139	63	134	High bias, <MRL in Samples
	N-Methyl perfluorooctane sulfonamidoethanol	157	62	141	High bias, <MRL in Samples
	N-Ethyl perfluorooctane sulfonamidoethanol	140	70	137	High bias, <MRL in Samples
	13C4-PFBA	125	34	116	Native in control, <MRL in Samples
	13C2-PFHxA	140	32	136	
	D5-EtFOSA	132	49	123	
Method Blank Surrogates	13C3-HFPO-DA	140	33	130	
	18O2-PFHxS	155	36	120	Native <MRL in MB
	13C4-PFOS	139	32	130	
	13C4-PFBA	140	34	116	
	13C2-PFHxA	150	32	136	
	13C4-PFHpA	164	36	133	
	13C4-PFOA	144	31	134	
	13C5-PFNA	144	27	133	
	13C2-PFDA	142	30	137	
	13C8-FOSA	149	40	132	
	D3-MeFOSA	149	51	132	
	D5-EtFOSA	144	49	123	
Surrogates	13C3-HFPO-DA	156	33	130	
	13C3-PFBS	124	33	109	Narrate high bias, ND
	18O2-PFHxS	136	36	120	
	13C4-PFOS	137	32	130	
	13C4-PFBA	168	34	116	

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

Analyte Exceptions

1st *UA* 04/23/21  
 2nd *[Signature]* 04/23/21

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
	13C5-PFPeA	156	39	133	Narrate high bias, ND
	13C2-PFHxA	166	32	136	
	13C4-PFHpA	145	36	133	
	13C5-PFNA	174	27	133	
	13C2-PFDA	169	30	137	
	13C2-PFDoDA	171	36	136	
	13C2-PFTeDA	185	39	138	
	13C8-FOSA	156	40	132	
	D3-MeFOSA	153	51	132	
	D5-EtFOSA	154	49	123	
	D3-MeFOSAA	212	20	154	
	D5-EtFOSAA	162	29	153	
	13C2-4:2 FTS	129	18	127	
	13C2-6:2 FTS	292	30	140	
	13C2-8:2 FTS	234	9	171	
	13C3-HFPO-DA	162	33	130	

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

# Quantitation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

<b>Data File:</b> J:\LCMS06\Data\210421_B2\210421_031	<b>Instrument:</b> K-LCMS-06
<b>Acqu Date:</b> 4/21/21 17:01	<b>Vial:</b> 5
<b>Run Type:</b> N/A	<b>Dilution:</b> 1
<b>Lab ID:</b> K2104028-001	<b>Raw Units:</b> ng/mL

<b>Bottle ID:</b> K2104028-001.01	<b>Tier:</b> IV	<b>Matrix:</b> Misc. Solid
<b>Prod Code:</b> PFAS	<b>Collect Date:</b> 4/12/21	<b>Receive Date:</b> 4/16/21

<b>Analysis Lot:</b> 720740	<b>Prep Lot:</b> 377476	<b>Report Group:</b> K2104028
<b>Analysis:</b> PFC/537M	<b>Prep Method:</b> ALS SOP	
	<b>Prep Date:</b> 4/14/21	

<b>Title:</b> Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b> KC2100210
	<b>Report List ID:</b> 19837

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.109	+0.00	3772273	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	% Rec	% Rec Criteria	Rpt?
13C3-PFBS	4.015		777319	6.2180	124 *	33 - 109	Y
18O2-PFHxS	4.394	+0.00	420367	6.7834	136 *	36 - 120	Y
13C4-PFOS	4.727	+0.00	631416	6.8362	137 *	32 - 130	Y
13C4-PFBA	3.401	+0.01	3690080	8.3947	168 *	34 - 116	Y
13C5-PFPeA	3.964	+0.04	3048175	7.8163	156 *	39 - 133	Y
13C2-PFHxA	4.216	+0.00	7012658	8.3132	166 *	32 - 136	Y
13C4-PFHpA	4.397	+0.01	5956409	7.2385	145 *	36 - 133	Y
13C4-PFOA	4.566		4834449	6.3770	128	31 - 134	Y
13C5-PFNA	4.742	+0.00	5533832	8.6925	174 *	27 - 133	Y
13C2-PFDA	4.924	+0.00	3547985	8.4552	169 *	30 - 137	Y
13C2-PFUnDA	5.109	+0.00	3624438	7.0407	141	32 - 146	Y
13C2-PFDODA	5.287	+0.00	4719816	8.5342	171 *	36 - 136	Y
13C2-PFTeDA	5.612	+0.00	3339647	9.2437	185 *	39 - 138	Y
13C8-FOSA	5.235	+0.00	2227238	7.8168	156 *	40 - 132	Y
D3-MeFOSA	5.631	+0.00	540120	7.6271	153 *	51 - 132	Y
D5-EtFOSA	5.766	+0.01	715169	7.7028	154 *	49 - 123	Y
D7-MeFOSE	5.602	+0.00	384717	5.8632	117	53 - 125	Y
D9-EtFOSE	5.731	+0.00	328352	4.5045	90	45 - 121	Y
13C2-6:2 FTS	4.557	+0.00	1134127	14.6247	292 *	30 - 140	Y
13C2-8:2 FTS	4.922	+0.00	445345	11.6909	234 *	9 - 171	Y

## Target Compounds

Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
----------------	----	-----------	----------	------------------	---------------	---	------

U: Undetected at or above MDL  
J: Analyte detected above MDL, but below MRL  
B: Hit above MRL also found in Method Blank  
E: Analyte concentration above high point of ICAL  
N: Presumptive evidence of compound

D: Result from dilution  
m: Manual integration performed  
d: Compound manually deleted  
NR: Analyte not reported from this analysis

\*: Result fails acceptance criteria  
#: Acceptance criteria not applicable  
?: Insufficient information to determine acceptance  
e: Result >= MRL, but MRL less than low point of ICAL  
c: check for co-elution

Printed: 4/23/21 10:02

\\alprews001\starlims\LIMSRpts\QuantValidation.rpt



<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_031	<b>Instrument:</b>	K-LCMS06 <i>206</i>	04/23/21
<b>Acqu Date:</b>	4/21/21 17:01	<b>Vial:</b>	5	
<b>Run Type:</b>	N/A	<b>Dilution:</b>	1	
<b>Lab ID:</b>	K2104028-001	<b>Raw Units:</b>	ng/mL	

**Target Compounds** Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perfluorobutane sulfonic acid (PFBS)	4.018	+0.00	700	0.0032	0.018	U	Y
Perfluorohexane sulfonic acid (PFHxS)	4.397	+0.01	4053	0.0066	0.038	U	Y
Perfluoroheptane sulfonic acid (PFHpS)	0		0	0	0	U	Y
Perfluorooctane sulfonic acid (PFOS)	4.733	+0.01	471	0.0045	0.026	U	Y
Perfluorodecane sulfonic acid (PFDS)	0		0	0	0	U	Y
Perfluorobutanoic acid (PFBA)	0		0	0	0	U	Y
Perfluoropentanoic acid (PFPeA)	3.964	+0.04	33541	-0.0012	0	U	Y
Perfluorohexanoic acid (PFHxA)	4.212	0.00	21770	0.0150	0.085	U	Y
Perfluoroheptanoic acid (PFHpA)	4.387	-0.01	10639	0.0089	0.051	U	Y
Perfluorooctanoic acid (PFOA)	4.566	+0.00	5626	0.0044	0.025	U	Y
Perfluorononanoic acid (PFNA)	4.739		433	0.0004	0.0023	U	Y
Perfluorodecanoic acid (PFDA)	4.901	-0.02	2275	0.0026	0.015	U	Y
Perfluoroundecanoic acid (PFUnDA)	5.106	+0.00	1022	0.0012	0.0068	U	Y
Perfluorododecanoic acid (PFDoDA)	5.286	+0.00	4450	0.0058	0.033	U	Y
Perfluorotridecanoic acid (PFTTrDA)	5.433	-0.02	1213	0.0014	0.0080	U	Y
Perfluorotetradecanoic acid (PFTeDA)	5.611	+0.00	6635	0.0089	0.051	U	Y
Perfluorooctane sulfonamide (FOSA)	5.239	+0.01	472	0.0008	0.0045	U	Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.632	+0.00	588	0.0035	0.020	U	Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	0		0	0	0	U	Y
N-Methyl perfluorooctane sulfonamidoethanol	5.610	+0.00	399	0.0022	0.013	U	Y
N-Ethyl perfluorooctane sulfonamidoethanol	0		0	0	0	U	Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.555	+0.00	1163	0.0042	0.024	U	Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.925	+0.01	163	0.0016	0.0091	U	Y

**Prep Amount:** 1.408 g      **Dilution:** 1  
**Prep Final Amount:** 8.00 mL      **Basis Factor:** 100.00

U: Undetected at or above MDL  
J: Analyte detected above MDL, but below MRL  
B: Hit above MRL also found in Method Blank  
E: Analyte concentration above high point of ICAL  
N: Presumptive evidence of compound  
D: Result from dilution  
m: Manual integration performed  
d: Compound manually deleted  
NR: Analyte not reported from this analysis  
\*: Result fails acceptance criteria  
#: Acceptance criteria not applicable  
?: Insufficient information to determine acceptance  
e: Result >= MRL, but MRL less than low point of ICAL  
c: check for co-elution



210421\_031

Sample ID: K2104028-001  
 Date Acquired: 4/21/2021 5:01:04 PM  
 Acquired by: System Administrator  
 Data File: 210421\_031  
 Vial: 9 | Inj. Volume: 15.0000uL | Tray: 3

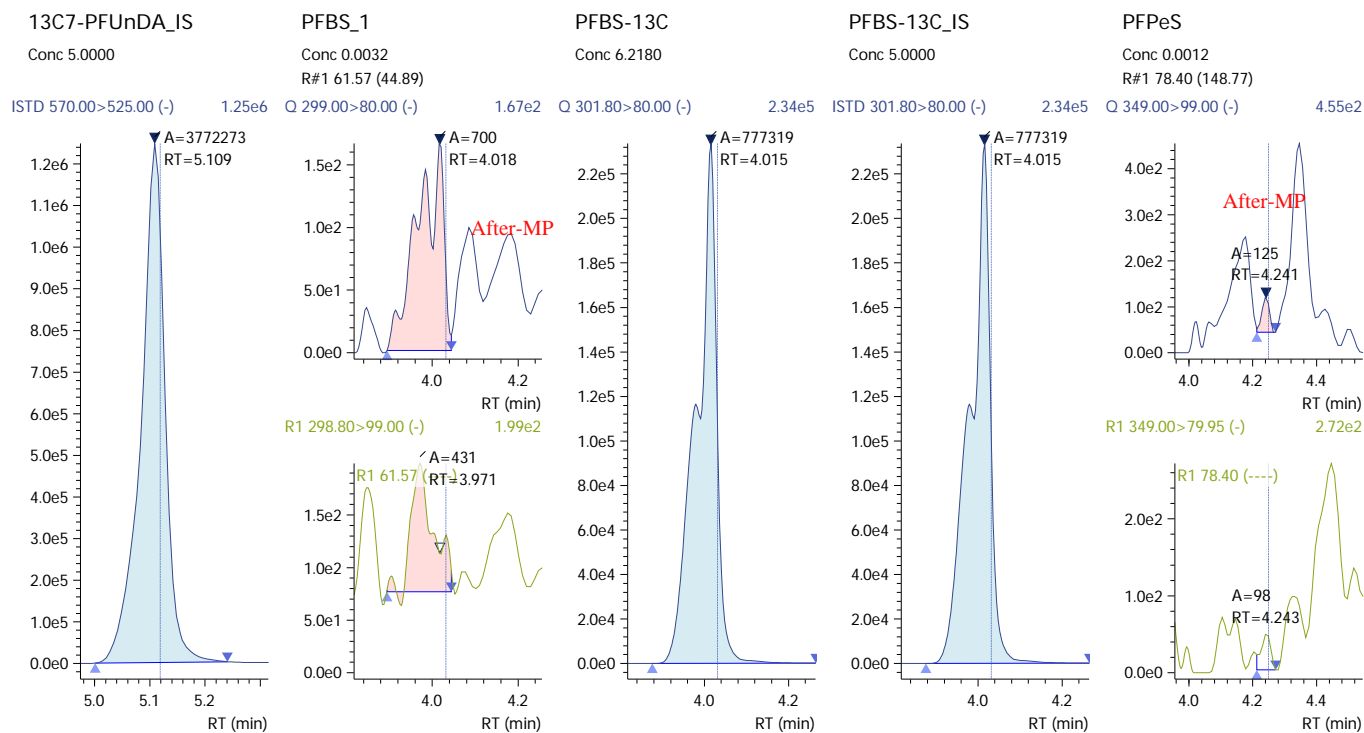
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.109	3772273	3772273	----	----	5.0000	ng/mL
PFBS_1	M	4.018	700	777319	PFBS-13C_IS	----	0.0032	ng/mL
PFBS-13C	Auto	4.015	777319	3772273	13C7-PFUnDA_IS	----	6.2180	ng/mL
PFBS-13C_IS	Auto	4.015	777319	777319	----	----	5.0000	ng/mL
PFPeS	M	4.241	125	777319	PFBS-13C_IS	----	0.0012	ng/mL
PFHxS_1	Auto	4.397	4053	420367	PFHxS-18O_IS	----	0.0066	ng/mL
PFHxS-18O	Auto	4.394	420367	3772273	13C7-PFUnDA_IS	----	6.7834	ng/mL
PFHxS-18O_IS	Auto	4.394	420367	420367	----	----	5.0000	ng/mL
PFHpS_1	ND(W/B)	----	----	420367	PFHxS-18O_IS	----	----	ng/mL
PFOS_1	Auto	4.733	471	631416	PFOS-13C_IS	----	0.0045	ng/mL
PFOS-13C	Auto	4.727	631416	3772273	13C7-PFUnDA_IS	----	6.8362	ng/mL
PFOS-13C_IS	Auto	4.727	631416	631416	----	----	5.0000	ng/mL
PFNS	M	4.936	461	631416	PFOS-13C_IS	----	0.0050	ng/mL
PFDS_1	ND(W/B)	----	----	631416	PFOS-13C_IS	----	----	ng/mL
PFBA	ND(W/B)	----	----	3690080	PFBA-13C_IS	----	----	ng/mL
PFBA-13C	Auto	3.401	3690080	3772273	13C7-PFUnDA_IS	----	8.3947	ng/mL
PFBA-13C_IS	Auto	3.401	3690080	3690080	----	----	5.0000	ng/mL
PFPeA	M	3.964	33541	3048175	PFPeA-13C_IS	----	-0.0012	ng/mL
PFPeA-13C	Auto	3.964	3048175	3772273	13C7-PFUnDA_IS	----	7.8163	ng/mL
PFPeA-13C_IS	Auto	3.964	3048175	3048175	----	----	5.0000	ng/mL
PFHxA	M	4.212	21770	7012658	PFHxA-13C_IS	----	0.0150	ng/mL
PFHxA-13C	Auto	4.216	7012658	3772273	13C7-PFUnDA_IS	----	8.3132	ng/mL
PFHxA-13C_IS	Auto	4.216	7012658	7012658	----	----	5.0000	ng/mL
PFHpA	M	4.387	10639	5956409	PFHpA-13C_IS	----	0.0089	ng/mL
PFHpA-13C	Auto	4.397	5956409	3772273	13C7-PFUnDA_IS	----	7.2385	ng/mL
PFHpA-13C_IS	Auto	4.397	5956409	5956409	----	----	5.0000	ng/mL
PFOA	M	4.566	5626	4834449	PFOA-13C_IS	----	0.0044	ng/mL
PFOA-13C	Auto	4.566	4834449	3772273	13C7-PFUnDA_IS	----	6.3770	ng/mL
PFOA-13C_IS	Auto	4.566	4834449	4834449	----	----	5.0000	ng/mL
PFNA	M	4.739	433	5533832	PFNA-13C_IS	----	0.0004	ng/mL
PFNA-13C	Auto	4.742	5533832	3772273	13C7-PFUnDA_IS	----	8.6925	ng/mL
PFNA-13C_IS	Auto	4.742	5533832	5533832	----	----	5.0000	ng/mL
PFDA	M	4.901	2275	3547985	PFDA-13C_IS	----	0.0026	ng/mL
PFDA-13C	Auto	4.924	3547985	3772273	13C7-PFUnDA_IS	----	8.4552	ng/mL
PFDA-13C_IS	Auto	4.924	3547985	3547985	----	----	5.0000	ng/mL
PFUnA	M	5.106	1022	3624438	PFUnA-13C_IS	----	0.0012	ng/mL
PFUnA-13C	Auto	5.109	3624438	3772273	13C7-PFUnDA_IS	----	7.0407	ng/mL
PFUnA-13C_IS	Auto	5.109	3624438	3624438	----	----	5.0000	ng/mL
PFDoA	Auto	5.286	4450	4719816	PFDoA-13C_IS	----	0.0058	ng/mL
PFDoA-13C	Auto	5.287	4719816	3772273	13C7-PFUnDA_IS	----	8.5342	ng/mL
PFDoA-13C_IS	Auto	5.287	4719816	4719816	----	----	5.0000	ng/mL
PFTeDA	M	5.433	1213	3339647	PFTeDA-13C_IS	----	0.0014	ng/mL
PFTeDA	M	5.611	6635	3339647	PFTeDA-13C_IS	----	0.0089	ng/mL
PFTeDA-13C	Auto	5.612	3339647	3772273	13C7-PFUnDA_IS	----	9.2437	ng/mL
PFTeDA-13C_IS	Auto	5.612	3339647	3339647	----	----	5.0000	ng/mL
FOSA	Auto	5.239	472	2227238	FOSA-13C_IS	----	0.0008	ng/mL
FOSA-13C	Auto	5.235	2227238	3772273	13C7-PFUnDA_IS	----	7.8168	ng/mL
FOSA-13C_IS	Auto	5.235	2227238	2227238	----	----	5.0000	ng/mL
N-MeFOSA	M	5.632	588	540120	N-MeFOSA-d3_IS	----	0.0035	ng/mL
N-MeFOSA-d3	Auto	5.631	540120	3772273	13C7-PFUnDA_IS	----	7.6271	ng/mL
N-MeFOSA-d3_IS	Auto	5.631	540120	540120	----	----	5.0000	ng/mL
N-EtFOSA	ND(W/B)	----	----	715169	N-EtFOSA-d9_IS	----	----	ng/mL
N-EtFOSA-d9	Auto	5.766	715169	3772273	13C7-PFUnDA_IS	----	7.7028	ng/mL
N-EtFOSA-d9_IS	Auto	5.766	715169	715169	----	----	5.0000	ng/mL



### 210421\_031 (continued)

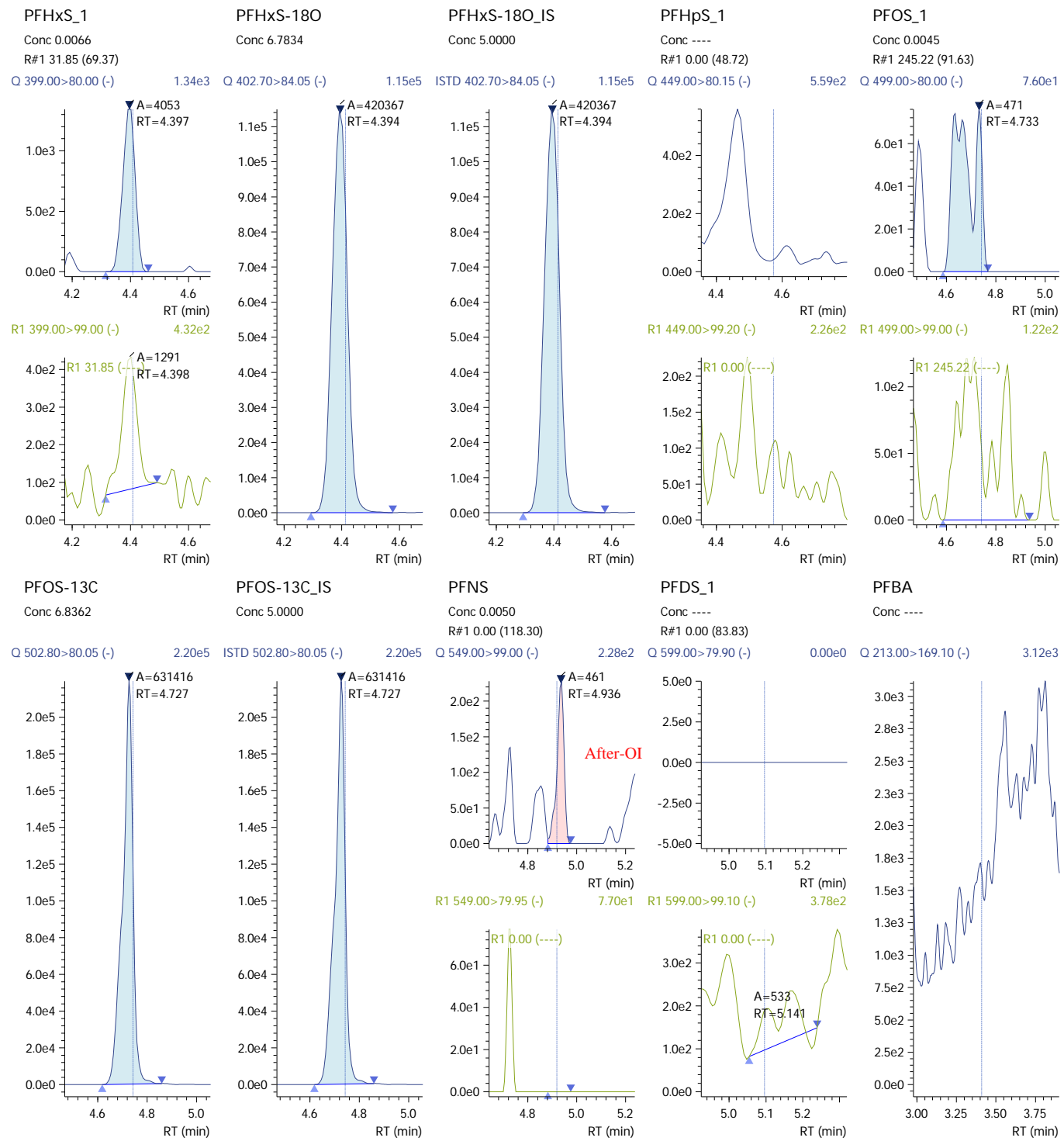
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.610	399	384717	N-MeFOSE-d7_IS	----	0.0022	ng/mL
N-MeFOSE-d7	Auto	5.602	384717	3772273	13C7-PFUnDA_IS	----	5.8632	ng/mL
N-MeFOSE-d7_IS	Auto	5.602	384717	384717	----	----	5.0000	ng/mL
N-EtFOSE	ND(W/B)	----	----	328352	N-EtFOSE-d9_IS	----	----	ng/mL
N-EtFOSE-d9	Auto	5.731	328352	3772273	13C7-PFUnDA_IS	----	4.5045	ng/mL
N-EtFOSE-d9_IS	Auto	5.731	328352	328352	----	----	5.0000	ng/mL
N-MeFOSAA	Auto	5.034	205	482899	N-MeFOSAA-d3_IS	----	0.0293	ng/mL
N-MeFOSAA-d3	Auto	5.025	482899	3772273	13C7-PFUnDA_IS	----	10.5760	ng/mL
N-MeFOSAA-d3_IS	Auto	5.025	482899	482899	----	----	5.0000	ng/mL
N-EtFOSAA	ND(W/B)	----	----	362168	N-EtFOSAA-d5_IS	----	----	ng/mL
N-EtFOSAA-d5	Auto	5.124	362168	3772273	13C7-PFUnDA_IS	----	8.0784	ng/mL
N-EtFOSAA-d5_IS	Auto	5.124	362168	362168	----	----	5.0000	ng/mL
4_2-FTS_1	Auto	4.181	378	930284	4_2-FTS-13C_IS	----	0.0019	ng/mL
4_2-FTS-13C	Auto	4.192	930284	3772273	13C7-PFUnDA_IS	----	6.4397	ng/mL
4_2-FTS-13C_IS	Auto	4.192	930284	930284	----	----	5.0000	ng/mL
6_2-FTS_1	M	4.555	1163	1134127	6_2-FTS-13C_IS	----	0.0042	ng/mL
6_2-FTS-13C	Auto	4.557	1134127	3772273	13C7-PFUnDA_IS	----	14.6247	ng/mL
6_2-FTS-13C_IS	Auto	4.557	1134127	1134127	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.925	163	445345	8_2-FTS-13C_IS	----	0.0016	ng/mL
8_2-FTS-13C	Auto	4.922	445345	3772273	13C7-PFUnDA_IS	----	11.6909	ng/mL
8_2-FTS-13C_IS	Auto	4.922	445345	445345	----	----	5.0000	ng/mL
10_2-FTS_1	Auto	5.290	5	445345	8_2-FTS-13C_IS	----	0.0001	ng/mL
HPFO_DA	M	4.289	206	2031263	HPFO_DA-13C_IS	----	0.0006	ng/mL
HPFO_DA-13C	Auto	4.283	2031263	3772273	13C7-PFUnDA_IS	----	8.0959	ng/mL
HPFO_DA-13C_IS	Auto	4.283	2031263	2031263	----	----	5.0000	ng/mL



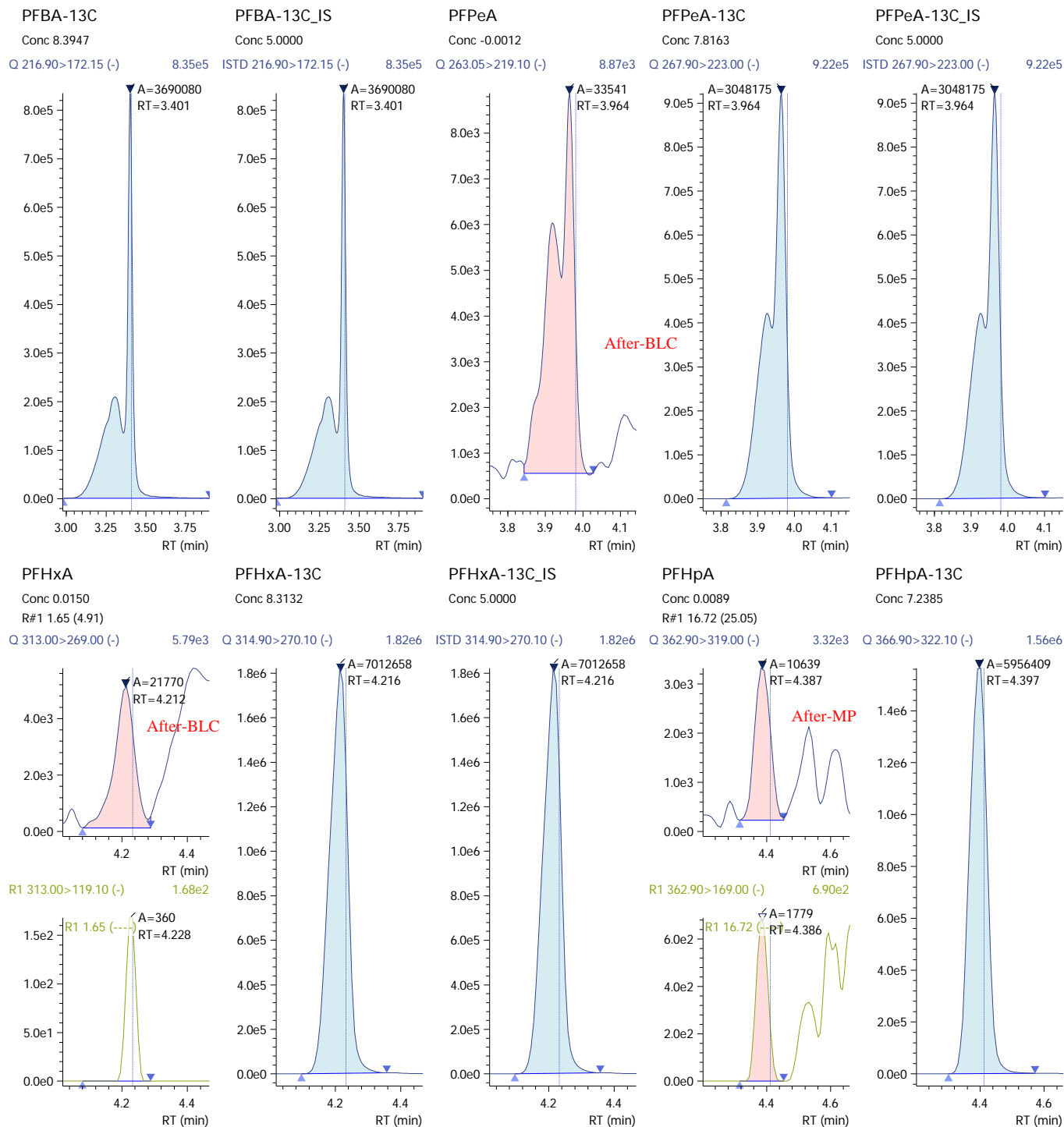


### 210421\_031 (continued)





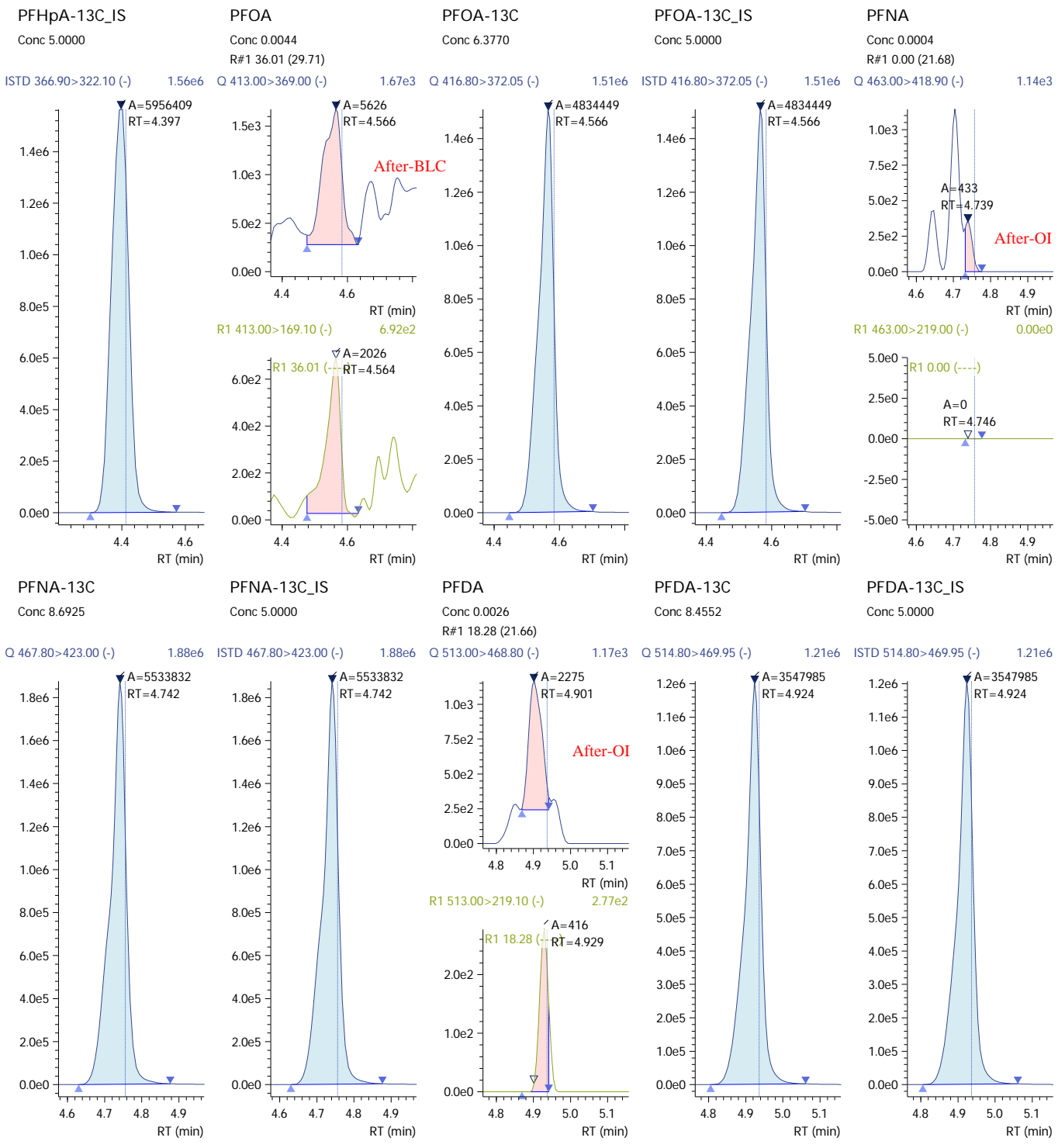
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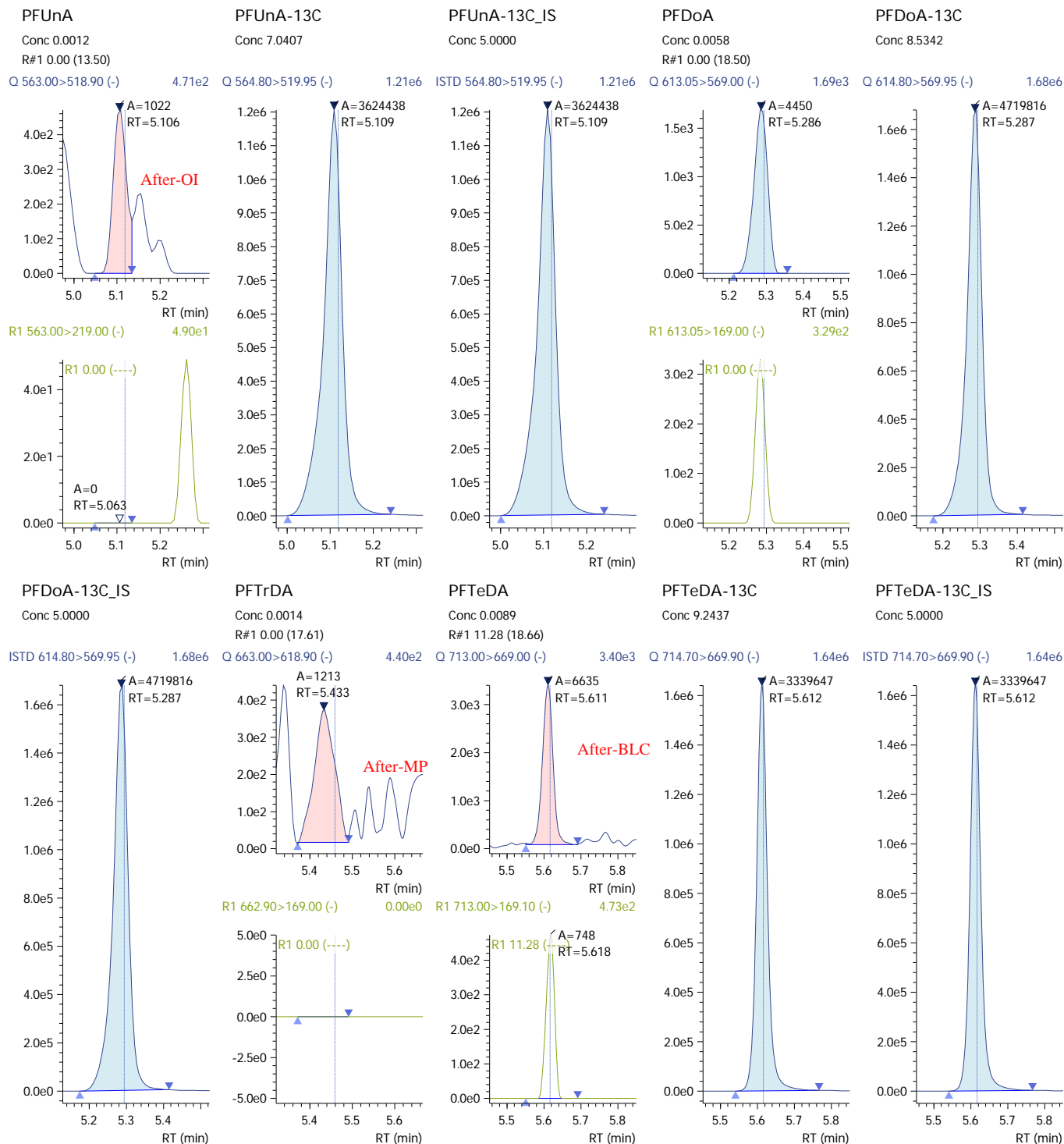


210421\_031 (continued)



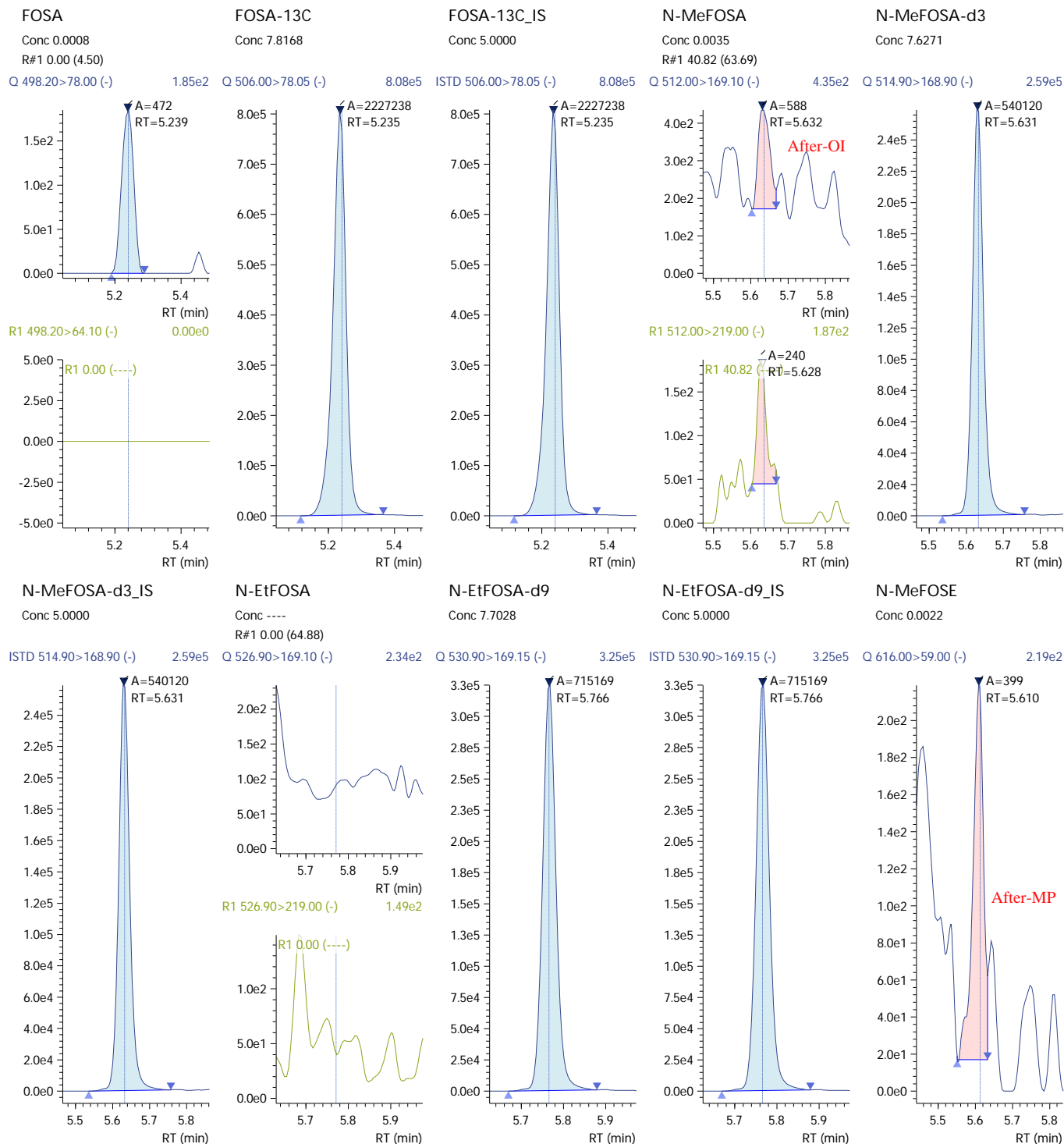


210421\_031 (continued)



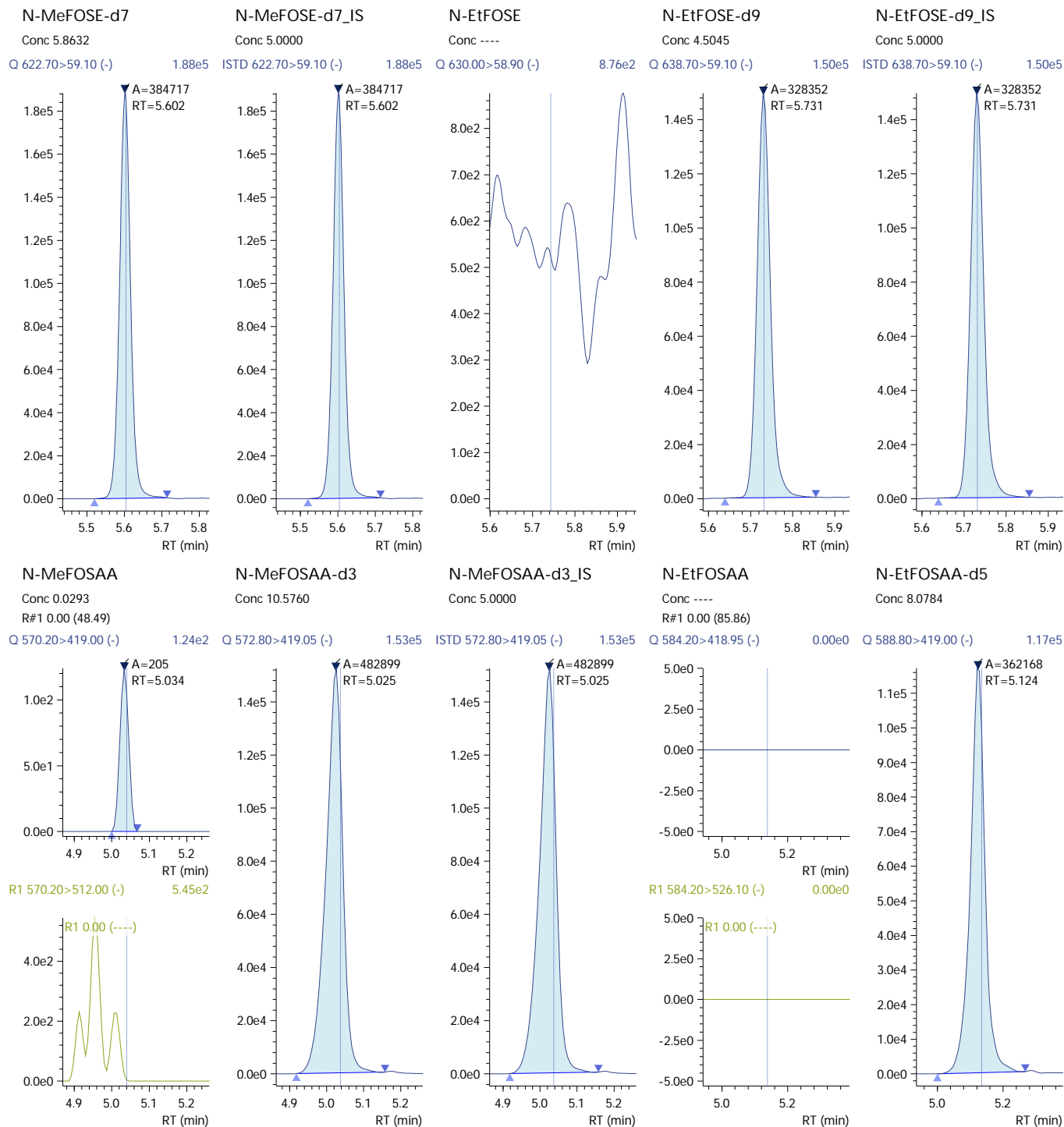


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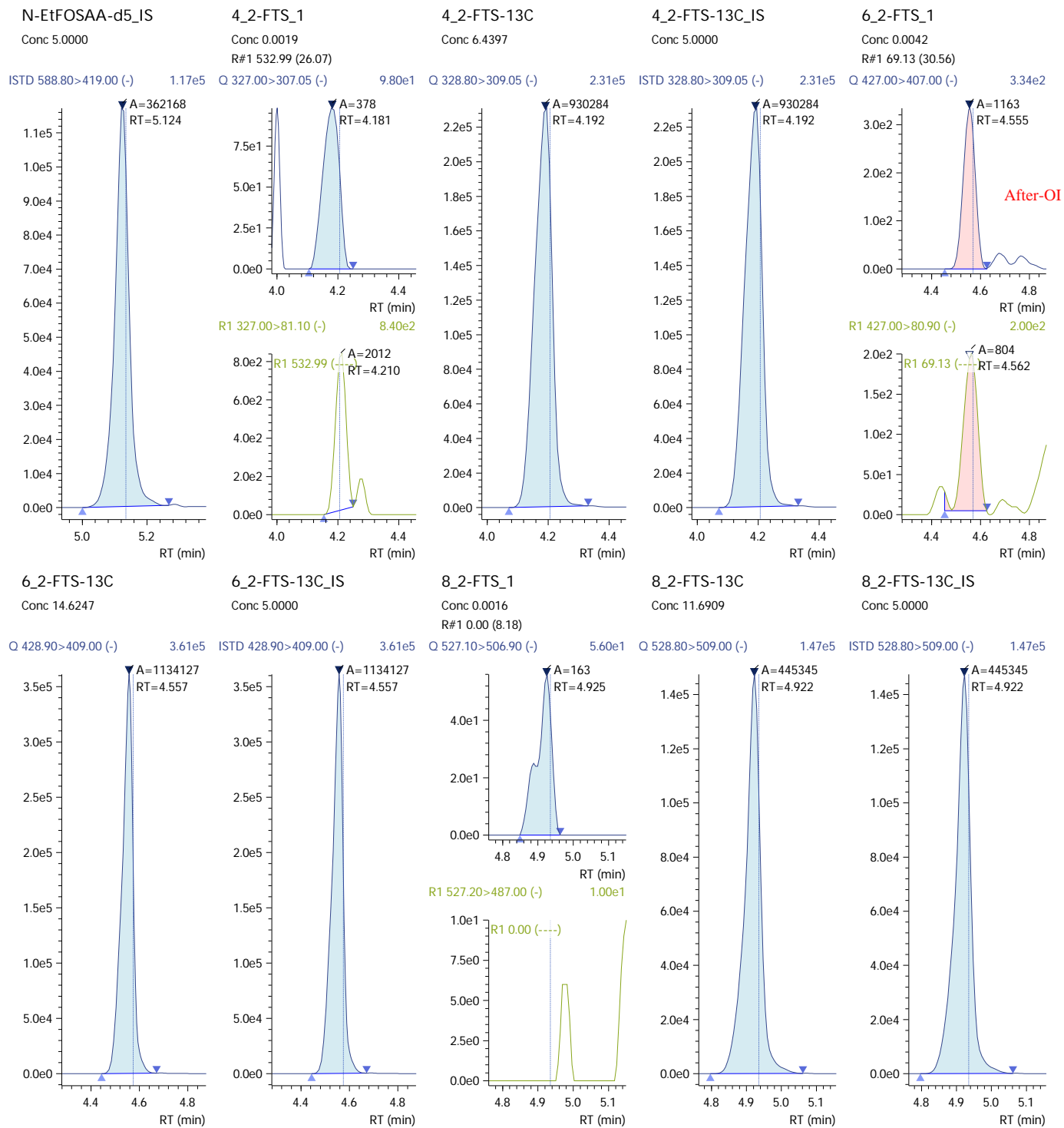


210421\_031 (continued)





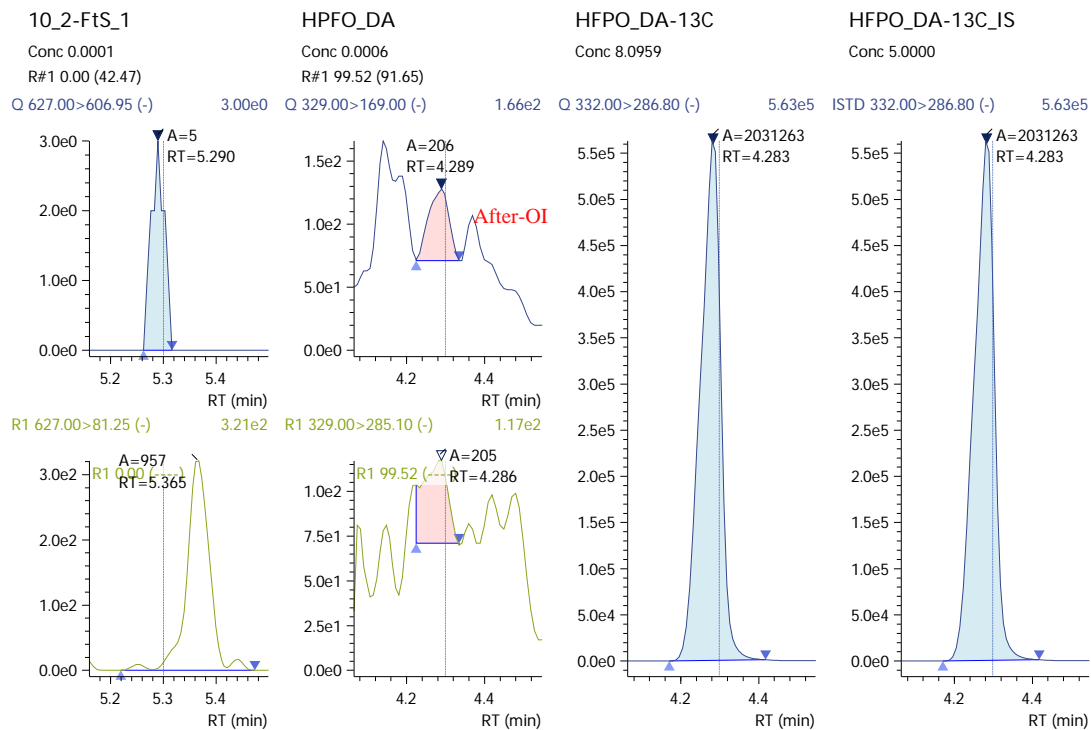
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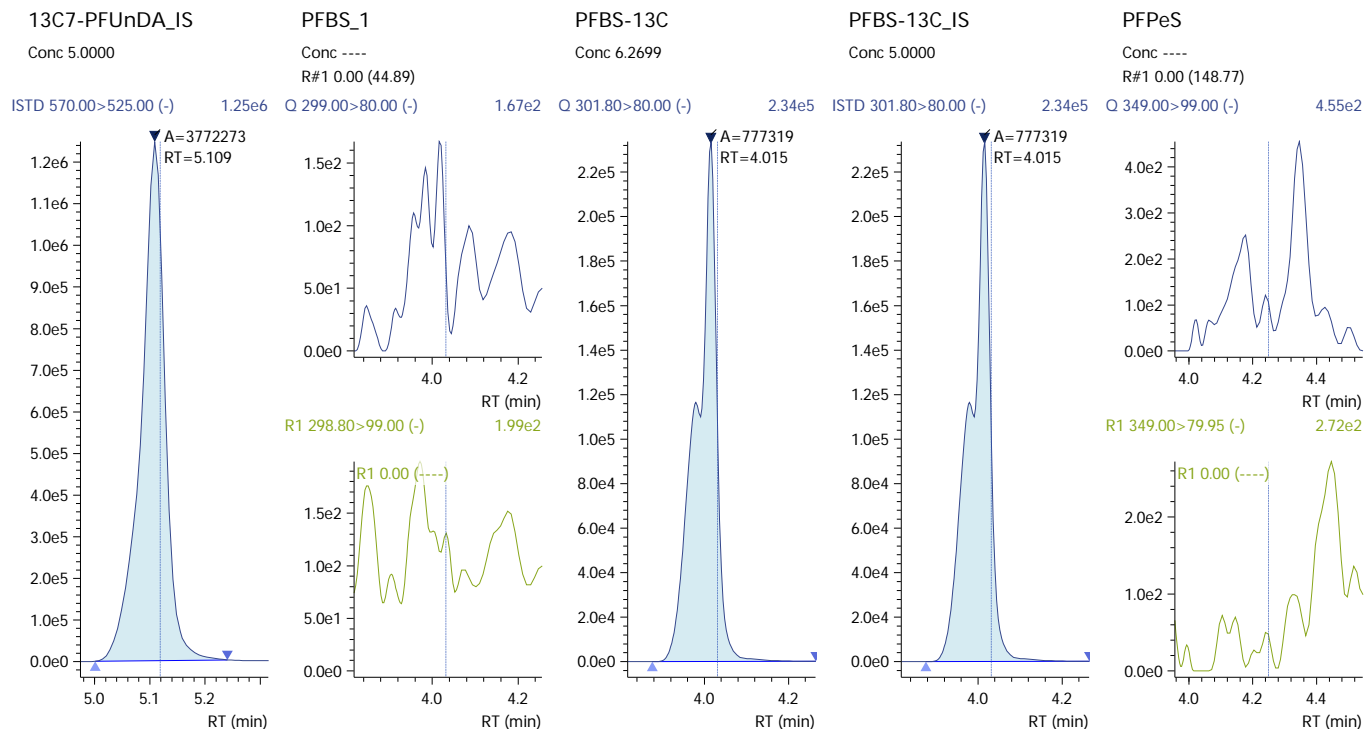
### 210421\_031 (continued)





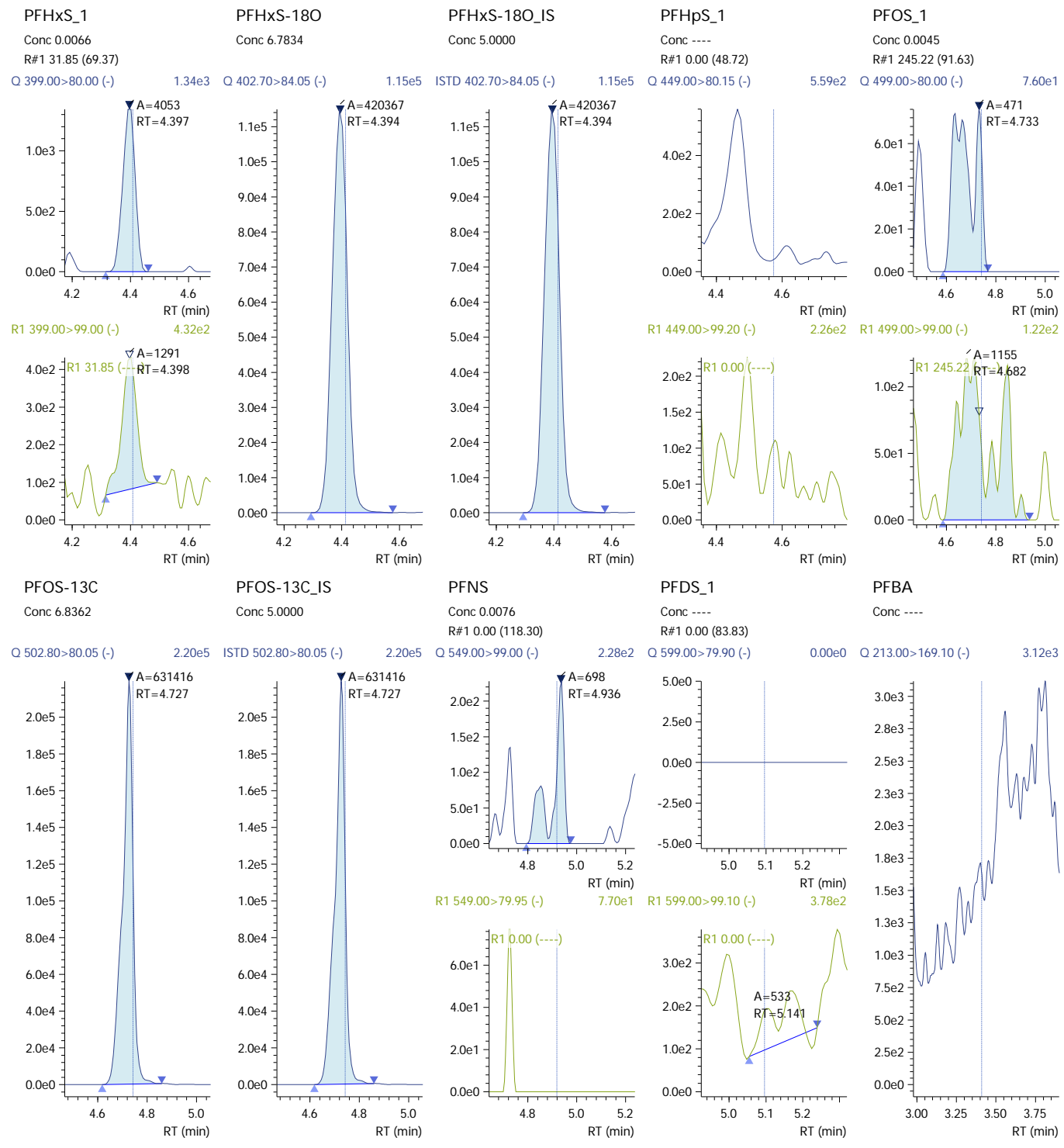
### 210421\_031

Sample ID: K2104028-001  
Date Acquired: 4/21/2021 5:01:04 PM  
Acquired by: System Administrator  
Data File: 210421\_031  
Vial: 9 | Inj. Volume: 15.0000uL | Tray: 3



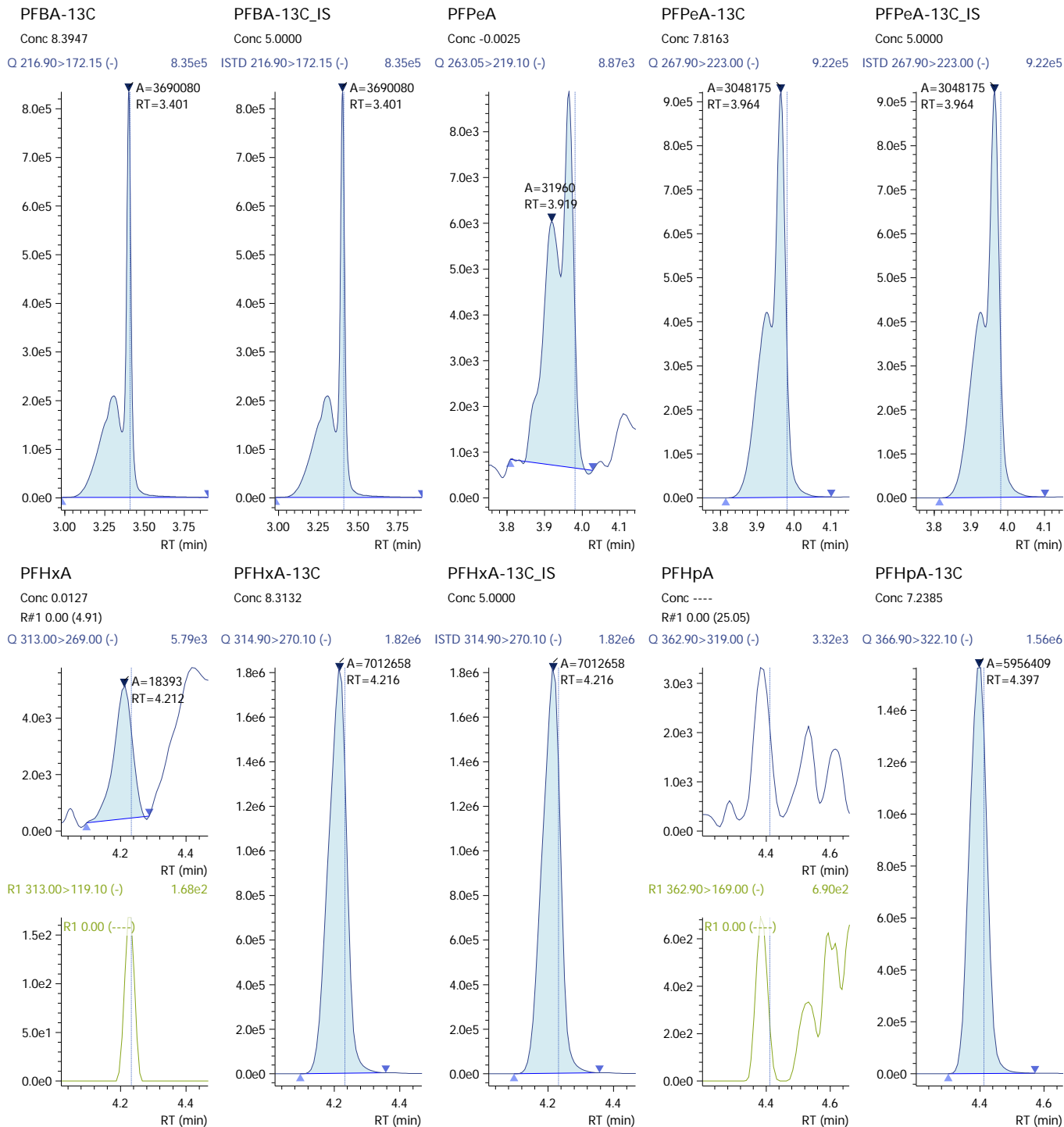


### 210421\_031 (continued)



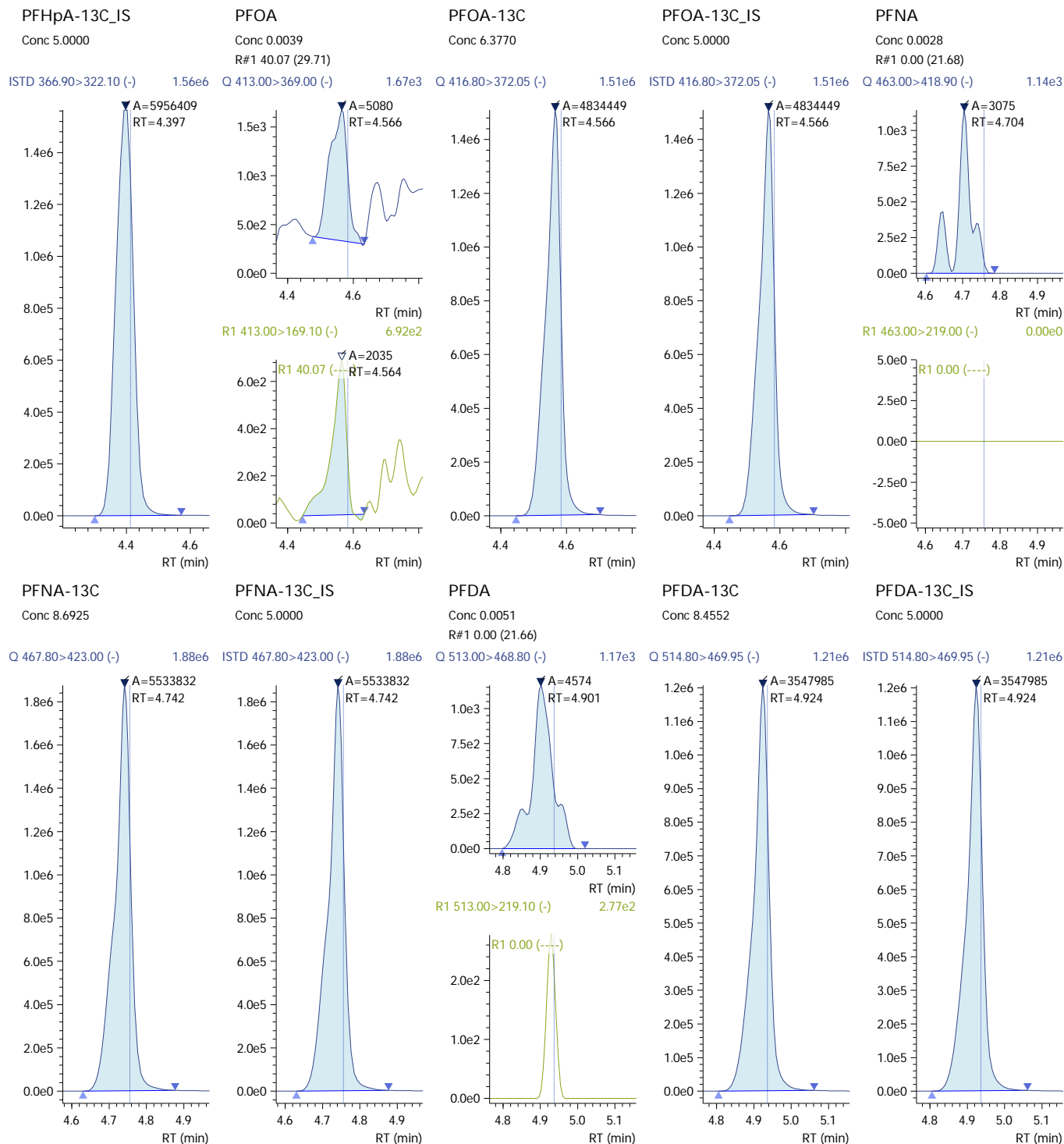


### 210421\_031 (continued)





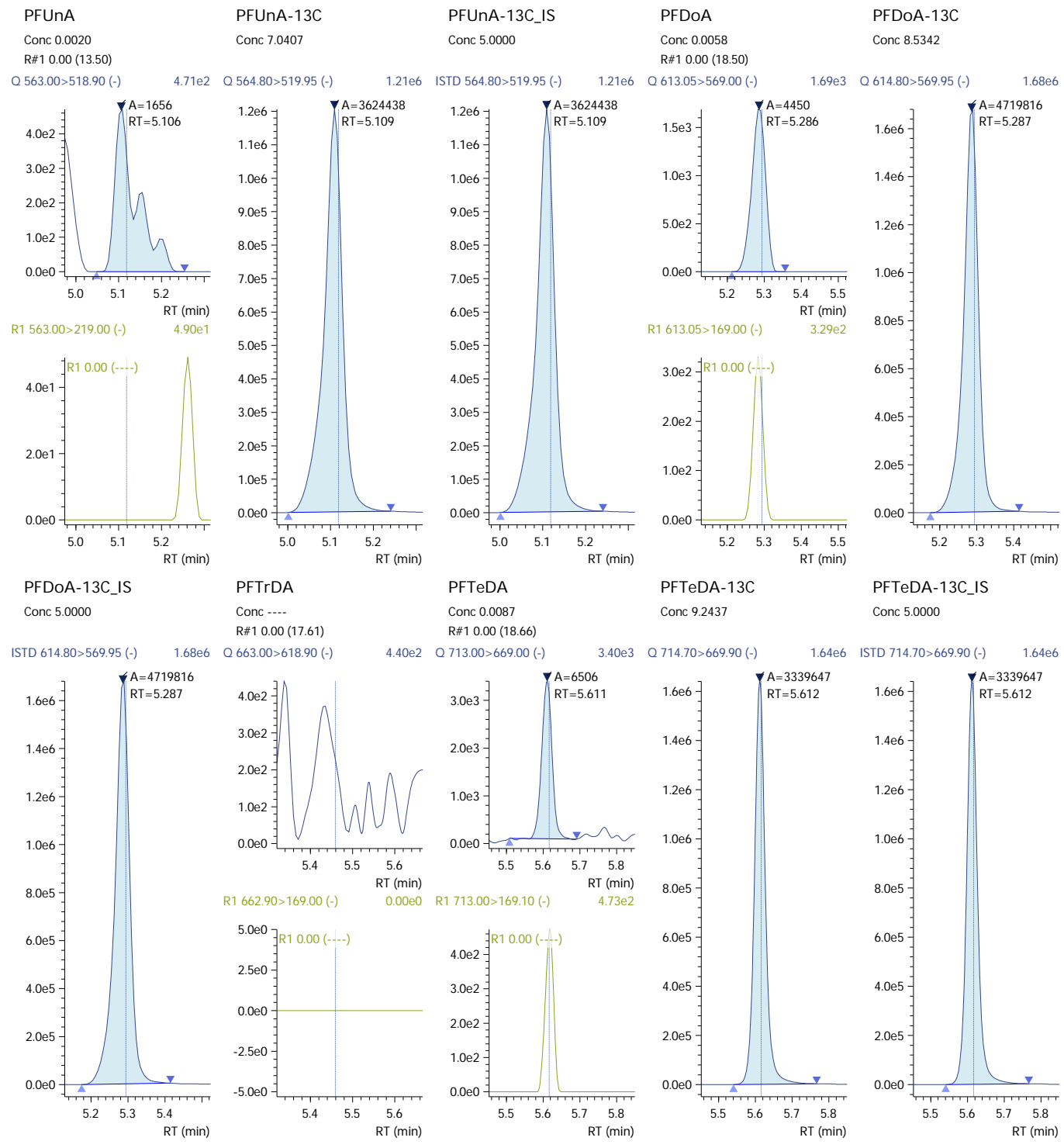
### 210421\_031 (continued)





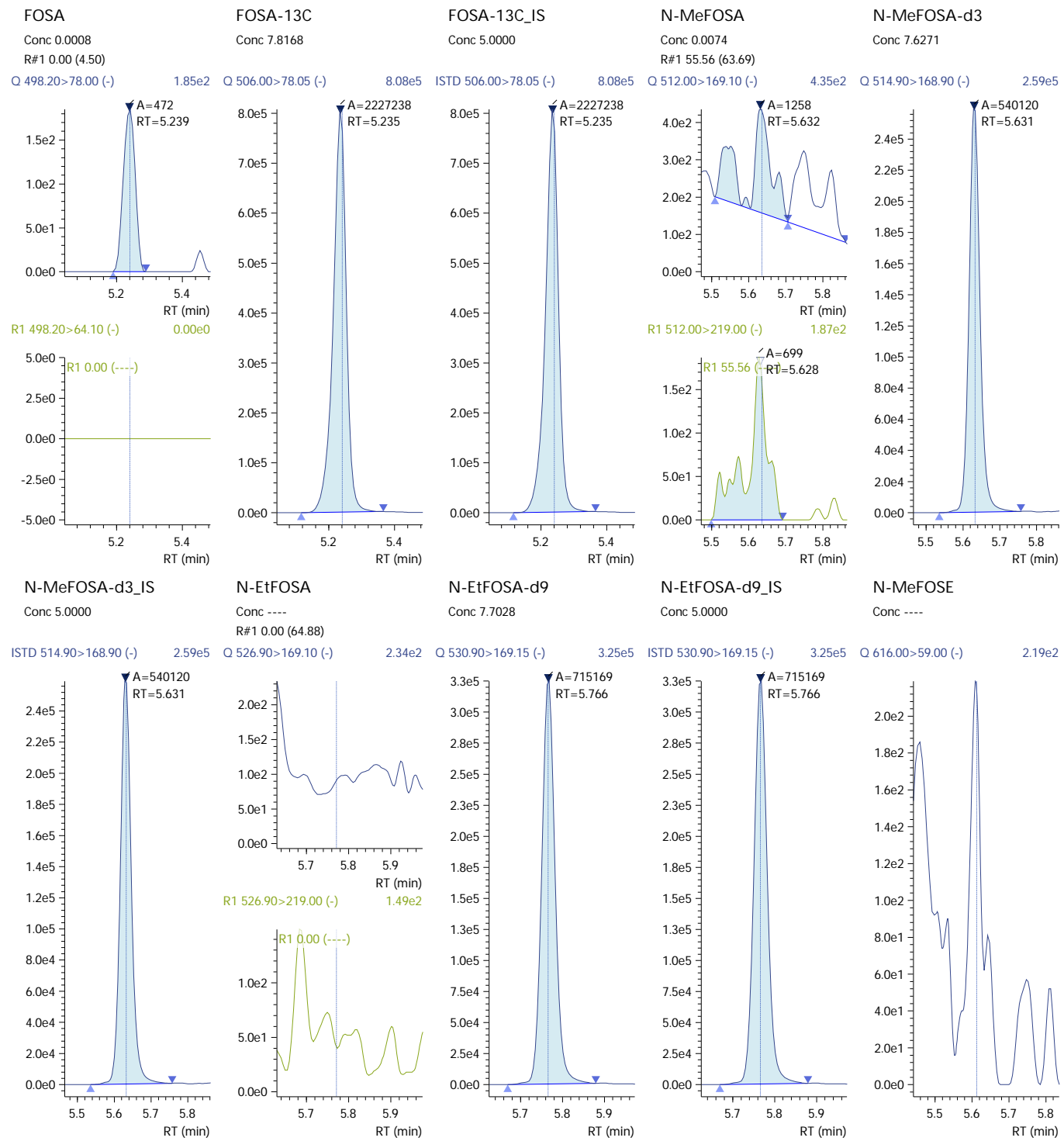


### 210421\_031 (continued)



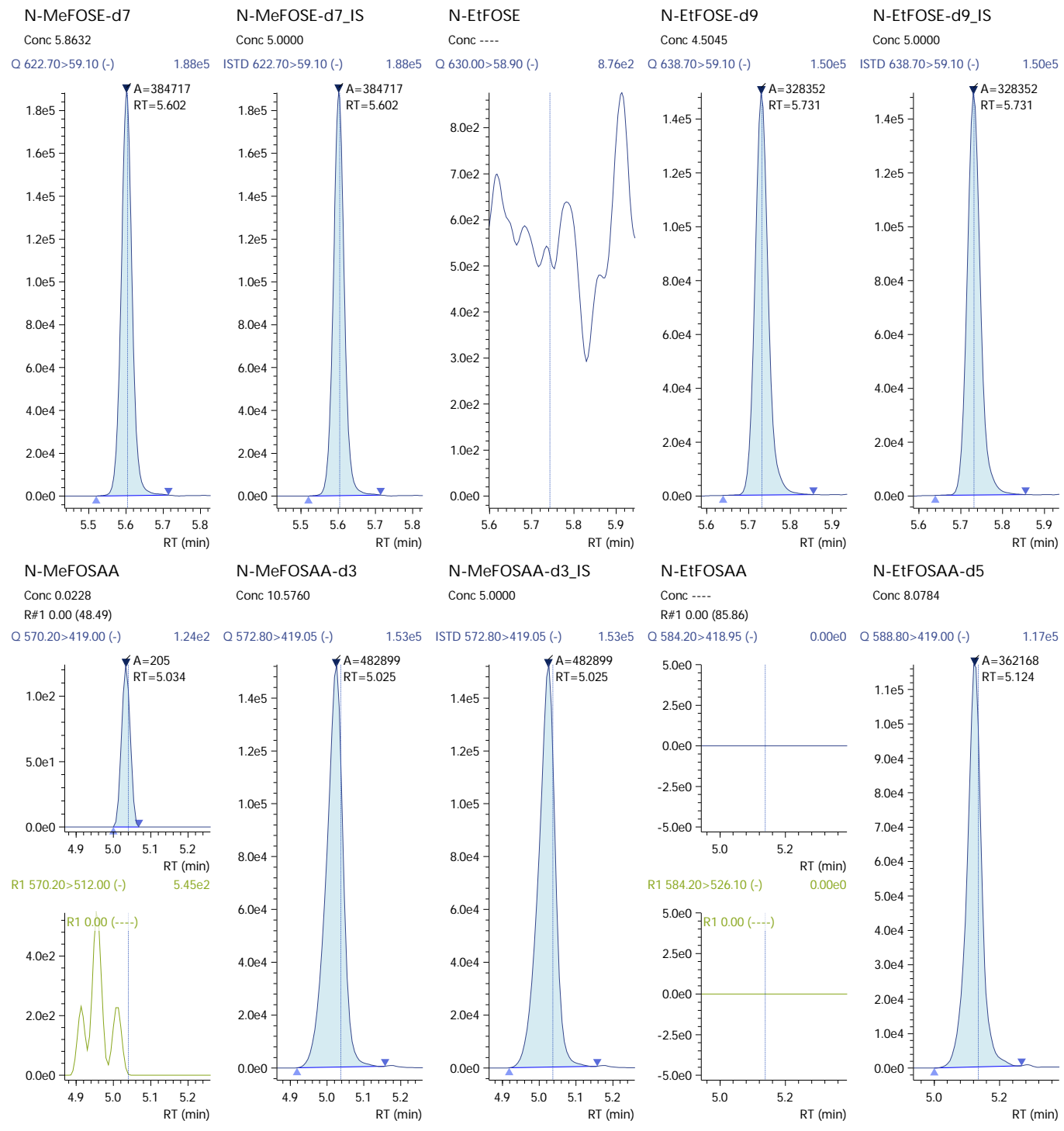


### 210421\_031 (continued)





### 210421\_031 (continued)





210421\_031 (continued)

N-EtFOSAA-d5\_IS  
 Conc 5.0000

4\_2-FTS\_1  
 Conc 0.0019  
 R#1 532.99 (26.07)

4\_2-FTS-13C  
 Conc 6.4397

4\_2-FTS-13C\_IS  
 Conc 5.0000

6\_2-FTS\_1  
 Conc 0.0050  
 R#1 68.18 (30.56)

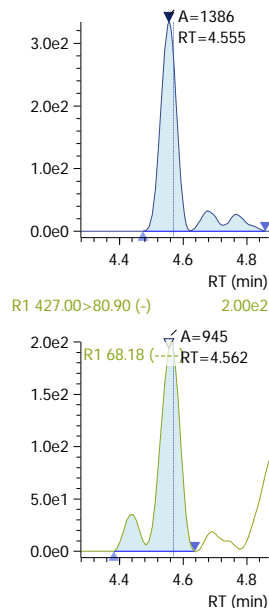
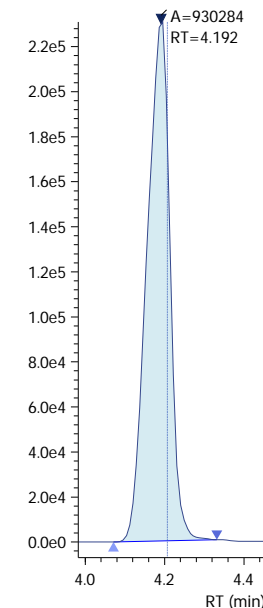
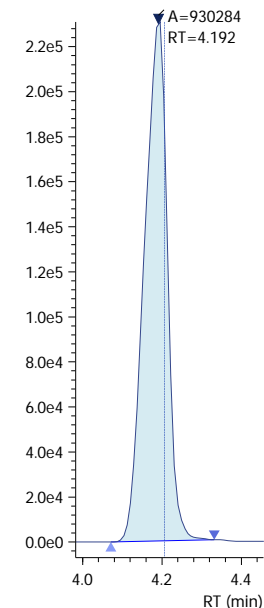
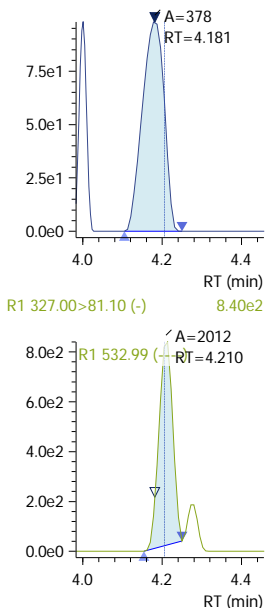
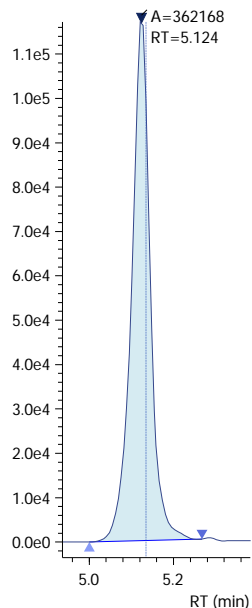
ISTD 588.80>419.00 (-) 1.17e5

Q 327.00>307.05 (-) 9.80e1

Q 328.80>309.05 (-) 2.31e5

ISTD 328.80>309.05 (-) 2.31e5

Q 427.00>407.00 (-) 3.34e2



6\_2-FTS-13C  
 Conc 14.6247

6\_2-FTS-13C\_IS  
 Conc 5.0000

8\_2-FTS\_1  
 Conc 0.0016  
 R#1 0.00 (8.18)

8\_2-FTS-13C  
 Conc 11.6909

8\_2-FTS-13C\_IS  
 Conc 5.0000

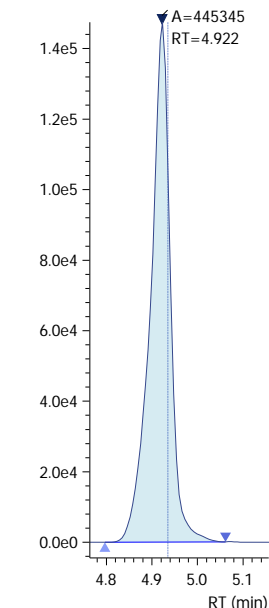
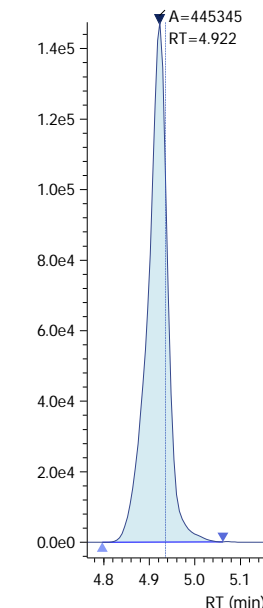
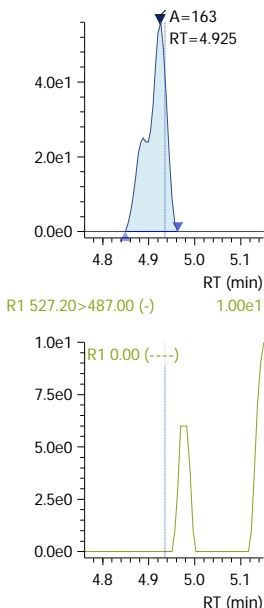
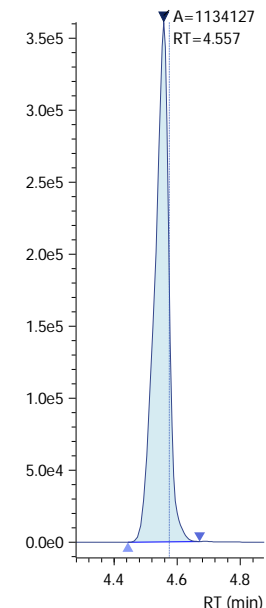
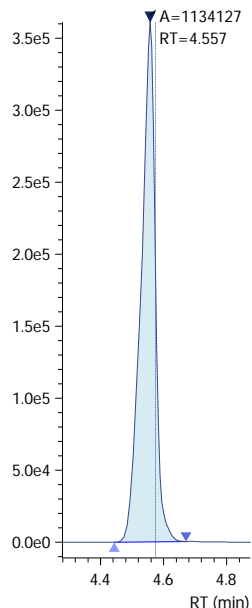
Q 428.90>409.00 (-) 3.61e5

ISTD 428.90>409.00 (-) 3.61e5

Q 527.10>506.90 (-) 5.60e1

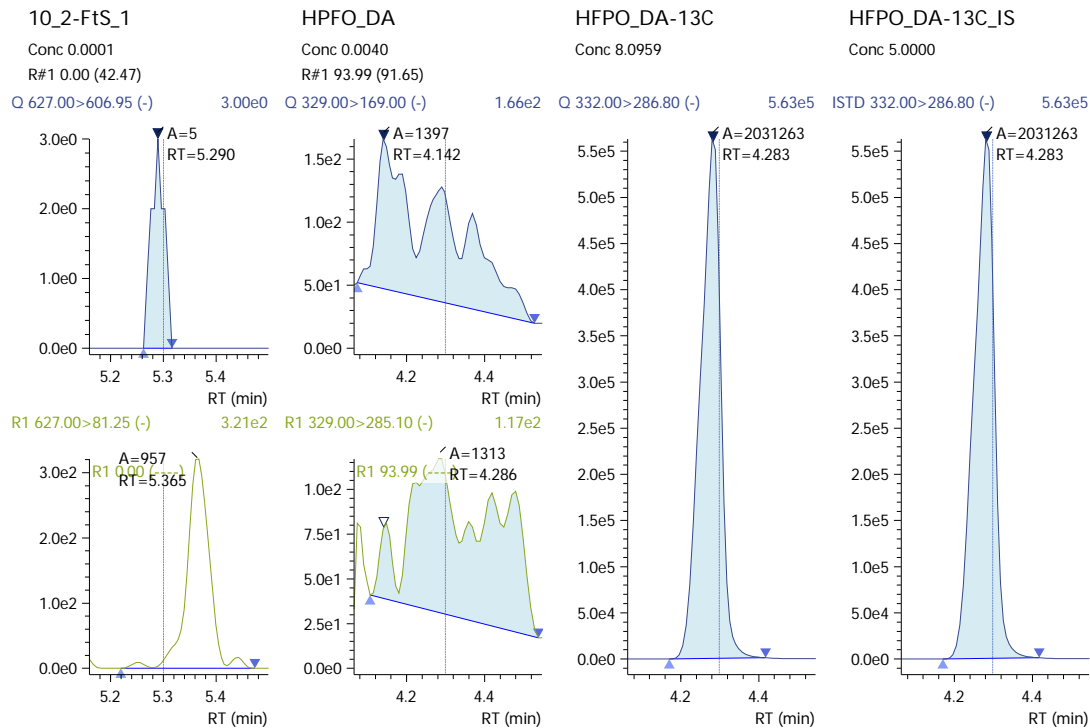
Q 528.80>509.00 (-) 1.47e5

ISTD 528.80>509.00 (-) 1.47e5





### 210421\_031 (continued)



# Validation Report

1st *UA* 04/23/21  
2nd *[Signature]* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_027  
**Lab ID:** KQ2106020-04  
**RunType:** MB  
**Matrix:** Solid

**Date Acquired:** 4/21/21 16:18  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
Analytical Hold Time	X	
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Continuing Calibration Recovery	X	
Internal Standards	X	
Surrogates		X
Std MRL Unsupported by ICAL	X	
Above Highest ICAL Level	X	

## Analyte Exceptions

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
Surrogates	18O2-PFHxS	155	36	120	Native <MRL in MB
	13C4-PFOS	139	32	130	
	13C4-PFBA	140	34	116	
	13C2-PFHxA	150	32	136	
	13C4-PFHpA	164	36	133	
	13C4-PFOA	144	31	134	
	13C5-PFNA	144	27	133	
	13C2-PFDA	142	30	137	
	13C8-FOSA	149	40	132	
	D3-MeFOSA	149	51	132	
	D5-EtFOSA	144	49	123	
	13C3-HFPO-DA	156	33	130	

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_



# Quantitation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

<b>Data File:</b> J:\LCMS06\Data\210421_B2\210421_027	<b>Instrument:</b> K-LCMS-06
<b>Acqu Date:</b> 4/21/21 16:18	<b>Vial:</b> 9
<b>Run Type:</b> MB	<b>Dilution:</b> 1
<b>Lab ID:</b> KQ2106020-04	<b>Raw Units:</b> ng/mL

<b>Bottle ID:</b>	<b>Tier:</b> II	<b>Matrix:</b> Solid
<b>Prod Code:</b> PFAS	<b>Collect Date:</b> 3/25/21	<b>Receive Date:</b> 4/5/21

<b>Analysis Lot:</b> 720740	<b>Prep Lot:</b> 377476	<b>Report Group:</b> KQ2106020
<b>Analysis:</b> PFC/537M	<b>Prep Method:</b> ALS SOP	
	<b>Prep Date:</b> 4/14/21	

<b>Title:</b> Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b> KC2100210
	<b>Report List ID:</b> 20091

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.111	+0.01	4020283	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	% Rec	% Rec Criteria	Rpt?
13C3-PFBS	4.019	+0.00	719518	5.4006	108	33 - 109	Y
18O2-PFHxS	4.403	+0.01	511809	7.7495	155 *	36 - 120	Y
13C4-PFOS	4.731	+0.01	683662	6.9452	139 *	32 - 130	Y
13C4-PFBA	3.405	+0.01	3285588	7.0134	140 *	34 - 116	Y
13C5-PFPeA	3.923	+0.00	2560306	6.1603	123	39 - 133	Y
13C2-PFHxA	4.222	+0.01	6756199	7.5151	150 *	32 - 136	Y
13C4-PFHpA	4.404	+0.01	7187408	8.1957	164 *	36 - 133	Y
13C4-PFOA	4.572	+0.01	5809304	7.1902	144 *	31 - 134	Y
13C5-PFNA	4.746	+0.01	4873129	7.1824	144 *	27 - 133	Y
13C2-PFDA	4.927	+0.01	3170451	7.0894	142 *	30 - 137	Y
13C2-PFUnDA	5.112	+0.01	3879631	7.0715	141	32 - 146	Y
13C2-PFDODA	5.290	+0.01	3916398	6.6447	133	36 - 136	Y
13C2-PFTeDA	5.616	+0.01	2385825	6.1963	124	39 - 138	Y
13C8-FOSA	5.238	+0.01	2255729	7.4284	149 *	40 - 132	Y
D3-MeFOSA	5.635	+0.01	560897	7.4319	149 *	51 - 132	Y
D5-EtFOSA	5.769	+0.01	714094	7.2167	144 *	49 - 123	Y
D7-MeFOSE	5.606	+0.01	387206	5.5371	111	53 - 125	Y
D9-EtFOSE	5.735	+0.01	446407	5.7462	115	45 - 121	Y
D3-MeFOSAA	5.029	+0.01	351995	7.2335	145	20 - 154	Y
D5-EtFOSAA	5.128	+0.01	285741	5.9805	120	29 - 153	Y
13C2-4:2 FTS	4.197	+0.01	867233	5.6329	113	18 - 127	Y
13C2-6:2 FTS	4.563	+0.01	556533	6.7338	135	30 - 140	Y
13C2-8:2 FTS	4.926	+0.01	297487	7.3277	147	9 - 171	Y
13C3-HFPO-DA	4.289	+0.01	2085058	7.7977	156 *	33 - 130	Y

<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_027	<b>Instrument:</b>	K-LCMS06 <del>206</del> <b>UA</b>
<b>Acqu Date:</b>	4/21/21 16:18	<b>Vial:</b>	9
<b>Run Type:</b>	MB	<b>Dilution:</b>	1
<b>Lab ID:</b>	KQ2106020-04	<b>Raw Units:</b>	ng/mL

**Target Compounds**

Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perfluorobutane sulfonic acid (PFBS)	4.021	+0.01	586	0.0029	0.023	U	Y
Perfluoropentane sulfonic acid (PFPeS)	0		0	0	0	U	Y
Perfluorohexane sulfonic acid (PFHxS)	4.397	+0.01	3594	-0.0013	0	U	Y
Perfluoroheptane sulfonic acid (PFHpS)	4.547	-0.01	237	0.0011	0.0088	U	Y
Perfluorooctane sulfonic acid (PFOS)	4.729	+0.01	198	0.0017	0.014	U	Y
Perfluorononane sulfonic acid (PFNS)	4.894	-0.01	264	0.0027	0.022	U	Y
Perfluorodecane sulfonic acid (PFDS)	0		0	0	0	U	Y
Perfluorobutanoic acid (PFBA)	0		0	0	0	U	Y
Perfluoropentanoic acid (PFPeA)	3.933	+0.01	30394	0.0009	0.0072	U	Y
Perfluorohexanoic acid (PFHxA)	4.220	+0.01	19211	0.0137	0.11	U	Y
Perfluoroheptanoic acid (PFHpA)	4.416	+0.02	6611	0.0046	0.037	U	Y
Perfluorooctanoic acid (PFOA)	4.570	+0.00	7602	0.0049	0.039	U	Y
Perfluorononanoic acid (PFNA)	4.739		4004	0.0041	0.033	U	Y
Perfluorodecanoic acid (PFDA)	4.920	0.00	3897	0.0049	0.039	U	Y
Perfluoroundecanoic acid (PFUnDA)	5.112	+0.01	4383	0.0049	0.039	U	Y
Perfluorododecanoic acid (PFDoDA)	5.279	0.00	1621	0.0026	0.021	U	Y
Perfluorotridecanoic acid (PFTrDA)	5.456	+0.01	1850	0.0030	0.024	U	Y
Perfluorotetradecanoic acid (PFTeDA)	5.617	+0.01	4671	0.0088	0.070	U	Y
Perfluorooctane sulfonamide (FOSA)	5.234	+0.00	608	0.0010	0.0080	U	Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.635	+0.01	1003	0.0058	0.046	U	Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	0		0	0	0	U	Y
N-Methyl perfluorooctane sulfonamidoethanol	5.617	+0.01	863	0.0048	0.038	U	Y
N-Ethyl perfluorooctane sulfonamidoethanol	5.739	+0.00	470	0.0023	0.018	U	Y
N-Methyl perfluorooctane sulfonamidoacetic acid	5.040	+0.01	101	0.0285	0.23	U	Y
N-Ethyl perfluorooctane sulfonamidoacetic acid	0		0	0	0	U	Y
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	4.168	-0.02	323	0.0017	0.014	U	Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.517	-0.03	393	0.0029	0.023	U	Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.928	+0.01	125	0.0018	0.014	U	Y
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	5.296	+0.01	10	0.0002	0.0016	U	Y
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.294	+0.01	144	0.0004	0.0032	U	Y

**Prep Amount:** 1 g      **Dilution:** 1  
**Prep Final Amount:** 8.00 mL      **Basis Factor:** 100.00

U: Undetected at or above MDL  
J: Analyte detected above MDL, but below MRL  
B: Hit above MRL also found in Method Blank  
E: Analyte concentration above high point of ICAL  
N: Presumptive evidence of compound  
D: Result from dilution  
m: Manual integration performed  
d: Compound manually deleted  
NR: Analyte not reported from this analysis  
\*: Result fails acceptance criteria  
#: Acceptance criteria not applicable  
?: Insufficient information to determine acceptance  
e: Result >= MRL, but MRL less than low point of ICAL  
c: check for co-elution



210421\_027

Sample ID: KQ2106020-04  
 Date Acquired: 4/21/2021 4:18:59 PM  
 Acquired by: System Administrator  
 Data File: 210421\_027  
 Vial: 5 | Inj. Volume: 15.000uL | Tray: 3

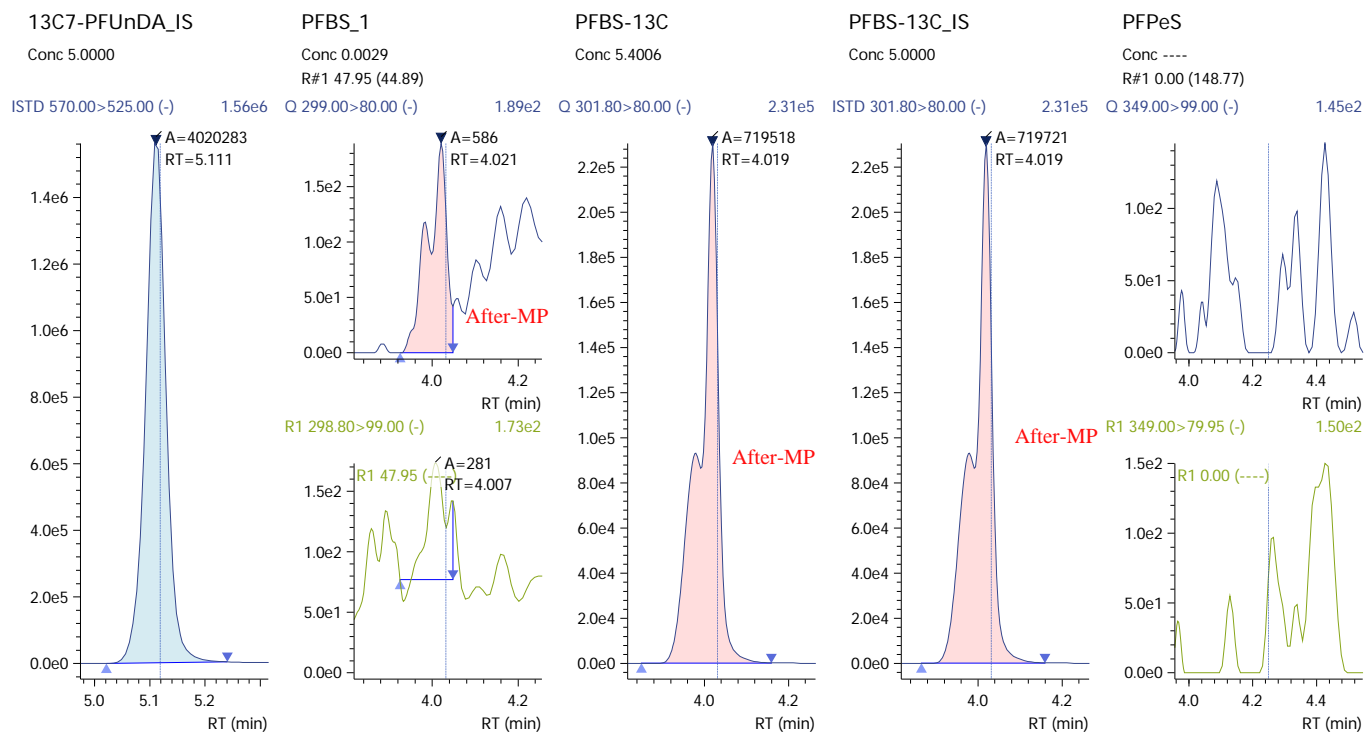
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.111	4020283	4020283	----	----	5.0000	ng/mL
PFBS_1	M	4.021	586	719721	PFBS-13C_IS	----	0.0029	ng/mL
PFBS-13C	M	4.019	719518	4020283	13C7-PFUnDA_IS	----	5.4006	ng/mL
PFBS-13C_IS	M	4.019	719721	719721	----	----	5.0000	ng/mL
PFPeS	ND(W/B)	----	----	719721	PFBS-13C_IS	----	----	ng/mL
PFHxS_1	M	4.397	3594	511809	PFHxS-18O_IS	----	-0.0013	ng/mL
PFHxS-18O	Auto	4.403	511809	4020283	13C7-PFUnDA_IS	----	7.7495	ng/mL
PFHxS-18O_IS	Auto	4.403	511809	511809	----	----	5.0000	ng/mL
PFHpS_1	M	4.547	237	511809	PFHxS-18O_IS	----	0.0011	ng/mL
PFOS_1	Auto	4.729	198	683662	PFOS-13C_IS	----	0.0017	ng/mL
PFOS-13C	Auto	4.731	683662	4020283	13C7-PFUnDA_IS	----	6.9452	ng/mL
PFOS-13C_IS	Auto	4.731	683662	683662	----	----	5.0000	ng/mL
PFNS	M	4.894	264	683662	PFOS-13C_IS	----	0.0027	ng/mL
PFDS_1	ND(W/B)	----	----	683662	PFOS-13C_IS	----	----	ng/mL
PFBA	ND(W/B)	----	----	3285588	PFBA-13C_IS	----	----	ng/mL
PFBA-13C	Auto	3.405	3285588	4020283	13C7-PFUnDA_IS	----	7.0134	ng/mL
PFBA-13C_IS	Auto	3.405	3285588	3285588	----	----	5.0000	ng/mL
PFPeA	Auto	3.933	30394	2560306	PFPeA-13C_IS	----	0.0009	ng/mL
PFPeA-13C	Auto	3.923	2560306	4020283	13C7-PFUnDA_IS	----	6.1603	ng/mL
PFPeA-13C_IS	Auto	3.923	2560306	2560306	----	----	5.0000	ng/mL
PFHxA	M	4.220	19211	6756199	PFHxA-13C_IS	----	0.0137	ng/mL
PFHxA-13C	Auto	4.222	6756199	4020283	13C7-PFUnDA_IS	----	7.5151	ng/mL
PFHxA-13C_IS	Auto	4.222	6756199	6756199	----	----	5.0000	ng/mL
PFHpA	M	4.416	6611	7187408	PFHpA-13C_IS	----	0.0046	ng/mL
PFHpA-13C	Auto	4.404	7187408	4020283	13C7-PFUnDA_IS	----	8.1957	ng/mL
PFHpA-13C_IS	Auto	4.404	7187408	7187408	----	----	5.0000	ng/mL
PFOA	M	4.570	7602	5809304	PFOA-13C_IS	----	0.0049	ng/mL
PFOA-13C	Auto	4.572	5809304	4020283	13C7-PFUnDA_IS	----	7.1902	ng/mL
PFOA-13C_IS	Auto	4.572	5809304	5809304	----	----	5.0000	ng/mL
PFNA	M	4.739	4004	4873129	PFNA-13C_IS	----	0.0041	ng/mL
PFNA-13C	Auto	4.746	4873129	4020283	13C7-PFUnDA_IS	----	7.1824	ng/mL
PFNA-13C_IS	Auto	4.746	4873129	4873129	----	----	5.0000	ng/mL
PFDA	Auto	4.920	3897	3170451	PFDA-13C_IS	----	0.0049	ng/mL
PFDA-13C	Auto	4.927	3170451	4020283	13C7-PFUnDA_IS	----	7.0894	ng/mL
PFDA-13C_IS	Auto	4.927	3170451	3170451	----	----	5.0000	ng/mL
PFUnA	M	5.112	4383	3879631	PFUnA-13C_IS	----	0.0049	ng/mL
PFUnA-13C	Auto	5.112	3879631	4020283	13C7-PFUnDA_IS	----	7.0715	ng/mL
PFUnA-13C_IS	Auto	5.112	3879631	3879631	----	----	5.0000	ng/mL
PFDaA	Auto	5.279	1621	3916398	PFDaA-13C_IS	----	0.0026	ng/mL
PFDaA-13C	Auto	5.290	3916398	4020283	13C7-PFUnDA_IS	----	6.6447	ng/mL
PFDaA-13C_IS	Auto	5.290	3916398	3916398	----	----	5.0000	ng/mL
PFTeDA	M	5.456	1850	2385825	PFTeDA-13C_IS	----	0.0030	ng/mL
PFTeDA	M	5.617	4671	2385825	PFTeDA-13C_IS	----	0.0088	ng/mL
PFTeDA-13C	Auto	5.616	2385825	4020283	13C7-PFUnDA_IS	----	6.1963	ng/mL
PFTeDA-13C_IS	Auto	5.616	2385825	2385825	----	----	5.0000	ng/mL
FOSA	Auto	5.234	608	2255729	FOSA-13C_IS	----	0.0010	ng/mL
FOSA-13C	Auto	5.238	2255729	4020283	13C7-PFUnDA_IS	----	7.4284	ng/mL
FOSA-13C_IS	Auto	5.238	2255729	2255729	----	----	5.0000	ng/mL
N-MeFOSA	M	5.635	1003	560897	N-MeFOSA-d3_IS	----	0.0058	ng/mL
N-MeFOSA-d3	Auto	5.635	560897	4020283	13C7-PFUnDA_IS	----	7.4319	ng/mL
N-MeFOSA-d3_IS	Auto	5.635	560897	560897	----	----	5.0000	ng/mL
N-EtFOSA	ND(W/B)	----	----	714094	N-EtFOSA-d9_IS	----	----	ng/mL
N-EtFOSA-d9	Auto	5.769	714094	4020283	13C7-PFUnDA_IS	----	7.2167	ng/mL
N-EtFOSA-d9_IS	Auto	5.769	714094	714094	----	----	5.0000	ng/mL



### 210421\_027 (continued)

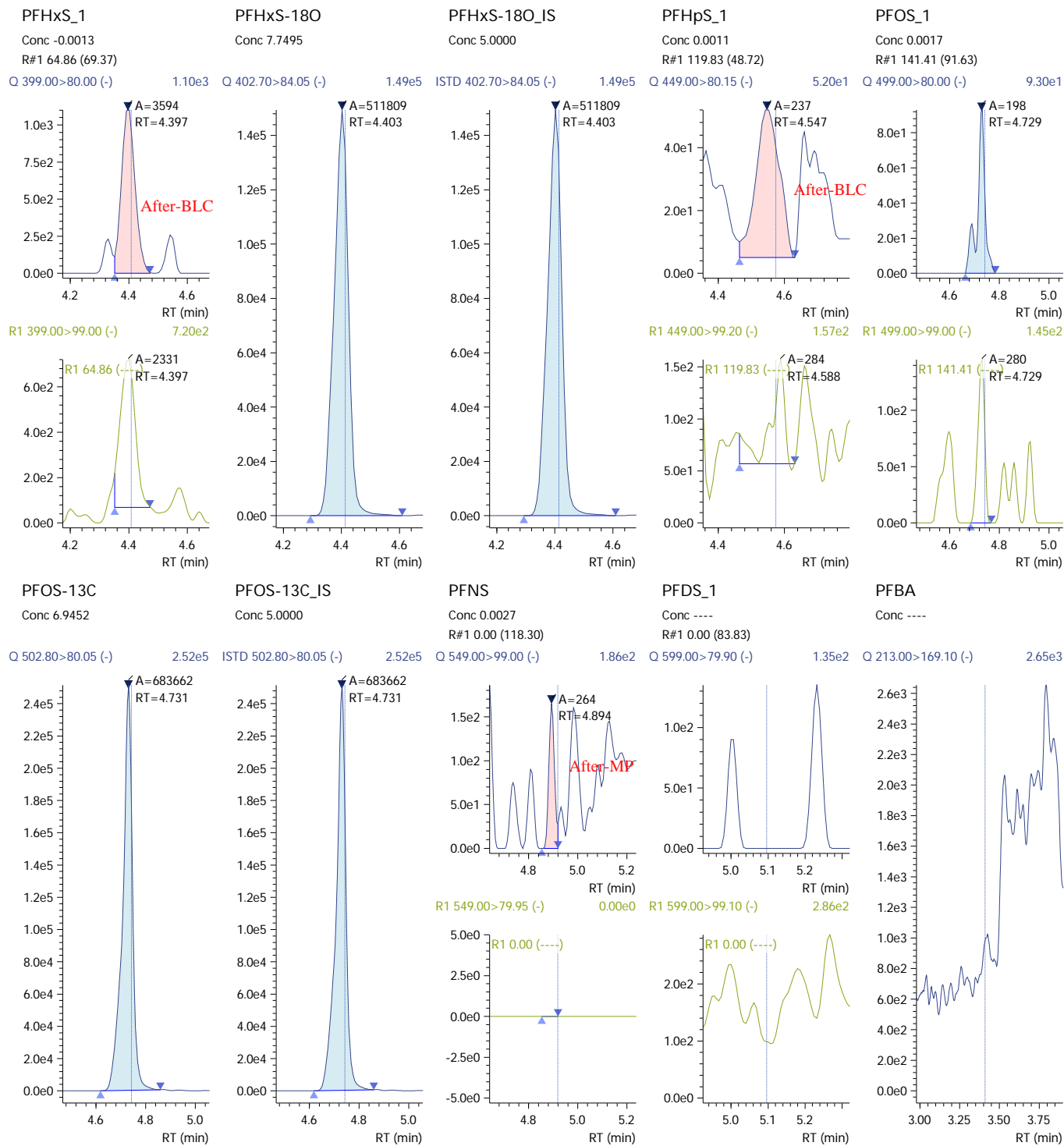
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.617	863	387206	N-MeFOSE-d7_IS	----	0.0048	ng/mL
N-MeFOSE-d7	Auto	5.606	387206	4020283	13C7-PFUnDA_IS	----	5.5371	ng/mL
N-MeFOSE-d7_IS	Auto	5.606	387206	387206	----	----	5.0000	ng/mL
N-EtFOSE	M	5.739	470	446407	N-EtFOSE-d9_IS	----	0.0023	ng/mL
N-EtFOSE-d9	Auto	5.735	446407	4020283	13C7-PFUnDA_IS	----	5.7462	ng/mL
N-EtFOSE-d9_IS	Auto	5.735	446407	446407	----	----	5.0000	ng/mL
N-MeFOSAA	Auto	5.040	101	351995	N-MeFOSAA-d3_IS	----	0.0285	ng/mL
N-MeFOSAA-d3	Auto	5.029	351995	4020283	13C7-PFUnDA_IS	----	7.2335	ng/mL
N-MeFOSAA-d3_IS	Auto	5.029	351995	351995	----	----	5.0000	ng/mL
N-EtFOSAA	ND(W/B)	----	----	285741	N-EtFOSAA-d5_IS	----	----	ng/mL
N-EtFOSAA-d5	Auto	5.128	285741	4020283	13C7-PFUnDA_IS	----	5.9805	ng/mL
N-EtFOSAA-d5_IS	Auto	5.128	285741	285741	----	----	5.0000	ng/mL
4_2-FTS_1	Auto	4.168	323	867233	4_2-FTS-13C_IS	----	0.0017	ng/mL
4_2-FTS-13C	Auto	4.197	867233	4020283	13C7-PFUnDA_IS	----	5.6329	ng/mL
4_2-FTS-13C_IS	Auto	4.197	867233	867233	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.517	393	556533	6_2-FTS-13C_IS	----	0.0029	ng/mL
6_2-FTS-13C	Auto	4.563	556533	4020283	13C7-PFUnDA_IS	----	6.7338	ng/mL
6_2-FTS-13C_IS	Auto	4.563	556533	556533	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.928	125	297487	8_2-FTS-13C_IS	----	0.0018	ng/mL
8_2-FTS-13C	Auto	4.926	297487	4020283	13C7-PFUnDA_IS	----	7.3277	ng/mL
8_2-FTS-13C_IS	Auto	4.926	297487	297487	----	----	5.0000	ng/mL
10_2-FTS_1	Auto	5.296	10	297487	8_2-FTS-13C_IS	----	0.0002	ng/mL
HFPO_DA	M	4.294	144	2085058	HFPO_DA-13C_IS	----	0.0004	ng/mL
HFPO_DA-13C	Auto	4.289	2085058	4020283	13C7-PFUnDA_IS	----	7.7977	ng/mL
HFPO_DA-13C_IS	Auto	4.289	2085058	2085058	----	----	5.0000	ng/mL



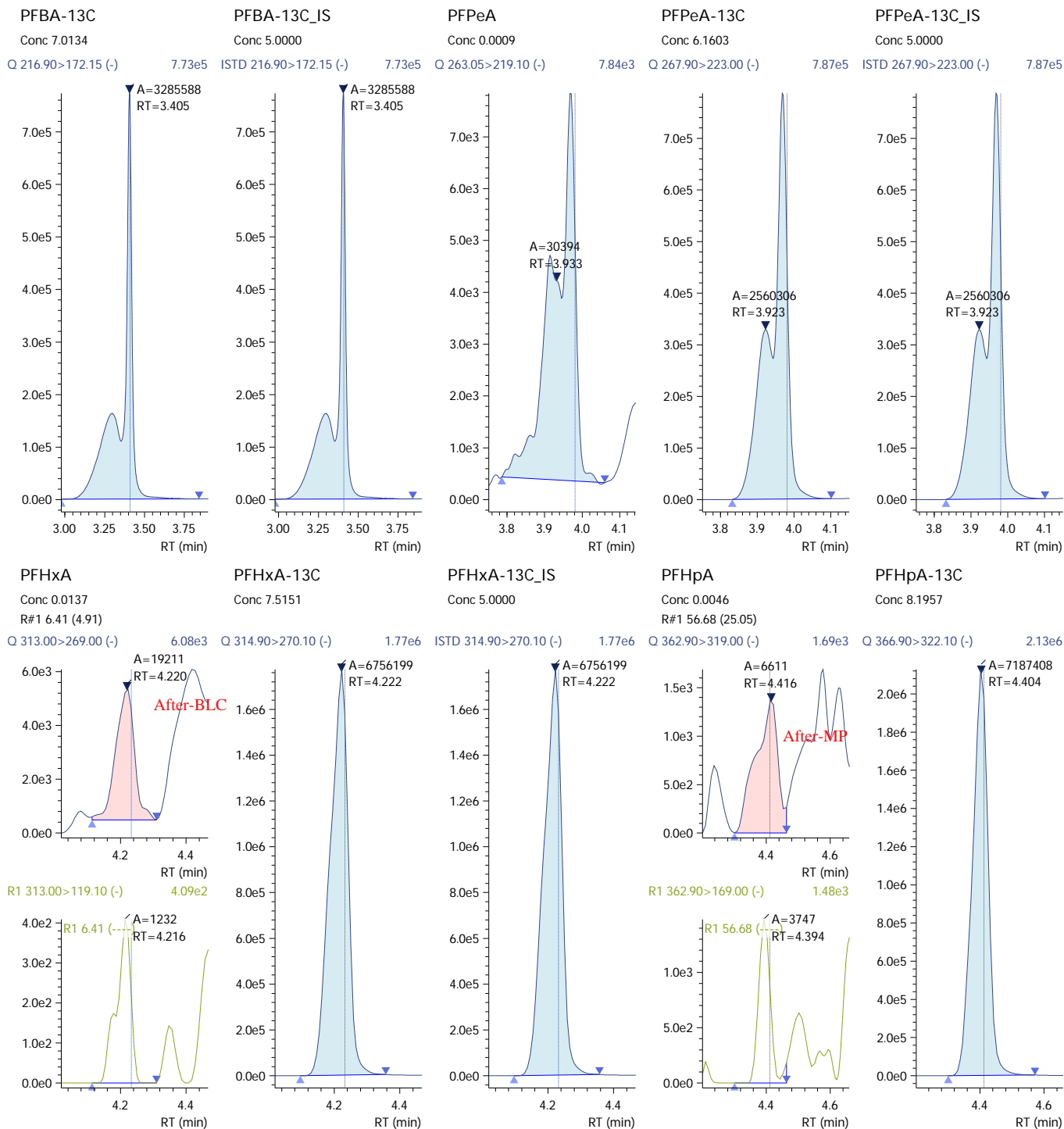


### 210421\_027 (continued)





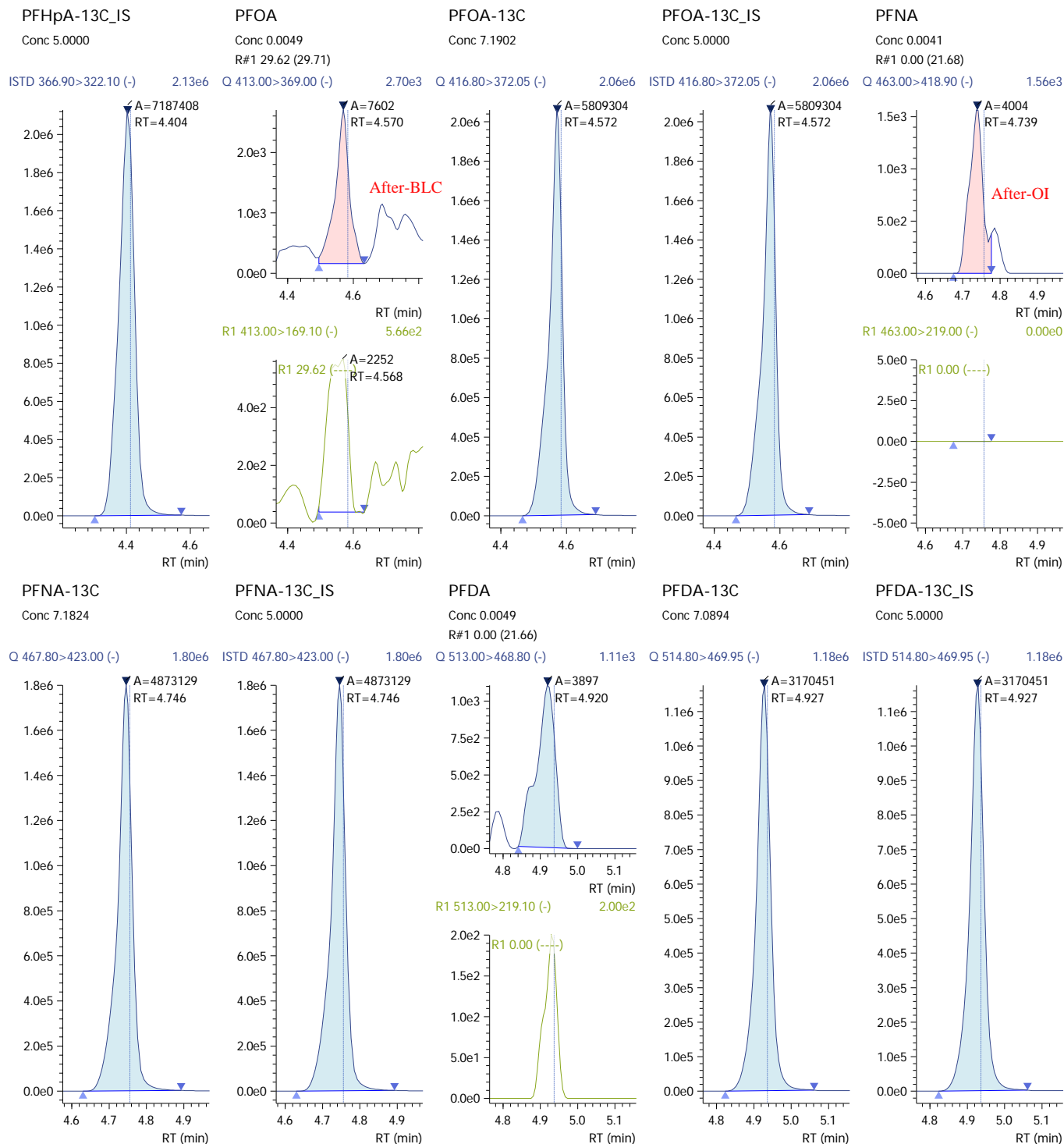
210421\_027 (continued)





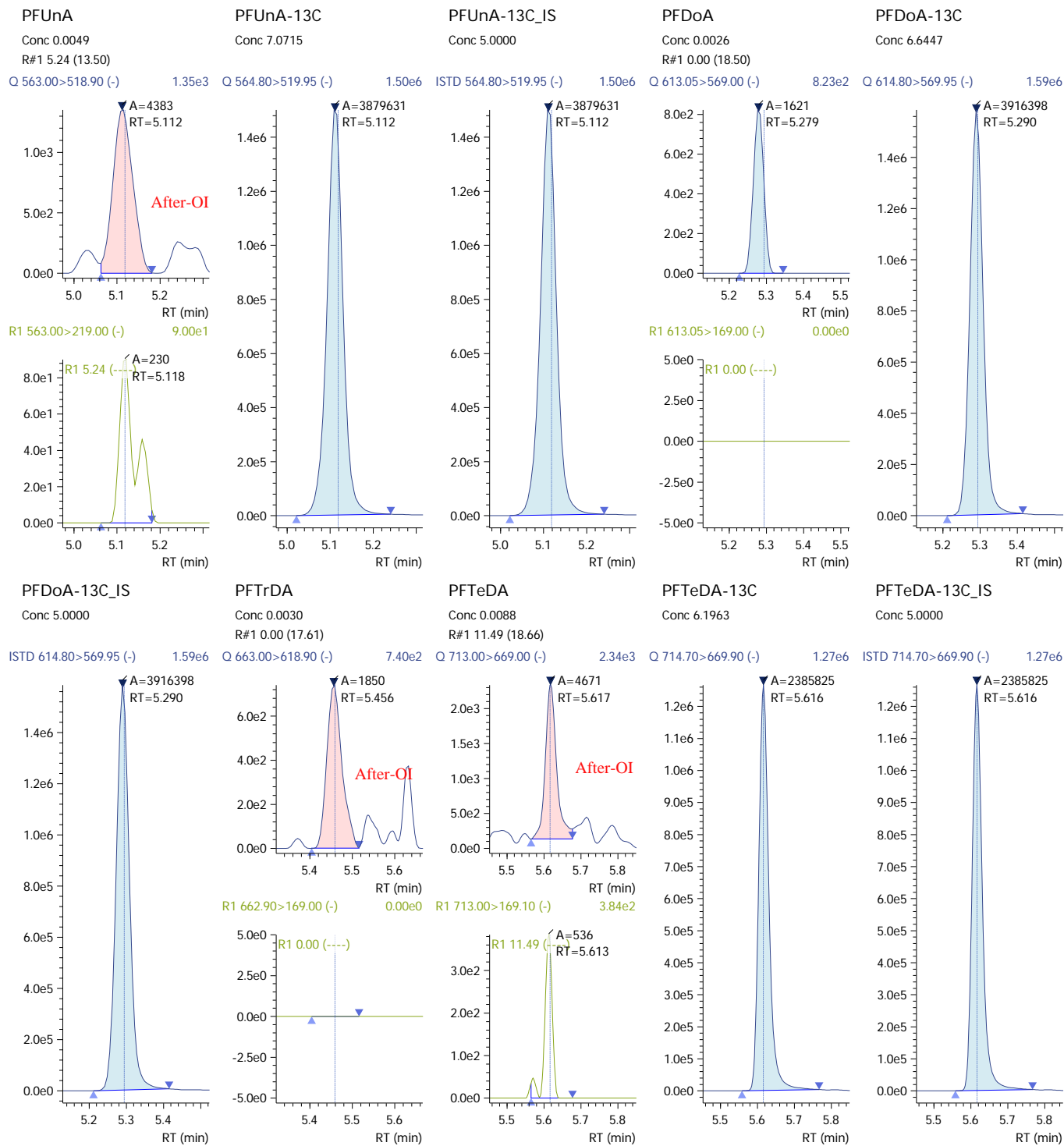


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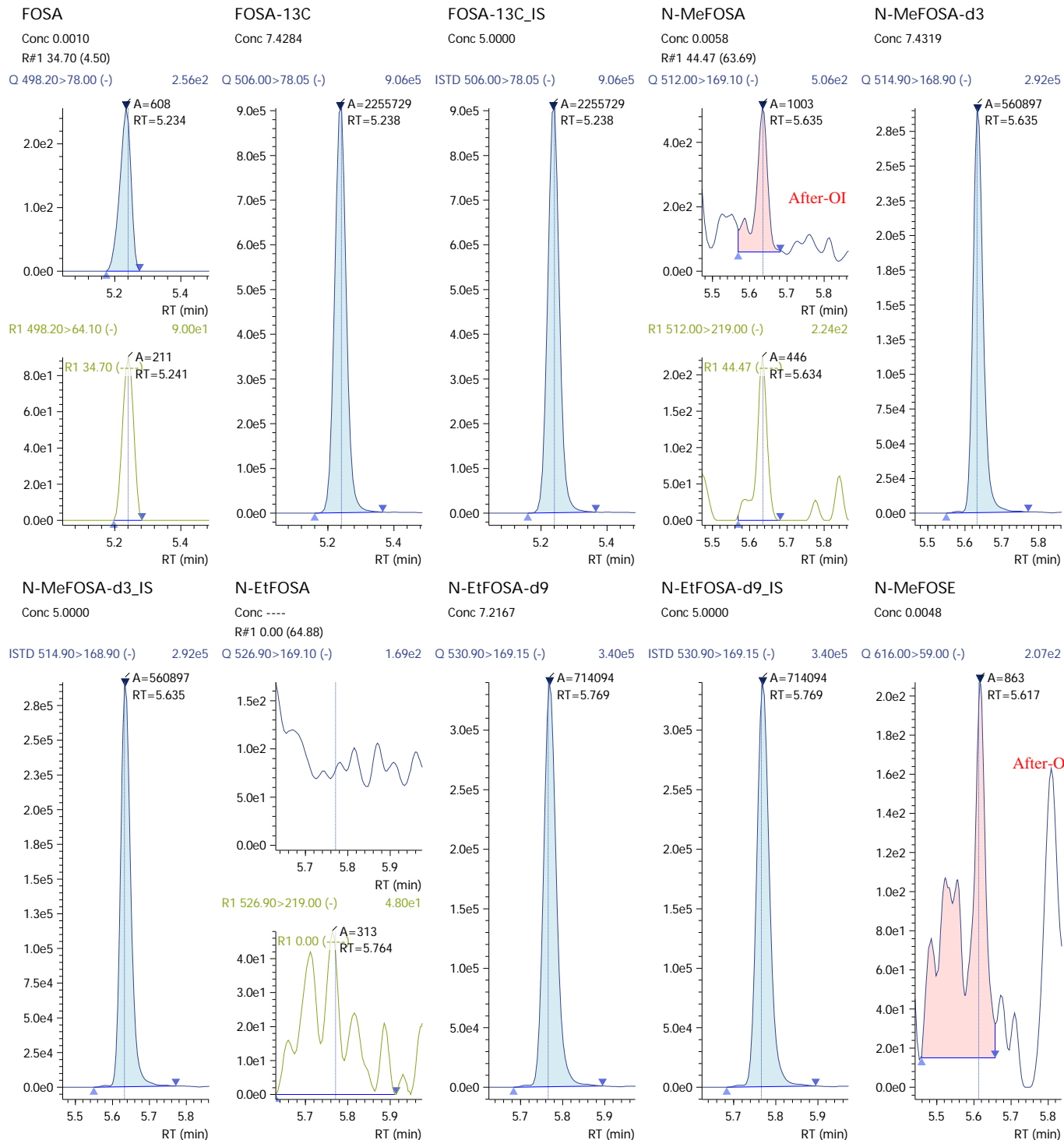


### 210421\_027 (continued)



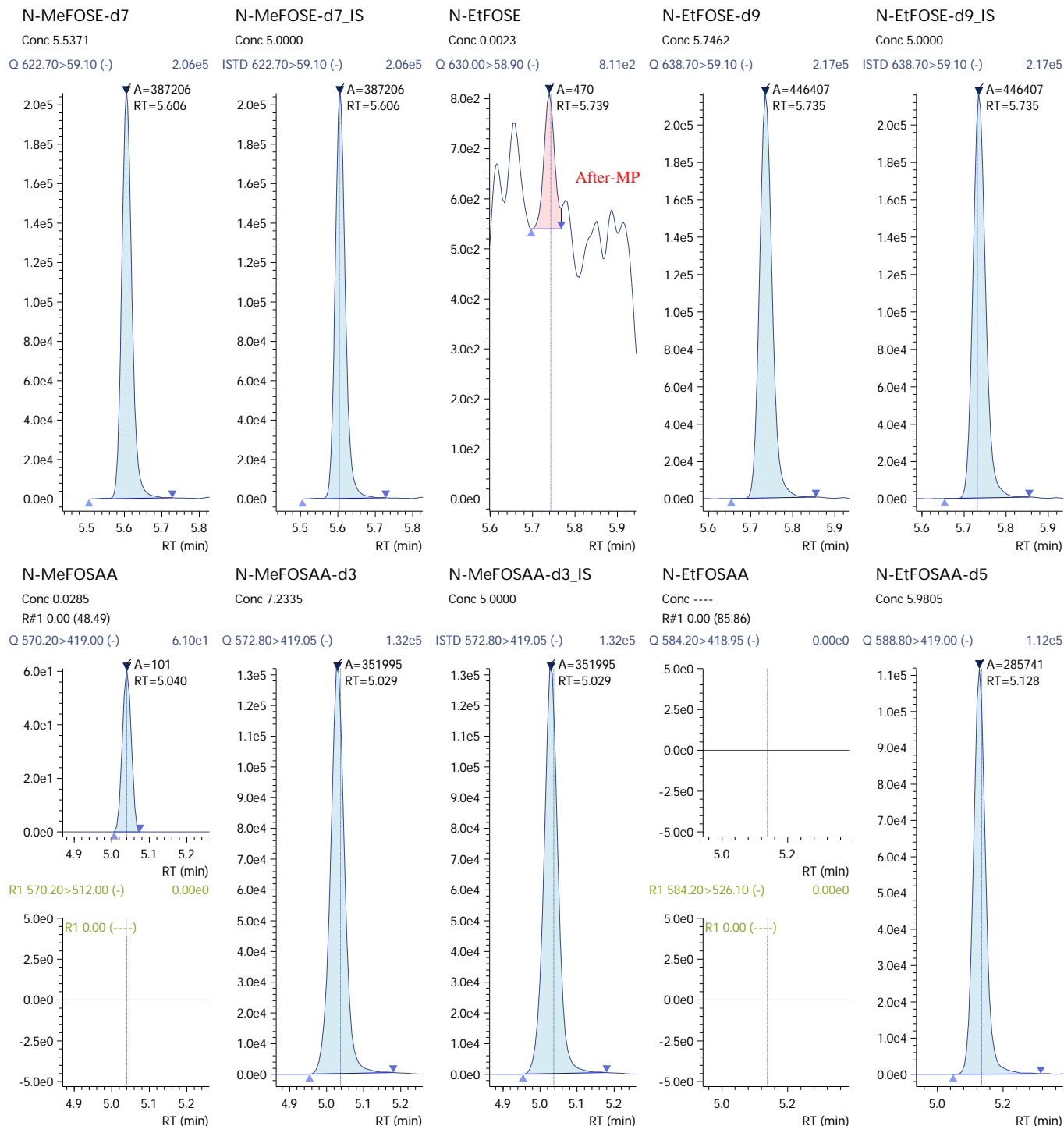


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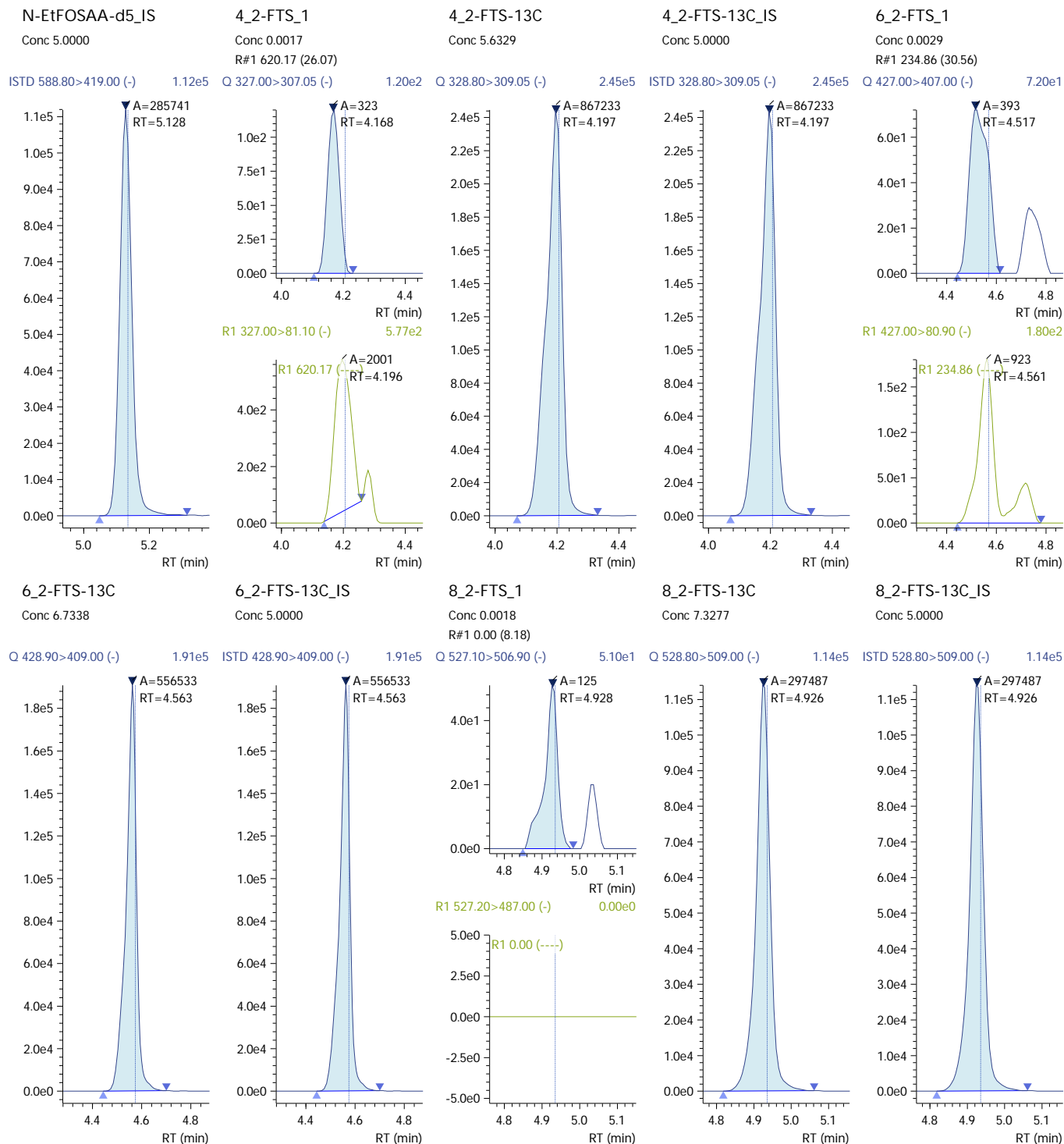


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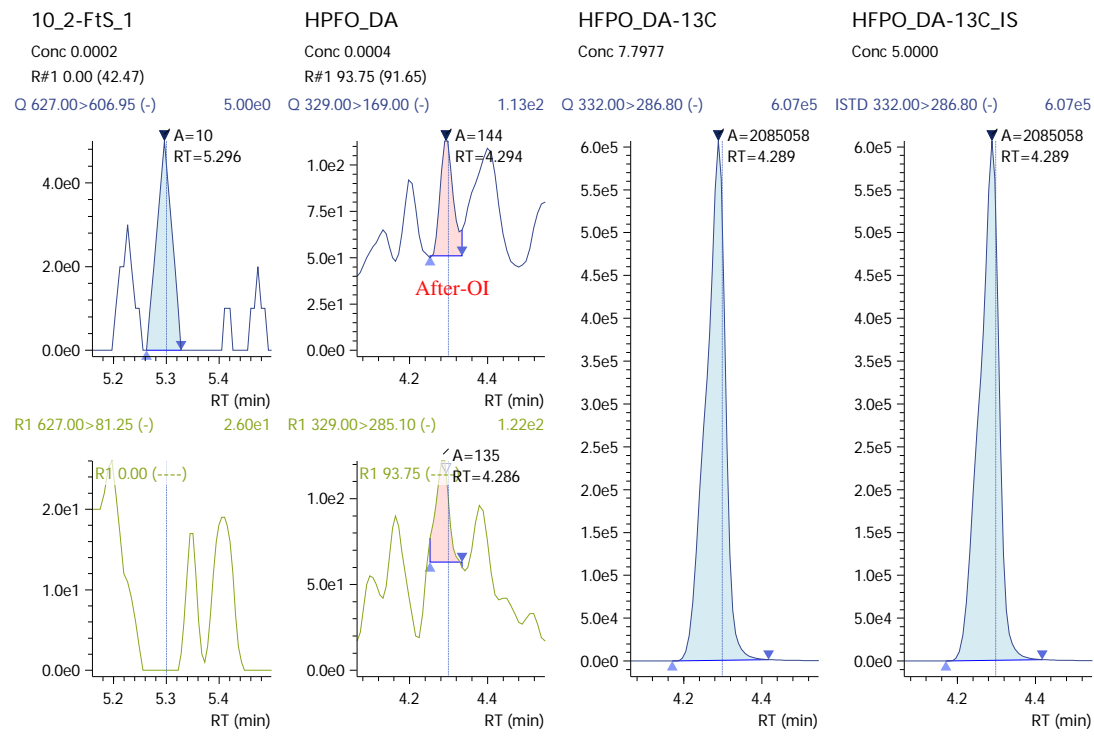


### 210421\_027 (continued)





### 210421\_027 (continued)

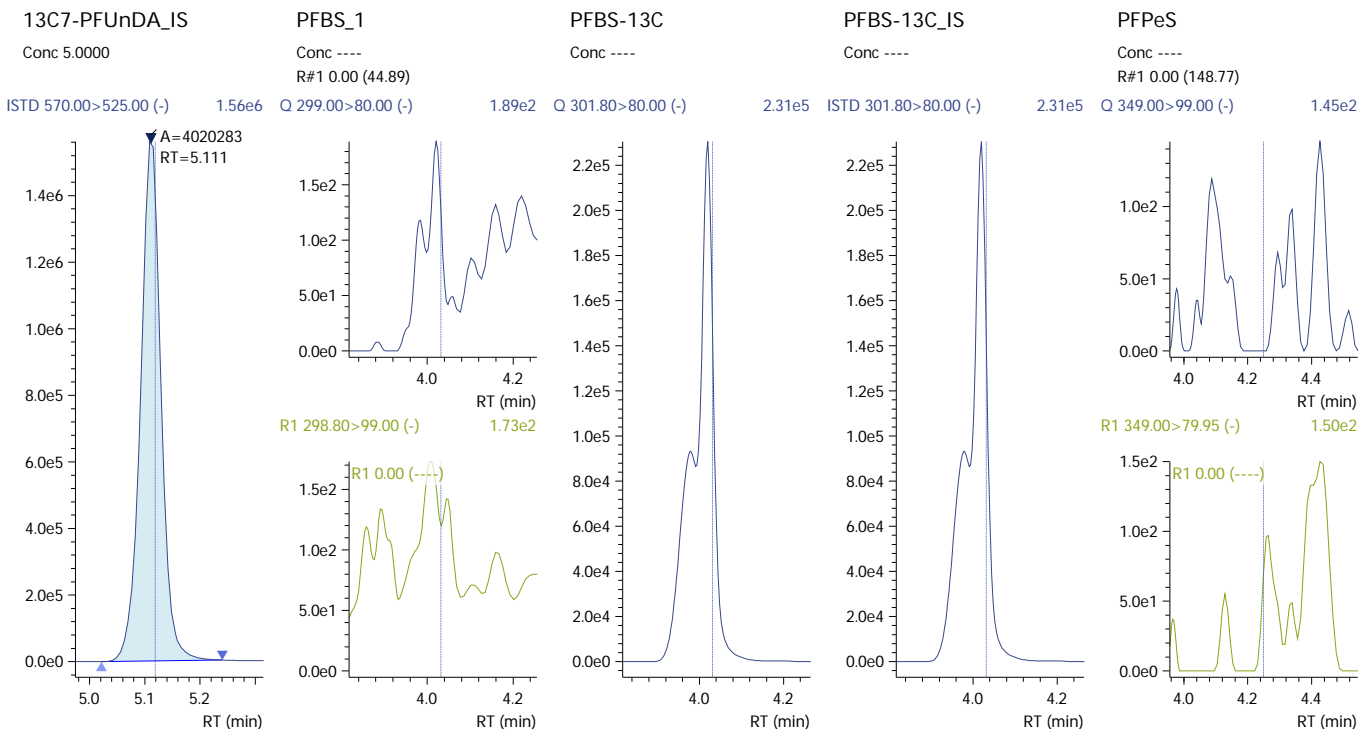






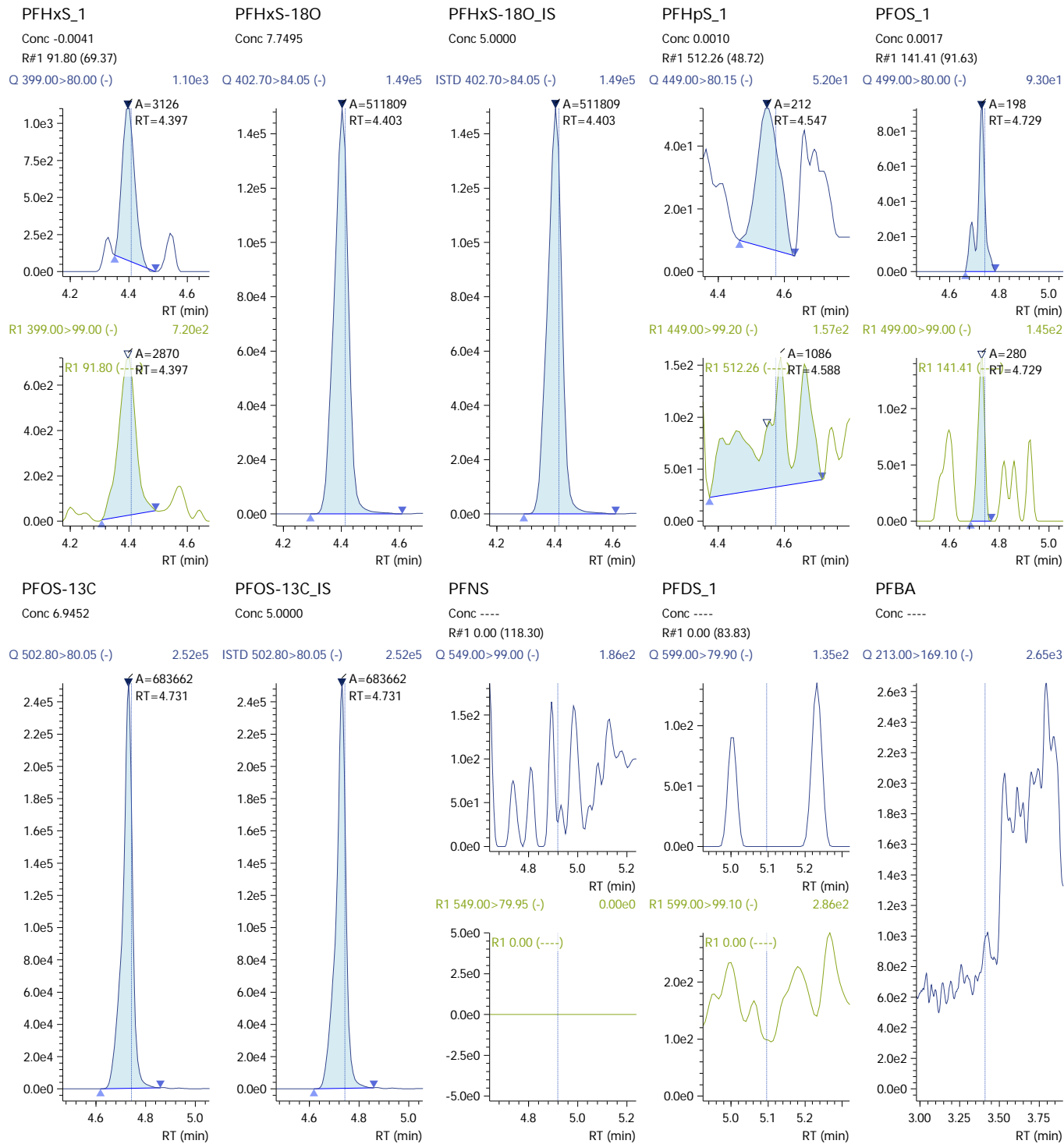
### 210421\_027

Sample ID: KQ2106020-04  
Date Acquired: 4/21/2021 4:18:59 PM  
Acquired by: System Administrator  
Data File: 210421\_027  
Vial: 5 | Inj. Volume: 15.0000uL | Tray: 3



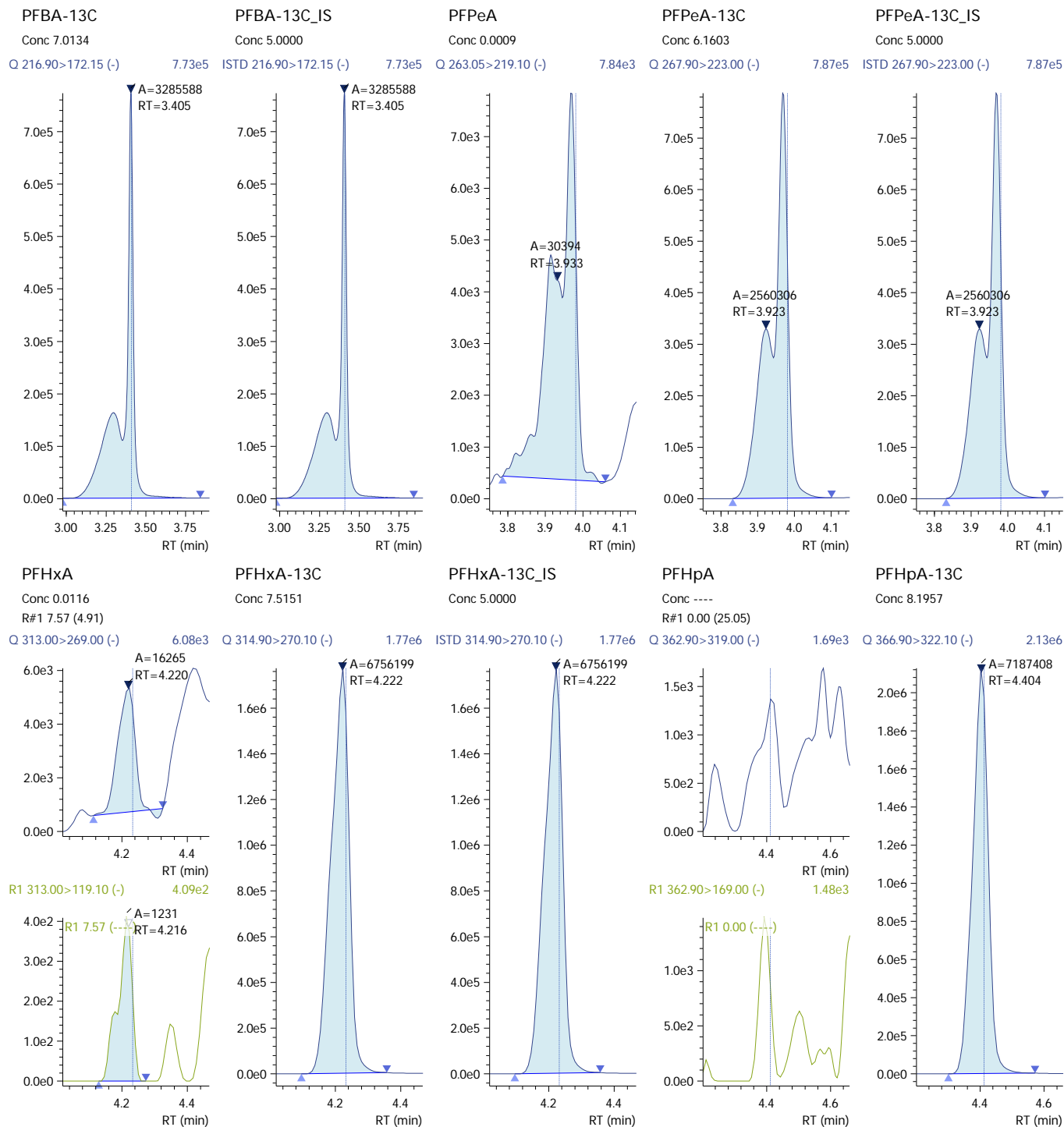


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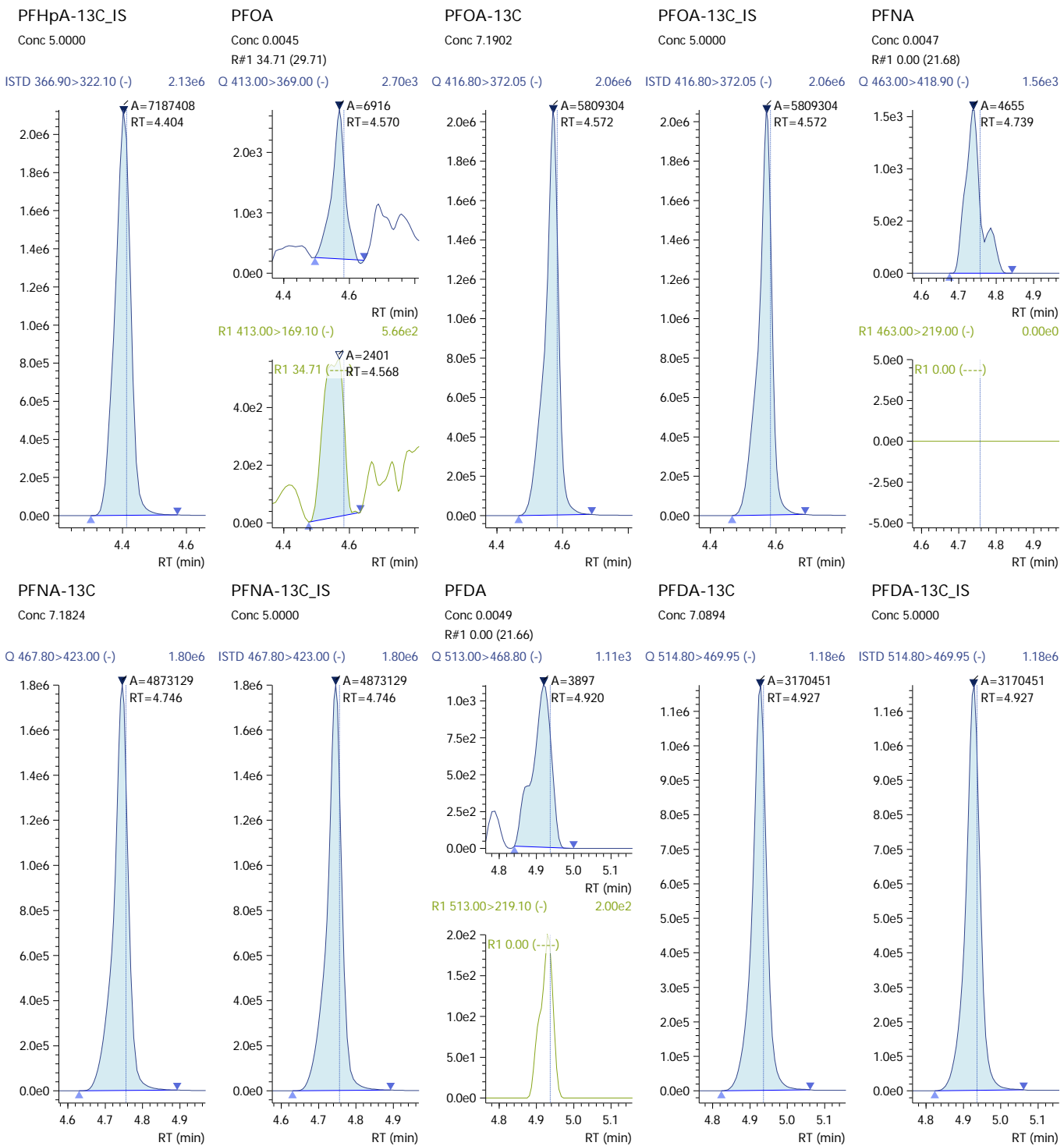


210421\_027 (continued)



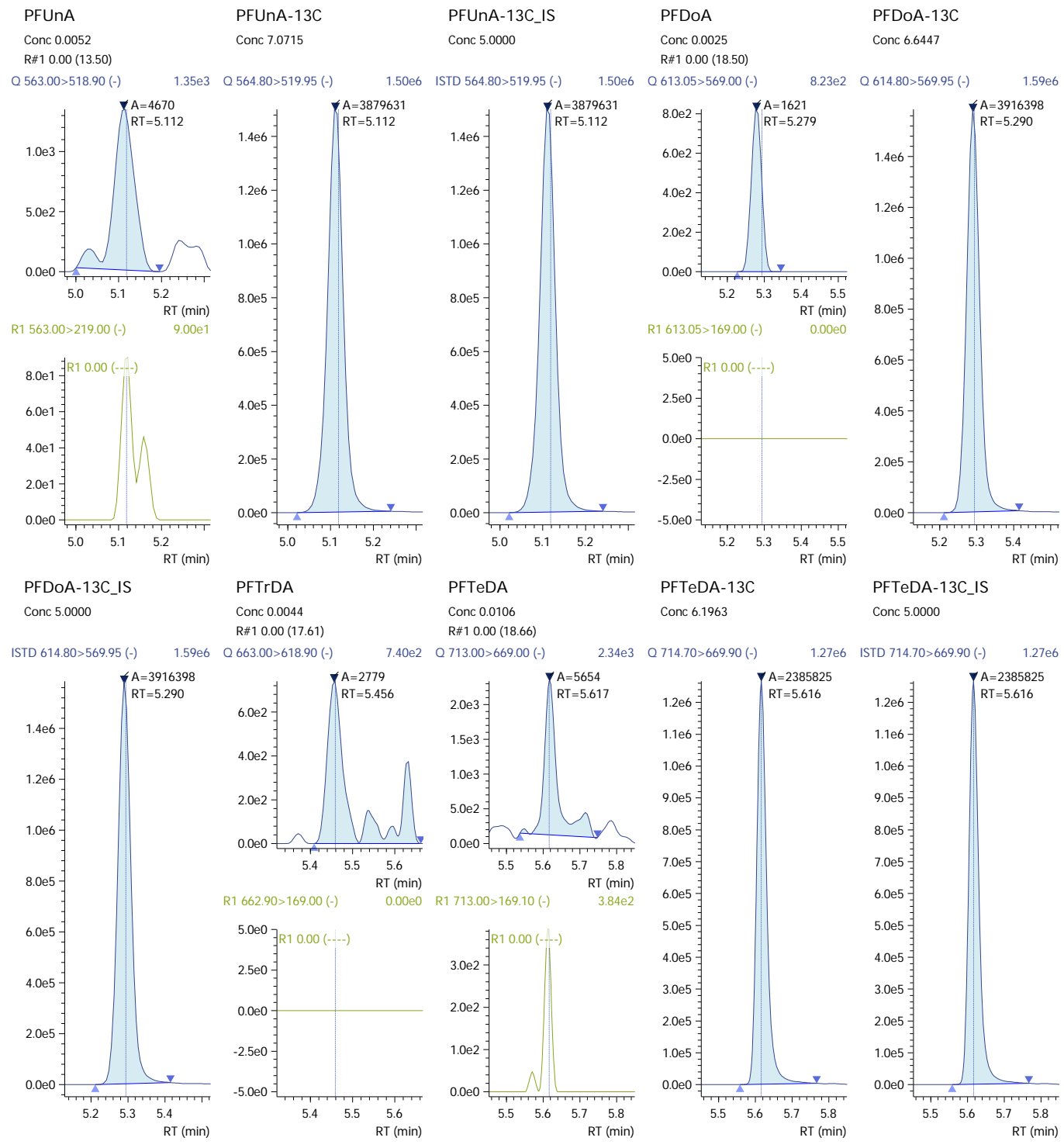


### 210421\_027 (continued)



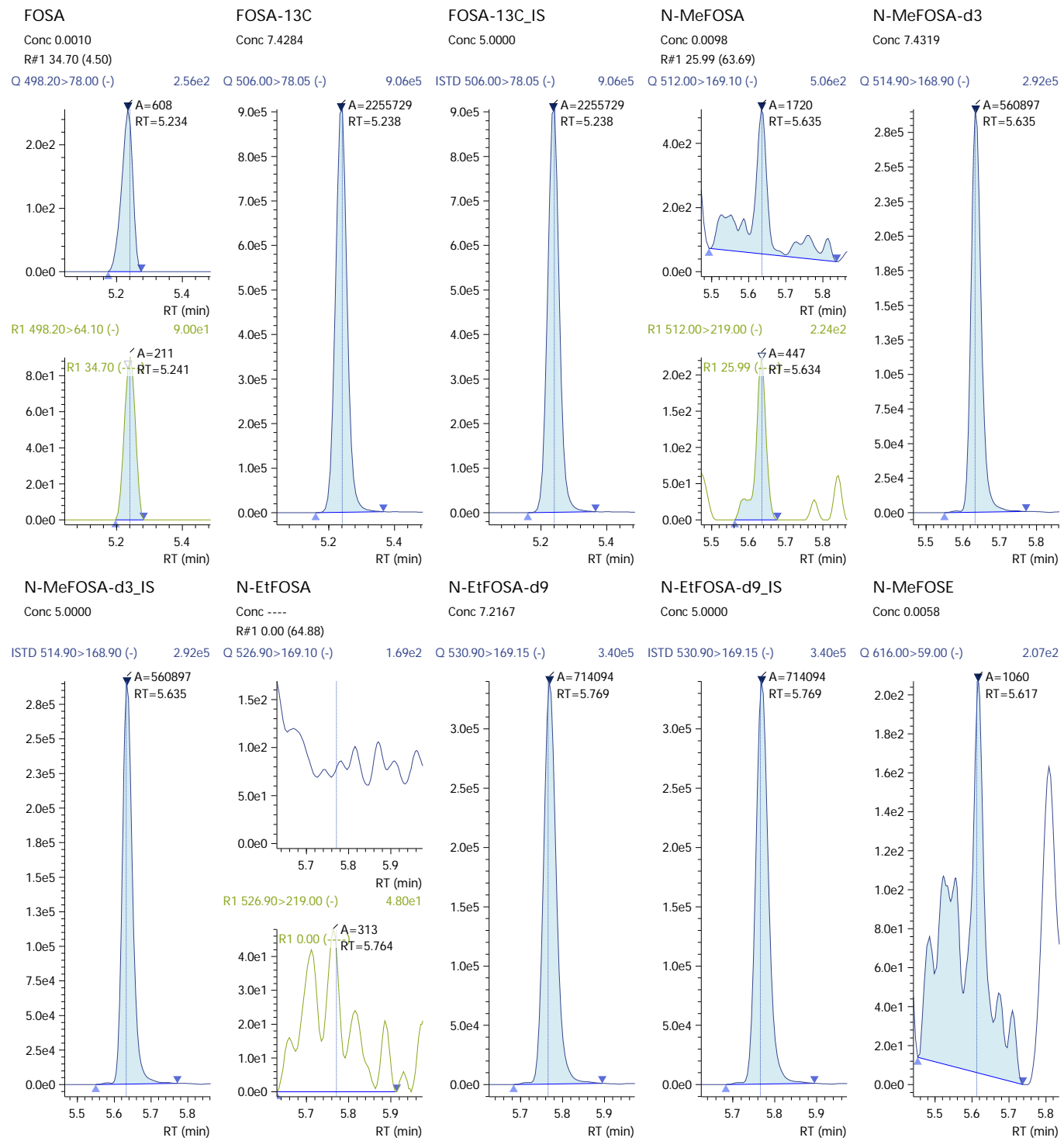


### 210421\_027 (continued)





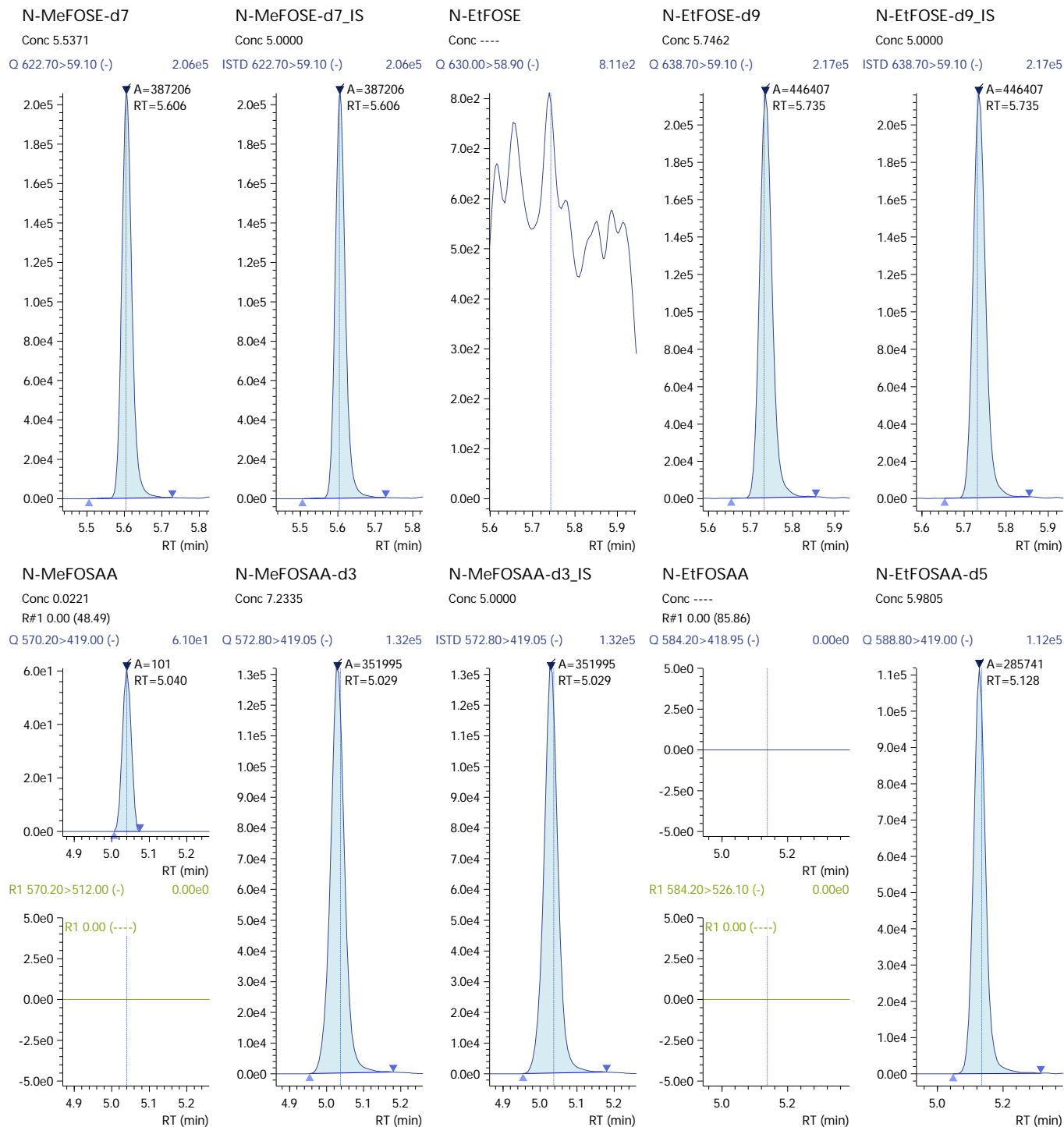
### 210421\_027 (continued)





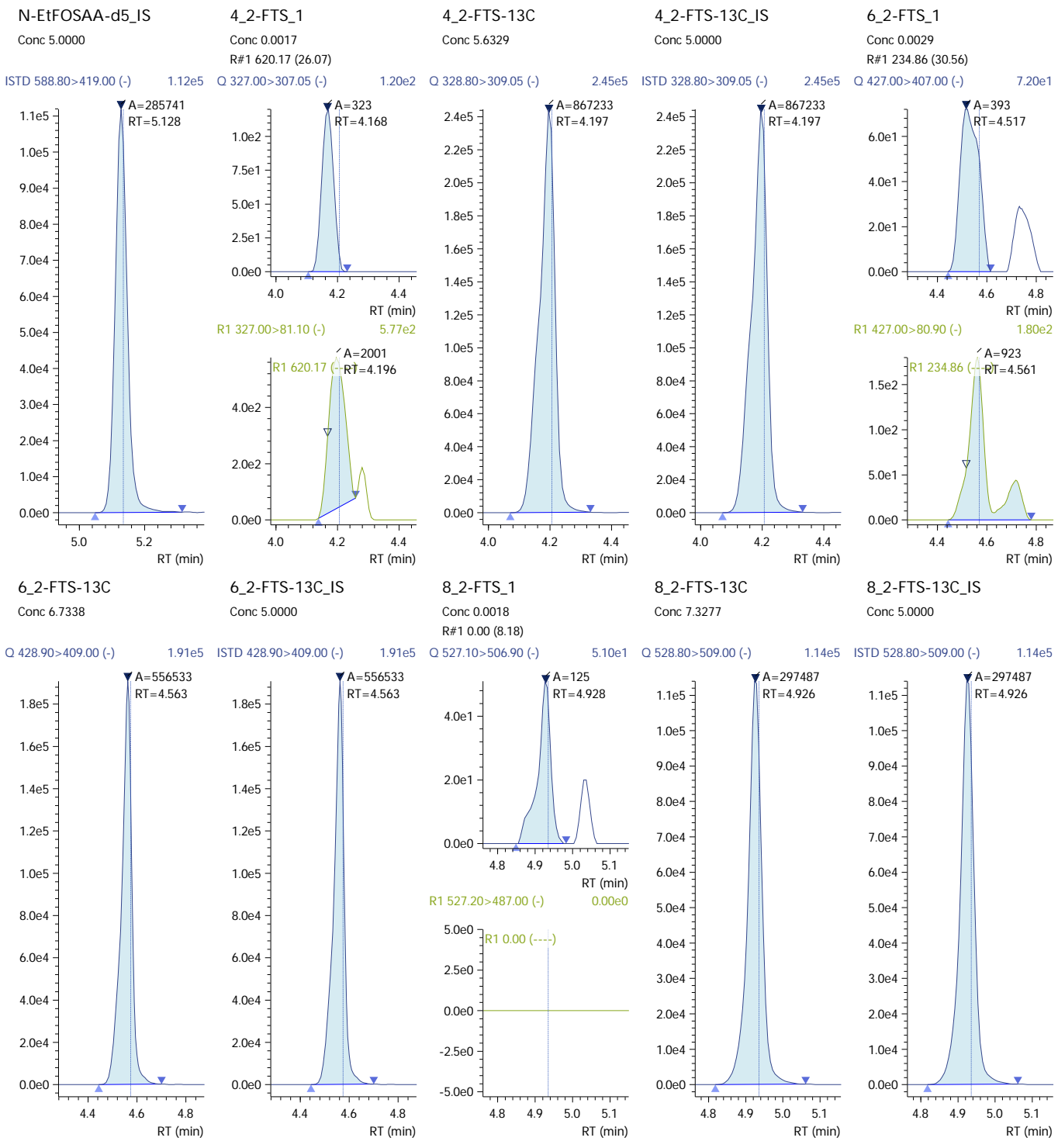


210421\_027 (continued)



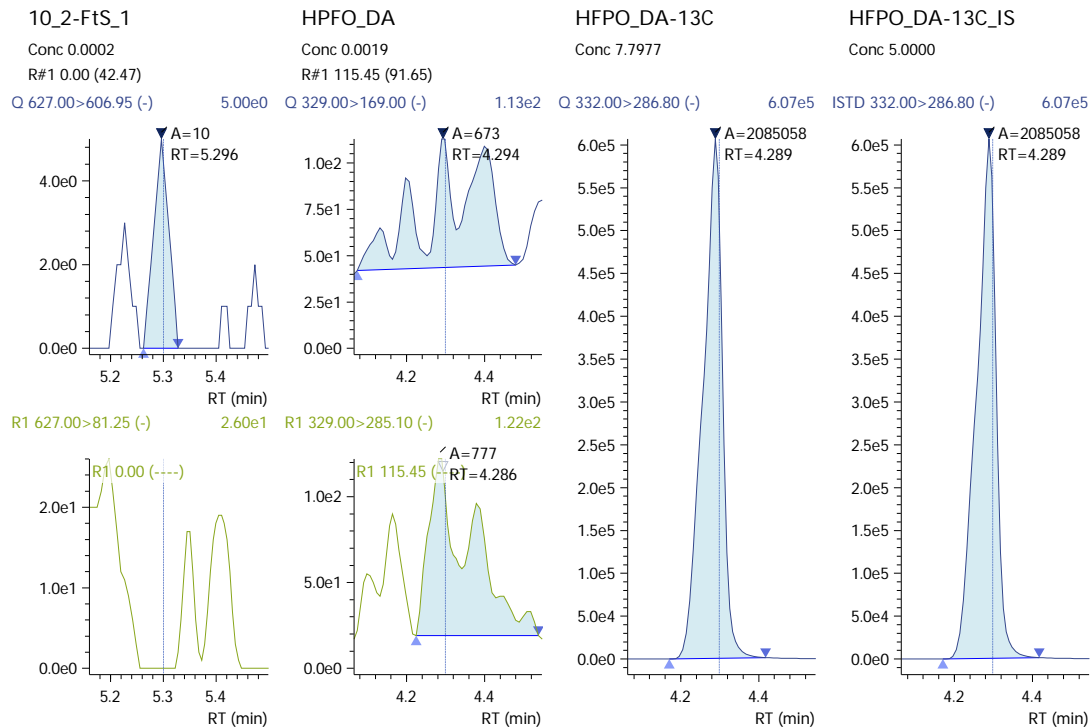


210421\_027 (continued)





### 210421\_027 (continued)



# Validation Report

1st *UA* 04/23/21  
2nd *[Signature]* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_028  
**Lab ID:** KQ2106020-03  
**RunType:** LCS  
**Matrix:** Solid

**Date Acquired:** 4/21/21 16:29  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
Analytical Hold Time	X	
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Continuing Calibration Recovery	X	
Internal Standards	X	
Surrogates		X
Std MRL Unsupported by ICAL	X	
Above Highest ICAL Level	X	

## Analyte Exceptions

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
Surrogates	13C4-PFBA	125	34	116	Native in control. <MRL in Sample
	13C2-PFHxA	140	32	136	
	D5-EtFOSA	132	49	123	
	13C3-HFPO-DA	140	33	130	

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

# Quantitation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

<b>Data File:</b> J:\LCMS06\Data\210421_B2\210421_028	<b>Instrument:</b> K-LCMS-06
<b>Acqu Date:</b> 4/21/21 16:29	<b>Vial:</b> 8
<b>Run Type:</b> LCS	<b>Dilution:</b> 1
<b>Lab ID:</b> KQ2106020-03	<b>Raw Units:</b> ng/mL

<b>Bottle ID:</b>	<b>Tier:</b> II	<b>Matrix:</b> Solid
<b>Prod Code:</b> PFAS	<b>Collect Date:</b> 3/25/21	<b>Receive Date:</b> 4/5/21

<b>Analysis Lot:</b> 720740	<b>Prep Lot:</b> 377476	<b>Report Group:</b> KQ2106020
<b>Analysis:</b> PFC/537M	<b>Prep Method:</b> ALS SOP	
	<b>Prep Date:</b> 4/14/21	

<b>Title:</b> Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b> KC2100210
	<b>Report List ID:</b> 20091

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.107	+0.00	4299893	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	% Rec	% Rec Criteria	Rpt?
13C3-PFBS	4.014	0.00	701088	4.9200	98	33 - 109	Y
18O2-PFHxS	4.392		422164	5.9765	120	36 - 120	Y
13C4-PFOS	4.727	+0.00	658404	6.2537	125	32 - 130	Y
13C4-PFBA	3.401	+0.01	3138241	6.2632	125	34 - 116	Y
13C5-PFPeA	3.922		2397644	5.3938	108	39 - 133	Y
13C2-PFHxA	4.215		6745531	7.0153	140	32 - 136	Y
13C4-PFHpA	4.393	+0.00	5438681	5.7983	116	36 - 133	Y
13C4-PFOA	4.566		5726850	6.6272	133	31 - 134	Y
13C5-PFNA	4.741	+0.00	4746051	6.5403	131	27 - 133	Y
13C2-PFDA	4.925	+0.00	3094061	6.4687	129	30 - 137	Y
13C2-PFUnDA	5.107	+0.00	3581869	6.1043	122	32 - 146	Y
13C2-PFDODA	5.285	+0.00	4019288	6.3758	128	36 - 136	Y
13C2-PFTeDA	5.612	+0.00	2307236	5.6025	112	39 - 138	Y
13C8-FOSA	5.233	+0.00	2088231	6.4296	129	40 - 132	Y
D3-MeFOSA	5.630	+0.00	527875	6.5396	131	51 - 132	Y
D5-EtFOSA	5.765	+0.00	696444	6.5807	132	49 - 123	Y
D7-MeFOSE	5.601	+0.00	381598	5.1021	102	53 - 125	Y
D9-EtFOSE	5.731	+0.00	447932	5.3909	108	45 - 121	Y
D3-MeFOSAA	5.025	+0.00	312209	5.9987	120	20 - 154	Y
D5-EtFOSAA	5.123	+0.00	293570	5.7448	115	29 - 153	Y
13C2-4:2 FTS	4.188	+0.00	721478	4.3815	88	18 - 127	Y
13C2-6:2 FTS	4.557	+0.00	537634	6.0821	122	30 - 140	Y
13C2-8:2 FTS	4.923	+0.00	274458	6.3208	126	9 - 171	Y
13C3-HFPO-DA	4.283	+0.00	2005046	7.0109	140	33 - 130	Y

U: Undetected at or above MDL  
 J: Analyte detected above MDL, but below MRL  
 B: Hit above MRL also found in Method Blank  
 E: Analyte concentration above high point of ICAL  
 N: Presumptive evidence of compound

D: Result from dilution  
 m: Manual integration performed  
 d: Compound manually deleted  
 NR: Analyte not reported from this analysis

\*: Result fails acceptance criteria  
 #: Acceptance criteria not applicable  
 ?: Insufficient information to determine acceptance  
 e: Result >= MRL, but MRL less than low point of ICAL  
 c: check for co-elution

Printed: 4/23/21 10:05

\\alprews001\starlims\LIMSReps\QuantValidation.rpt

<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_028	<b>Instrument:</b>	K-LCMS06 <i>206</i> <i>UA</i>
<b>Acqu Date:</b>	4/21/21 16:29	<b>Vial:</b>	8
<b>Run Type:</b>	LCS	<b>Dilution:</b>	1
<b>Lab ID:</b>	KQ2106020-03	<b>Raw Units:</b>	ng/mL

**Target Compounds**

Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perfluorobutane sulfonic acid (PFBS)	4.014	0.00	230848	1.1528	9.22		Y
Perfluoropentane sulfonic acid (PFPeS)	4.227	+0.00	116050	1.2436	9.95		Y
Perfluorohexane sulfonic acid (PFHxS)	4.388		166297	1.1746	9.40		Y
Perfluoroheptane sulfonic acid (PFHpS)	4.556		238804	1.3606	10.9		Y
Perfluorooctane sulfonic acid (PFOS)	4.726	+0.00	125214	1.1477	9.18		Y
Perfluorononane sulfonic acid (PFNS)	4.906	+0.00	121083	1.2706	10.2		Y
Perfluorodecane sulfonic acid (PFDS)	5.083	+0.00	161999	1.2154	9.72		Y
Perfluorobutanoic acid (PFBA)	3.402	+0.01	870555	1.2852	10.3		Y
Perfluoropentanoic acid (PFPeA)	3.923		1247600	1.2543	10.0		Y
Perfluorohexanoic acid (PFHxA)	4.215		1597881	1.1436	9.15		Y
Perfluoroheptanoic acid (PFHpA)	4.393	+0.00	1296575	1.1935	9.55		Y
Perfluorooctanoic acid (PFOA)	4.566	+0.00	1782016	1.1650	9.32		Y
Perfluorononanoic acid (PFNA)	4.741	+0.00	1255915	1.3108	10.5		Y
Perfluorodecanoic acid (PFDA)	4.924	+0.00	941920	1.2111	9.69		Y
Perfluoroundecanoic acid (PFUnDA)	5.107	+0.00	1064811	1.2975	10.4		Y
Perfluorododecanoic acid (PFDoDA)	5.285	+0.00	893773	1.3712	11.0		Y
Perfluorotridecanoic acid (PFTrDA)	5.453	+0.00	828506	1.3858	11.1		Y
Perfluorotetradecanoic acid (PFTeDA)	5.612	+0.00	699501	1.3586	10.9		Y
Perfluorooctane sulfonamide (FOSA)	5.233	+0.00	611530	1.1386	9.11		Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.633	+0.00	200137	1.2259	9.81		Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	5.771	+0.00	41112	1.1844	9.48		Y
N-Methyl perfluorooctane sulfonamidoethanol	5.610	+0.00	280814	1.5724	12.6		Y
N-Ethyl perfluorooctane sulfonamidoethanol	5.742	+0.00	287547	1.3992	11.2		Y
N-Methyl perfluorooctane sulfonamidoacetic acid	5.028	+0.00	79724	1.4666	11.7		Y
N-Ethyl perfluorooctane sulfonamidoacetic acid	5.127	+0.00	62482	1.2370	9.90		Y
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	4.188		201263	1.2796	10.2		Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.553	+0.00	167200	1.2712	10.2		Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.923	+0.00	80883	1.2509	10.0		Y
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	5.291	+0.00	42482	1.1275	9.02		Y
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.283	+0.00	386896	1.1141	8.91		Y

**Prep Amount:** 1 g      **Dilution:** 1  
**Prep Final Amount:** 8.00 mL      **Basis Factor:** 100.00

U: Undetected at or above MDL  
J: Analyte detected above MDL, but below MRL  
B: Hit above MRL also found in Method Blank  
E: Analyte concentration above high point of ICAL  
N: Presumptive evidence of compound  
D: Result from dilution  
m: Manual integration performed  
d: Compound manually deleted  
NR: Analyte not reported from this analysis  
\*: Result fails acceptance criteria  
#: Acceptance criteria not applicable  
?: Insufficient information to determine acceptance  
e: Result >= MRL, but MRL less than low point of ICAL  
c: check for co-elution





210421\_028

Sample ID: KQ2106020-03  
 Date Acquired: 4/21/2021 4:29:34 PM  
 Acquired by: System Administrator  
 Data File: 210421\_028  
 Vial: 6 | Inj. Volume: 15.0000uL | Tray: 3

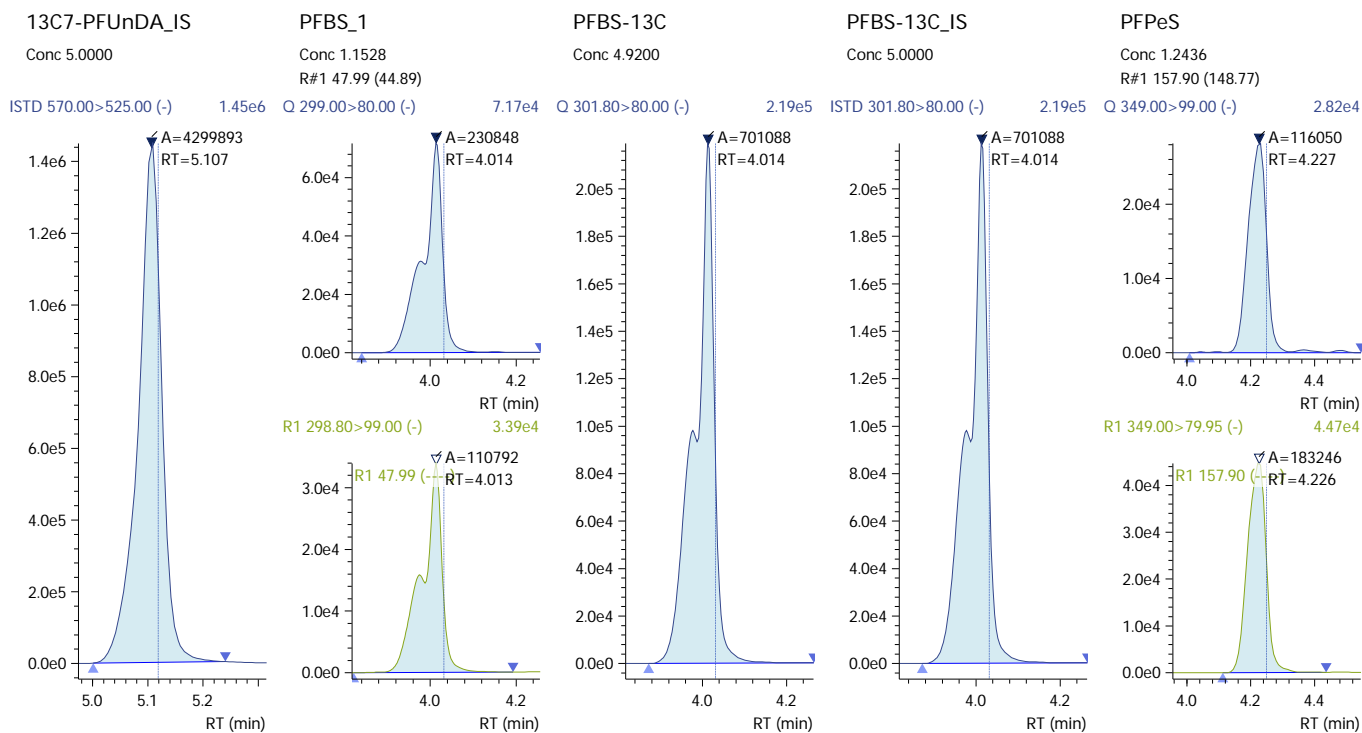
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.107	4299893	4299893	----	----	5.0000	ng/mL
PFBS_1	Auto	4.014	230848	701088	PFBS-13C_IS	----	1.1528	ng/mL
PFBS-13C	Auto	4.014	701088	4299893	13C7-PFUnDA_IS	----	4.9200	ng/mL
PFBS-13C_IS	Auto	4.014	701088	701088	----	----	5.0000	ng/mL
PFPeS	Auto	4.227	116050	701088	PFBS-13C_IS	----	1.2436	ng/mL
PFHxS_1	Auto	4.388	166297	422164	PFHxS-18O_IS	----	1.1746	ng/mL
PFHxS-18O	Auto	4.392	422164	4299893	13C7-PFUnDA_IS	----	5.9765	ng/mL
PFHxS-18O_IS	Auto	4.392	422164	422164	----	----	5.0000	ng/mL
PFHpS_1	Auto	4.556	238804	422164	PFHxS-18O_IS	----	1.3606	ng/mL
PFOS_1	Auto	4.726	125214	658404	PFOS-13C_IS	----	1.1477	ng/mL
PFOS-13C	Auto	4.727	658404	4299893	13C7-PFUnDA_IS	----	6.2537	ng/mL
PFOS-13C_IS	Auto	4.727	658404	658404	----	----	5.0000	ng/mL
PFNS	Auto	4.906	121083	658404	PFOS-13C_IS	----	1.2706	ng/mL
PFDS_1	Auto	5.083	161999	658404	PFOS-13C_IS	----	1.2154	ng/mL
PFBA	Auto	3.402	870555	3138241	PFBA-13C_IS	----	1.2852	ng/mL
PFBA-13C	Auto	3.401	3138241	4299893	13C7-PFUnDA_IS	----	6.2632	ng/mL
PFBA-13C_IS	Auto	3.401	3138241	3138241	----	----	5.0000	ng/mL
PFPeA	Auto	3.923	1247600	2397644	PFPeA-13C_IS	----	1.2543	ng/mL
PFPeA-13C	Auto	3.922	2397644	4299893	13C7-PFUnDA_IS	----	5.3938	ng/mL
PFPeA-13C_IS	Auto	3.922	2397644	2397644	----	----	5.0000	ng/mL
PFHxA	Auto	4.215	1597881	6745531	PFHxA-13C_IS	----	1.1436	ng/mL
PFHxA-13C	Auto	4.215	6745531	4299893	13C7-PFUnDA_IS	----	7.0153	ng/mL
PFHxA-13C_IS	Auto	4.215	6745531	6745531	----	----	5.0000	ng/mL
PFHpA	Auto	4.393	1296575	5438681	PFHpA-13C_IS	----	1.1935	ng/mL
PFHpA-13C	Auto	4.393	5438681	4299893	13C7-PFUnDA_IS	----	5.7983	ng/mL
PFHpA-13C_IS	Auto	4.393	5438681	5438681	----	----	5.0000	ng/mL
PFOA	Auto	4.566	1782016	5726850	PFOA-13C_IS	----	1.1650	ng/mL
PFOA-13C	Auto	4.566	5726850	4299893	13C7-PFUnDA_IS	----	6.6272	ng/mL
PFOA-13C_IS	Auto	4.566	5726850	5726850	----	----	5.0000	ng/mL
PFNA	Auto	4.741	1255915	4746051	PFNA-13C_IS	----	1.3108	ng/mL
PFNA-13C	Auto	4.741	4746051	4299893	13C7-PFUnDA_IS	----	6.5403	ng/mL
PFNA-13C_IS	Auto	4.741	4746051	4746051	----	----	5.0000	ng/mL
PFDA	Auto	4.924	941920	3094061	PFDA-13C_IS	----	1.2111	ng/mL
PFDA-13C	Auto	4.925	3094061	4299893	13C7-PFUnDA_IS	----	6.4687	ng/mL
PFDA-13C_IS	Auto	4.925	3094061	3094061	----	----	5.0000	ng/mL
PFUnA	Auto	5.107	1064811	3581869	PFUnA-13C_IS	----	1.2975	ng/mL
PFUnA-13C	Auto	5.107	3581869	4299893	13C7-PFUnDA_IS	----	6.1043	ng/mL
PFUnA-13C_IS	Auto	5.107	3581869	3581869	----	----	5.0000	ng/mL
PFDaA	Auto	5.285	893773	4019288	PFDaA-13C_IS	----	1.3712	ng/mL
PFDaA-13C	Auto	5.285	4019288	4299893	13C7-PFUnDA_IS	----	6.3758	ng/mL
PFDaA-13C_IS	Auto	5.285	4019288	4019288	----	----	5.0000	ng/mL
PFTeDA	Auto	5.453	828506	2307236	PFTeDA-13C_IS	----	1.3858	ng/mL
PFTeDA	Auto	5.612	699501	2307236	PFTeDA-13C_IS	----	1.3586	ng/mL
PFTeDA-13C	Auto	5.612	2307236	4299893	13C7-PFUnDA_IS	----	5.6025	ng/mL
PFTeDA-13C_IS	Auto	5.612	2307236	2307236	----	----	5.0000	ng/mL
FOSA	Auto	5.233	611530	2088231	FOSA-13C_IS	----	1.1386	ng/mL
FOSA-13C	Auto	5.233	2088231	4299893	13C7-PFUnDA_IS	----	6.4296	ng/mL
FOSA-13C_IS	Auto	5.233	2088231	2088231	----	----	5.0000	ng/mL
N-MeFOSA	Auto	5.633	200137	527875	N-MeFOSA-d3_IS	----	1.2259	ng/mL
N-MeFOSA-d3	Auto	5.630	527875	4299893	13C7-PFUnDA_IS	----	6.5396	ng/mL
N-MeFOSA-d3_IS	Auto	5.630	527875	527875	----	----	5.0000	ng/mL
N-EtFOSA	Auto	5.771	41112	696444	N-EtFOSA-d9_IS	----	1.1844	ng/mL
N-EtFOSA-d9	Auto	5.765	696444	4299893	13C7-PFUnDA_IS	----	6.5807	ng/mL
N-EtFOSA-d9_IS	Auto	5.765	696444	696444	----	----	5.0000	ng/mL



210421\_028 (continued)

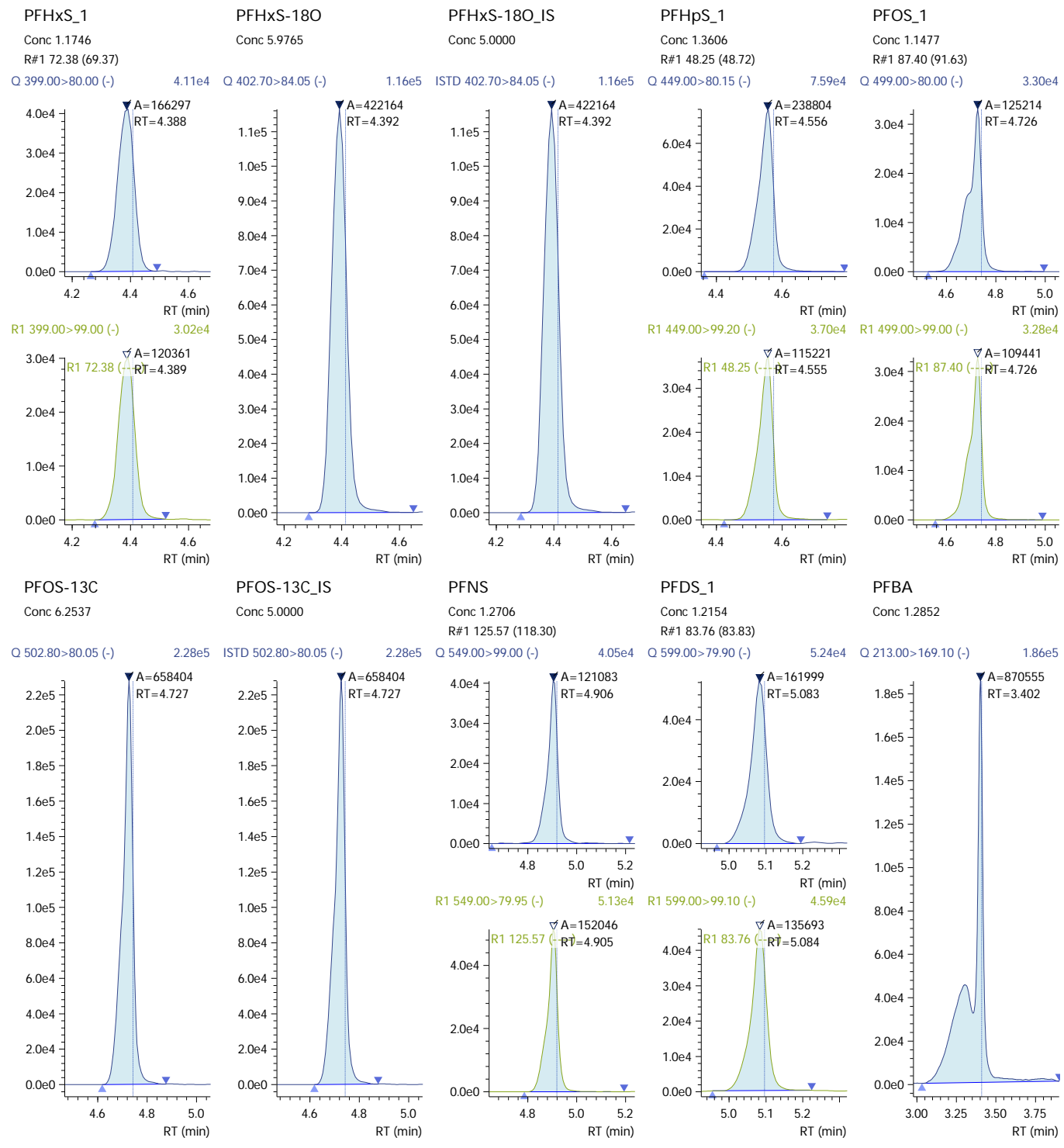
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.610	280814	381598	N-MeFOSE-d7_IS	----	1.5724	ng/mL
N-MeFOSE-d7	Auto	5.601	381598	4299893	13C7-PFUnDA_IS	----	5.1021	ng/mL
N-MeFOSE-d7_IS	Auto	5.601	381598	381598	----	----	5.0000	ng/mL
N-EtFOSE	Auto	5.742	287547	447932	N-EtFOSE-d9_IS	----	1.3992	ng/mL
N-EtFOSE-d9	Auto	5.731	447932	4299893	13C7-PFUnDA_IS	----	5.3909	ng/mL
N-EtFOSE-d9_IS	Auto	5.731	447932	447932	----	----	5.0000	ng/mL
N-MeFOSAA	Auto	5.028	79724	312209	N-MeFOSAA-d3_IS	----	1.4666	ng/mL
N-MeFOSAA-d3	Auto	5.025	312209	4299893	13C7-PFUnDA_IS	----	5.9987	ng/mL
N-MeFOSAA-d3_IS	Auto	5.025	312209	312209	----	----	5.0000	ng/mL
N-EtFOSAA	Auto	5.127	62482	293570	N-EtFOSAA-d5_IS	----	1.2370	ng/mL
N-EtFOSAA-d5	Auto	5.123	293570	4299893	13C7-PFUnDA_IS	----	5.7448	ng/mL
N-EtFOSAA-d5_IS	Auto	5.123	293570	293570	----	----	5.0000	ng/mL
4_2-FTS_1	Auto	4.188	201263	721478	4_2-FTS-13C_IS	----	1.2796	ng/mL
4_2-FTS-13C	Auto	4.188	721478	4299893	13C7-PFUnDA_IS	----	4.3815	ng/mL
4_2-FTS-13C_IS	Auto	4.188	721478	721478	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.553	167200	537634	6_2-FTS-13C_IS	----	1.2712	ng/mL
6_2-FTS-13C	Auto	4.557	537634	4299893	13C7-PFUnDA_IS	----	6.0821	ng/mL
6_2-FTS-13C_IS	Auto	4.557	537634	537634	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.923	80883	274458	8_2-FTS-13C_IS	----	1.2509	ng/mL
8_2-FTS-13C	Auto	4.923	274458	4299893	13C7-PFUnDA_IS	----	6.3208	ng/mL
8_2-FTS-13C_IS	Auto	4.923	274458	274458	----	----	5.0000	ng/mL
10_2-FTS_1	Auto	5.291	42482	274458	8_2-FTS-13C_IS	----	1.1275	ng/mL
HFPO_DA	Auto	4.283	386896	2005046	HFPO_DA-13C_IS	----	1.1141	ng/mL
HFPO_DA-13C	Auto	4.283	2005046	4299893	13C7-PFUnDA_IS	----	7.0109	ng/mL
HFPO_DA-13C_IS	Auto	4.283	2005046	2005046	----	----	5.0000	ng/mL



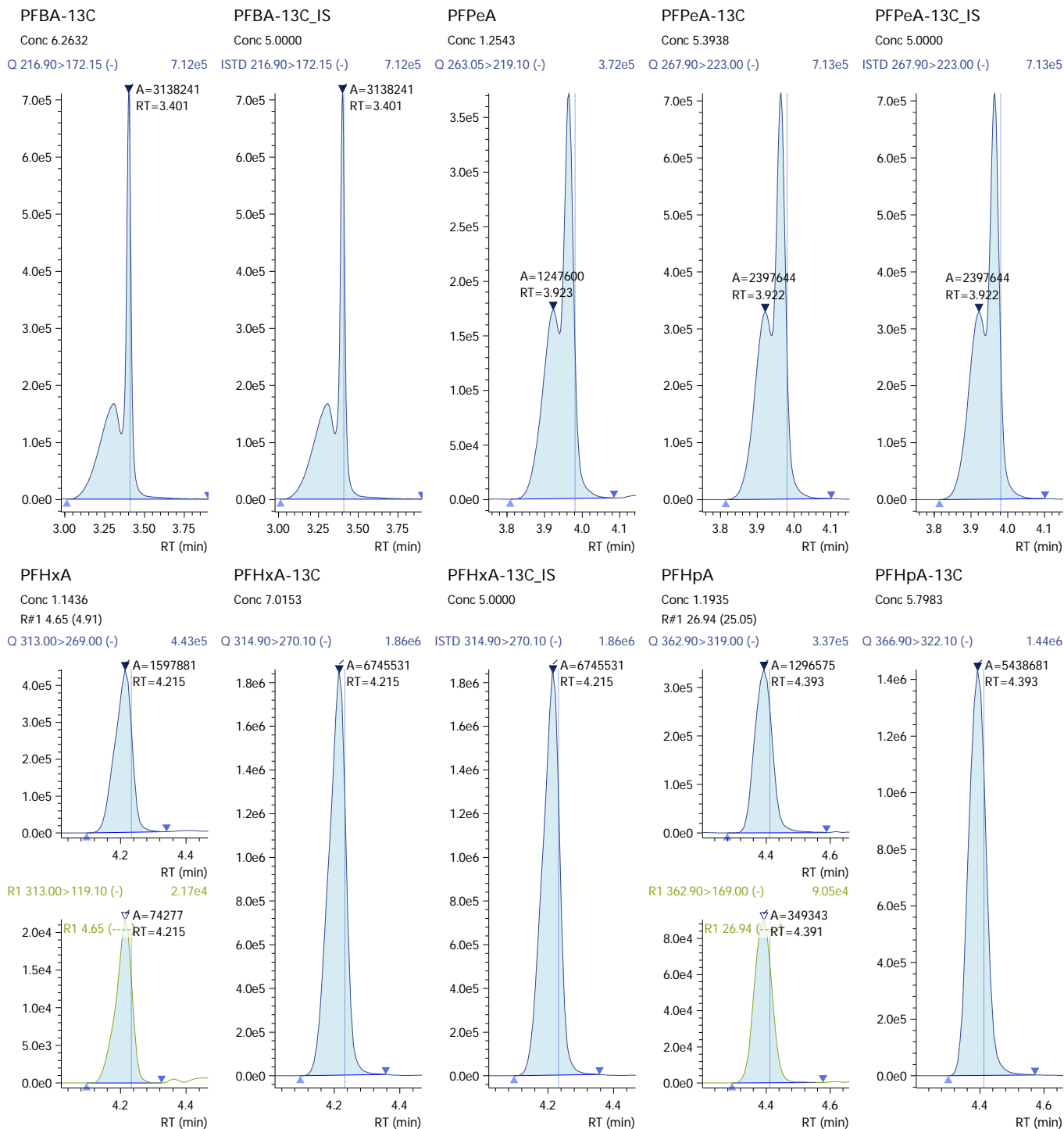


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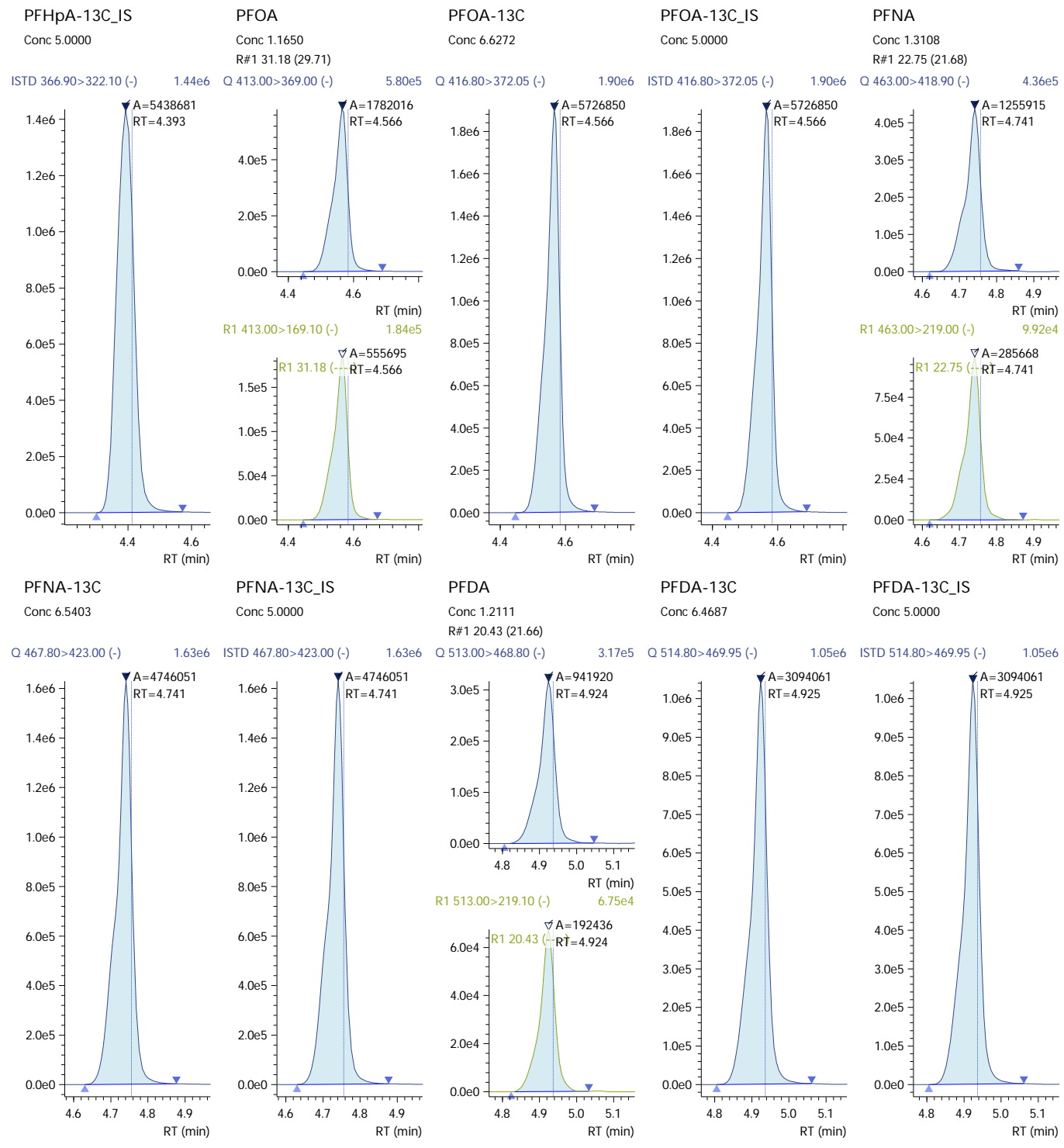


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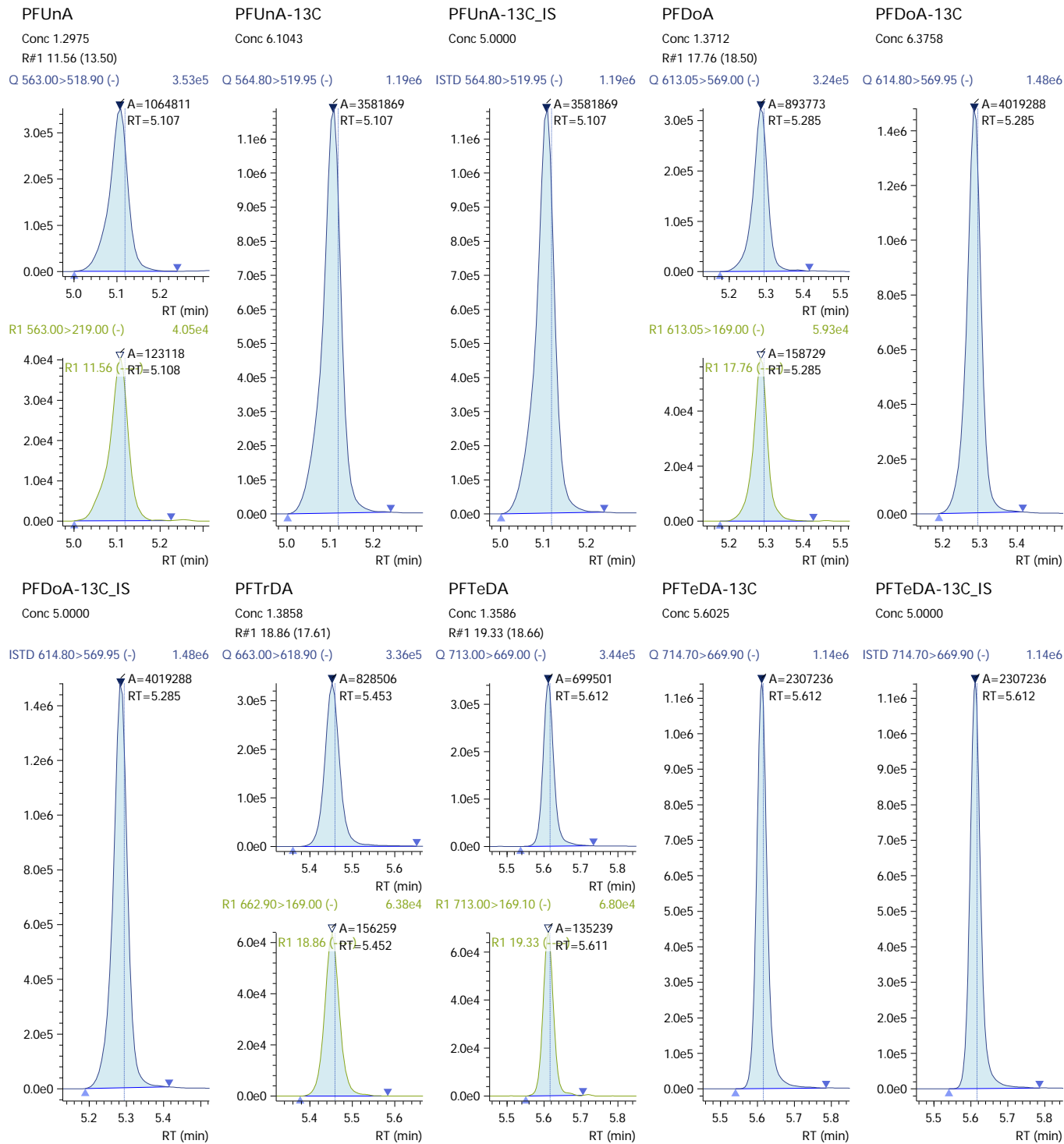


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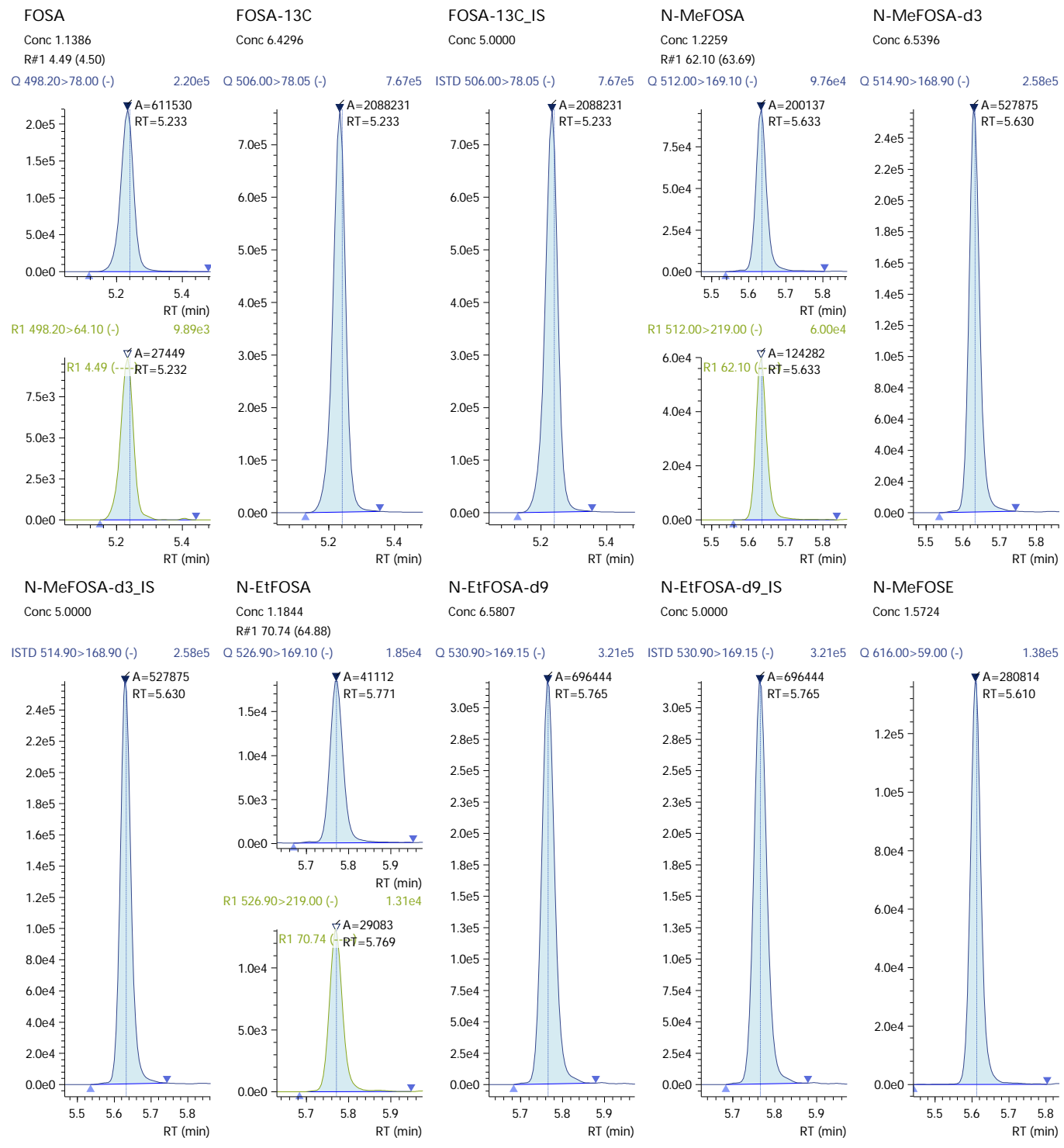
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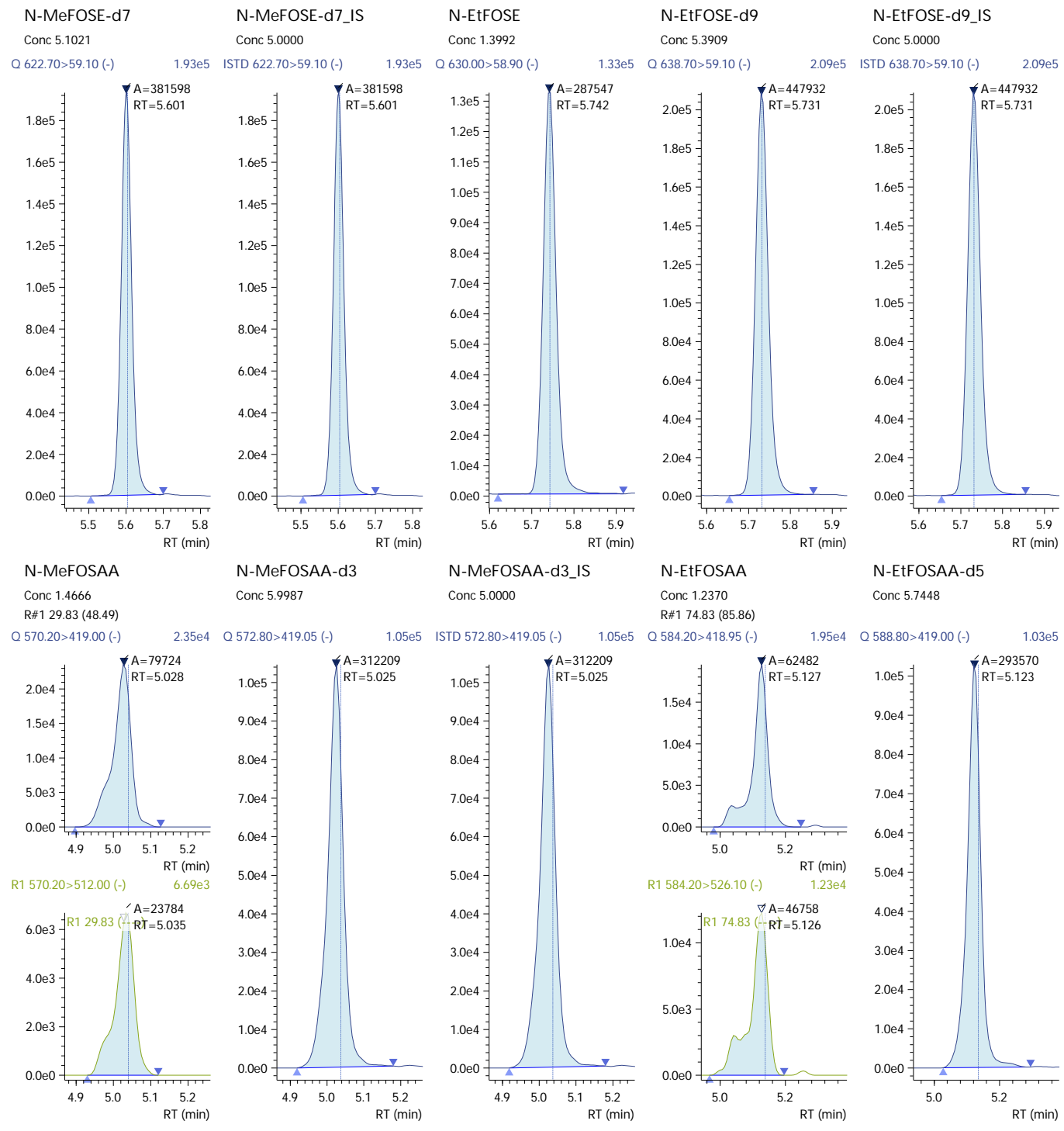


### 210421\_028 (continued)



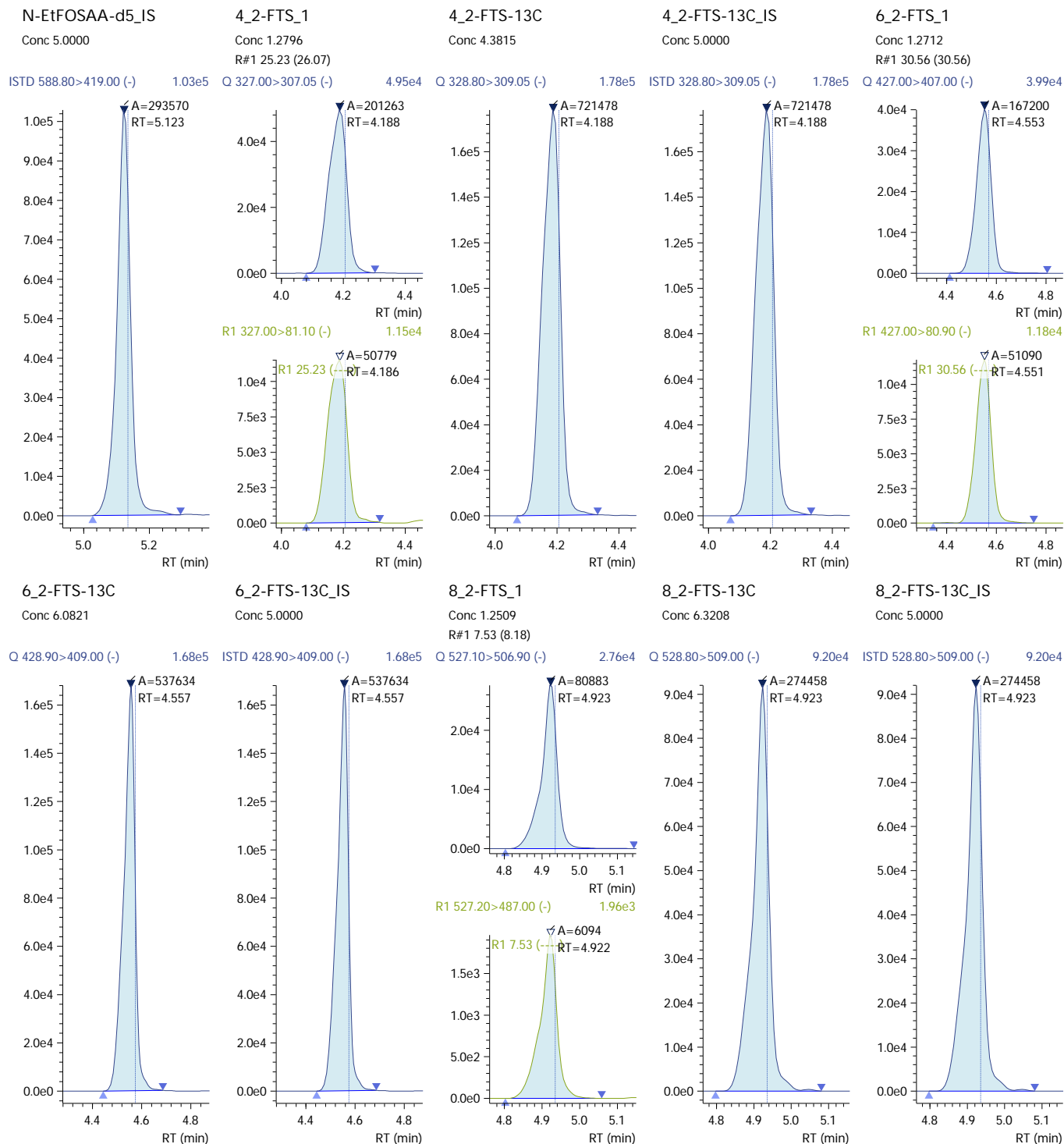


### 210421\_028 (continued)



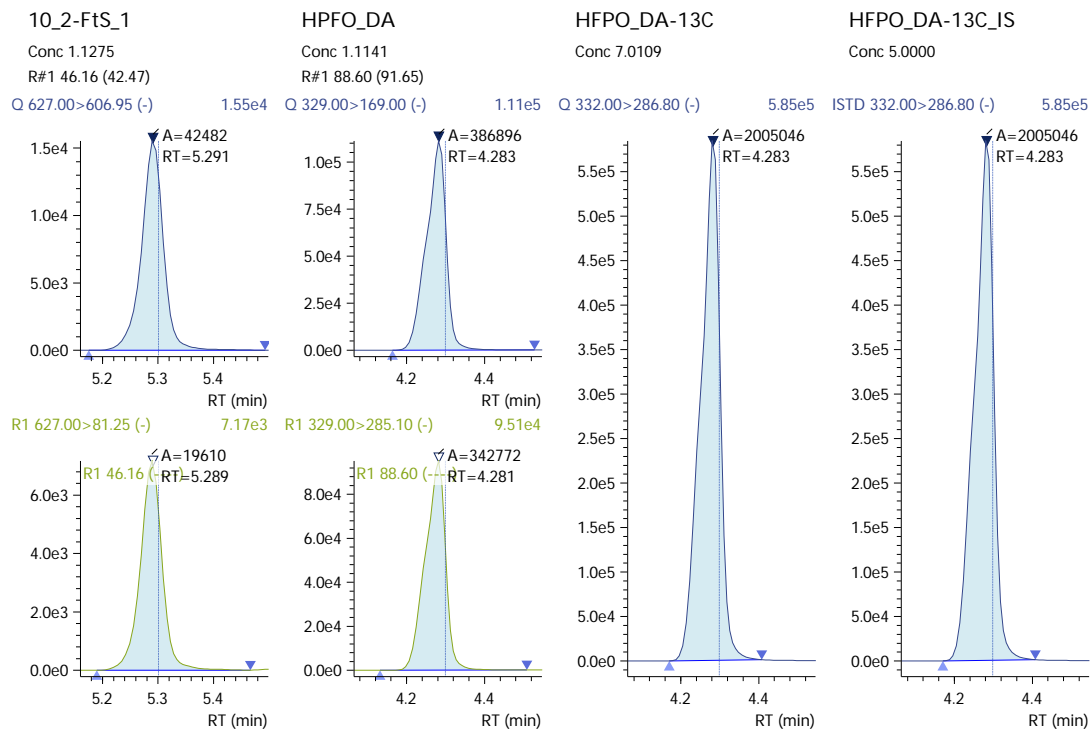


### 210421\_028 (continued)





### 210421\_028 (continued)



# Validation Report

1st *UA* 04/23/21  
2nd *h* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_032  
**Lab ID:** KQ2106020-01  
**RunType:** MS  
**Matrix:** Solid

**Date Acquired:** 4/21/21 17:11  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
Analytical Hold Time	X	
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Continuing Calibration Recovery	X	
Internal Standards	X	
Surrogates		X
Std MRL Unsupported by ICAL	X	
Above Highest ICAL Level	X	

## Analyte Exceptions

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
Surrogates	13C2-6:2 FTS	230	30	140	matrix effect

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

# Quantitation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

<b>Data File:</b> J:\LCMS06\Data\210421_B2\210421_032	<b>Instrument:</b> K-LCMS-06
<b>Acqu Date:</b> 4/21/21 17:11	<b>Vial:</b> 6
<b>Run Type:</b> MS	<b>Dilution:</b> 1
<b>Lab ID:</b> KQ2106020-01	<b>Raw Units:</b> ng/mL

<b>Bottle ID:</b> K2103455-002.01	<b>Tier:</b> II	<b>Matrix:</b> Solid
<b>Prod Code:</b> PFAS	<b>Collect Date:</b> 3/25/21	<b>Receive Date:</b> 4/5/21

<b>Analysis Lot:</b> 720740	<b>Prep Lot:</b> 377476	<b>Report Group:</b> KQ2106020
<b>Analysis:</b> PFC/537M	<b>Prep Method:</b> ALS SOP	
	<b>Prep Date:</b> 4/14/21	

<b>Title:</b> Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b> KC2100210
	<b>Report List ID:</b> 20091

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.115	+0.01	5605412	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	% Rec	Criteria	Rpt?
13C3-PFBS	4.022	+0.01	710993	3.8275	77	33 - 109	Y
18O2-PFHxS	4.402	+0.01	483652	5.2523	105	36 - 120	Y
13C4-PFOS	4.734	+0.01	601534	4.3828	88	32 - 130	Y
13C4-PFBA	3.405	+0.01	3722078	5.6983	114	34 - 116	Y
13C5-PFPeA	3.971	+0.05	2682717	4.6295	93	39 - 133	Y
13C2-PFHxA	4.224	+0.01	7557953	6.0295	121	32 - 136	Y
13C4-PFHpA	4.402	+0.01	6568594	5.3720	107	36 - 133	Y
13C4-PFOA	4.574	+0.01	5503248	4.8852	98	31 - 134	Y
13C5-PFNA	4.749	+0.01	5469138	5.7814	116	27 - 133	Y
13C2-PFDA	4.931	+0.01	3342882	5.3612	107	30 - 137	Y
13C2-PFUnDA	5.116	+0.01	4674526	6.1110	122	32 - 146	Y
13C2-PFDoDA	5.292	+0.01	4722075	5.7460	115	36 - 136	Y
13C2-PFTeDA	5.616	+0.01	2655786	4.9469	99	39 - 138	Y
13C8-FOSA	5.240	+0.01	2188373	5.1686	103	40 - 132	Y
D3-MeFOSA	5.635	+0.01	569018	5.4075	108	51 - 132	Y
D5-EtFOSA	5.768	+0.01	714939	5.1821	104	49 - 123	Y
D7-MeFOSE	5.607	+0.01	355859	3.6498	73	53 - 125	Y
D9-EtFOSE	5.735	+0.01	449806	4.1526	83	45 - 121	Y
D3-MeFOSAA	5.033	+0.01	472557	6.9649	139	20 - 154	Y
D5-EtFOSAA	5.131	+0.01	463509	6.9577	139	29 - 153	Y
13C2-4:2 FTS	4.197	+0.01	1082975	5.0450	101	18 - 127	Y
13C2-6:2 FTS	4.563	+0.01	1327068	11.5163	230	30 - 140	Y
13C2-8:2 FTS	4.931	+0.01	358257	6.3291	127	9 - 171	Y
13C3-HFPO-DA	4.290	+0.01	2089761	5.6052	112	33 - 130	Y

U: Undetected at or above MDL  
 J: Analyte detected above MDL, but below MRL  
 B: Hit above MRL also found in Method Blank  
 E: Analyte concentration above high point of ICAL  
 N: Presumptive evidence of compound

D: Result from dilution  
 m: Manual integration performed  
 d: Compound manually deleted  
 NR: Analyte not reported from this analysis

\*: Result fails acceptance criteria  
 #: Acceptance criteria not applicable  
 ?: Insufficient information to determine acceptance  
 e: Result >= MRL, but MRL less than low point of ICAL  
 c: check for co-elution

Printed: 4/23/21 10:05

\\alprews001\starlims\LIMSReps\QuantValidation.rpt



<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_032	<b>Instrument:</b>	K-LCMS06 <i>206</i>	04/23/21
<b>Acqu Date:</b>	4/21/21 17:11	<b>Vial:</b>	6	
<b>Run Type:</b>	MS	<b>Dilution:</b>	1	
<b>Lab ID:</b>	KQ2106020-01	<b>Raw Units:</b>	ng/mL	

**Target Compounds**

Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perfluorobutane sulfonic acid (PFBS)	4.022	+0.01	206746	1.0180	7.45		Y
Perfluoropentane sulfonic acid (PFPeS)	4.233	+0.01	111075	1.1737	8.59		Y
Perfluorohexane sulfonic acid (PFHxS)	4.395	+0.01	150685	0.9243	6.77		Y
Perfluoroheptane sulfonic acid (PFHpS)	4.564	+0.01	182444	0.9074	6.64		Y
Perfluorooctane sulfonic acid (PFOS)	4.735	+0.01	105395	1.0573	7.74		Y
Perfluorononane sulfonic acid (PFNS)	4.913	+0.01	103262	1.1861	8.68		Y
Perfluorodecane sulfonic acid (PFDS)	5.093	+0.01	142501	1.1702	8.57		Y
Perfluorobutanoic acid (PFBA)	3.406	+0.01	915156	1.1391	8.34		Y
Perfluoropentanoic acid (PFPeA)	3.971	+0.05	1221941	1.0944	8.01		Y
Perfluorohexanoic acid (PFHxA)	4.224	+0.01	1590251	1.0158	7.43		Y
Perfluoroheptanoic acid (PFHpA)	4.403	+0.01	1523521	1.1611	8.50		Y
Perfluorooctanoic acid (PFOA)	4.575	+0.01	1519097	1.0335	7.56		Y
Perfluorononanoic acid (PFNA)	4.749	+0.01	1265484	1.1462	8.39		Y
Perfluorodecanoic acid (PFDA)	4.931	+0.01	888440	1.0573	7.74		Y
Perfluoroundecanoic acid (PFUnDA)	5.115	+0.01	1155076	1.0785	7.89		Y
Perfluorododecanoic acid (PFDoDA)	5.291	+0.01	901011	1.1766	8.61		Y
Perfluorotridecanoic acid (PFTrDA)	5.460	+0.01	762409	1.1079	8.11		Y
Perfluorotetradecanoic acid (PFTeDA)	5.616	+0.01	679226	1.1461	8.39		Y
Perfluorooctane sulfonamide (FOSA)	5.240	+0.01	609180	1.0823	7.92		Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.638	+0.01	192591	1.0944	8.01		Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	5.773	+0.01	36942	1.0329	7.56		Y
N-Methyl perfluorooctane sulfonamidoethanol	5.615	+0.01	266833	1.6021	11.7		Y
N-Ethyl perfluorooctane sulfonamidoethanol	5.746	+0.01	295094	1.4299	10.5		Y
N-Methyl perfluorooctane sulfonamidoacetic acid	5.034	+0.01	88090	1.0779	7.89		Y
N-Ethyl perfluorooctane sulfonamidoacetic acid	5.136	+0.01	95504	1.1975	8.76		Y
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	4.197	+0.01	255085	1.0805	7.91		Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.560	+0.01	365188	1.1248	8.23		Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.929	+0.01	84960	1.0066	7.37		Y
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	5.298	+0.01	48785	0.9920	7.26		Y
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.290	+0.01	351704	0.9717	7.11		Y

**Prep Amount:** 1.093 g      **Dilution:** 1  
**Prep Final Amount:** 8.00 mL      **Basis Factor:** 100.00

U: Undetected at or above MDL  
J: Analyte detected above MDL, but below MRL  
B: Hit above MRL also found in Method Blank  
E: Analyte concentration above high point of ICAL  
N: Presumptive evidence of compound  
D: Result from dilution  
m: Manual integration performed  
d: Compound manually deleted  
NR: Analyte not reported from this analysis  
\*: Result fails acceptance criteria  
#: Acceptance criteria not applicable  
?: Insufficient information to determine acceptance  
e: Result >= MRL, but MRL less than low point of ICAL  
c: check for co-elution



210421\_032

Sample ID: KQ2106020-01  
 Date Acquired: 4/21/2021 5:11:32 PM  
 Acquired by: System Administrator  
 Data File: 210421\_032  
 Vial: 10 | Inj. Volume: 15.0000uL | Tray: 3

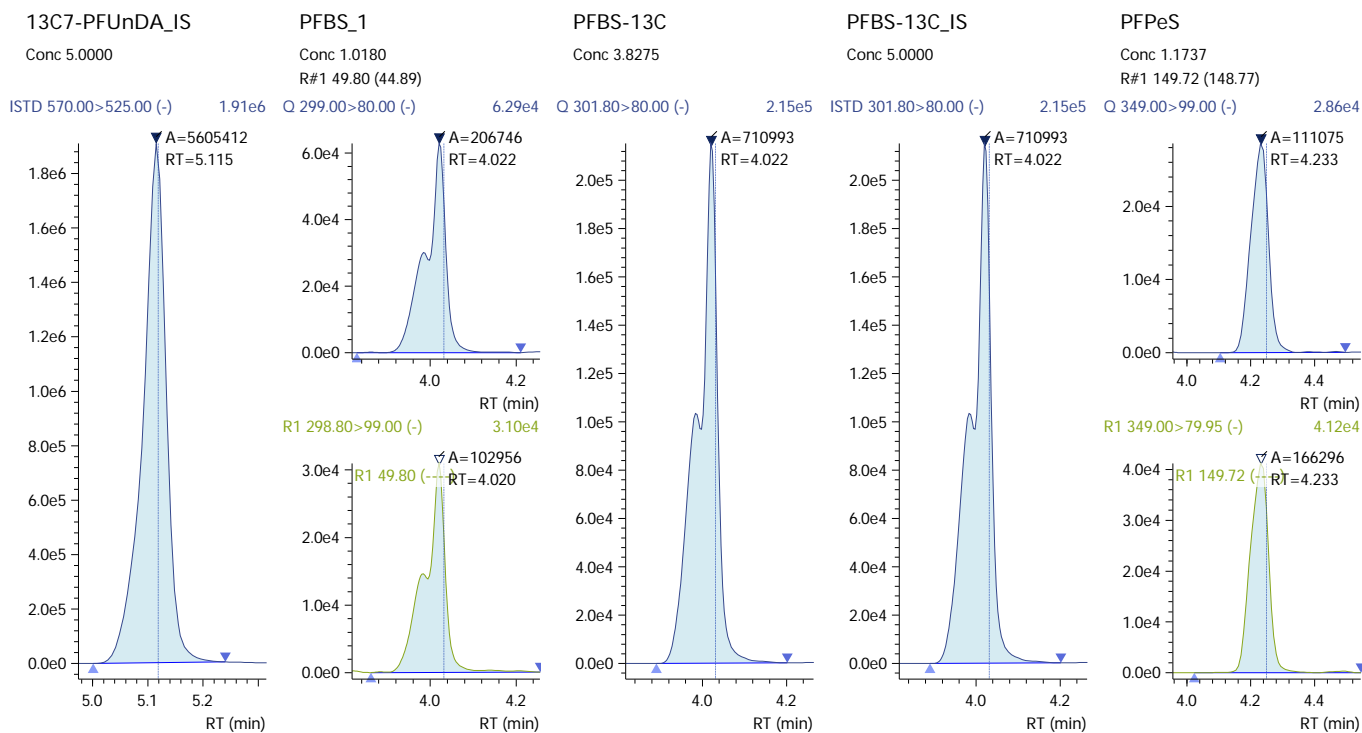
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.115	5605412	5605412	----	----	5.0000	ng/mL
PFBS_1	Auto	4.022	206746	710993	PFBS-13C_IS	----	1.0180	ng/mL
PFBS-13C	Auto	4.022	710993	5605412	13C7-PFUnDA_IS	----	3.8275	ng/mL
PFBS-13C_IS	Auto	4.022	710993	710993	----	----	5.0000	ng/mL
PFPeS	Auto	4.233	111075	710993	PFBS-13C_IS	----	1.1737	ng/mL
PFHxS_1	Auto	4.395	150685	483652	PFHxS-18O_IS	----	0.9243	ng/mL
PFHxS-18O	Auto	4.402	483652	5605412	13C7-PFUnDA_IS	----	5.2523	ng/mL
PFHxS-18O_IS	Auto	4.402	483652	483652	----	----	5.0000	ng/mL
PFHpS_1	Auto	4.564	182444	483652	PFHxS-18O_IS	----	0.9074	ng/mL
PFOS_1	Auto	4.735	105395	601534	PFOS-13C_IS	----	1.0573	ng/mL
PFOS-13C	Auto	4.734	601534	5605412	13C7-PFUnDA_IS	----	4.3828	ng/mL
PFOS-13C_IS	Auto	4.734	601534	601534	----	----	5.0000	ng/mL
PFNS	Auto	4.913	103262	601534	PFOS-13C_IS	----	1.1861	ng/mL
PFDS_1	Auto	5.093	142501	601534	PFOS-13C_IS	----	1.1702	ng/mL
PFBA	M	3.406	915156	3722078	PFBA-13C_IS	----	1.1391	ng/mL
PFBA-13C	Auto	3.405	3722078	5605412	13C7-PFUnDA_IS	----	5.6983	ng/mL
PFBA-13C_IS	Auto	3.405	3722078	3722078	----	----	5.0000	ng/mL
PFPeA	Auto	3.971	1221941	2682717	PFPeA-13C_IS	----	1.0944	ng/mL
PFPeA-13C	Auto	3.971	2682717	5605412	13C7-PFUnDA_IS	----	4.6295	ng/mL
PFPeA-13C_IS	Auto	3.971	2682717	2682717	----	----	5.0000	ng/mL
PFHxA	Auto	4.224	1590251	7557953	PFHxA-13C_IS	----	1.0158	ng/mL
PFHxA-13C	Auto	4.224	7557953	5605412	13C7-PFUnDA_IS	----	6.0295	ng/mL
PFHxA-13C_IS	Auto	4.224	7557953	7557953	----	----	5.0000	ng/mL
PFHpA	Auto	4.403	1523521	6568594	PFHpA-13C_IS	----	1.1611	ng/mL
PFHpA-13C	Auto	4.402	6568594	5605412	13C7-PFUnDA_IS	----	5.3720	ng/mL
PFHpA-13C_IS	Auto	4.402	6568594	6568594	----	----	5.0000	ng/mL
PFOA	Auto	4.575	1519097	5503248	PFOA-13C_IS	----	1.0335	ng/mL
PFOA-13C	Auto	4.574	5503248	5605412	13C7-PFUnDA_IS	----	4.8852	ng/mL
PFOA-13C_IS	Auto	4.574	5503248	5503248	----	----	5.0000	ng/mL
PFNA	Auto	4.749	1265484	5469138	PFNA-13C_IS	----	1.1462	ng/mL
PFNA-13C	Auto	4.749	5469138	5605412	13C7-PFUnDA_IS	----	5.7814	ng/mL
PFNA-13C_IS	Auto	4.749	5469138	5469138	----	----	5.0000	ng/mL
PFDA	Auto	4.931	888440	3342882	PFDA-13C_IS	----	1.0573	ng/mL
PFDA-13C	Auto	4.931	3342882	5605412	13C7-PFUnDA_IS	----	5.3612	ng/mL
PFDA-13C_IS	Auto	4.931	3342882	3342882	----	----	5.0000	ng/mL
PFUnA	Auto	5.115	1155076	4674526	PFUnA-13C_IS	----	1.0785	ng/mL
PFUnA-13C	Auto	5.116	4674526	5605412	13C7-PFUnDA_IS	----	6.1110	ng/mL
PFUnA-13C_IS	Auto	5.116	4674526	4674526	----	----	5.0000	ng/mL
PFDoA	Auto	5.291	901011	4722075	PFDoA-13C_IS	----	1.1766	ng/mL
PFDoA-13C	Auto	5.292	4722075	5605412	13C7-PFUnDA_IS	----	5.7460	ng/mL
PFDoA-13C_IS	Auto	5.292	4722075	4722075	----	----	5.0000	ng/mL
PFTeDA	Auto	5.460	762409	2655786	PFTeDA-13C_IS	----	1.1079	ng/mL
PFTeDA	Auto	5.616	679226	2655786	PFTeDA-13C_IS	----	1.1461	ng/mL
PFTeDA-13C	Auto	5.616	2655786	5605412	13C7-PFUnDA_IS	----	4.9469	ng/mL
PFTeDA-13C_IS	Auto	5.616	2655786	2655786	----	----	5.0000	ng/mL
FOSA	Auto	5.240	609180	2188373	FOSA-13C_IS	----	1.0823	ng/mL
FOSA-13C	Auto	5.240	2188373	5605412	13C7-PFUnDA_IS	----	5.1686	ng/mL
FOSA-13C_IS	Auto	5.240	2188373	2188373	----	----	5.0000	ng/mL
N-MeFOSA	Auto	5.638	192591	569018	N-MeFOSA-d3_IS	----	1.0944	ng/mL
N-MeFOSA-d3	Auto	5.635	569018	5605412	13C7-PFUnDA_IS	----	5.4075	ng/mL
N-MeFOSA-d3_IS	Auto	5.635	569018	569018	----	----	5.0000	ng/mL
N-EtFOSA	Auto	5.773	36942	714939	N-EtFOSA-d9_IS	----	1.0329	ng/mL
N-EtFOSA-d9	Auto	5.768	714939	5605412	13C7-PFUnDA_IS	----	5.1821	ng/mL
N-EtFOSA-d9_IS	Auto	5.768	714939	714939	----	----	5.0000	ng/mL



210421\_032 (continued)

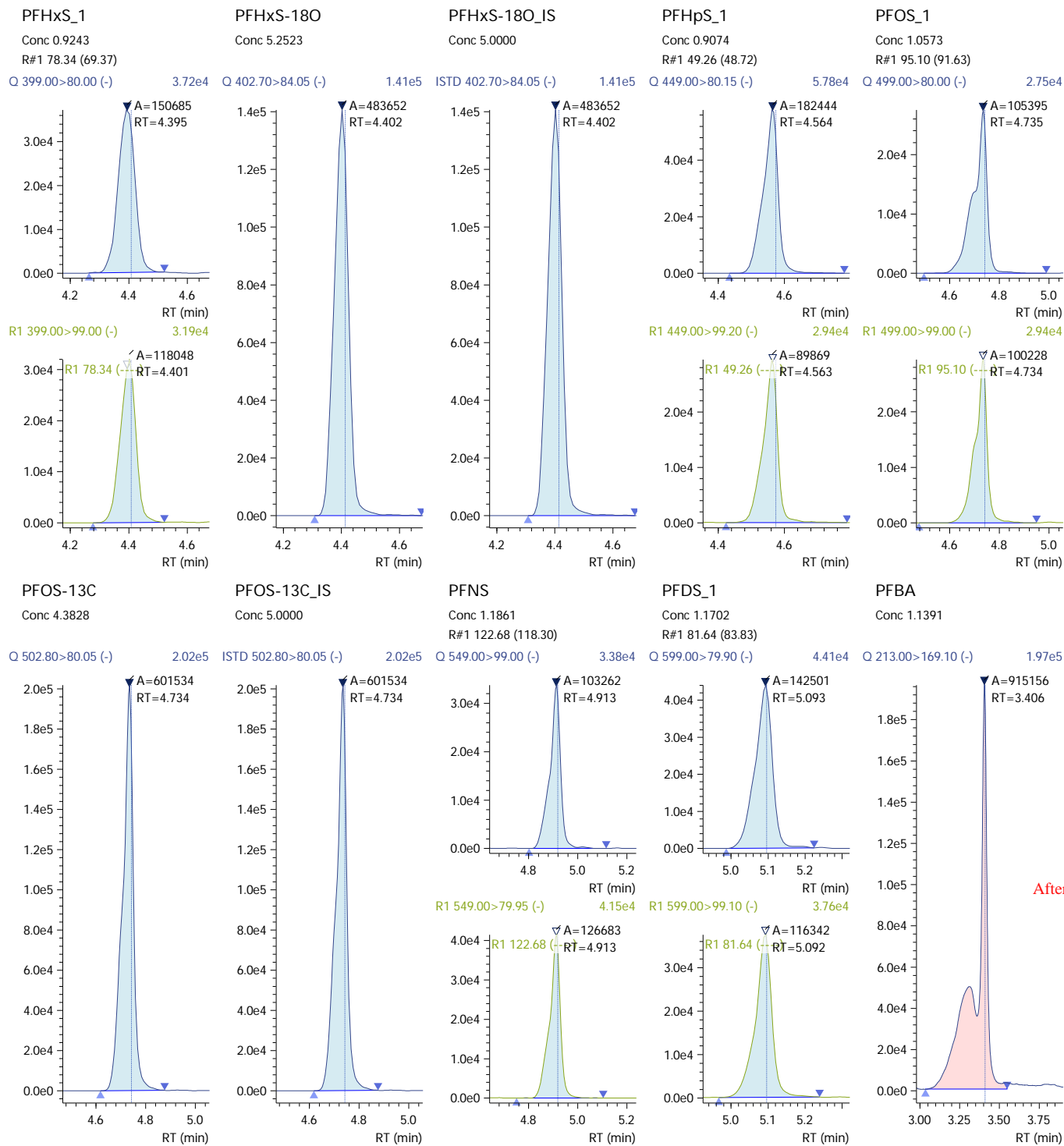
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.615	266833	355859	N-MeFOSE-d7_IS	----	1.6021	ng/mL
N-MeFOSE-d7	Auto	5.607	355859	5605412	13C7-PFUnDA_IS	----	3.6498	ng/mL
N-MeFOSE-d7_IS	Auto	5.607	355859	355859	----	----	5.0000	ng/mL
N-EtFOSE	Auto	5.746	295094	449806	N-EtFOSE-d9_IS	----	1.4299	ng/mL
N-EtFOSE-d9	Auto	5.735	449806	5605412	13C7-PFUnDA_IS	----	4.1526	ng/mL
N-EtFOSE-d9_IS	Auto	5.735	449806	449806	----	----	5.0000	ng/mL
N-MeFOSAA	Auto	5.034	88090	472557	N-MeFOSAA-d3_IS	----	1.0779	ng/mL
N-MeFOSAA-d3	Auto	5.033	472557	5605412	13C7-PFUnDA_IS	----	6.9649	ng/mL
N-MeFOSAA-d3_IS	Auto	5.033	472557	472557	----	----	5.0000	ng/mL
N-EtFOSAA	Auto	5.136	95504	463509	N-EtFOSAA-d5_IS	----	1.1975	ng/mL
N-EtFOSAA-d5	Auto	5.131	463509	5605412	13C7-PFUnDA_IS	----	6.9577	ng/mL
N-EtFOSAA-d5_IS	Auto	5.131	463509	463509	----	----	5.0000	ng/mL
4_2-FTS_1	Auto	4.197	255085	1082975	4_2-FTS-13C_IS	----	1.0805	ng/mL
4_2-FTS-13C	Auto	4.197	1082975	5605412	13C7-PFUnDA_IS	----	5.0450	ng/mL
4_2-FTS-13C_IS	Auto	4.197	1082975	1082975	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.560	365188	1327068	6_2-FTS-13C_IS	----	1.1248	ng/mL
6_2-FTS-13C	Auto	4.563	1327068	5605412	13C7-PFUnDA_IS	----	11.5163	ng/mL
6_2-FTS-13C_IS	Auto	4.563	1327068	1327068	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.929	84960	358257	8_2-FTS-13C_IS	----	1.0066	ng/mL
8_2-FTS-13C	Auto	4.931	358257	5605412	13C7-PFUnDA_IS	----	6.3291	ng/mL
8_2-FTS-13C_IS	Auto	4.931	358257	358257	----	----	5.0000	ng/mL
10_2-FTS_1	Auto	5.298	48785	358257	8_2-FTS-13C_IS	----	0.9920	ng/mL
HPFO_DA	Auto	4.290	351704	2089761	HPFO_DA-13C_IS	----	0.9717	ng/mL
HPFO_DA-13C	Auto	4.290	2089761	5605412	13C7-PFUnDA_IS	----	5.6052	ng/mL
HPFO_DA-13C_IS	Auto	4.290	2089761	2089761	----	----	5.0000	ng/mL





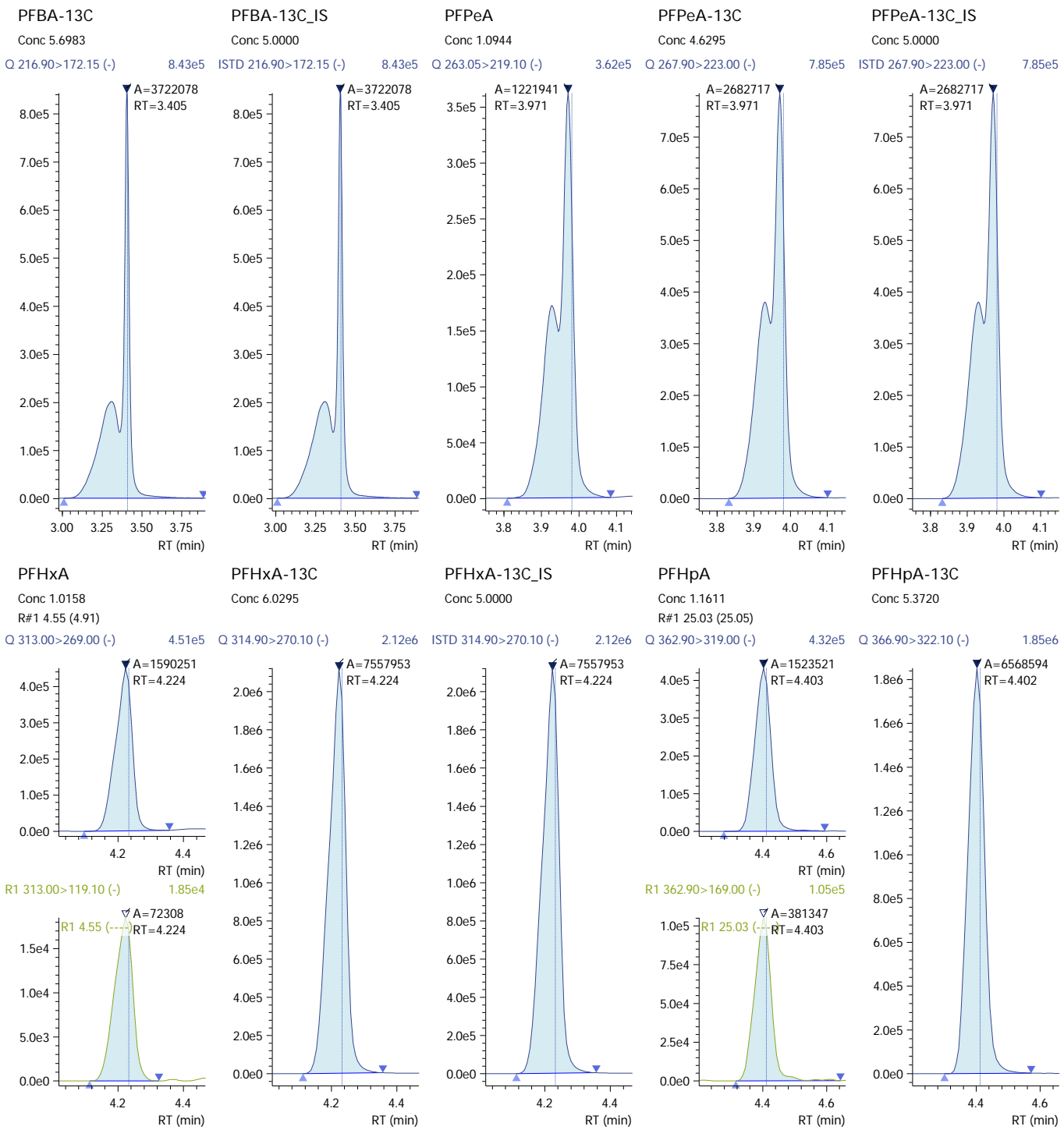
### 210421\_032 (continued)



After-OI

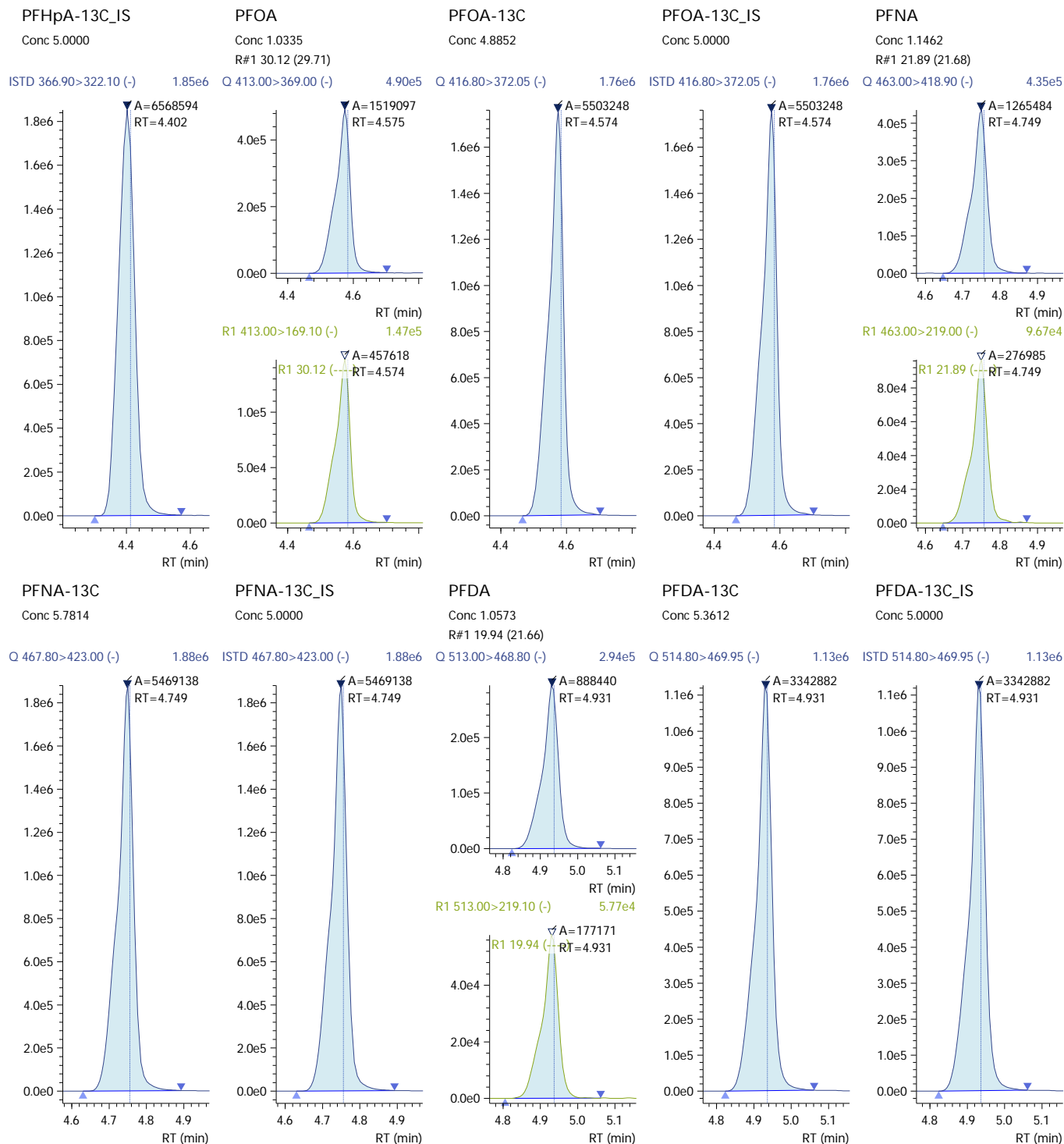


### 210421\_032 (continued)





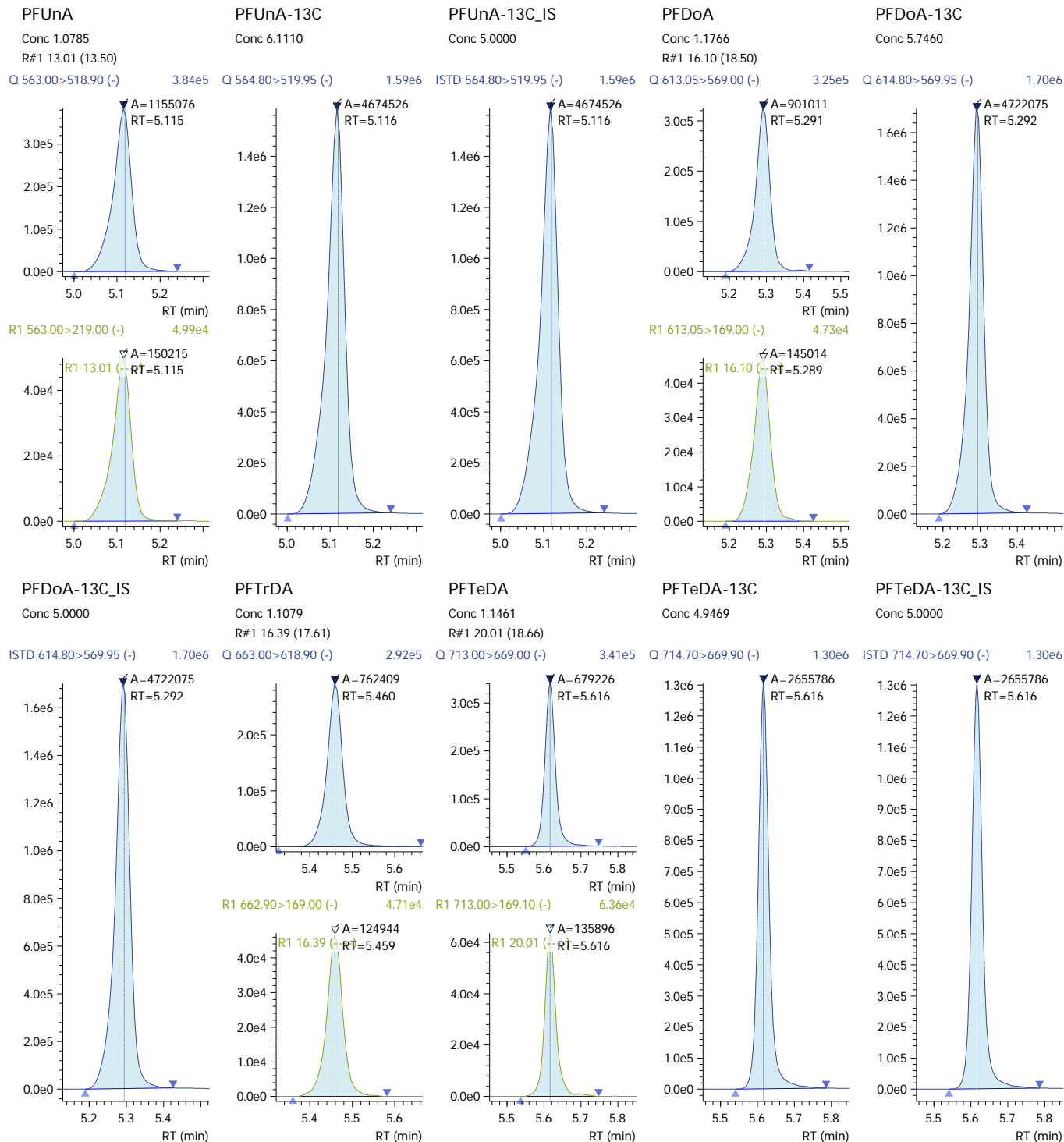
210421\_032 (continued)





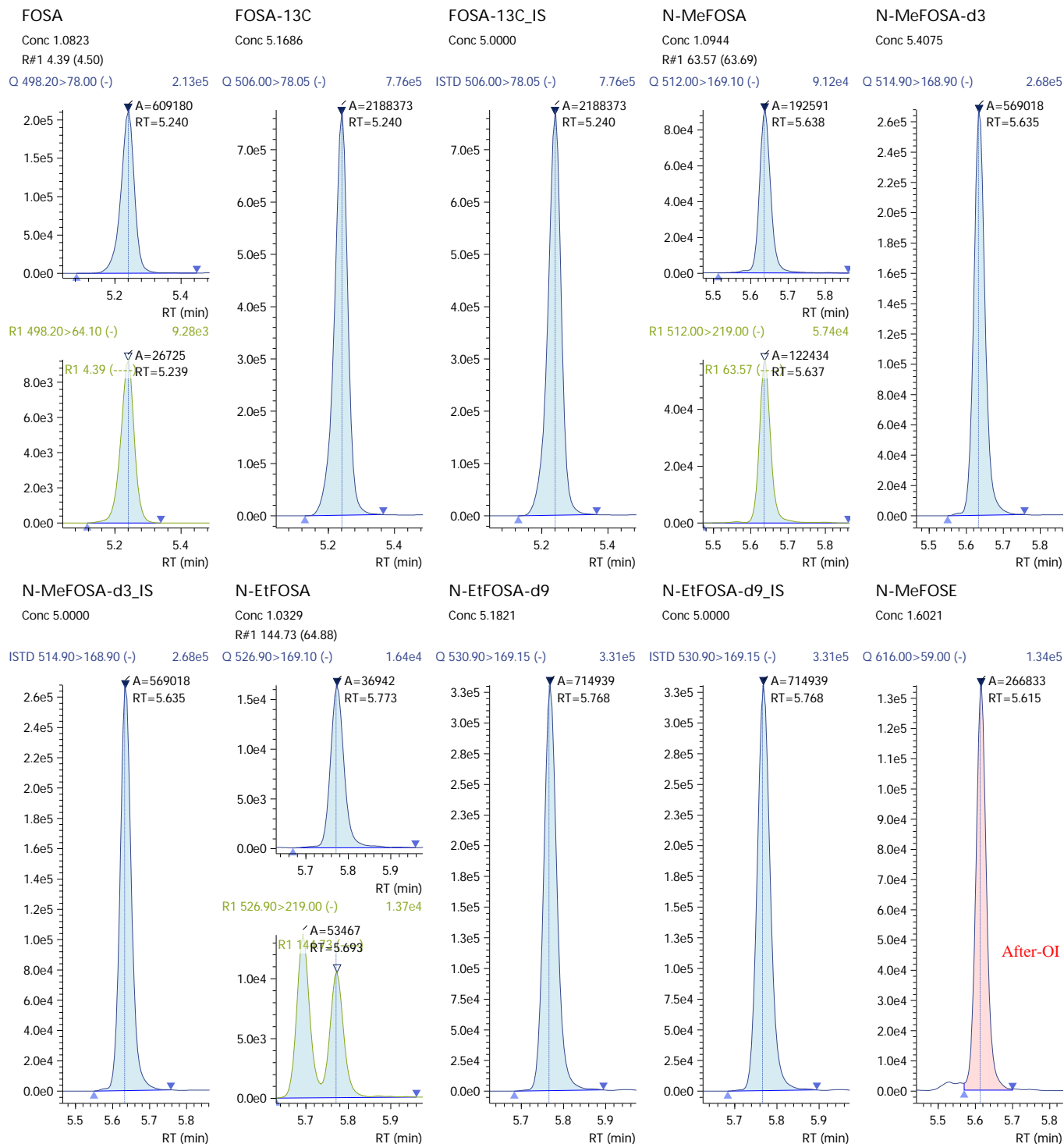


### 210421\_032 (continued)



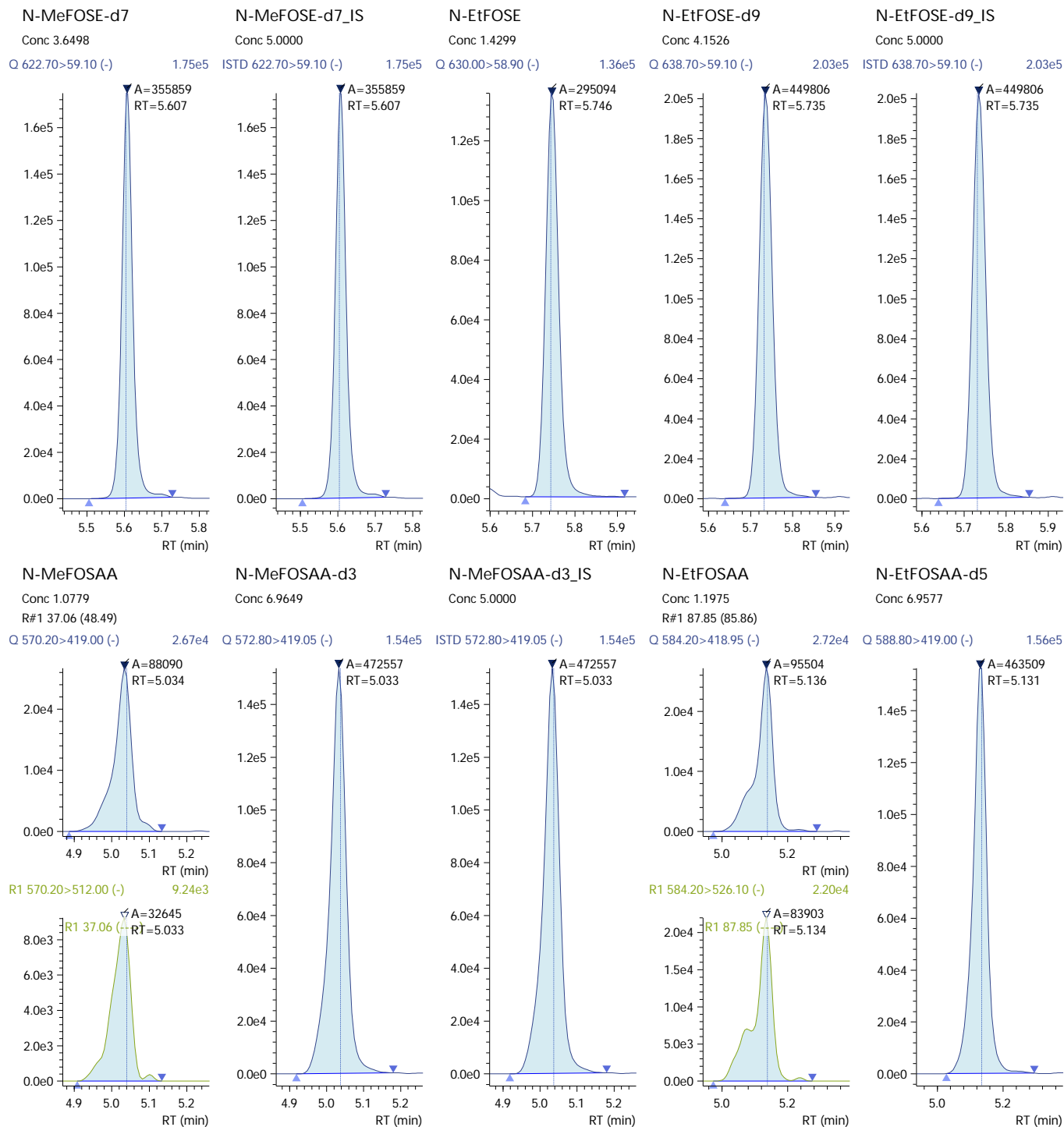


### 210421\_032 (continued)



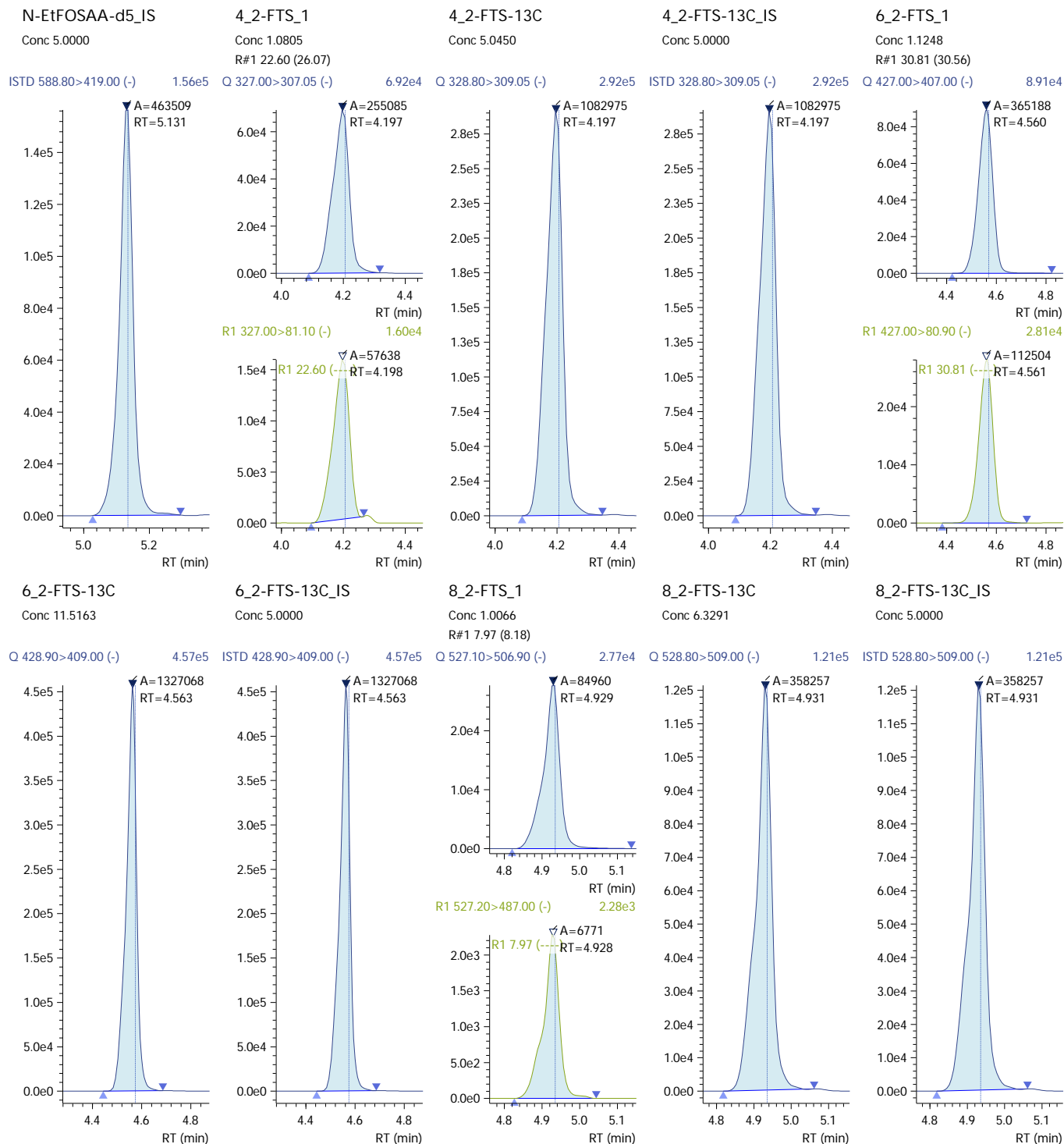


### 210421\_032 (continued)



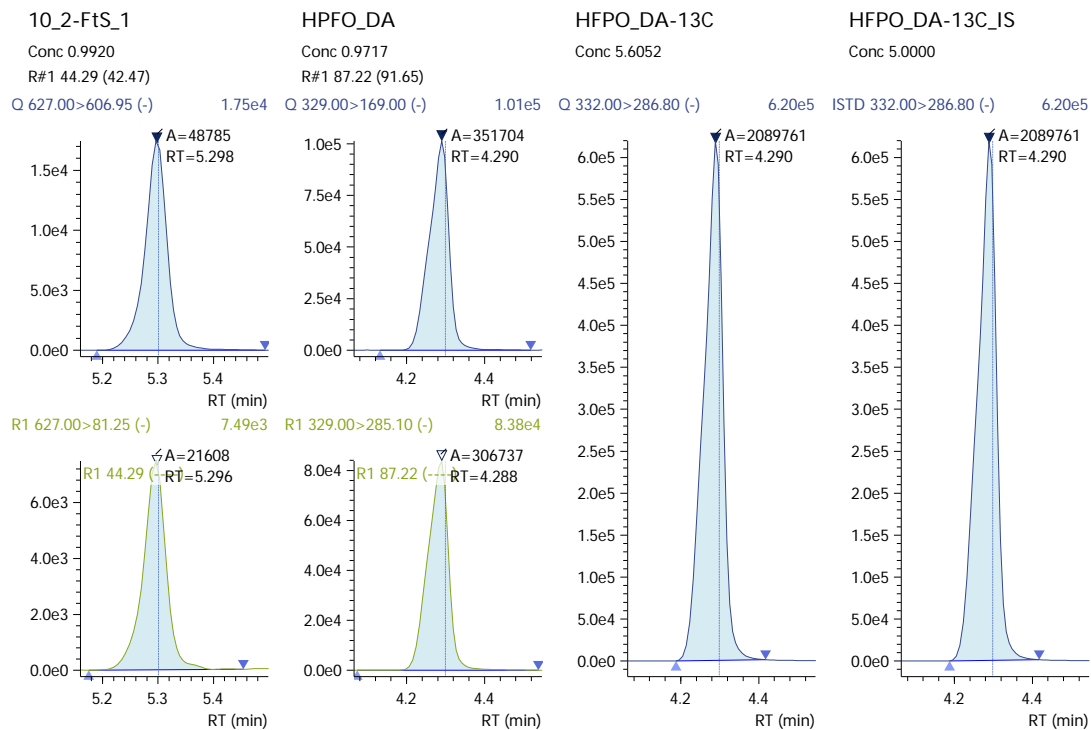


210421\_032 (continued)





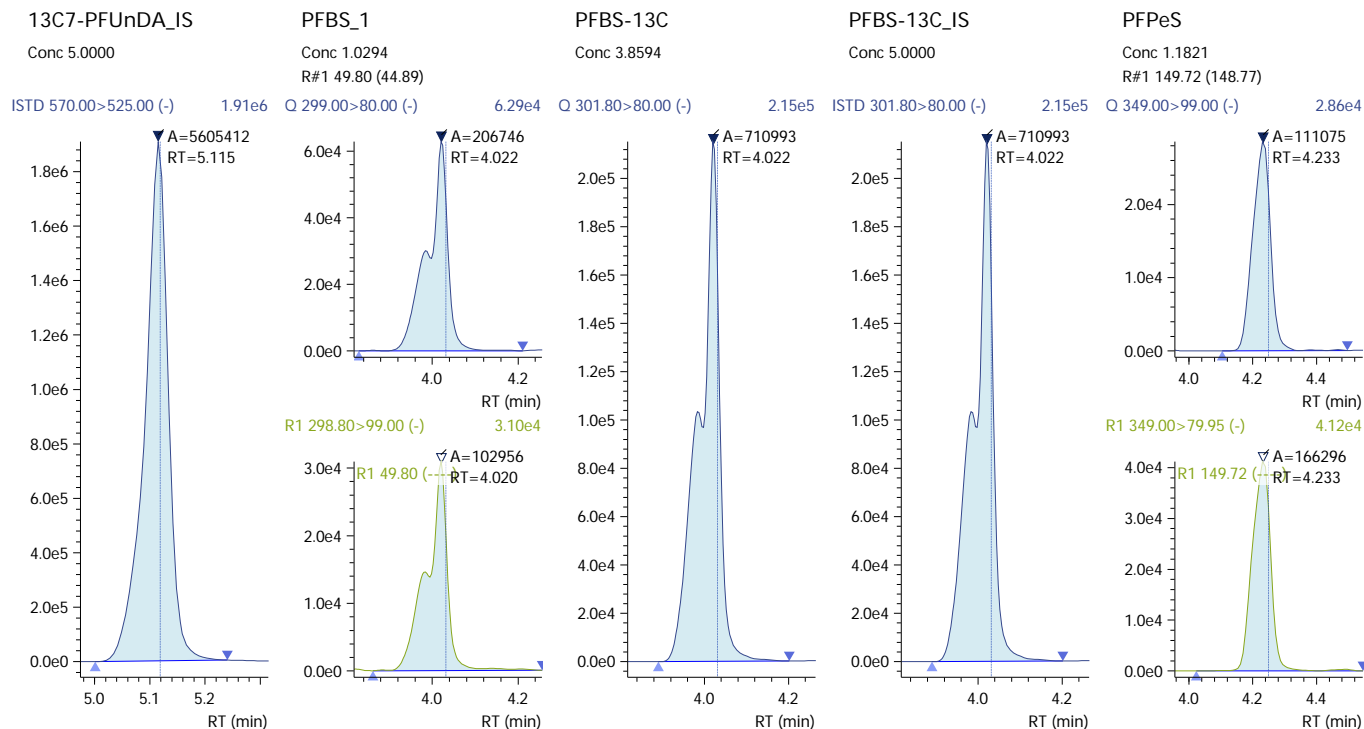
### 210421\_032 (continued)





### 210421\_032

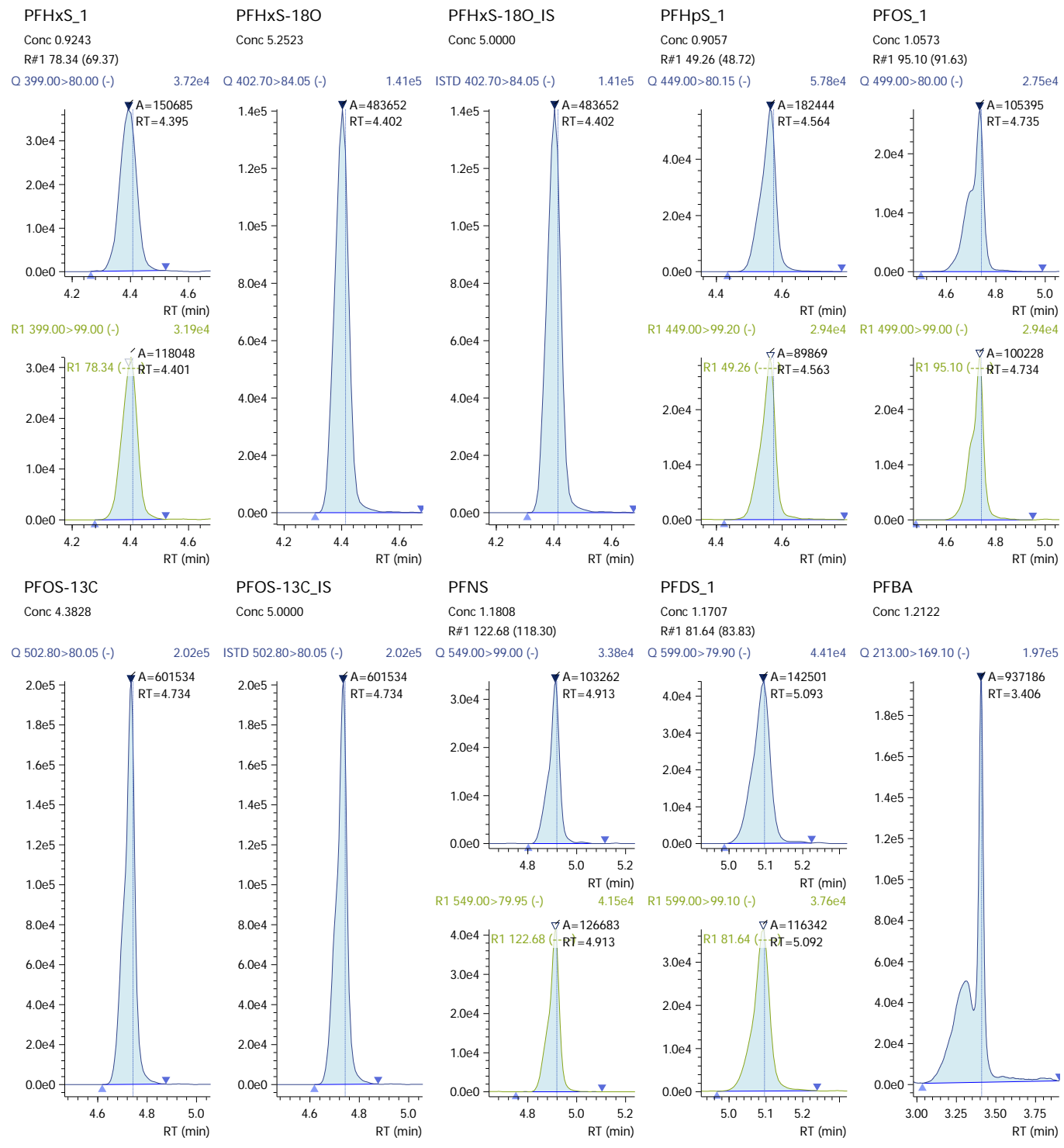
Sample ID: KQ2106020-01  
Date Acquired: 4/21/2021 5:11:32 PM  
Acquired by: System Administrator  
Data File: 210421\_032  
Vial: 10 | Inj. Volume: 15.0000uL | Tray: 3





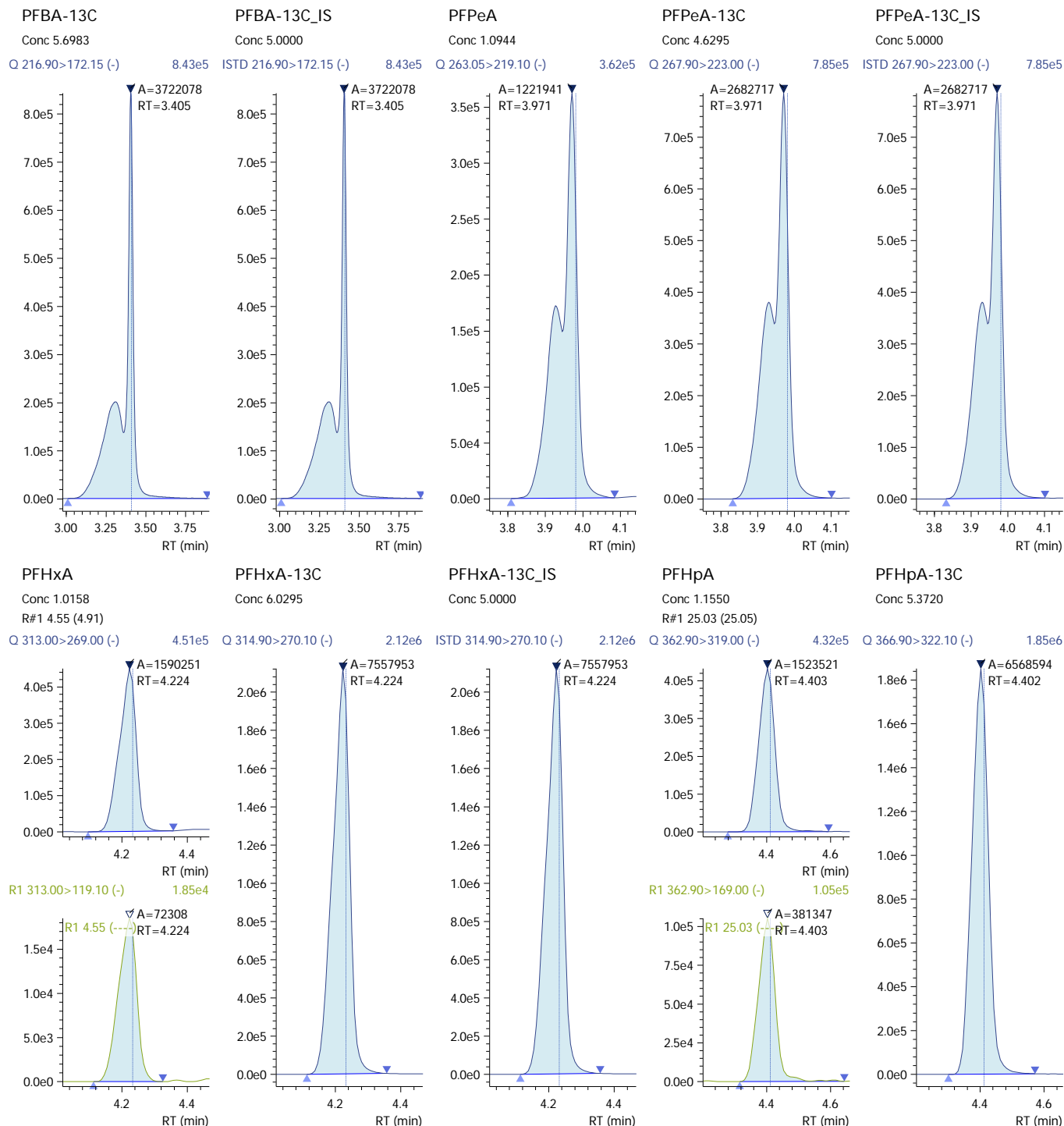


### 210421\_032 (continued)



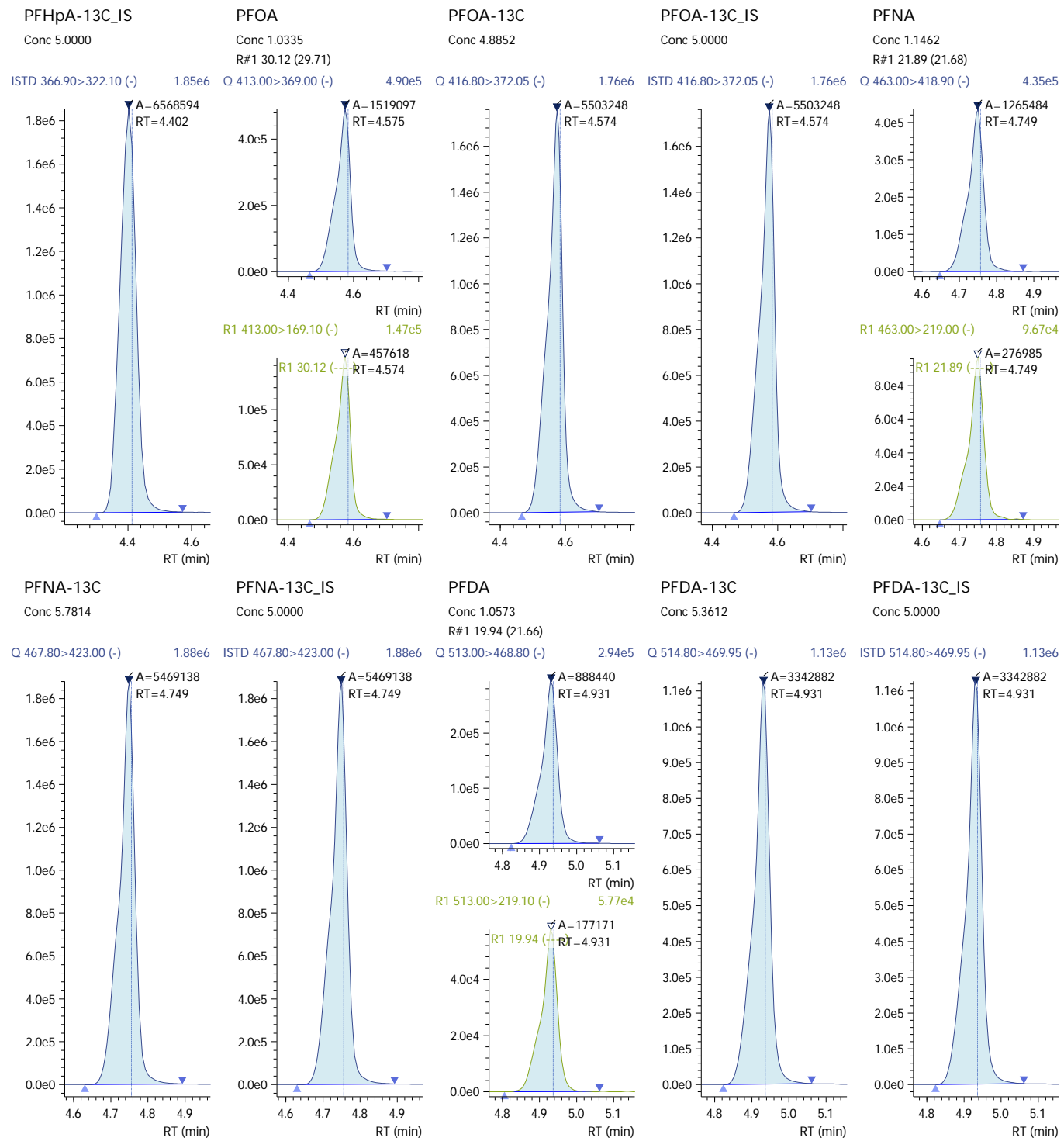


### 210421\_032 (continued)



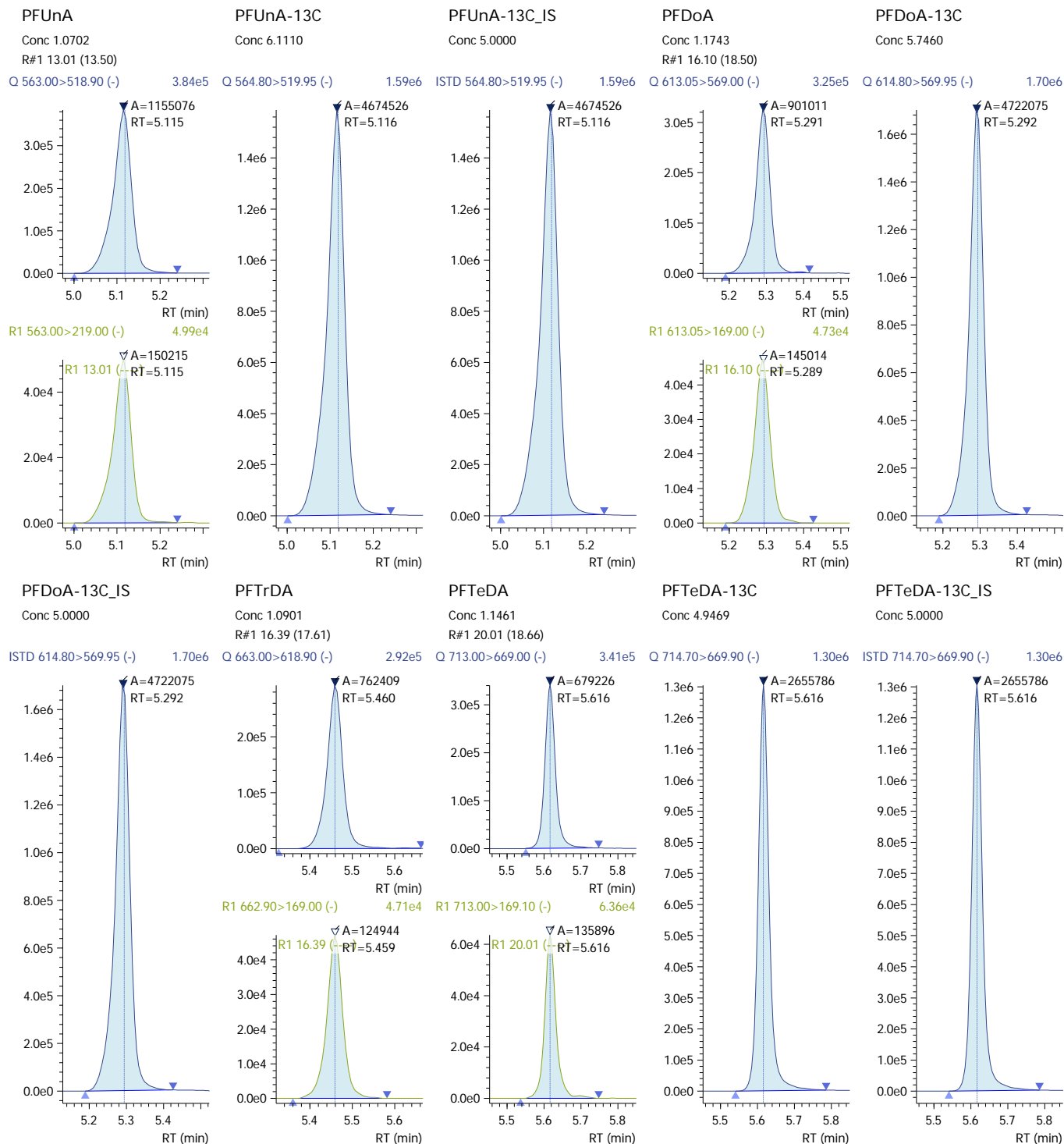


### 210421\_032 (continued)



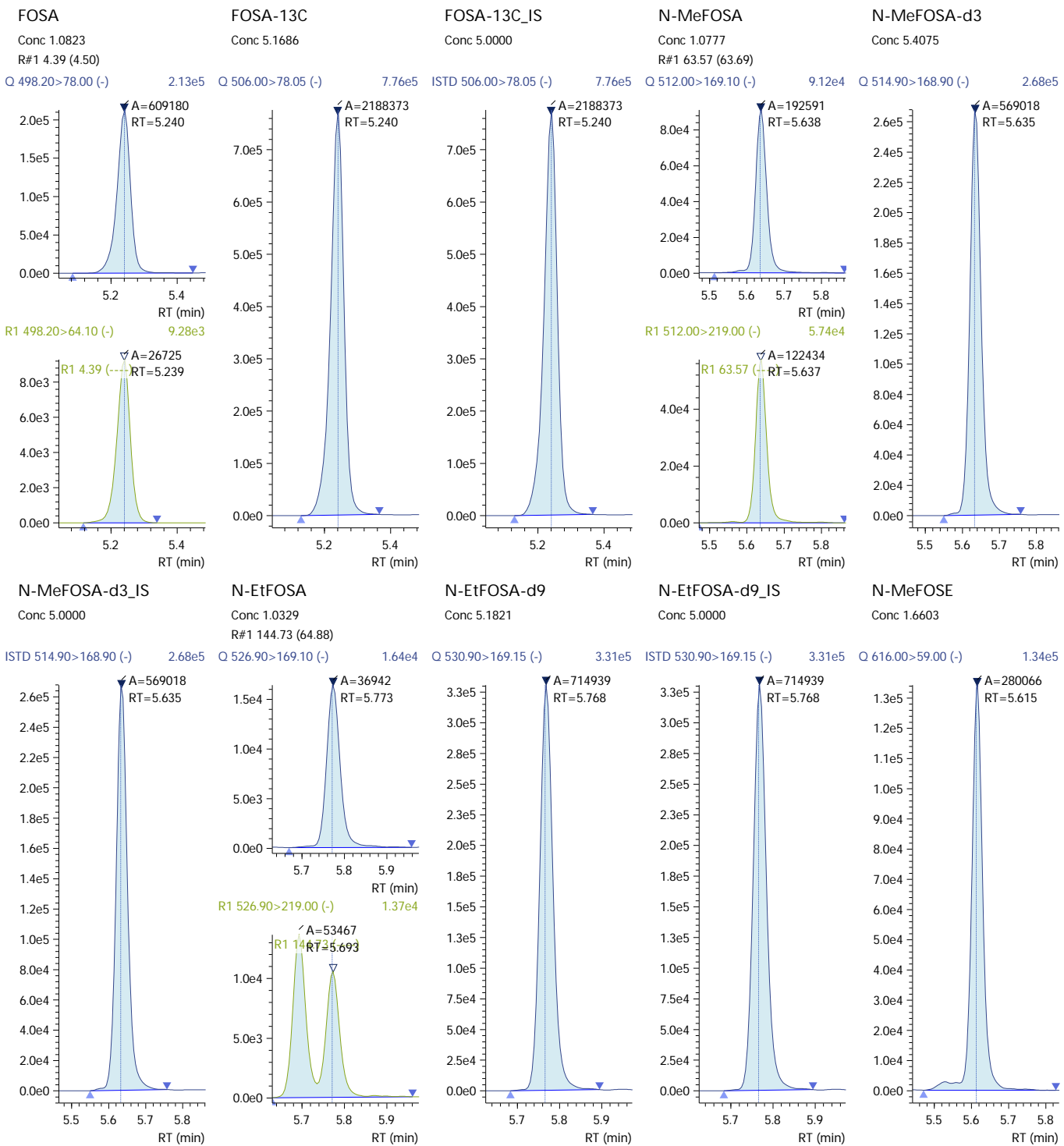


### 210421\_032 (continued)



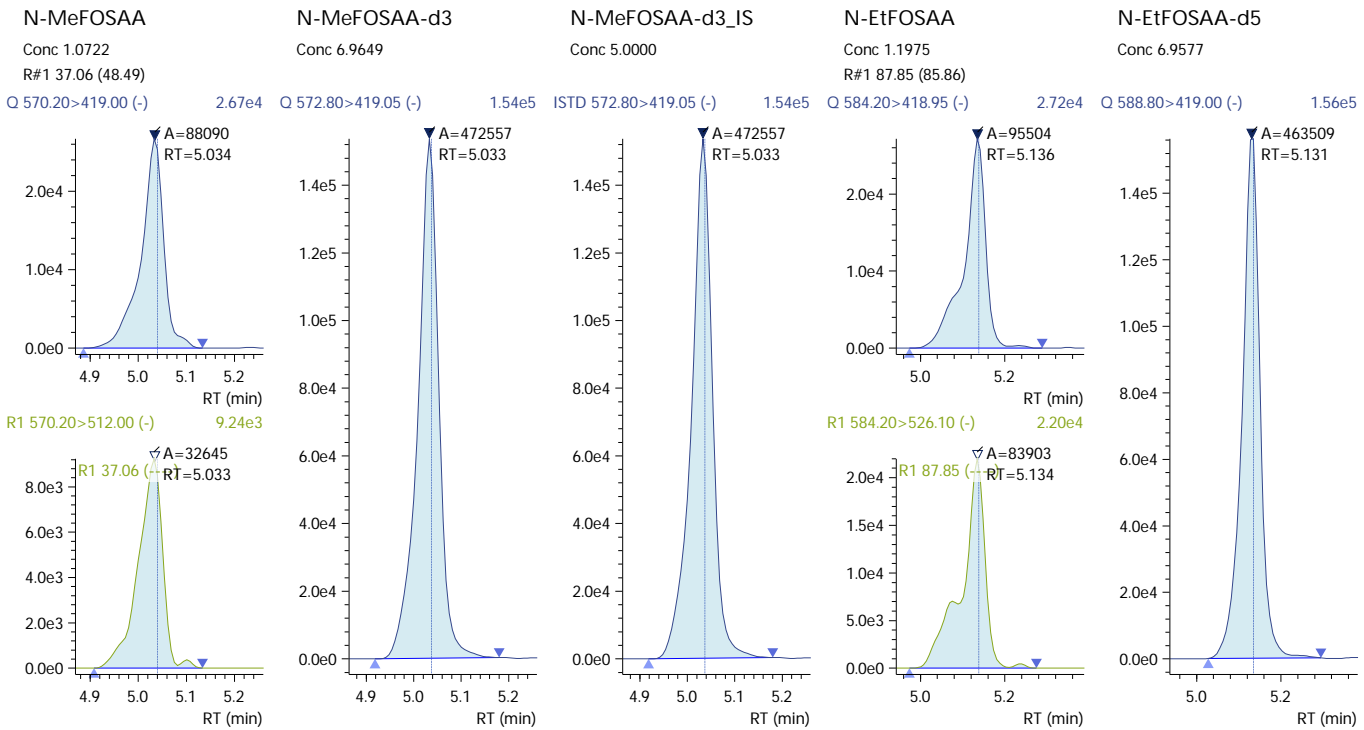
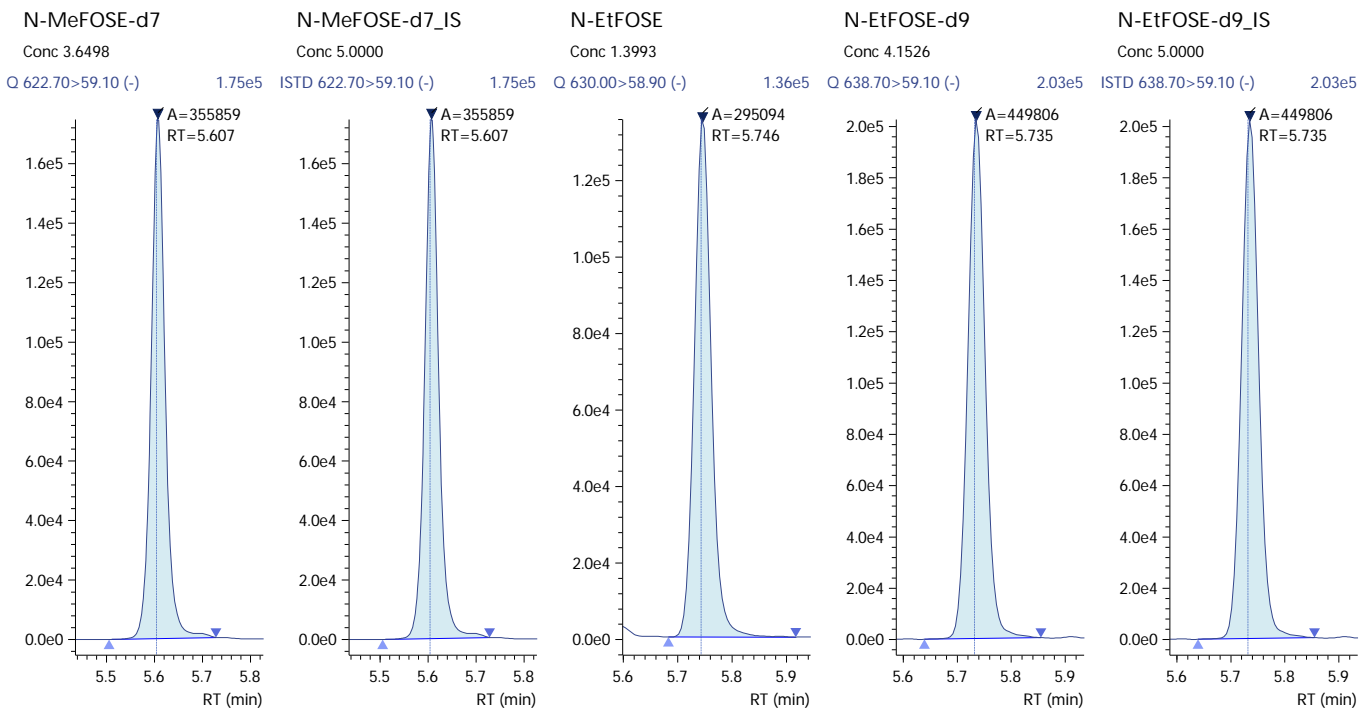


### 210421\_032 (continued)





210421\_032 (continued)







210421\_032 (continued)

N-EtFOSAA-d5\_IS  
 Conc 5.0000

4\_2-FTS\_1  
 Conc 1.0805  
 R#1 22.60 (26.07)

4\_2-FTS-13C  
 Conc 5.0450

4\_2-FTS-13C\_IS  
 Conc 5.0000

6\_2-FTS\_1  
 Conc 1.1248  
 R#1 30.81 (30.56)

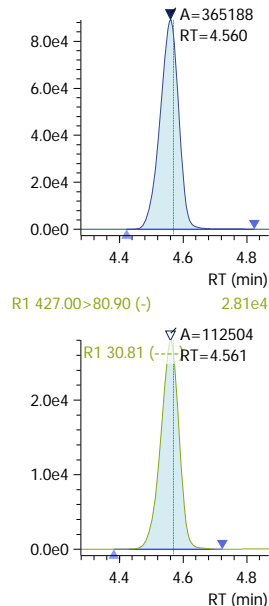
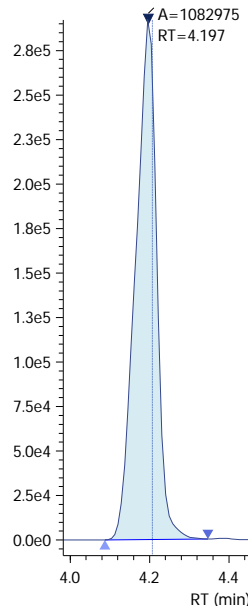
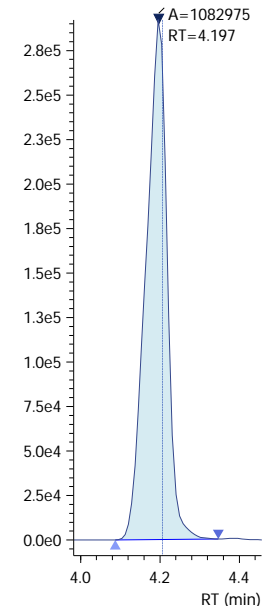
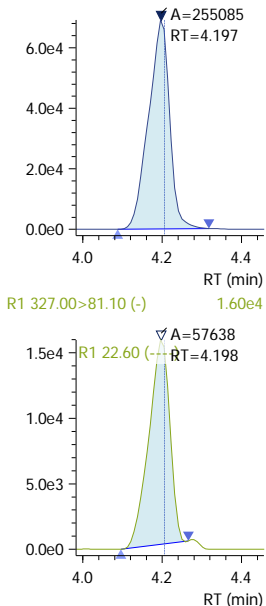
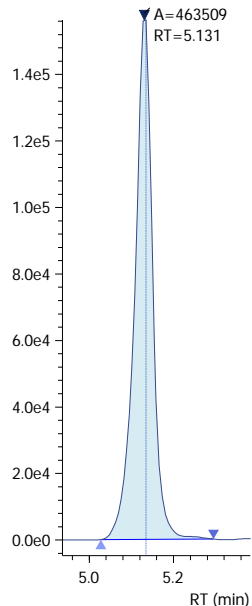
ISTD 588.80>419.00 (-) 1.56e5

Q 327.00>307.05 (-) 6.92e4

Q 328.80>309.05 (-) 2.92e5

ISTD 328.80>309.05 (-) 2.92e5

Q 427.00>407.00 (-) 8.91e4



6\_2-FTS-13C  
 Conc 11.5163

6\_2-FTS-13C\_IS  
 Conc 5.0000

8\_2-FTS\_1  
 Conc 1.0048  
 R#1 7.97 (8.18)

8\_2-FTS-13C  
 Conc 6.3291

8\_2-FTS-13C\_IS  
 Conc 5.0000

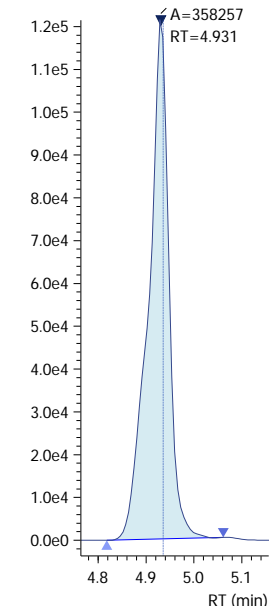
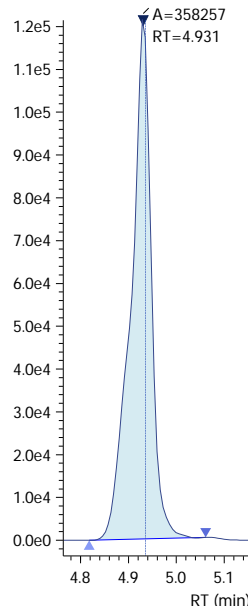
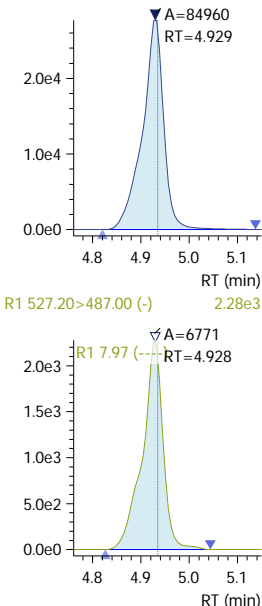
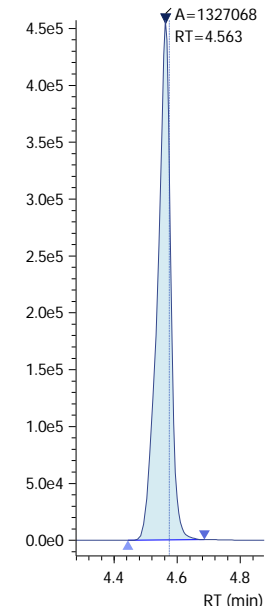
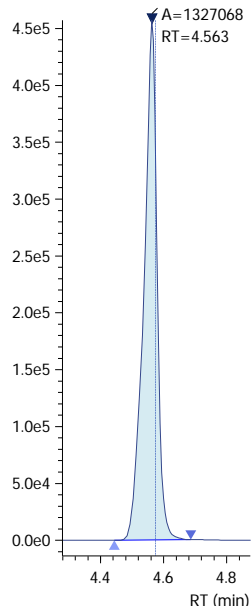
Q 428.90>409.00 (-) 4.57e5

ISTD 428.90>409.00 (-) 4.57e5

Q 527.10>506.90 (-) 2.77e4

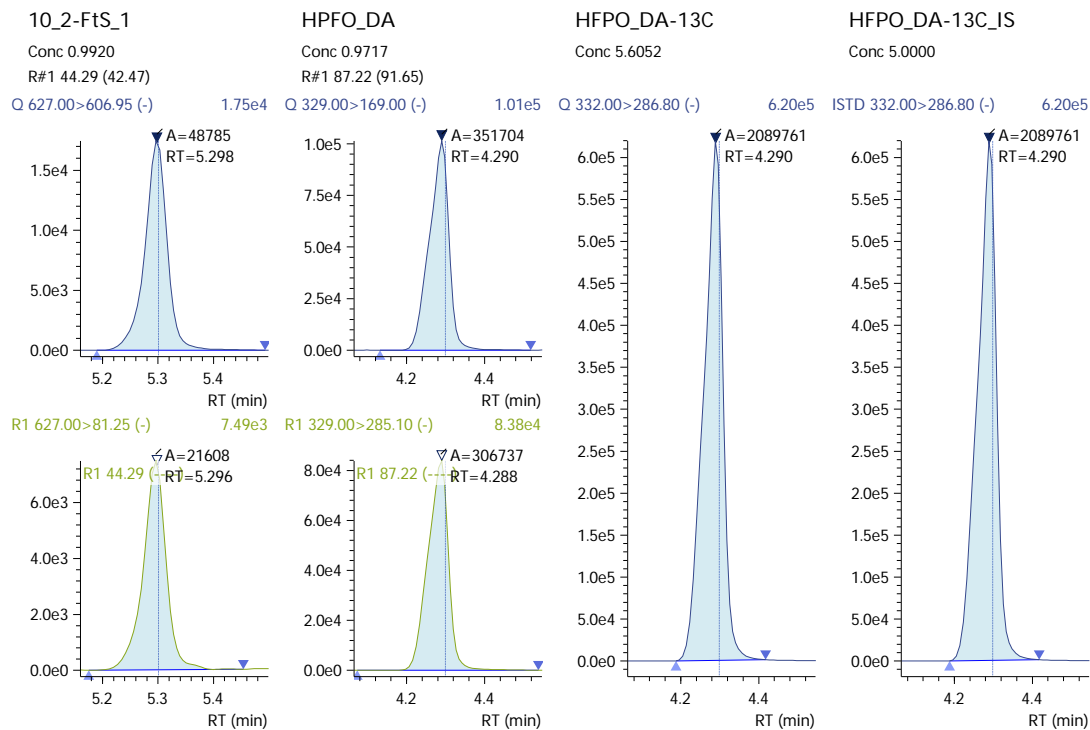
Q 528.80>509.00 (-) 1.21e5

ISTD 528.80>509.00 (-) 1.21e5





### 210421\_032 (continued)



# Validation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_033  
**Lab ID:** KQ2106020-02  
**RunType:** DMS  
**Matrix:** Solid

**Date Acquired:** 4/21/21 17:22  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
Analytical Hold Time	X	
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Continuing Calibration Recovery	X	
Internal Standards	X	
Surrogates		X
Std MRL Unsupported by ICAL	X	
Above Highest ICAL Level	X	

## Analyte Exceptions

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
Surrogates	13C4-PFBA	119	34	116	matrix
	D3-MeFOSAA	172	20	154	
	D5-EtFOSAA	160	29	153	
	13C2-6:2 FTS	244	30	140	

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

# Quantitation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_033	<b>Instrument:</b>	K-LCMS-06
<b>Acqu Date:</b>	4/21/21 17:22	<b>Vial:</b>	7
<b>Run Type:</b>	DMS	<b>Dilution:</b>	1
<b>Lab ID:</b>	KQ2106020-02	<b>Raw Units:</b>	ng/mL

<b>Bottle ID:</b>	K2103455-002.01	<b>Tier:</b>	II
<b>Prod Code:</b>	PFAS	<b>Collect Date:</b>	3/25/21
		<b>Matrix:</b>	Solid
		<b>Receive Date:</b>	4/5/21

<b>Analysis Lot:</b>	720740	<b>Prep Lot:</b>	377476
<b>Analysis</b>	PFC/537M	<b>Prep Method:</b>	ALS SOP
		<b>Prep Date:</b>	4/14/21
		<b>Report Group:</b>	KQ2106020

<b>Title:</b>	Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b>	KC2100210
		<b>Report List ID:</b>	20091

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.112	+0.01	5328311	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	% Rec	% Rec Criteria	Rpt?
13C3-PFBS	4.019	+0.00	729634	4.1321	83	33 - 109	Y
18O2-PFHxS	4.402	+0.01	459625	5.2509	105	36 - 120	Y
13C4-PFOS	4.732	+0.01	621226	4.7617	95	32 - 130	Y
13C4-PFBA	3.405	+0.01	3706031	5.9688	119 *	34 - 116	Y
13C5-PFPeA	3.969	+0.05	2824190	5.1271	103	39 - 133	Y
13C2-PFHxA	4.221	+0.01	6917105	5.8053	116	32 - 136	Y
13C4-PFHpA	4.403	+0.01	7527081	6.4760	130	36 - 133	Y
13C4-PFOA	4.572	+0.01	5580892	5.2118	104	31 - 134	Y
13C5-PFNA	4.747	+0.01	5693404	6.3314	127	27 - 133	Y
13C2-PFDA	4.928	+0.01	3448198	5.8177	116	30 - 137	Y
13C2-PFUnDA	5.113	+0.01	4969532	6.8345	137	32 - 146	Y
13C2-PFDoDA	5.291	+0.01	4815707	6.1647	123	36 - 136	Y
13C2-PFTeDA	5.617	+0.01	3032088	5.9416	119	39 - 138	Y
13C8-FOSA	5.238	+0.01	2386588	5.9299	119	40 - 132	Y
D3-MeFOSA	5.635	+0.01	583831	5.8368	117	51 - 132	Y
D5-EtFOSA	5.768	+0.01	706913	5.3904	108	49 - 123	Y
D7-MeFOSE	5.607	+0.01	360831	3.8933	78	53 - 125	Y
D9-EtFOSE	5.735	+0.01	426026	4.1377	83	45 - 121	Y
D3-MeFOSAA	5.029	+0.01	555815	8.6180	172 *	20 - 154	Y
D5-EtFOSAA	5.128	+0.01	506261	7.9947	160 *	29 - 153	Y
13C2-4:2 FTS	4.197	+0.01	1282813	6.2868	126	18 - 127	Y
13C2-6:2 FTS	4.561	+0.01	1339064	12.2247	244 *	30 - 140	Y
13C2-8:2 FTS	4.927	+0.01	406680	7.5582	151	9 - 171	Y
13C3-HFPO-DA	4.288	+0.01	2081439	5.8733	117	33 - 130	Y

<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_033	<b>Instrument:</b>	K-LCMS06 <i>206</i> 04/23/21
<b>Acqu Date:</b>	4/21/21 17:22	<b>Vial:</b>	7
<b>Run Type:</b>	DMS	<b>Dilution:</b>	1
<b>Lab ID:</b>	KQ2106020-02	<b>Raw Units:</b>	ng/mL

**Target Compounds**

Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perfluorobutane sulfonic acid (PFBS)	4.019	+0.00	212332	1.0188	7.11		Y
Perfluoropentane sulfonic acid (PFPeS)	4.231	+0.01	126189	1.2993	9.07		Y
Perfluorohexane sulfonic acid (PFHxS)	4.399	+0.01	169213	1.0963	7.65		Y
Perfluoroheptane sulfonic acid (PFHpS)	4.562	+0.01	186041	0.9736	6.80		Y
Perfluorooctane sulfonic acid (PFOS)	4.731	+0.01	103967	1.0099	7.05		Y
Perfluorononane sulfonic acid (PFNS)	4.910	+0.01	101364	1.1274	7.87		Y
Perfluorodecane sulfonic acid (PFDS)	5.089	+0.01	133844	1.0643	7.43		Y
Perfluorobutanoic acid (PFBA)	3.405	+0.01	956371	1.1956	8.35		Y
Perfluoropentanoic acid (PFPeA)	3.927	+0.00	1275022	1.0845	7.57		Y
Perfluorohexanoic acid (PFHxA)	4.221	+0.01	1492393	1.0417	7.27		Y
Perfluoroheptanoic acid (PFHpA)	4.404	+0.01	1665769	1.1079	7.73		Y
Perfluorooctanoic acid (PFOA)	4.572	+0.01	1550753	1.0404	7.26		Y
Perfluorononanoic acid (PFNA)	4.747	+0.01	1377369	1.1984	8.37		Y
Perfluorodecanoic acid (PFDA)	4.928	+0.01	941695	1.0865	7.58		Y
Perfluoroundecanoic acid (PFUnDA)	5.112	+0.01	1220994	1.0724	7.49		Y
Perfluorododecanoic acid (PFDoDA)	5.291	+0.01	949729	1.2161	8.49		Y
Perfluorotridecanoic acid (PFTrDA)	5.460	+0.01	749009	0.9533	6.65		Y
Perfluorotetradecanoic acid (PFTeDA)	5.616	+0.01	771378	1.1401	7.96		Y
Perfluorooctane sulfonamide (FOSA)	5.238	+0.01	648986	1.0573	7.38		Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.637	+0.01	204945	1.1350	7.92		Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	5.773	+0.01	36398	1.0292	7.18		Y
N-Methyl perfluorooctane sulfonamidoethanol	5.615	+0.01	290915	1.7227	12.0		Y
N-Ethyl perfluorooctane sulfonamidoethanol	5.746	+0.01	279138	1.4281	9.97		Y
N-Methyl perfluorooctane sulfonamidoacetic acid	5.032	+0.01	101388	1.0554	7.37		Y
N-Ethyl perfluorooctane sulfonamidoacetic acid	5.131	+0.01	95097	1.0917	7.62		Y
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	4.197	+0.01	301035	1.0765	7.51		Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.558	+0.01	377635	1.1528	8.05		Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.926	+0.01	101084	1.0550	7.36		Y
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	5.297	+0.01	54407	0.9745	6.80		Y
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.288	+0.01	330696	0.9173	6.40		Y

**Prep Amount:** 1.146 g      **Dilution:** 1  
**Prep Final Amount:** 8.00 mL      **Basis Factor:** 100.00

U: Undetected at or above MDL  
J: Analyte detected above MDL, but below MRL  
B: Hit above MRL also found in Method Blank  
E: Analyte concentration above high point of ICAL  
N: Presumptive evidence of compound  
D: Result from dilution  
m: Manual integration performed  
d: Compound manually deleted  
NR: Analyte not reported from this analysis  
\*: Result fails acceptance criteria  
#: Acceptance criteria not applicable  
?: Insufficient information to determine acceptance  
e: Result >= MRL, but MRL less than low point of ICAL  
c: check for co-elution



210421\_033

Sample ID: KQ2106020-02  
 Date Acquired: 4/21/2021 5:22:01 PM  
 Acquired by: System Administrator  
 Data File: 210421\_033  
 Vial: 11 | Inj. Volume: 15.0000uL | Tray: 3

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.112	5328311	5328311	----	----	5.0000	ng/mL
PFBS_1	Auto	4.019	212332	729634	PFBS-13C_IS	----	1.0188	ng/mL
PFBS-13C	Auto	4.019	729634	5328311	13C7-PFUnDA_IS	----	4.1321	ng/mL
PFBS-13C_IS	Auto	4.019	729634	729634	----	----	5.0000	ng/mL
PFPeS	Auto	4.231	126189	729634	PFBS-13C_IS	----	1.2993	ng/mL
PFHxS_1	Auto	4.399	169213	459625	PFHxS-18O_IS	----	1.0963	ng/mL
PFHxS-18O	Auto	4.402	459625	5328311	13C7-PFUnDA_IS	----	5.2509	ng/mL
PFHxS-18O_IS	Auto	4.402	459625	459625	----	----	5.0000	ng/mL
PFHpS_1	Auto	4.562	186041	459625	PFHxS-18O_IS	----	0.9736	ng/mL
PFOS_1	Auto	4.731	103967	621226	PFOS-13C_IS	----	1.0099	ng/mL
PFOS-13C	Auto	4.732	621226	5328311	13C7-PFUnDA_IS	----	4.7617	ng/mL
PFOS-13C_IS	Auto	4.732	621226	621226	----	----	5.0000	ng/mL
PFNS	Auto	4.910	101364	621226	PFOS-13C_IS	----	1.1274	ng/mL
PFDS_1	Auto	5.089	133844	621226	PFOS-13C_IS	----	1.0643	ng/mL
PFBA	Auto	3.405	956371	3706031	PFBA-13C_IS	----	1.1956	ng/mL
PFBA-13C	Auto	3.405	3706031	5328311	13C7-PFUnDA_IS	----	5.9688	ng/mL
PFBA-13C_IS	Auto	3.405	3706031	3706031	----	----	5.0000	ng/mL
PFPeA	Auto	3.927	1275022	2824190	PFPeA-13C_IS	----	1.0845	ng/mL
PFPeA-13C	Auto	3.969	2824190	5328311	13C7-PFUnDA_IS	----	5.1271	ng/mL
PFPeA-13C_IS	Auto	3.969	2824190	2824190	----	----	5.0000	ng/mL
PFHxA	Auto	4.221	1492393	6917105	PFHxA-13C_IS	----	1.0417	ng/mL
PFHxA-13C	Auto	4.221	6917105	5328311	13C7-PFUnDA_IS	----	5.8053	ng/mL
PFHxA-13C_IS	Auto	4.221	6917105	6917105	----	----	5.0000	ng/mL
PFHpA	Auto	4.404	1665769	7527081	PFHpA-13C_IS	----	1.1079	ng/mL
PFHpA-13C	Auto	4.403	7527081	5328311	13C7-PFUnDA_IS	----	6.4760	ng/mL
PFHpA-13C_IS	Auto	4.403	7527081	7527081	----	----	5.0000	ng/mL
PFOA	Auto	4.572	1550753	5580892	PFOA-13C_IS	----	1.0404	ng/mL
PFOA-13C	Auto	4.572	5580892	5328311	13C7-PFUnDA_IS	----	5.2118	ng/mL
PFOA-13C_IS	Auto	4.572	5580892	5580892	----	----	5.0000	ng/mL
PFNA	Auto	4.747	1377369	5693404	PFNA-13C_IS	----	1.1984	ng/mL
PFNA-13C	Auto	4.747	5693404	5328311	13C7-PFUnDA_IS	----	6.3314	ng/mL
PFNA-13C_IS	Auto	4.747	5693404	5693404	----	----	5.0000	ng/mL
PFDA	Auto	4.928	941695	3448198	PFDA-13C_IS	----	1.0865	ng/mL
PFDA-13C	Auto	4.928	3448198	5328311	13C7-PFUnDA_IS	----	5.8177	ng/mL
PFDA-13C_IS	Auto	4.928	3448198	3448198	----	----	5.0000	ng/mL
PFUnA	Auto	5.112	1220994	4969532	PFUnA-13C_IS	----	1.0724	ng/mL
PFUnA-13C	Auto	5.113	4969532	5328311	13C7-PFUnDA_IS	----	6.8345	ng/mL
PFUnA-13C_IS	Auto	5.113	4969532	4969532	----	----	5.0000	ng/mL
PFDaA	Auto	5.291	949729	4815707	PFDaA-13C_IS	----	1.2161	ng/mL
PFDaA-13C	Auto	5.291	4815707	5328311	13C7-PFUnDA_IS	----	6.1647	ng/mL
PFDaA-13C_IS	Auto	5.291	4815707	4815707	----	----	5.0000	ng/mL
PFTeDA	Auto	5.460	749009	3032088	PFTeDA-13C_IS	----	0.9533	ng/mL
PFTeDA	Auto	5.616	771378	3032088	PFTeDA-13C_IS	----	1.1401	ng/mL
PFTeDA-13C	Auto	5.617	3032088	5328311	13C7-PFUnDA_IS	----	5.9416	ng/mL
PFTeDA-13C_IS	Auto	5.617	3032088	3032088	----	----	5.0000	ng/mL
FOSA	Auto	5.238	648986	2386588	FOSA-13C_IS	----	1.0573	ng/mL
FOSA-13C	Auto	5.238	2386588	5328311	13C7-PFUnDA_IS	----	5.9299	ng/mL
FOSA-13C_IS	Auto	5.238	2386588	2386588	----	----	5.0000	ng/mL
N-MeFOSA	Auto	5.637	204945	583831	N-MeFOSA-d3_IS	----	1.1350	ng/mL
N-MeFOSA-d3	Auto	5.635	583831	5328311	13C7-PFUnDA_IS	----	5.8368	ng/mL
N-MeFOSA-d3_IS	Auto	5.635	583831	583831	----	----	5.0000	ng/mL
N-EtFOSA	Auto	5.773	36398	706913	N-EtFOSA-d9_IS	----	1.0292	ng/mL
N-EtFOSA-d9	Auto	5.768	706913	5328311	13C7-PFUnDA_IS	----	5.3904	ng/mL
N-EtFOSA-d9_IS	Auto	5.768	706913	706913	----	----	5.0000	ng/mL

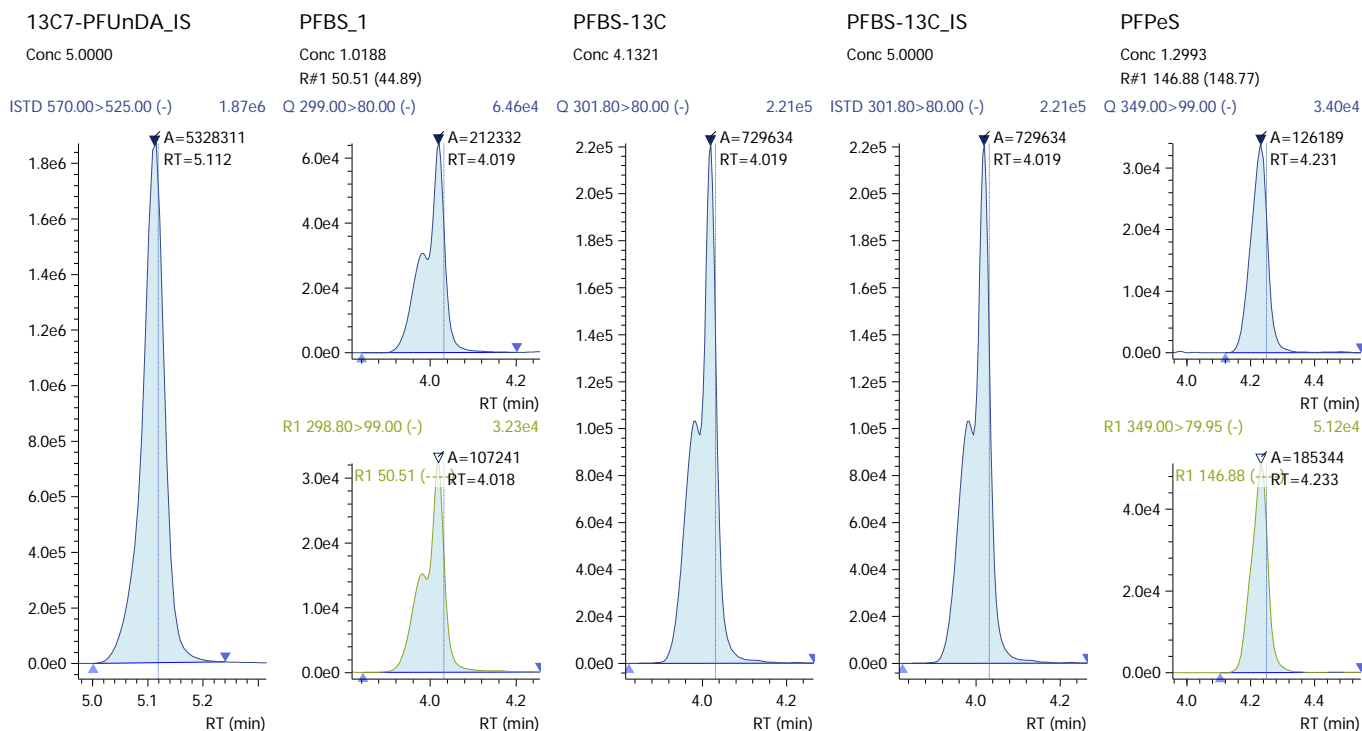




210421\_033 (continued)

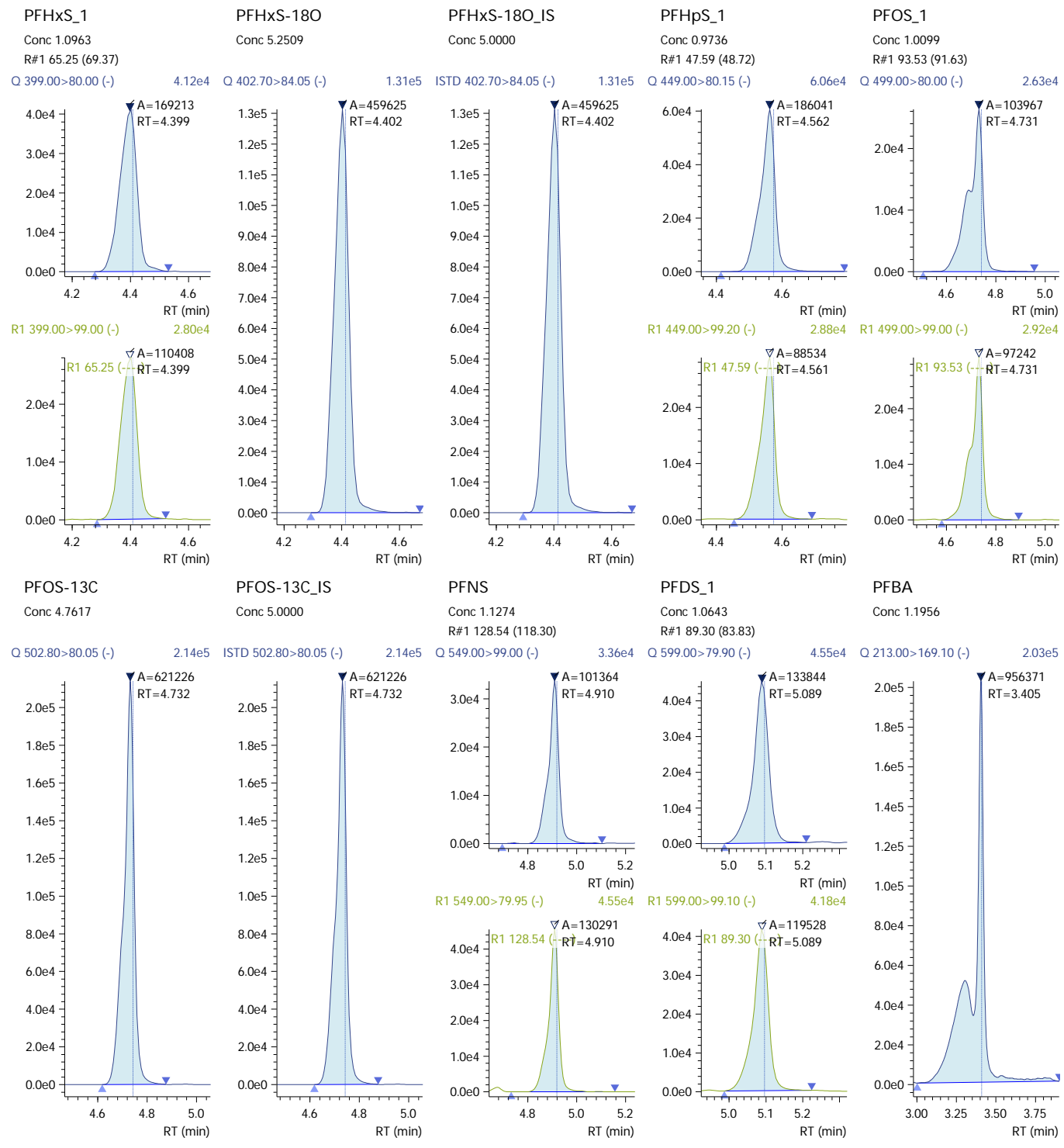
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.615	290915	360831	N-MeFOSE-d7_IS	----	1.7227	ng/mL
N-MeFOSE-d7	Auto	5.607	360831	5328311	13C7-PFUnDA_IS	----	3.8933	ng/mL
N-MeFOSE-d7_IS	Auto	5.607	360831	360831	----	----	5.0000	ng/mL
N-EtFOSE	Auto	5.746	279138	426026	N-EtFOSE-d9_IS	----	1.4281	ng/mL
N-EtFOSE-d9	Auto	5.735	426026	5328311	13C7-PFUnDA_IS	----	4.1377	ng/mL
N-EtFOSE-d9_IS	Auto	5.735	426026	426026	----	----	5.0000	ng/mL
N-MeFOSAA	Auto	5.032	101388	555815	N-MeFOSAA-d3_IS	----	1.0554	ng/mL
N-MeFOSAA-d3	Auto	5.029	555815	5328311	13C7-PFUnDA_IS	----	8.6180	ng/mL
N-MeFOSAA-d3_IS	Auto	5.029	555815	555815	----	----	5.0000	ng/mL
N-EtFOSAA	Auto	5.131	95097	506261	N-EtFOSAA-d5_IS	----	1.0917	ng/mL
N-EtFOSAA-d5	Auto	5.128	506261	5328311	13C7-PFUnDA_IS	----	7.9947	ng/mL
N-EtFOSAA-d5_IS	Auto	5.128	506261	506261	----	----	5.0000	ng/mL
4_2-FTS_1	Auto	4.197	301035	1282813	4_2-FTS-13C_IS	----	1.0765	ng/mL
4_2-FTS-13C	Auto	4.197	1282813	5328311	13C7-PFUnDA_IS	----	6.2868	ng/mL
4_2-FTS-13C_IS	Auto	4.197	1282813	1282813	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.558	377635	1339064	6_2-FTS-13C_IS	----	1.1528	ng/mL
6_2-FTS-13C	Auto	4.561	1339064	5328311	13C7-PFUnDA_IS	----	12.2247	ng/mL
6_2-FTS-13C_IS	Auto	4.561	1339064	1339064	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.926	101084	406680	8_2-FTS-13C_IS	----	1.0550	ng/mL
8_2-FTS-13C	Auto	4.927	406680	5328311	13C7-PFUnDA_IS	----	7.5582	ng/mL
8_2-FTS-13C_IS	Auto	4.927	406680	406680	----	----	5.0000	ng/mL
10_2-FTS_1	Auto	5.297	54407	406680	8_2-FTS-13C_IS	----	0.9745	ng/mL
HPFO_DA	Auto	4.288	330696	2081439	HPFO_DA-13C_IS	----	0.9173	ng/mL
HPFO_DA-13C	Auto	4.288	2081439	5328311	13C7-PFUnDA_IS	----	5.8733	ng/mL
HPFO_DA-13C_IS	Auto	4.288	2081439	2081439	----	----	5.0000	ng/mL



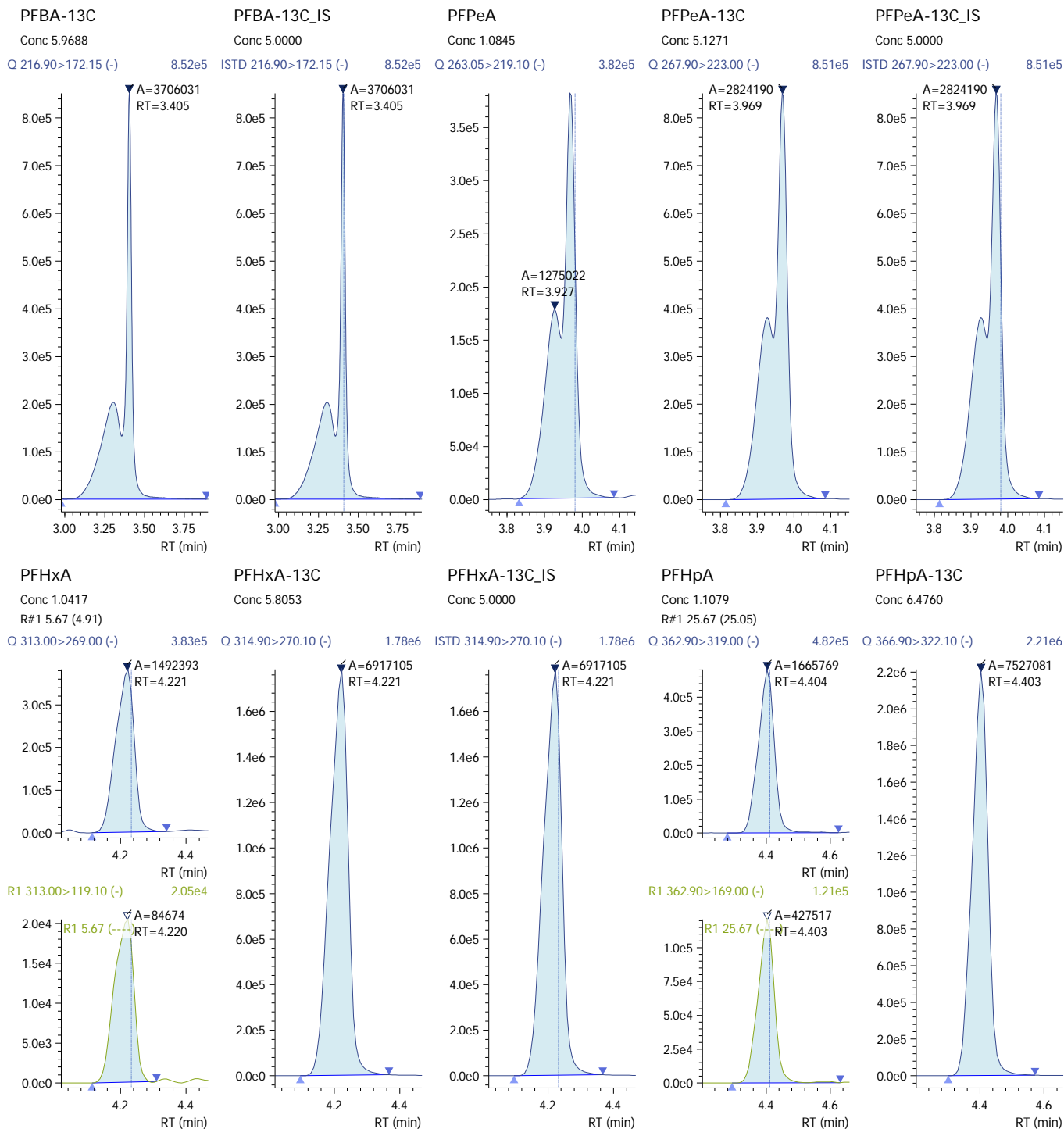


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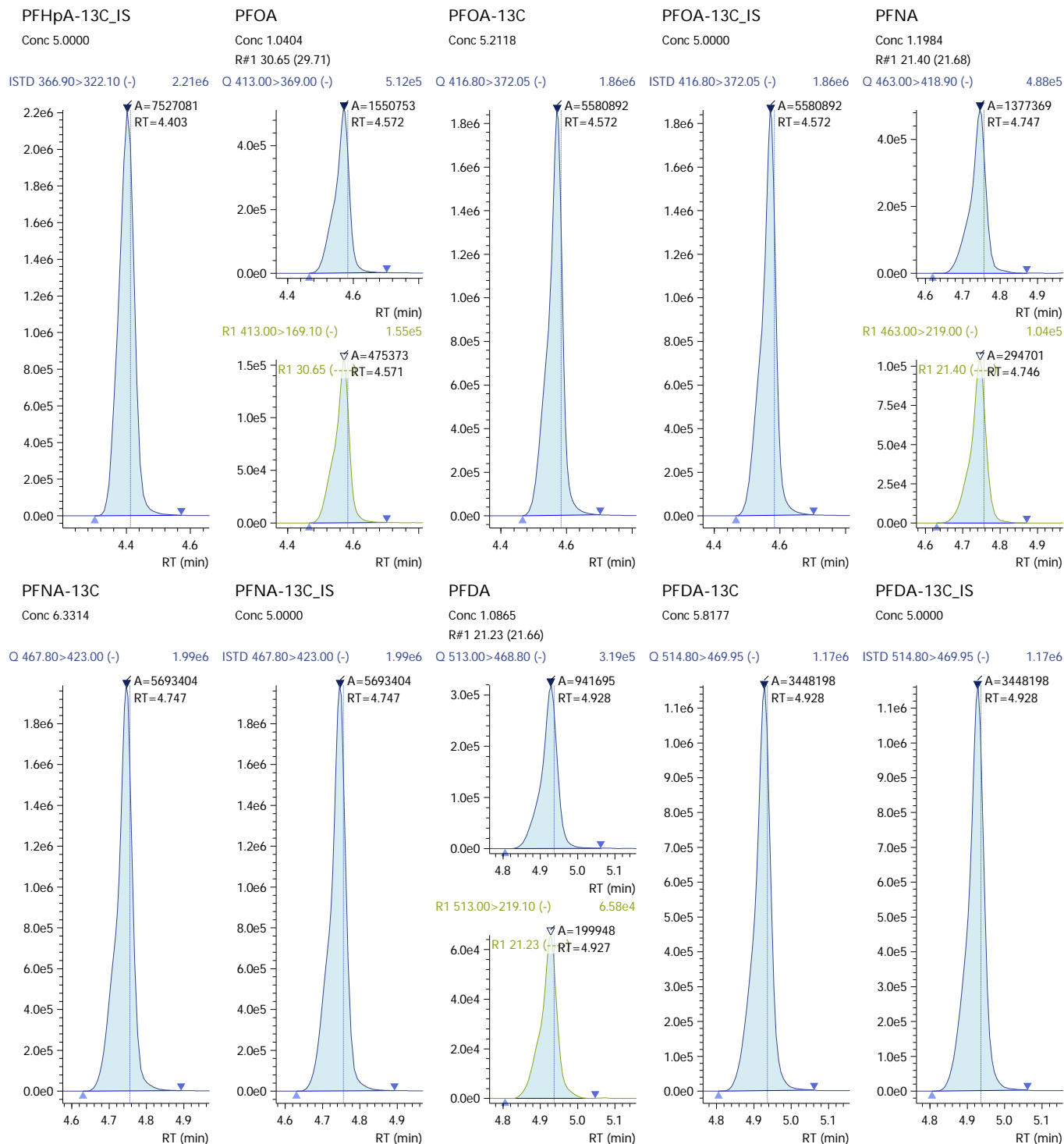


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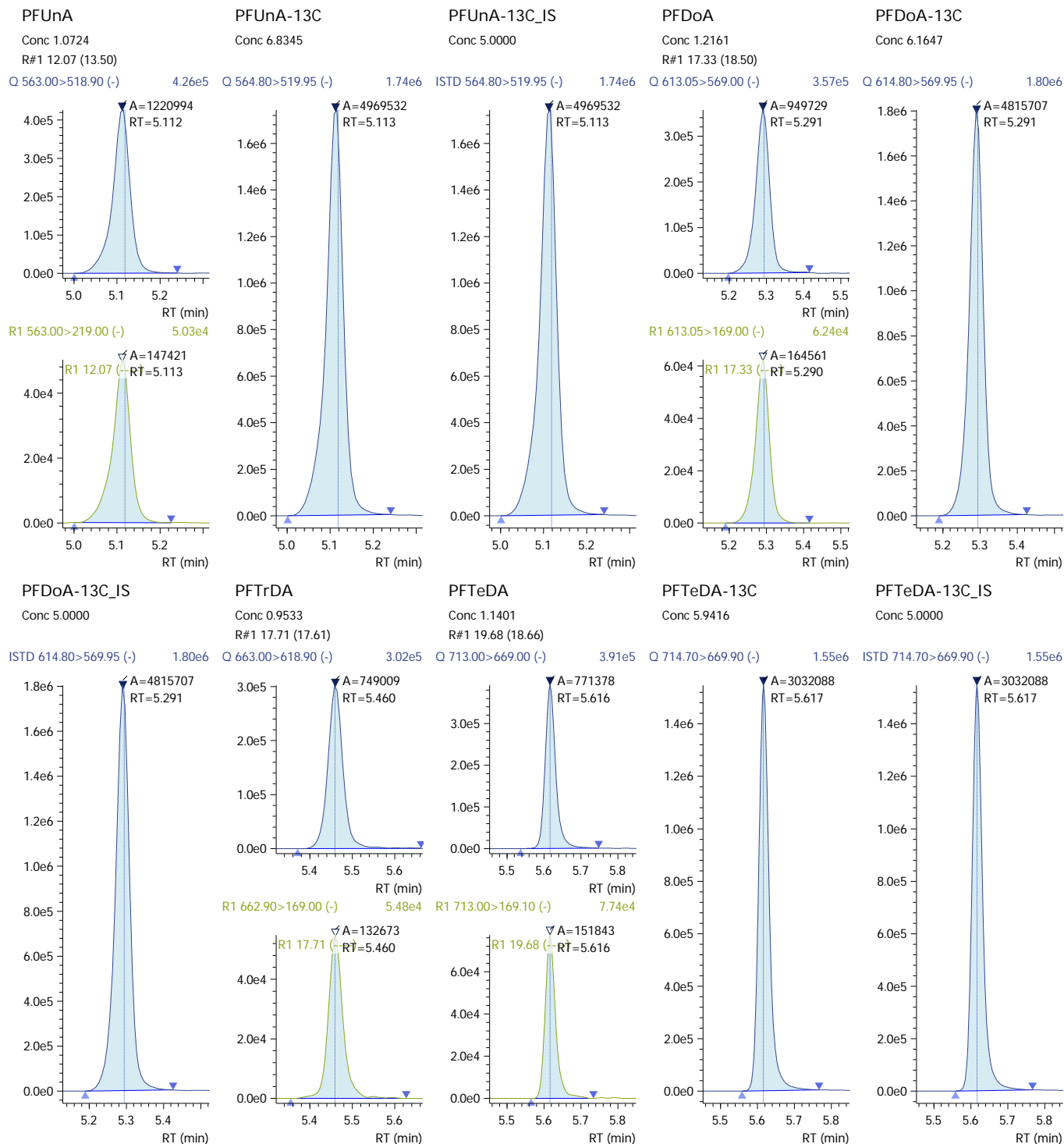


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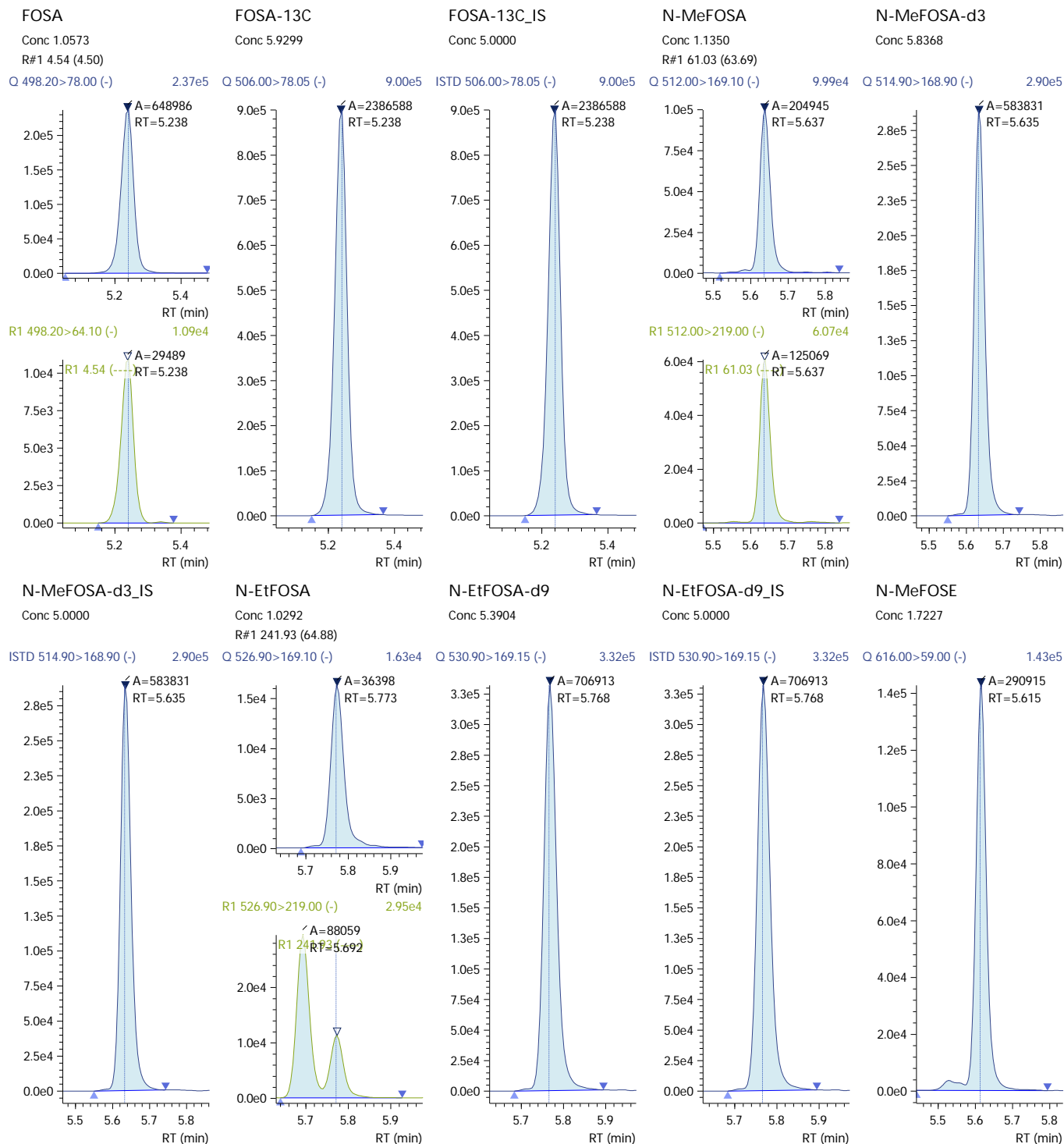


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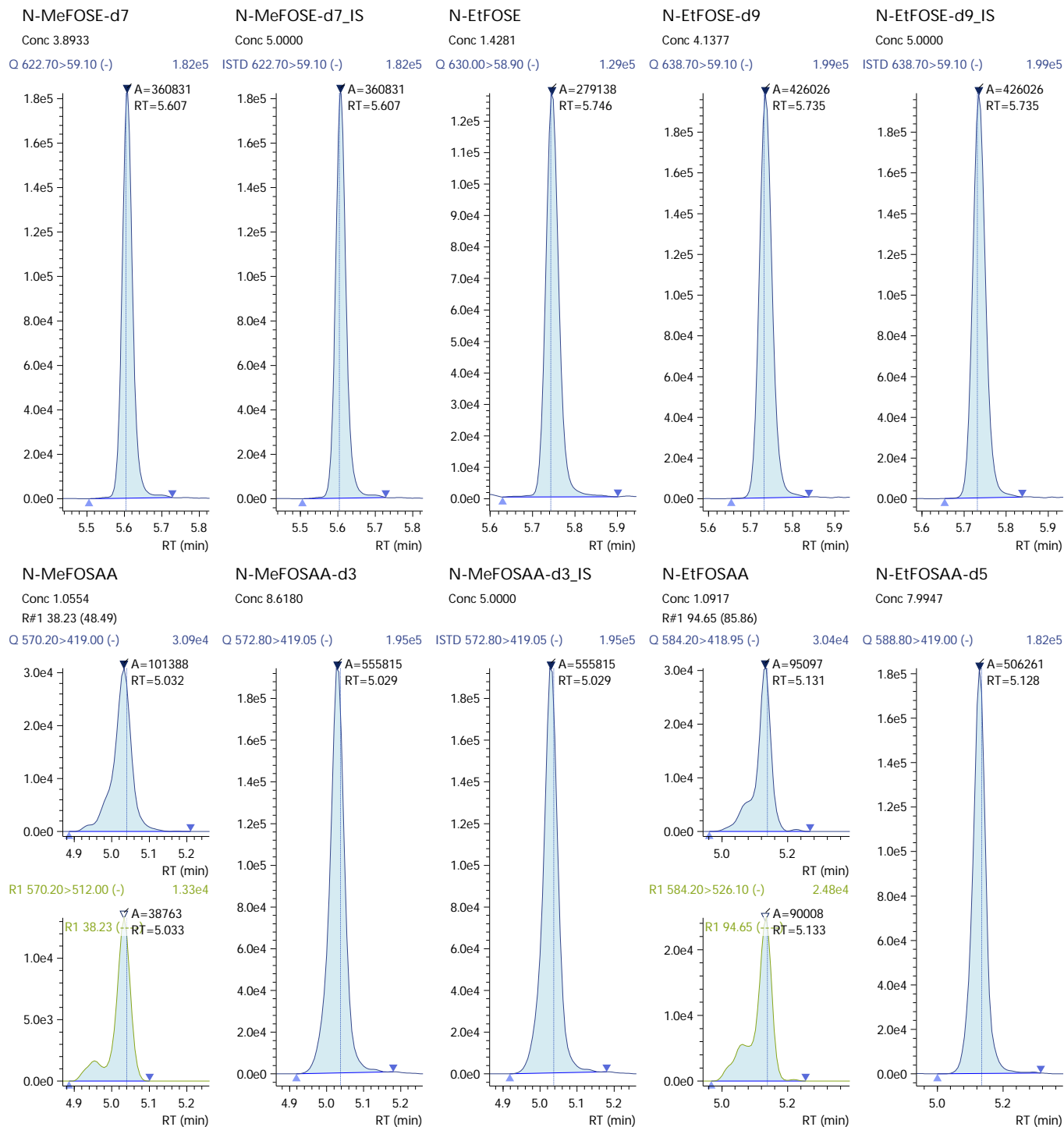
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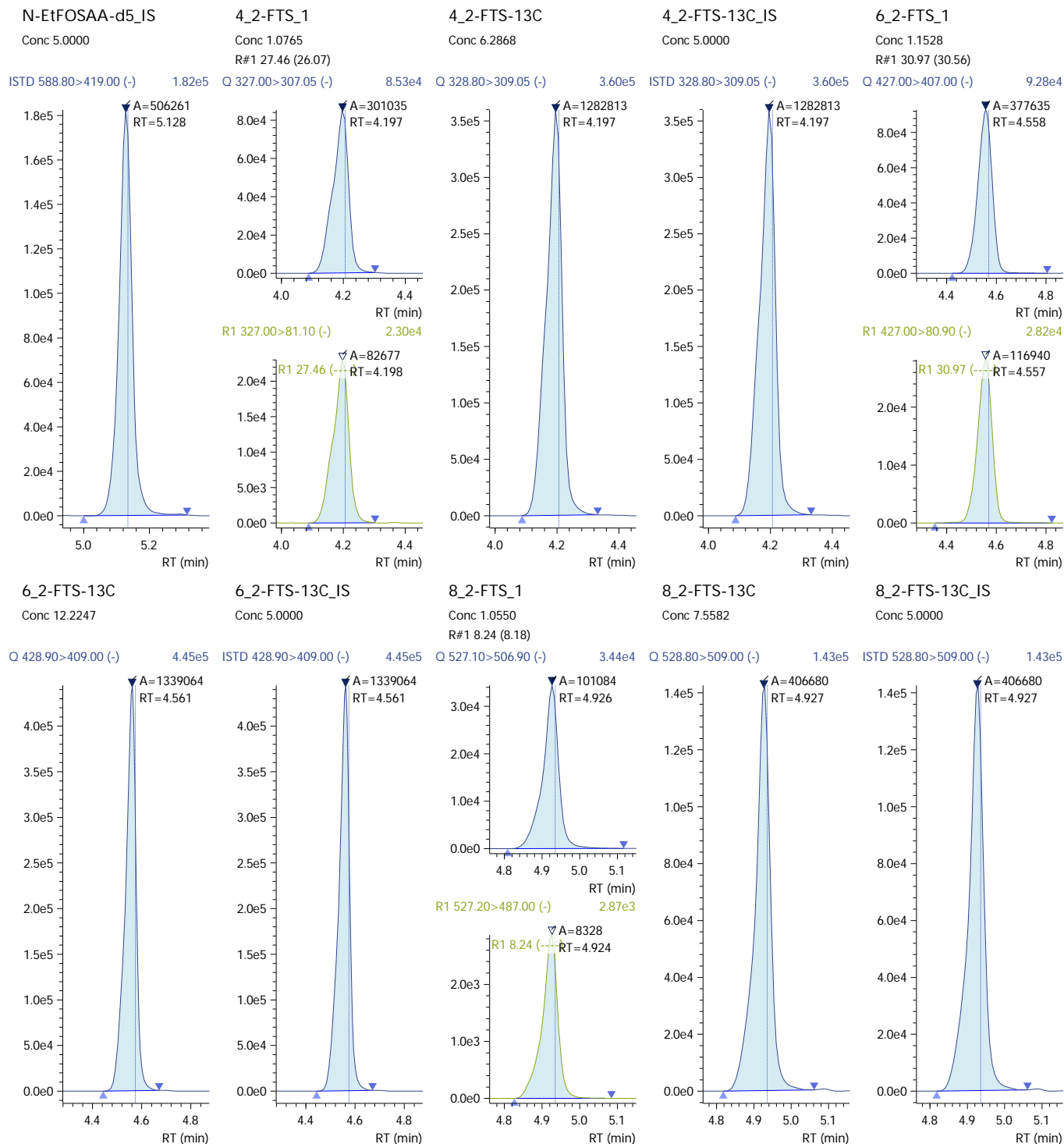


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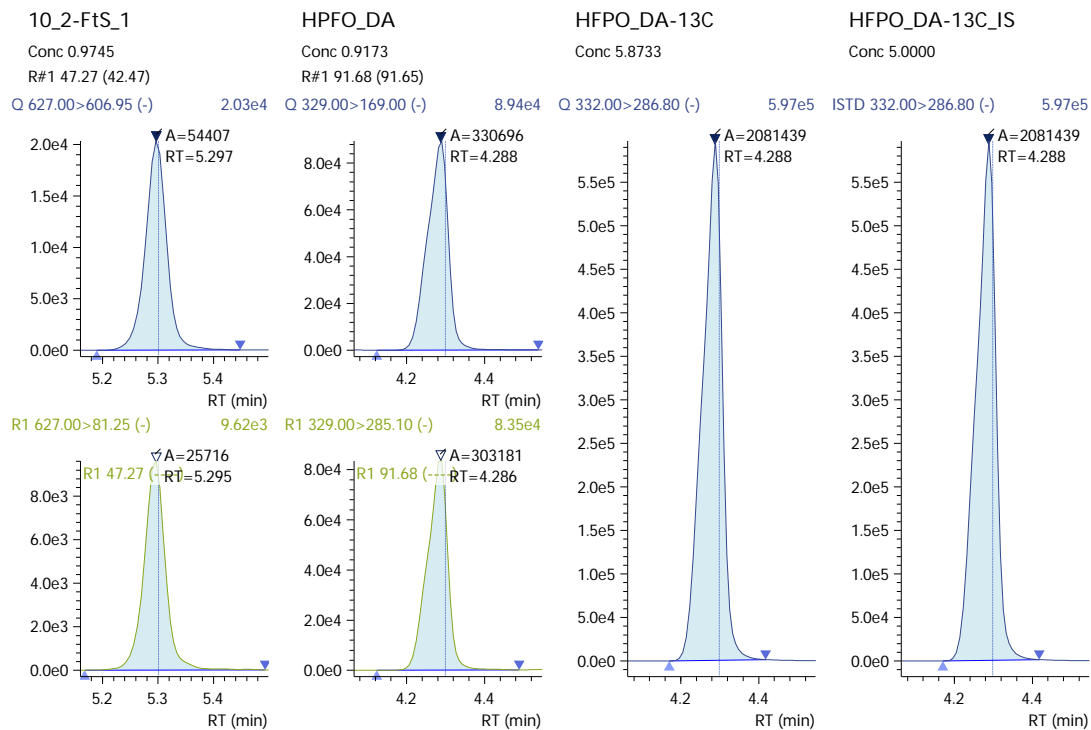


### 210421\_033 (continued)





### 210421\_033 (continued)



# Validation Report

1st *UA* 04/23/21  
2nd *[Signature]* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_020  
**Lab ID:** KQ2106600-02  
**RunType:** CCB  
**Matrix:** Solid

**Date Acquired:** 4/21/21 12:33  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Continuing Calibration Recovery	X	
Internal Standards	X	
Surrogates		X
Above Highest ICAL Level	X	

## Analyte Exceptions

Exception Categories	Analyte Name	Result	Low Limit	High Limit	Corrective Action
Surrogates	D5-EtFOSA	126	49	123	Native <MRL in CCB

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

# Quantitation Report

1st *UA* 04/23/21  
2nd *UA* 04/23/21

<b>Data File:</b> J:\LCMS06\Data\210421_B2\210421_020	<b>Instrument:</b> K-LCMS-06
<b>Acqu Date:</b> 4/21/21 12:33	<b>Vial:</b> 2
<b>Run Type:</b> CCB	<b>Dilution:</b> 1
<b>Lab ID:</b> KQ2106600-02	<b>Raw Units:</b> ng/mL

<b>Bottle ID:</b>	<b>Tier:</b> II	<b>Matrix:</b> Solid
<b>Prod Code:</b> PFAS	<b>Collect Date:</b> 3/25/21	<b>Receive Date:</b> 4/5/21

<b>Analysis Lot:</b> 720740	<b>Prep Lot:</b>	<b>Report Group:</b> KQ2106600
<b>Analysis:</b> PFC/537M	<b>Prep Method:</b>	
	<b>Prep Date:</b>	

<b>Title:</b> Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b> KC2100210
	<b>Report List ID:</b> 20091

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.114	+0.01	4916347	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	% Rec	% Rec Criteria	Rpt?
13C3-PFBS	4.022	+0.01	496722	3.0488	61	33 - 109	Y
18O2-PFHxS	4.405	+0.01	415458	5.1441	103	36 - 120	Y
13C4-PFOS	4.734	+0.01	585312	4.8624	97	32 - 130	Y
13C4-PFBA	3.412	+0.02	2659430	4.6421	93	34 - 116	Y
13C5-PFPeA	3.972	+0.05	2267219	4.4608	89	39 - 133	Y
13C2-PFHxA	4.226	+0.01	6490704	5.9039	118	32 - 136	Y
13C4-PFHpA	4.406	+0.01	5912516	5.5131	110	36 - 133	Y
13C4-PFOA	4.574	+0.01	5219171	5.2824	106	31 - 134	Y
13C5-PFNA	4.749	+0.01	4703145	5.6685	113	27 - 133	Y
13C2-PFDA	4.930	+0.01	2900855	5.3043	106	30 - 137	Y
13C2-PFUnDA	5.114	+0.01	3649478	5.4396	109	32 - 146	Y
13C2-PFDODA	5.292	+0.01	3845184	5.3348	107	36 - 136	Y
13C2-PFTeDA	5.617	+0.01	2352104	4.9953	100	39 - 138	Y
13C8-FOSA	5.238	+0.01	2274069	6.1238	122	40 - 132	Y
D3-MeFOSA	5.634	+0.01	604859	6.5537	131	51 - 132	Y
D5-EtFOSA	5.768	+0.01	761224	6.2909	126 *	49 - 123	Y
D7-MeFOSE	5.605	+0.01	426088	4.9826	100	53 - 125	Y
D9-EtFOSE	5.734	+0.01	449360	4.7300	95	45 - 121	Y
D3-MeFOSAA	5.032	+0.01	303909	5.1070	102	20 - 154	Y
D5-EtFOSAA	5.129	+0.01	301570	5.1613	103	29 - 153	Y
13C2-4:2 FTS	4.200	+0.01	742659	3.9446	79	18 - 127	Y
13C2-6:2 FTS	4.565	+0.01	493866	4.8865	98	30 - 140	Y
13C2-8:2 FTS	4.930	+0.01	273194	5.5028	110	9 - 171	Y
13C3-HFPO-DA	4.292	+0.01	1859665	5.6872	114	33 - 130	Y

<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_020	<b>Instrument:</b>	K-LCMS06
<b>Acqu Date:</b>	4/21/21 12:33	<b>Vial:</b>	2
<b>Run Type:</b>	CCB	<b>Dilution:</b>	1
<b>Lab ID:</b>	KQ2106600-02	<b>Raw Units:</b>	ng/mL

**Target Compounds**

Final Conc.Units: ng/g

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perfluorobutane sulfonic acid (PFBS)	4.025	+0.01	615	0.0043	0.034	U	Y
Perfluoropentane sulfonic acid (PFPeS)	4.195	-0.03	154	0.0023	0.018	U	Y
Perfluorohexane sulfonic acid (PFHxS)	4.407	+0.02	3359	0.0019	0.015	U	Y
Perfluoroheptane sulfonic acid (PFHpS)	4.560	+0.00	171	0.0010	0.0080	U	Y
Perfluorooctane sulfonic acid (PFOS)	4.737	+0.01	373	0.0038	0.030	U	Y
Perfluorononane sulfonic acid (PFNS)	4.925	+0.02	240	0.0028	0.022	U	Y
Perfluorodecane sulfonic acid (PFDS)	0		0	0	0	U	Y
Perfluorobutanoic acid (PFBA)	3.415	+0.02	1149	0.0020	0.016	U	Y
Perfluoropentanoic acid (PFPeA)	3.972	+0.05	27415	0.0015	0.012	U	Y
Perfluorohexanoic acid (PFHxA)	4.224	+0.01	15883	0.0118	0.094	U	Y
Perfluoroheptanoic acid (PFHpA)	4.395	+0.00	11014	0.0093	0.074	U	Y
Perfluorooctanoic acid (PFOA)	4.572	+0.01	8709	0.0062	0.050	U	Y
Perfluorononanoic acid (PFNA)	4.751	+0.01	2011	0.0021	0.017	U	Y
Perfluorodecanoic acid (PFDA)	4.925	+0.00	5944	0.0082	0.066	U	Y
Perfluoroundecanoic acid (PFUnDA)	5.117	+0.01	3995	0.0048	0.038	U	Y
Perfluorododecanoic acid (PFDoDA)	5.296	+0.01	3742	0.0060	0.048	U	Y
Perfluorotridecanoic acid (PFTrDA)	5.464	+0.01	2100	0.0034	0.027	U	Y
Perfluorotetradecanoic acid (PFTeDA)	5.618	+0.01	5100	0.0097	0.078	U	Y
Perfluorooctane sulfonamide (FOSA)	5.240	+0.01	1777	0.0030	0.024	U	Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.632	+0.00	563	0.0030	0.024	U	Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	5.773	+0.01	564	-0.0152	0	U	Y
N-Methyl perfluorooctane sulfonamidoethanol	5.606	0.00	677	0.0034	0.027	U	Y
N-Ethyl perfluorooctane sulfonamidoethanol	5.752	+0.01	1116	0.0054	0.043	U	Y
N-Methyl perfluorooctane sulfonamidoacetic acid	5.007	-0.02	100	0.0288	0.23	U	Y
N-Ethyl perfluorooctane sulfonamidoacetic acid	5.144	+0.02	190	0.0037	0.030	U	Y
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	4.188		389	0.0024	0.019	U	Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.564	+0.01	183	0.0015	0.012	U	Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.923	+0.00	185	0.0029	0.023	U	Y
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	5.300	+0.01	7	0.0002	0.0016	U	Y
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.337	+0.06	245	0.0008	0.0064	U	Y

U: Undetected at or above MDL  
 J: Analyte detected above MDL, but below MRL  
 B: Hit above MRL also found in Method Blank  
 E: Analyte concentration above high point of ICAL  
 N: Presumptive evidence of compound

D: Result from dilution  
 m: Manual integration performed  
 d: Compound manually deleted  
 NR: Analyte not reported from this analysis

\*: Result fails acceptance criteria  
 #: Acceptance criteria not applicable  
 ?: Insufficient information to determine acceptance  
 e: Result >= MRL, but MRL less than low point of ICAL  
 c: check for co-elution





210421\_020

Sample ID: CCB  
 Date Acquired: 4/21/2021 12:33:47 PM  
 Acquired by: System Administrator  
 Data File: 210421\_020  
 Vial: 12 | Inj. Volume: 15.0000uL | Tray: 1

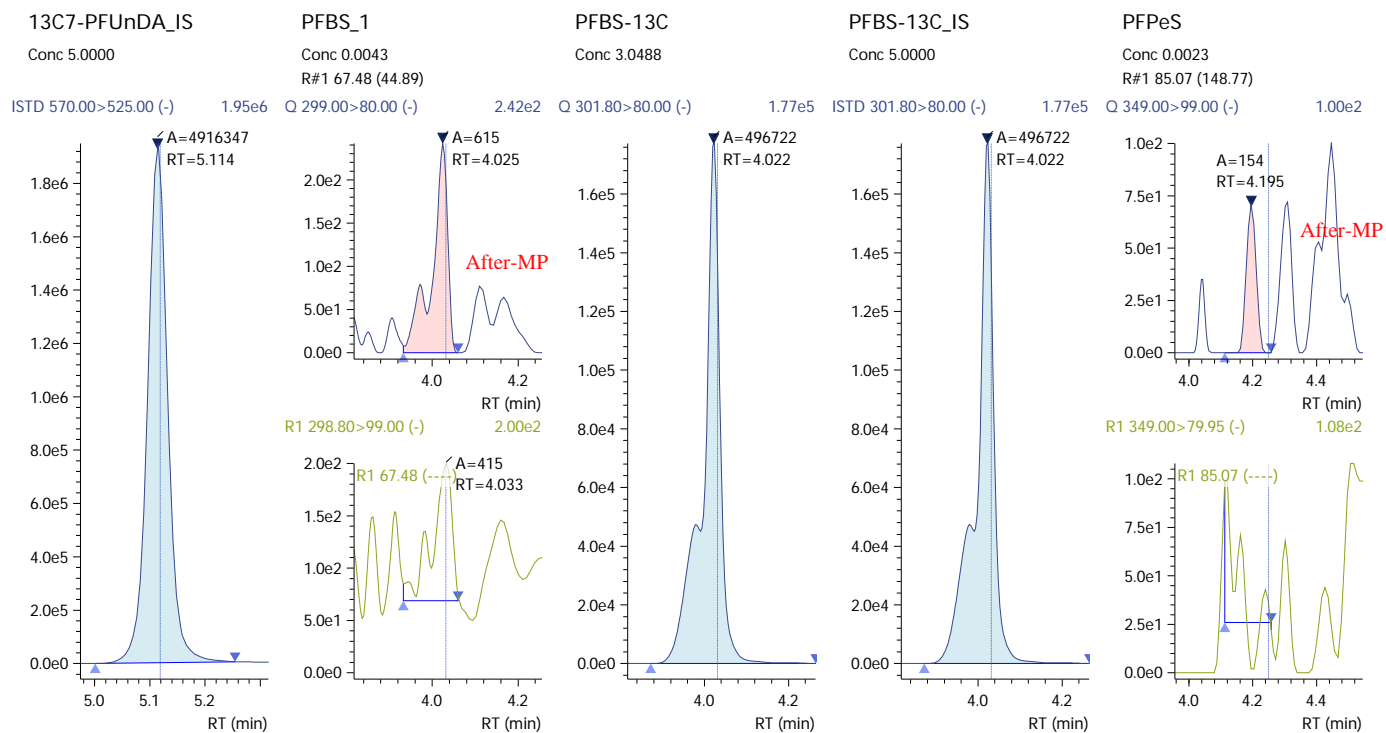
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.114	4916347	4916347	----	----	5.0000	ng/mL
PFBS_1	M	4.025	615	496722	PFBS-13C_IS	----	0.0043	ng/mL
PFBS-13C	Auto	4.022	496722	4916347	13C7-PFUnDA_IS	----	3.0488	ng/mL
PFBS-13C_IS	Auto	4.022	496722	496722	----	----	5.0000	ng/mL
PFPeS	M	4.195	154	496722	PFBS-13C_IS	----	0.0023	ng/mL
PFHxS_1	Auto	4.407	3359	415458	PFHxS-18O_IS	----	0.0019	ng/mL
PFHxS-18O	Auto	4.405	415458	4916347	13C7-PFUnDA_IS	----	5.1441	ng/mL
PFHxS-18O_IS	Auto	4.405	415458	415458	----	----	5.0000	ng/mL
PFHpS_1	M	4.560	171	415458	PFHxS-18O_IS	----	0.0010	ng/mL
PFOS_1	Auto	4.737	373	585312	PFOS-13C_IS	----	0.0038	ng/mL
PFOS-13C	Auto	4.734	585312	4916347	13C7-PFUnDA_IS	----	4.8624	ng/mL
PFOS-13C_IS	Auto	4.734	585312	585312	----	----	5.0000	ng/mL
PFNS	M	4.925	240	585312	PFOS-13C_IS	----	0.0028	ng/mL
PFDS_1	ND(W/B)	----	----	585312	PFOS-13C_IS	----	----	ng/mL
PFBA	M	3.415	1149	2659430	PFBA-13C_IS	----	0.0020	ng/mL
PFBA-13C	Auto	3.412	2659430	4916347	13C7-PFUnDA_IS	----	4.6421	ng/mL
PFBA-13C_IS	Auto	3.412	2659430	2659430	----	----	5.0000	ng/mL
PFPeA	Auto	3.972	27415	2267219	PFPeA-13C_IS	----	0.0015	ng/mL
PFPeA-13C	Auto	3.972	2267219	4916347	13C7-PFUnDA_IS	----	4.4608	ng/mL
PFPeA-13C_IS	Auto	3.972	2267219	2267219	----	----	5.0000	ng/mL
PFHxA	M	4.224	15883	6490704	PFHxA-13C_IS	----	0.0118	ng/mL
PFHxA-13C	Auto	4.226	6490704	4916347	13C7-PFUnDA_IS	----	5.9039	ng/mL
PFHxA-13C_IS	Auto	4.226	6490704	6490704	----	----	5.0000	ng/mL
PFHpA	M	4.395	11014	5912516	PFHpA-13C_IS	----	0.0093	ng/mL
PFHpA-13C	Auto	4.406	5912516	4916347	13C7-PFUnDA_IS	----	5.5131	ng/mL
PFHpA-13C_IS	Auto	4.406	5912516	5912516	----	----	5.0000	ng/mL
PFOA	M	4.572	8709	5219171	PFOA-13C_IS	----	0.0062	ng/mL
PFOA-13C	Auto	4.574	5219171	4916347	13C7-PFUnDA_IS	----	5.2824	ng/mL
PFOA-13C_IS	Auto	4.574	5219171	5219171	----	----	5.0000	ng/mL
PFNA	M	4.751	2011	4703145	PFNA-13C_IS	----	0.0021	ng/mL
PFNA-13C	Auto	4.749	4703145	4916347	13C7-PFUnDA_IS	----	5.6685	ng/mL
PFNA-13C_IS	Auto	4.749	4703145	4703145	----	----	5.0000	ng/mL
PFDA	Auto	4.925	5944	2900855	PFDA-13C_IS	----	0.0082	ng/mL
PFDA-13C	Auto	4.930	2900855	4916347	13C7-PFUnDA_IS	----	5.3043	ng/mL
PFDA-13C_IS	Auto	4.930	2900855	2900855	----	----	5.0000	ng/mL
PFUnA	M	5.117	3995	3649478	PFUnA-13C_IS	----	0.0048	ng/mL
PFUnA-13C	Auto	5.114	3649478	4916347	13C7-PFUnDA_IS	----	5.4396	ng/mL
PFUnA-13C_IS	Auto	5.114	3649478	3649478	----	----	5.0000	ng/mL
PFDoA	M	5.296	3742	3845184	PFDoA-13C_IS	----	0.0060	ng/mL
PFDoA-13C	Auto	5.292	3845184	4916347	13C7-PFUnDA_IS	----	5.3348	ng/mL
PFDoA-13C_IS	Auto	5.292	3845184	3845184	----	----	5.0000	ng/mL
PFTeDA	M	5.464	2100	2352104	PFTeDA-13C_IS	----	0.0034	ng/mL
PFTeDA	M	5.618	5100	2352104	PFTeDA-13C_IS	----	0.0097	ng/mL
PFTeDA-13C	Auto	5.617	2352104	4916347	13C7-PFUnDA_IS	----	4.9953	ng/mL
PFTeDA-13C_IS	Auto	5.617	2352104	2352104	----	----	5.0000	ng/mL
FOSA	M	5.240	1777	2274069	FOSA-13C_IS	----	0.0030	ng/mL
FOSA-13C	Auto	5.238	2274069	4916347	13C7-PFUnDA_IS	----	6.1238	ng/mL
FOSA-13C_IS	Auto	5.238	2274069	2274069	----	----	5.0000	ng/mL
N-MeFOSA	M	5.632	563	604859	N-MeFOSA-d3_IS	----	0.0030	ng/mL
N-MeFOSA-d3	Auto	5.634	604859	4916347	13C7-PFUnDA_IS	----	6.5537	ng/mL
N-MeFOSA-d3_IS	Auto	5.634	604859	604859	----	----	5.0000	ng/mL
N-EtFOSA	M	5.773	564	761224	N-EtFOSA-d9_IS	----	-0.0152	ng/mL
N-EtFOSA-d9	Auto	5.768	761224	4916347	13C7-PFUnDA_IS	----	6.2909	ng/mL
N-EtFOSA-d9_IS	Auto	5.768	761224	761224	----	----	5.0000	ng/mL



### 210421\_020 (continued)

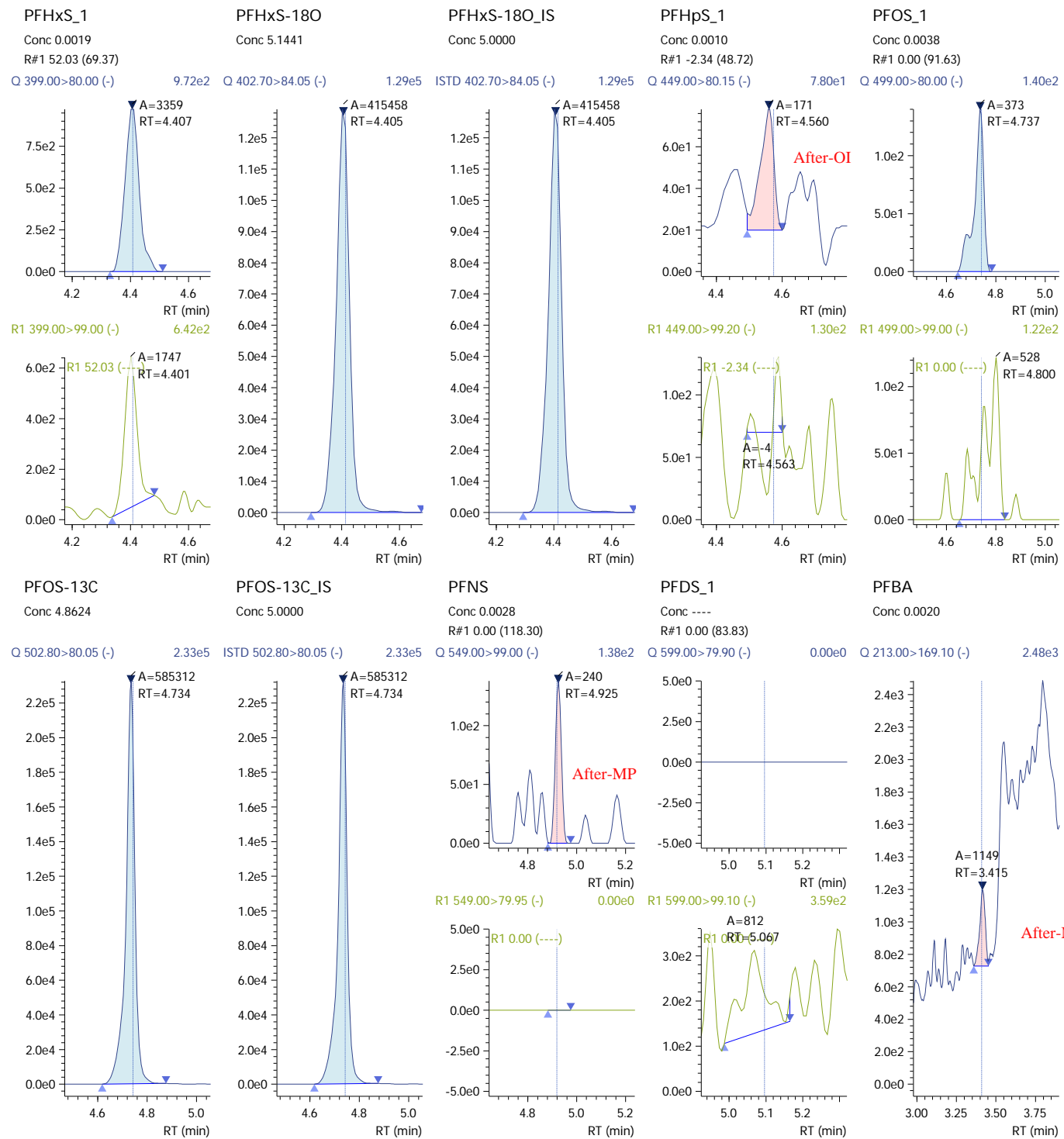
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.606	677	426088	N-MeFOSE-d7_IS	----	0.0034	ng/mL
N-MeFOSE-d7	Auto	5.605	426088	4916347	13C7-PFUnDA_IS	----	4.9826	ng/mL
N-MeFOSE-d7_IS	Auto	5.605	426088	426088	----	----	5.0000	ng/mL
N-EtFOSE	M	5.752	1116	449360	N-EtFOSE-d9_IS	----	0.0054	ng/mL
N-EtFOSE-d9	Auto	5.734	449360	4916347	13C7-PFUnDA_IS	----	4.7300	ng/mL
N-EtFOSE-d9_IS	Auto	5.734	449360	449360	----	----	5.0000	ng/mL
N-MeFOSAA	Auto	5.007	100	303909	N-MeFOSAA-d3_IS	----	0.0288	ng/mL
N-MeFOSAA-d3	Auto	5.032	303909	4916347	13C7-PFUnDA_IS	----	5.1070	ng/mL
N-MeFOSAA-d3_IS	Auto	5.032	303909	303909	----	----	5.0000	ng/mL
N-EtFOSAA	M	5.144	190	301570	N-EtFOSAA-d5_IS	----	0.0037	ng/mL
N-EtFOSAA-d5	Auto	5.129	301570	4916347	13C7-PFUnDA_IS	----	5.1613	ng/mL
N-EtFOSAA-d5_IS	Auto	5.129	301570	301570	----	----	5.0000	ng/mL
4_2-FTS_1	Auto	4.188	389	742659	4_2-FTS-13C_IS	----	0.0024	ng/mL
4_2-FTS-13C	Auto	4.200	742659	4916347	13C7-PFUnDA_IS	----	3.9446	ng/mL
4_2-FTS-13C_IS	Auto	4.200	742659	742659	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.564	183	493866	6_2-FTS-13C_IS	----	0.0015	ng/mL
6_2-FTS-13C	Auto	4.565	493866	4916347	13C7-PFUnDA_IS	----	4.8865	ng/mL
6_2-FTS-13C_IS	Auto	4.565	493866	493866	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.923	185	273194	8_2-FTS-13C_IS	----	0.0029	ng/mL
8_2-FTS-13C	Auto	4.930	273194	4916347	13C7-PFUnDA_IS	----	5.5028	ng/mL
8_2-FTS-13C_IS	Auto	4.930	273194	273194	----	----	5.0000	ng/mL
10_2-FTS_1	M	5.300	7	273194	8_2-FTS-13C_IS	----	0.0002	ng/mL
HPFO_DA	M	4.337	245	1859665	HPFO_DA-13C_IS	----	0.0008	ng/mL
HPFO_DA-13C	Auto	4.292	1859665	4916347	13C7-PFUnDA_IS	----	5.6872	ng/mL
HPFO_DA-13C_IS	Auto	4.292	1859665	1859665	----	----	5.0000	ng/mL



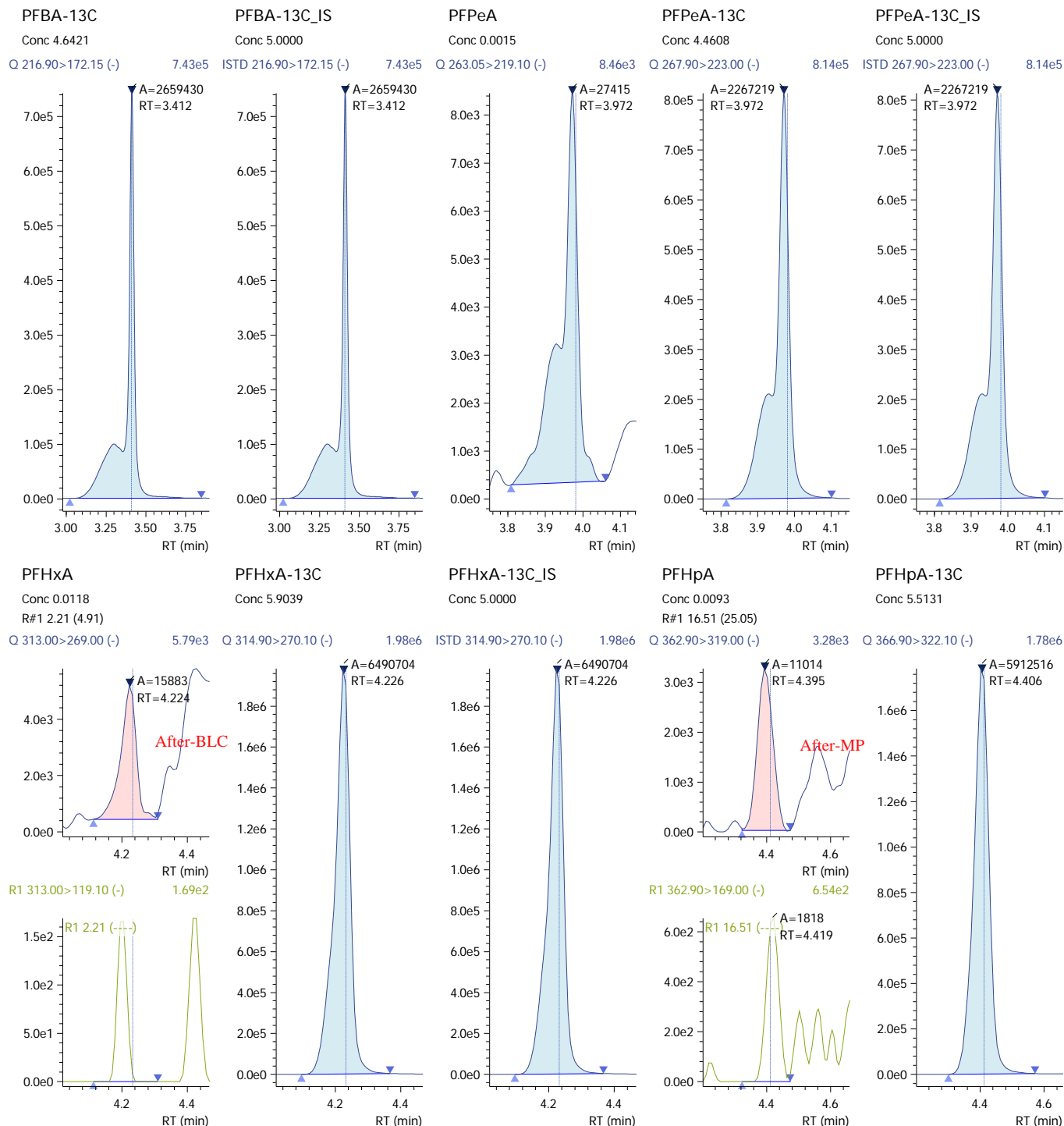


### 210421\_020 (continued)



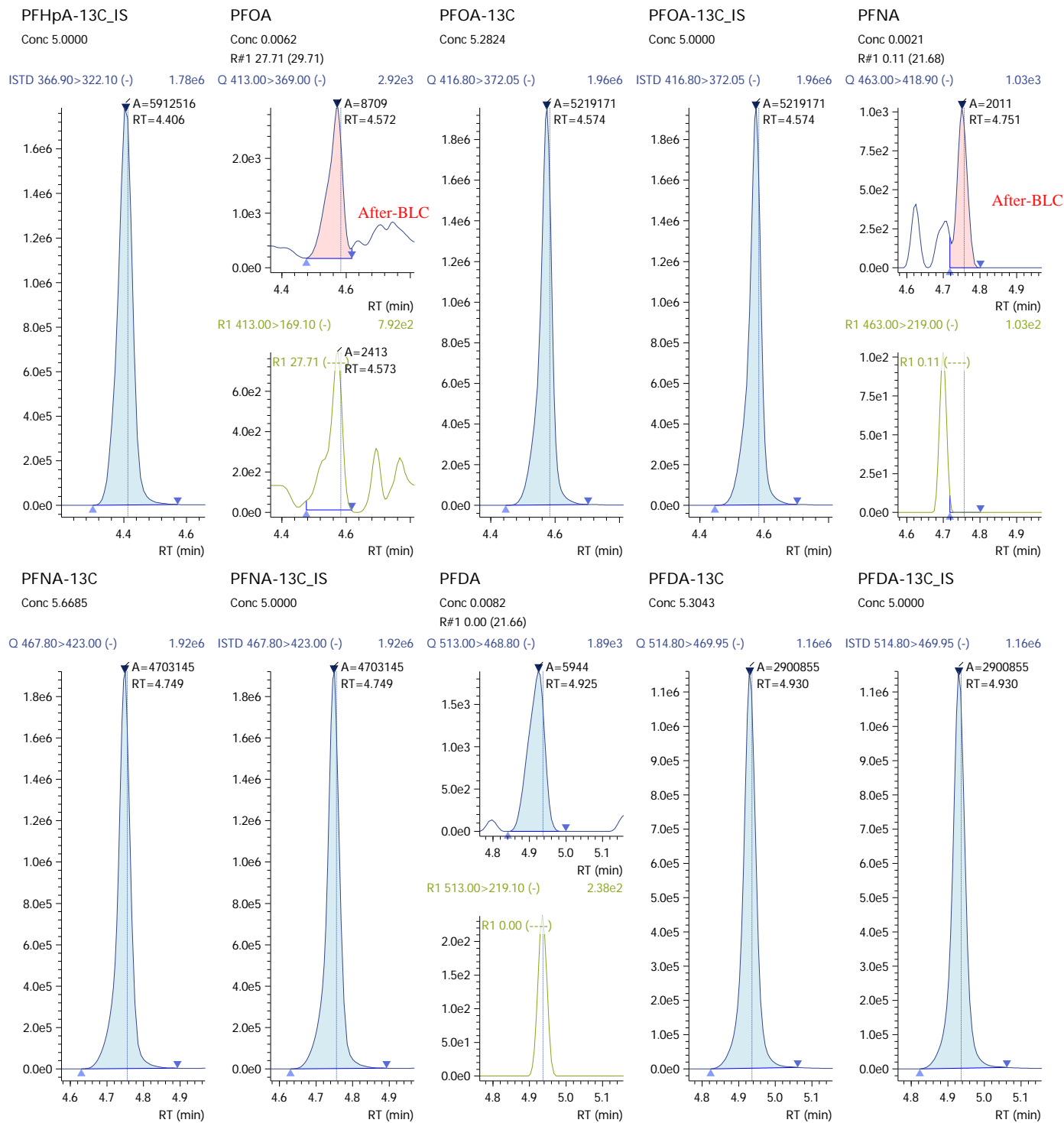


### 210421\_020 (continued)



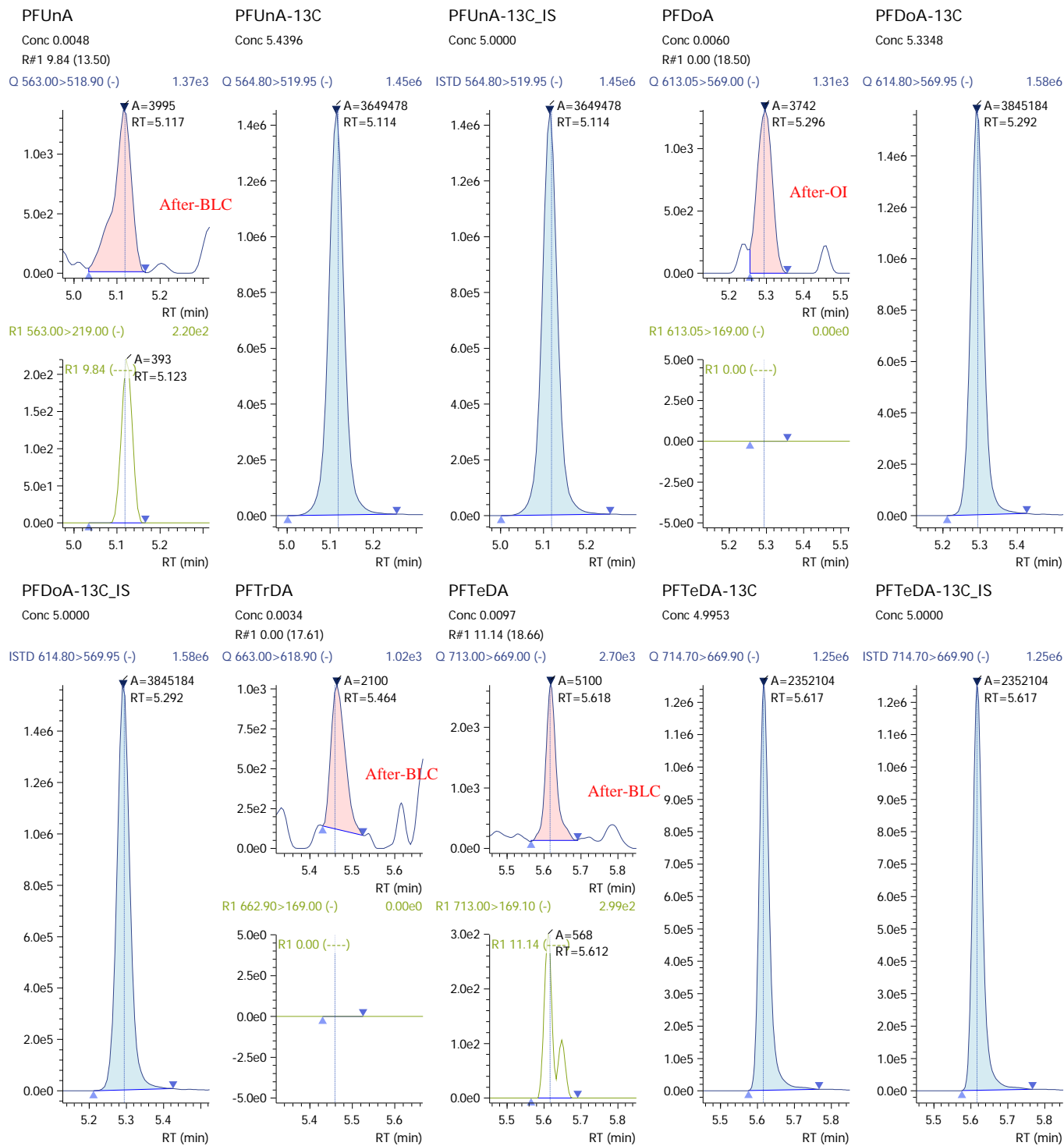


### 210421\_020 (continued)





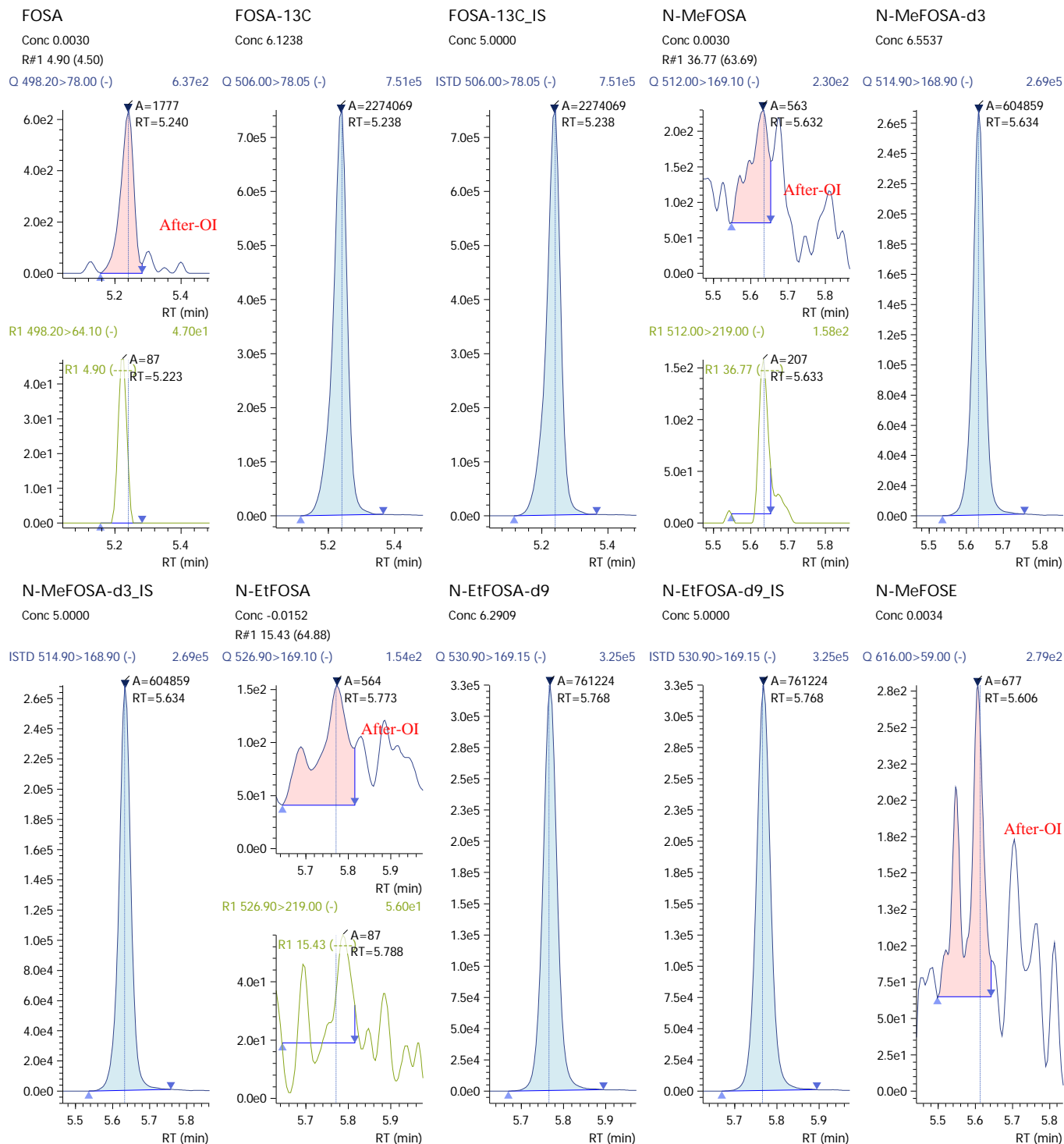
### 210421\_020 (continued)





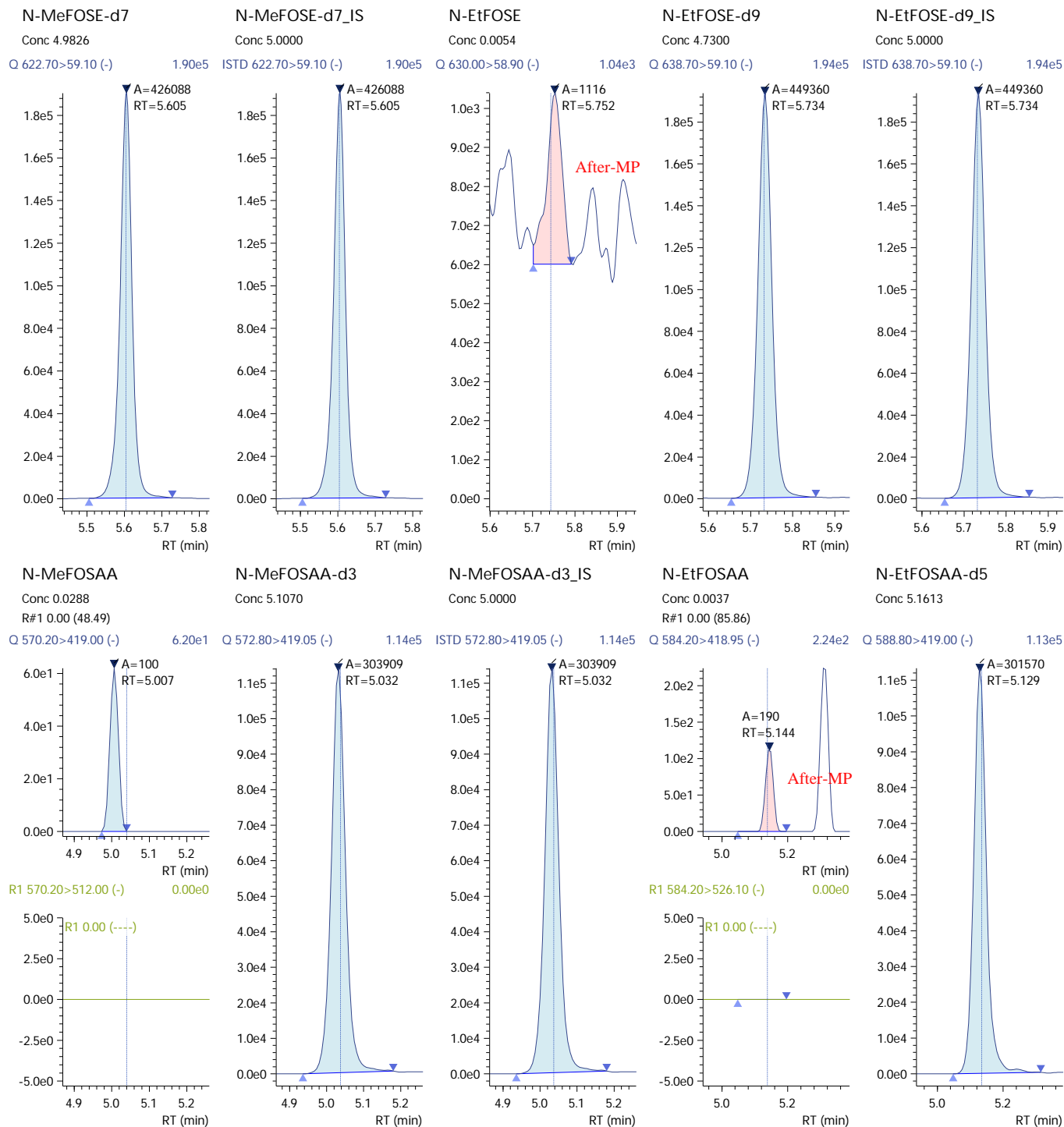


210421\_020 (continued)



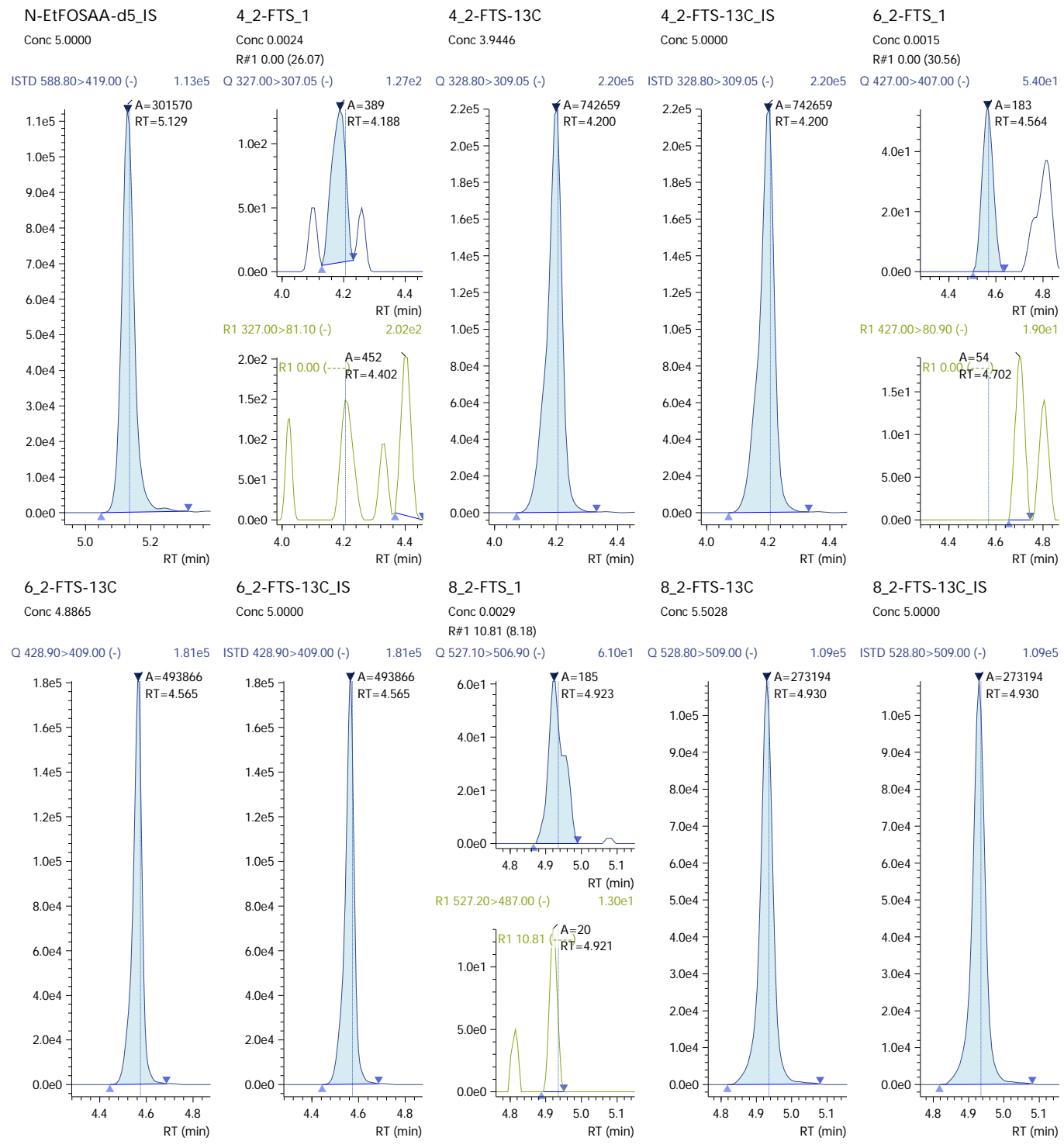


210421\_020 (continued)



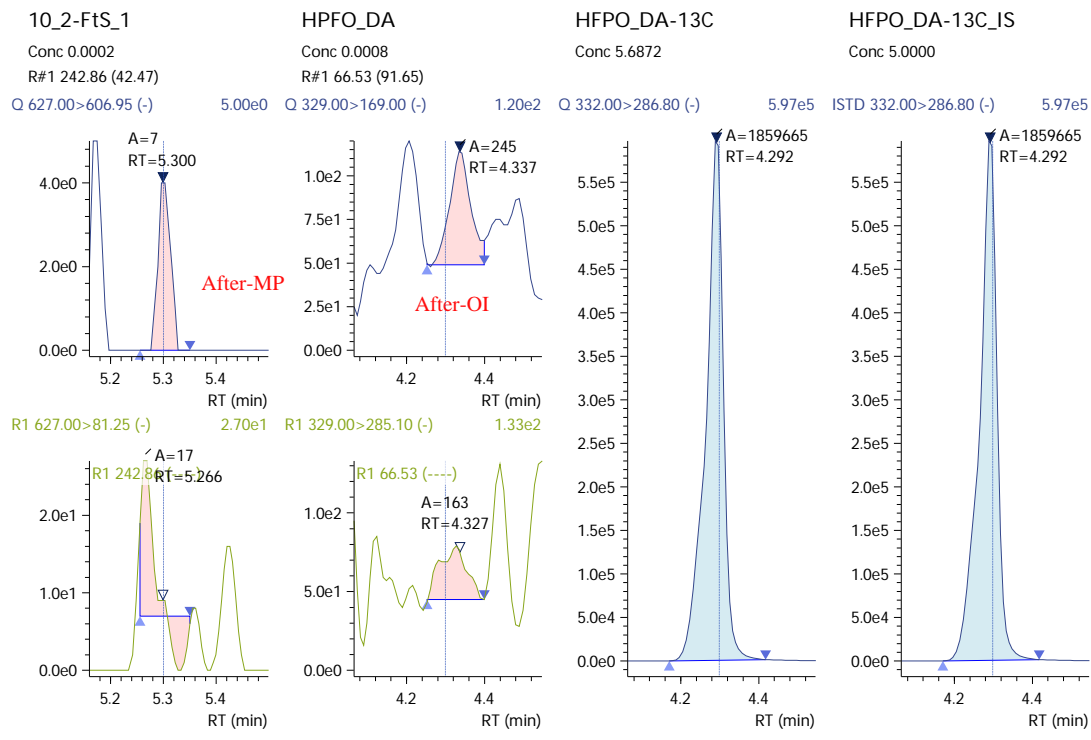


### 210421\_020 (continued)





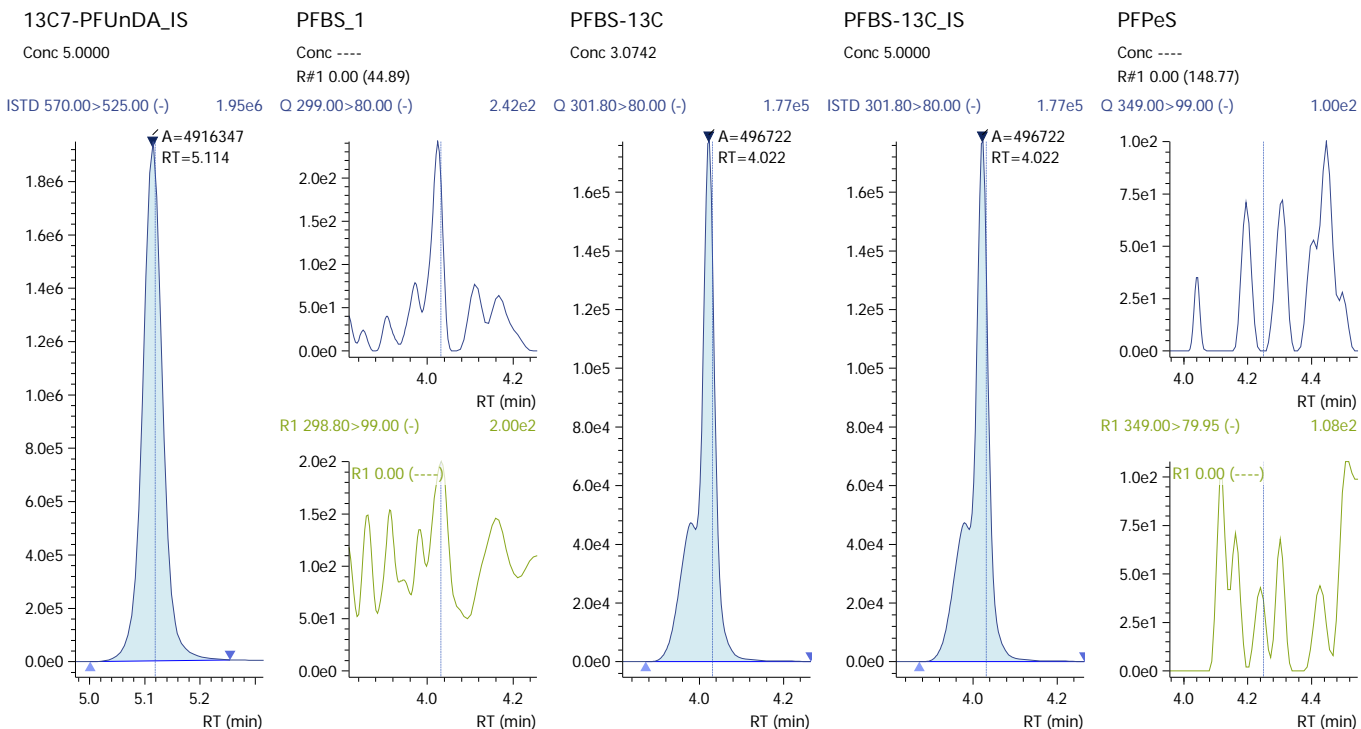
### 210421\_020 (continued)





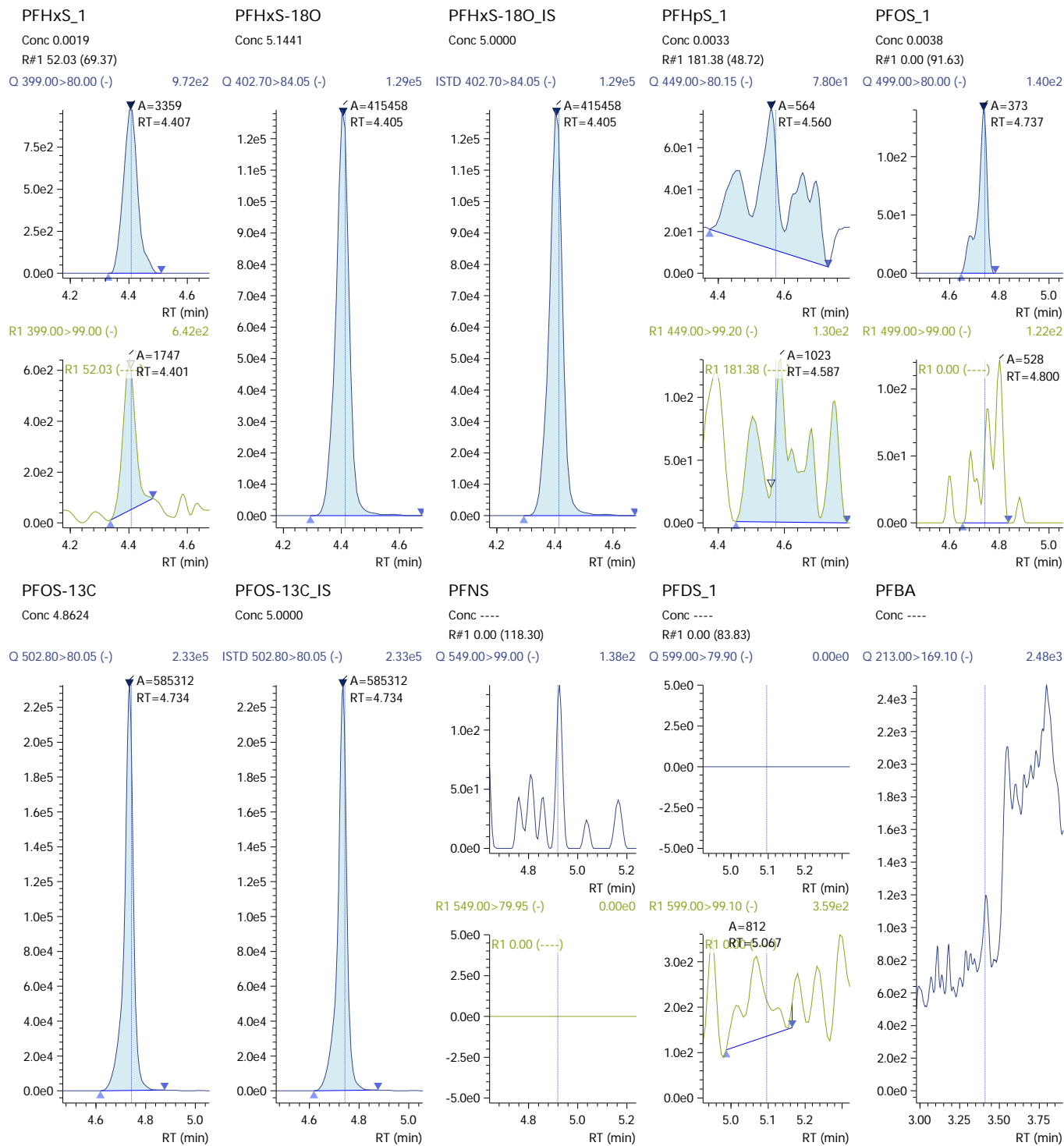
### 210421\_020

Sample ID: CCB  
Date Acquired: 4/21/2021 12:33:47 PM  
Acquired by: System Administrator  
Data File: 210421\_020  
Vial: 12 | Inj. Volume: 15.0000uL | Tray: 1





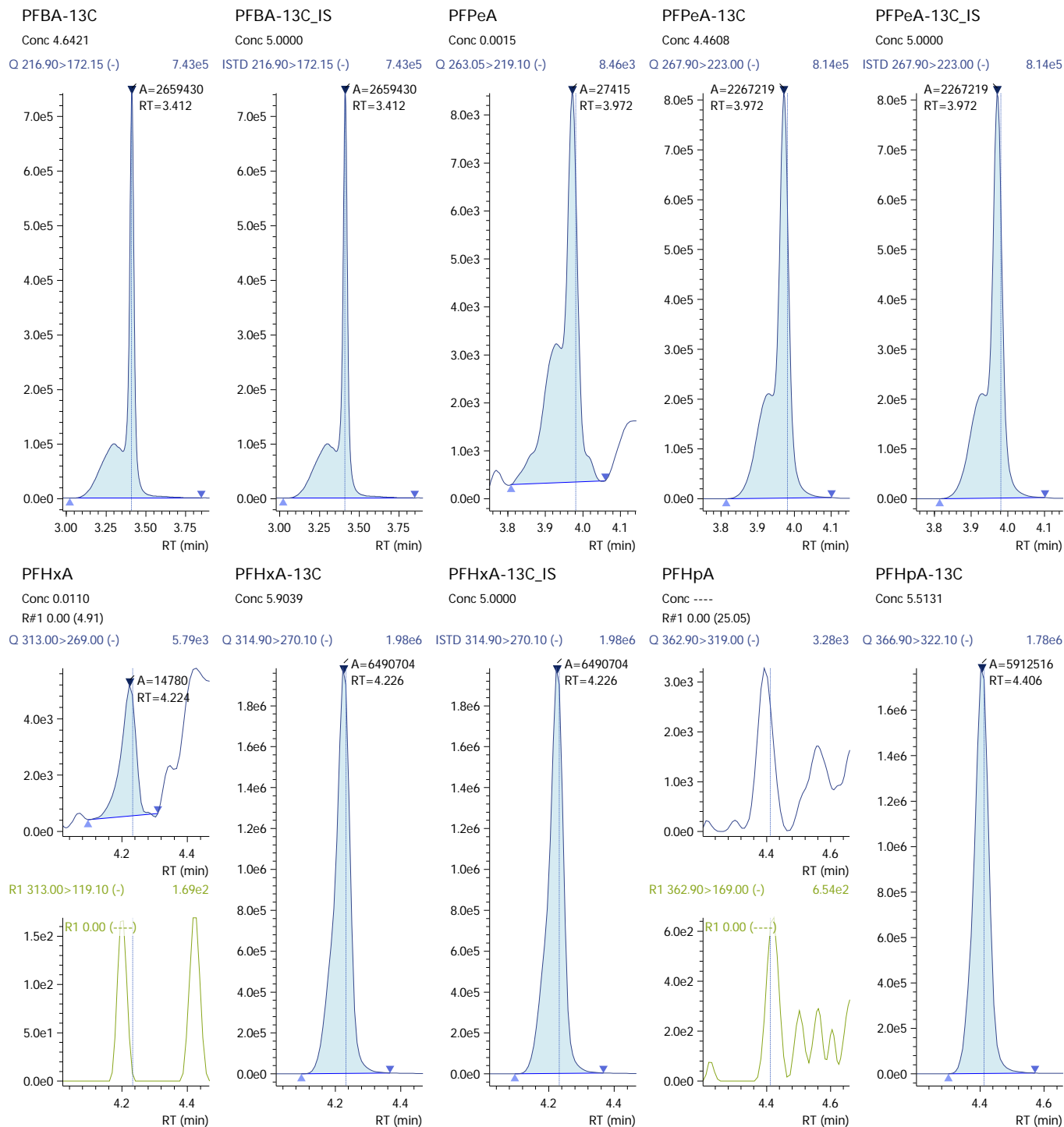
### 210421\_020 (continued)





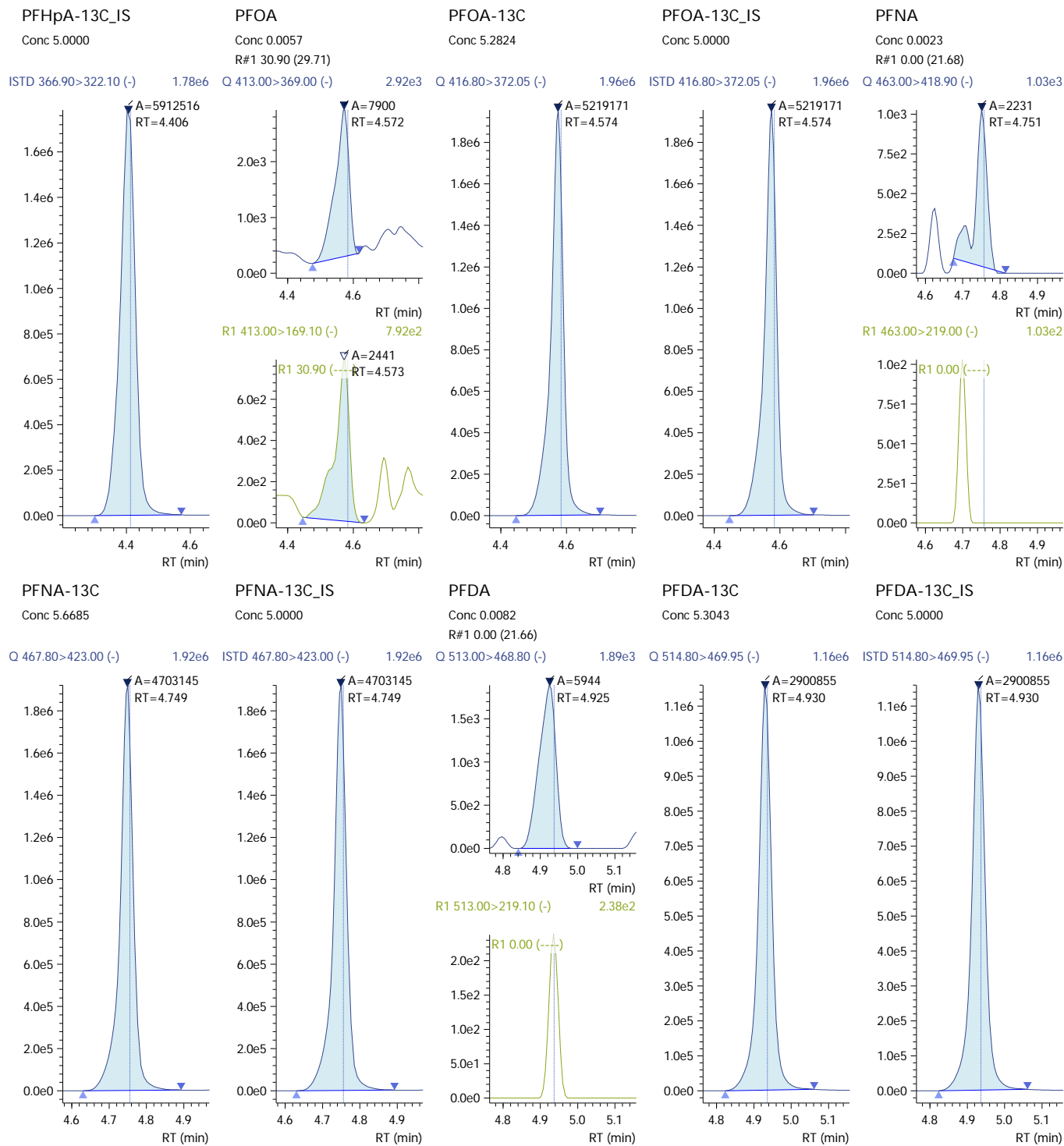


### 210421\_020 (continued)



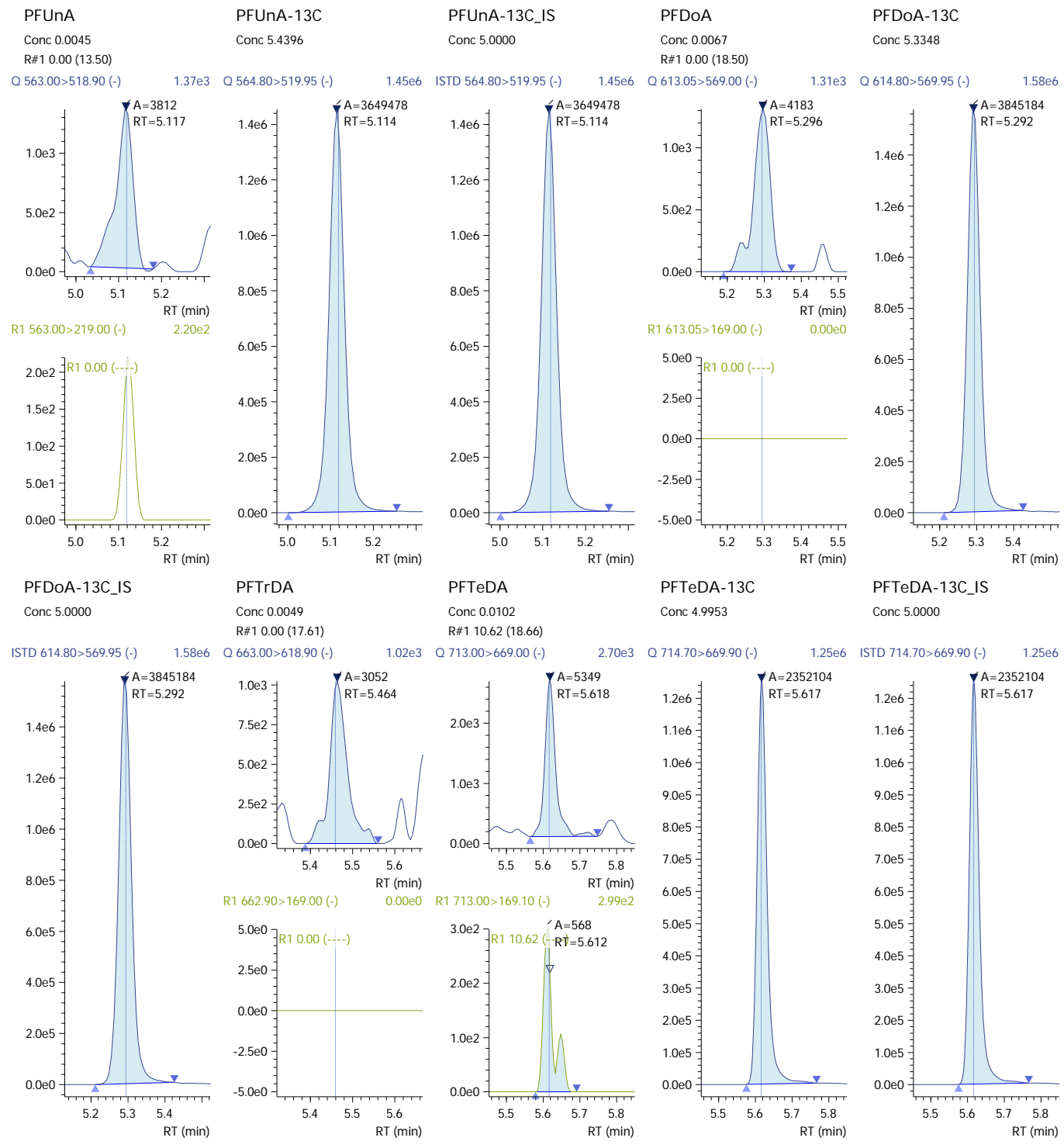


### 210421\_020 (continued)



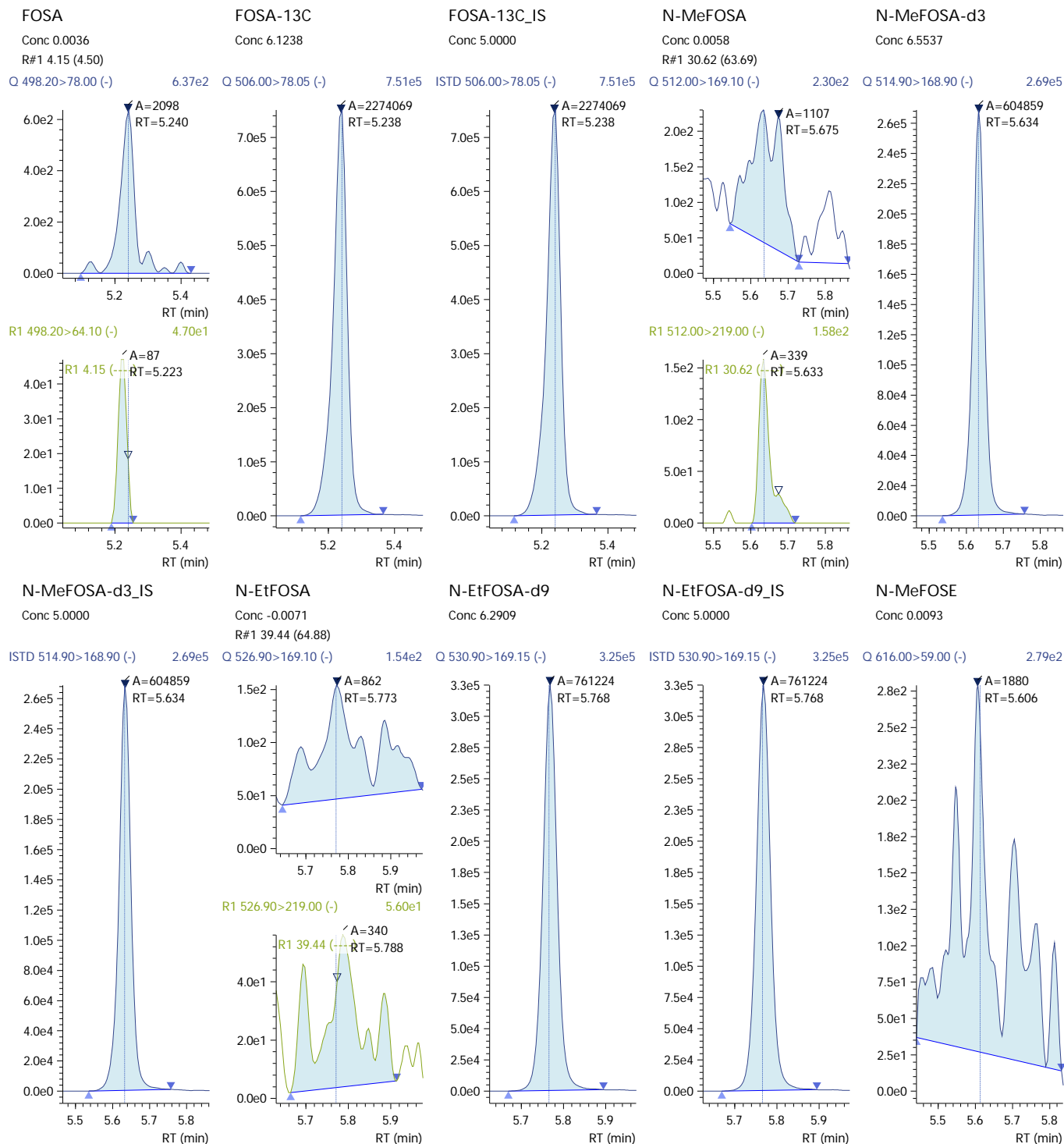


### 210421\_020 (continued)



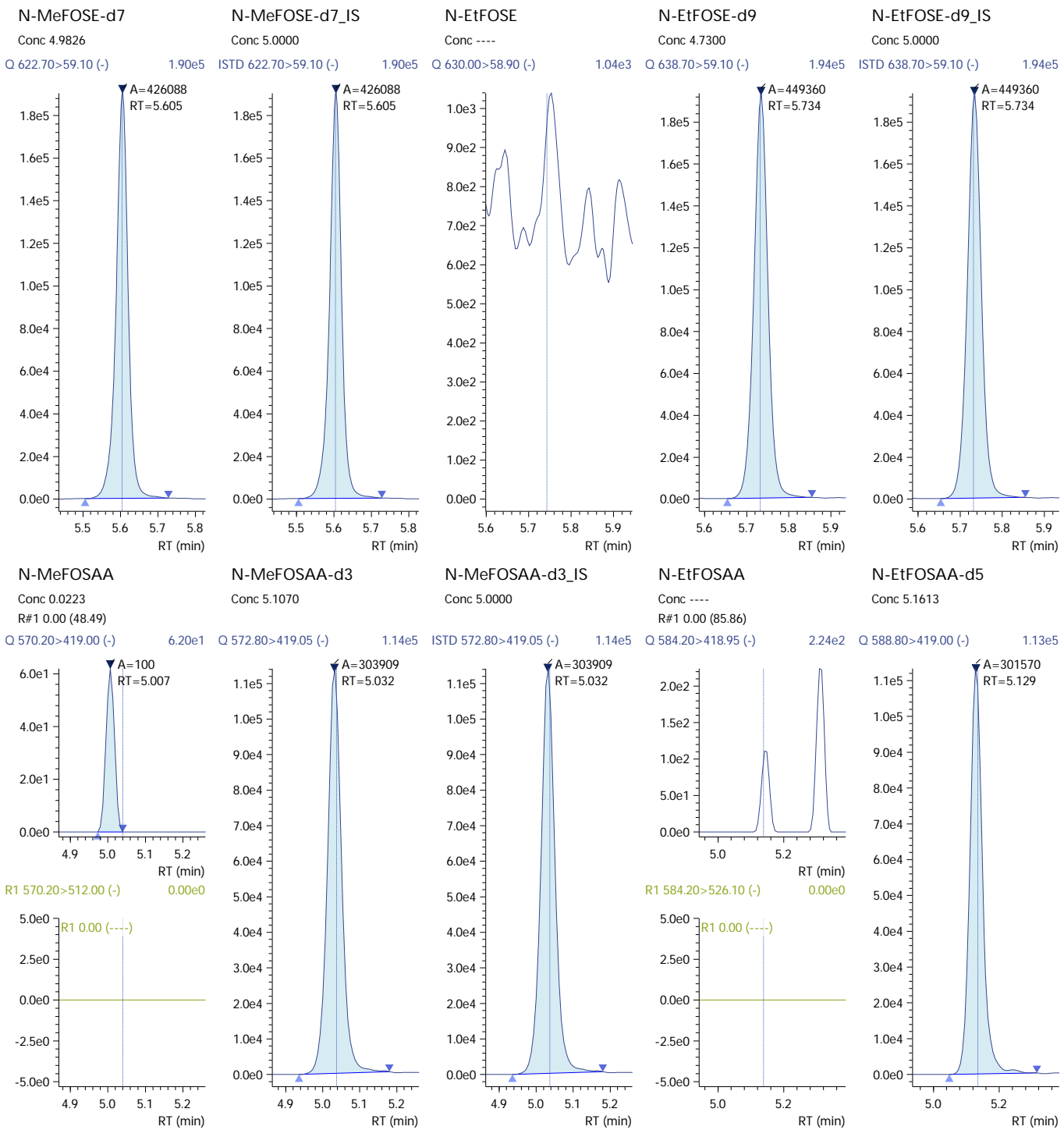


### 210421\_020 (continued)





### 210421\_020 (continued)





210421\_020 (continued)

N-EtFOSAA-d5\_IS  
 Conc 5.0000

4\_2-FTS\_1  
 Conc 0.0024  
 R#1 0.00 (26.07)

4\_2-FTS-13C  
 Conc 3.9446

4\_2-FTS-13C\_IS  
 Conc 5.0000

6\_2-FTS\_1  
 Conc 0.0015  
 R#1 0.00 (30.56)

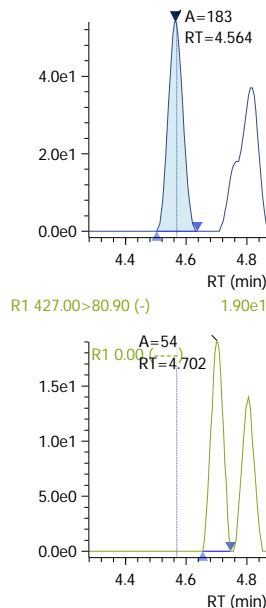
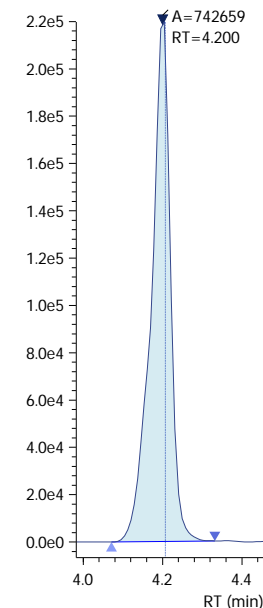
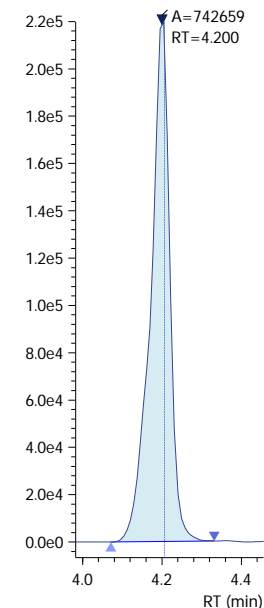
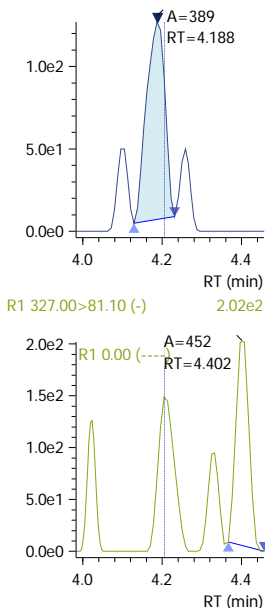
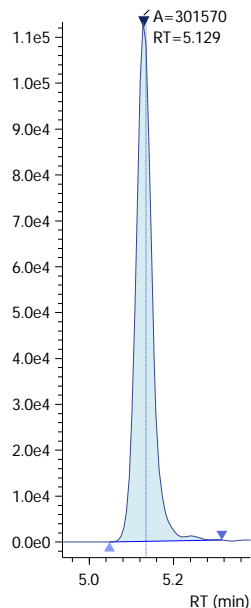
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Q 327.00>307.05 (-) 1.27e2

Q 328.80>309.05 (-) 2.20e5

ISTD 328.80>309.05 (-) 2.20e5

Q 427.00>407.00 (-) 5.40e1



6\_2-FTS-13C  
 Conc 4.8865

6\_2-FTS-13C\_IS  
 Conc 5.0000

8\_2-FTS\_1  
 Conc 0.0029  
 R#1 10.81 (8.18)

8\_2-FTS-13C  
 Conc 5.5028

8\_2-FTS-13C\_IS  
 Conc 5.0000

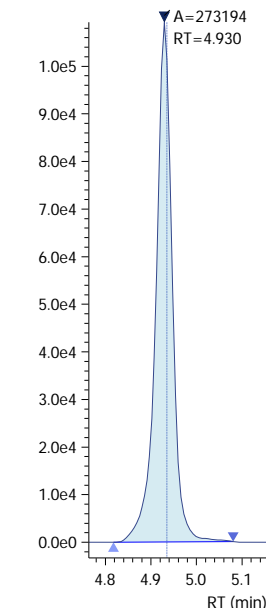
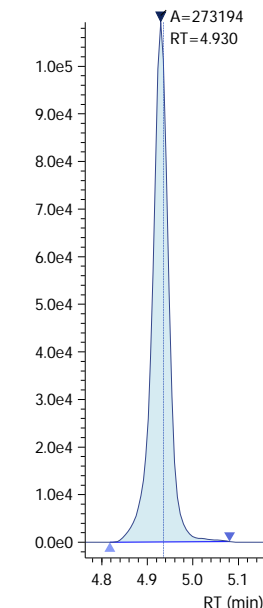
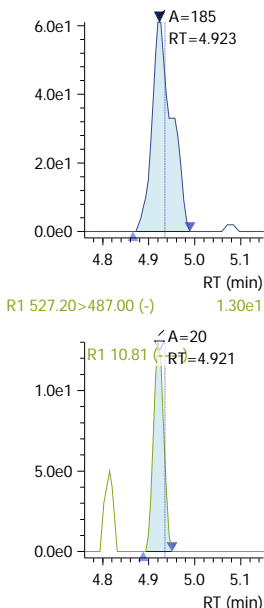
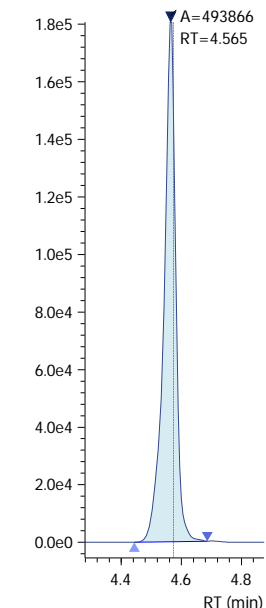
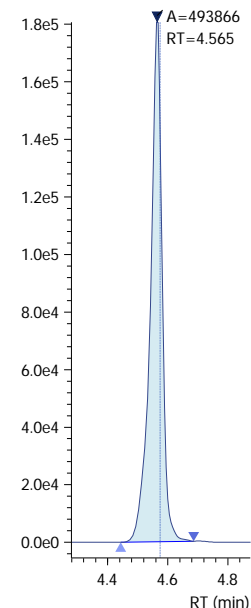
Q 428.90>409.00 (-) 1.81e5

ISTD 428.90>409.00 (-) 1.81e5

Q 527.10>506.90 (-) 6.10e1

Q 528.80>509.00 (-) 1.09e5

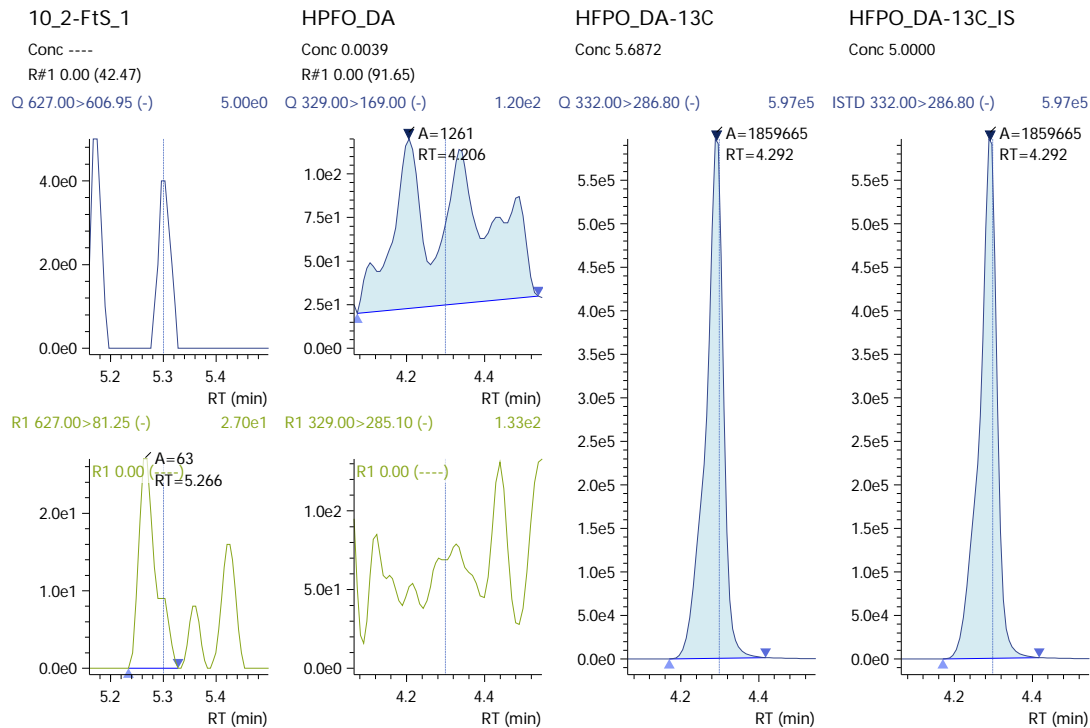
ISTD 528.80>509.00 (-) 1.09e5







### 210421\_020 (continued)



# Validation Report

1st *UA* 04/23/21  
2nd *[Signature]* 04/23/21

**Data File:** J:\LCMS06\Data\210421\_B2\210421\_019  
**Lab ID:** KQ2106600-01  
**RunType:** CCV  
**Matrix:** Solid

**Date Acquired:** 4/21/21 12:23  
**Batch ID:** 720740  
**Analysis Method:** PFC/537M/PFAS

## Validations

Validation Categories	Pass	Fail
ICAL Analyte Recovery	X	
Second Source ICAL Verification	X	
Internal Standards	X	
Above Highest ICAL Level	X	

Primary Review: \_\_\_\_\_

Secondary Review: \_\_\_\_\_

# Quantitation Report

1st *UA* 04/23/21  
2nd *h* 04/23/21

<b>Data File:</b> J:\LCMS06\Data\210421_B2\210421_019	<b>Instrument:</b> K-LCMS-06
<b>Acqu Date:</b> 4/21/21 12:23	<b>Vial:</b> 1
<b>Run Type:</b> CCV	<b>Dilution:</b> 1
<b>Lab ID:</b> KQ2106600-01	<b>Raw Units:</b> ng/mL

<b>Bottle ID:</b>	<b>Tier:</b> II	<b>Matrix:</b> Solid
<b>Prod Code:</b> PFAS	<b>Collect Date:</b> 3/25/21	<b>Receive Date:</b> 4/5/21

<b>Analysis Lot:</b> 720740	<b>Prep Lot:</b>	<b>Report Group:</b> KQ2106600
<b>Analysis:</b> PFC/537M	<b>Prep Method:</b>	
	<b>Prep Date:</b>	

<b>Title:</b> Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	<b>Calibration ID:</b> KC2100210
	<b>Report List ID:</b> 20091

## Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
13C7-PFUnDA	5.105		7085487	5.0000	OK

## Surrogate Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
13C3-PFBS	4.015		1052563	4.4826	Y
18O2-PFHxS	4.392		525540	4.5150	Y
13C4-PFOS	4.724		764879	4.4089	Y
13C4-PFBA	3.395		3612677	4.3755	Y
13C5-PFPeA	3.922		3457325	4.7199	Y
13C2-PFHxA	4.215		8477708	5.3505	Y
13C4-PFHpA	4.392		6503944	4.2080	Y
13C4-PFOA	4.566		6623326	4.6514	Y
13C5-PFNA	4.739		5626255	4.7051	Y
13C2-PFDA	4.921		3574058	4.5346	Y
13C2-PFUnDA	5.105		4343693	4.4923	Y
13C2-PFDODA	5.283		4348644	4.1863	Y
13C2-PFTeDA	5.608		2659698	3.9193	Y
13C8-FOSA	5.231		2457841	4.5925	Y
D3-MeFOSA	5.627		640269	4.8136	Y
D5-EtFOSA	5.761		782452	4.4867	Y
D7-MeFOSE	5.598		454093	3.6845	Y
D9-EtFOSE	5.727		487450	3.5601	Y
D3-MeFOSAA	5.023		364798	4.2535	Y
D5-EtFOSAA	5.121		332639	3.9502	Y
13C2-4:2 FTS	4.187		1025979	3.7811	Y
13C2-6:2 FTS	4.556		671670	4.6112	Y
13C2-8:2 FTS	4.920		345272	4.8256	Y
13C3-HFPO-DA	4.282		2300806	4.8822	Y

U: Undetected at or above MDL  
 J: Analyte detected above MDL, but below MRL  
 B: Hit above MRL also found in Method Blank  
 E: Analyte concentration above high point of ICAL  
 N: Presumptive evidence of compound

D: Result from dilution  
 m: Manual integration performed  
 d: Compound manually deleted  
 NR: Analyte not reported from this analysis

\*: Result fails acceptance criteria  
 #: Acceptance criteria not applicable  
 ?: Insufficient information to determine acceptance  
 e: Result >= MRL, but MRL less than low point of ICAL  
 c: check for co-elution

Printed: 4/23/21 10:05

\\alprews001\starlims\LIMSRpts\QuantValidation.rpt

<b>Data File:</b>	J:\LCMS06\Data\210421_B2\210421_019	<b>Instrument:</b>	K-LCMS06 <i>206</i> <i>UA</i> 04/23/21
<b>Acqu Date:</b>	4/21/21 12:23	<b>Vial:</b>	1
<b>Run Type:</b>	CCV	<b>Dilution:</b>	1
<b>Lab ID:</b>	KQ2106600-01	<b>Raw Units:</b>	ng/mL

**Target Compounds**

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perfluorobutane sulfonic acid (PFBS)	4.015		265632	0.8835	Y
Perfluoropentane sulfonic acid (PFPeS)	4.225		124837	0.8910	Y
Perfluorohexane sulfonic acid (PFHxS)	4.388		163029	0.9202	Y
Perfluoroheptane sulfonic acid (PFHpS)	4.556		241926	1.1073	Y
Perfluorooctane sulfonic acid (PFOS)	4.724		121749	0.9606	Y
Perfluorononane sulfonic acid (PFNS)	4.902		125176	1.1307	Y
Perfluorodecane sulfonic acid (PFDS)	5.082		163941	1.0588	Y
Perfluorobutanoic acid (PFBA)	3.396		853148	1.0941	Y
Perfluoropentanoic acid (PFPeA)	3.923		1484976	1.0304	Y
Perfluorohexanoic acid (PFHxA)	4.215		1651191	0.9403	Y
Perfluoroheptanoic acid (PFHpA)	4.392		1365026	1.0507	Y
Perfluorooctanoic acid (PFOA)	4.565		1780817	1.0067	Y
Perfluorononanoic acid (PFNA)	4.739		1295530	1.1406	Y
Perfluorodecanoic acid (PFDA)	4.921		951421	1.0591	Y
Perfluoroundecanoic acid (PFUnDA)	5.105		1084351	1.0896	Y
Perfluorododecanoic acid (PFDoDA)	5.283		783784	1.1114	Y
Perfluorotridecanoic acid (PFTrDA)	5.450		827158	1.2002	Y
Perfluorotetradecanoic acid (PFTeDA)	5.608		673467	1.1347	Y
Perfluorooctane sulfonamide (FOSA)	5.231		637422	1.0084	Y
N-Methyl perfluorooctane sulfonamide (MeFOSA)	5.630		203185	1.0261	Y
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	5.767		42297	1.0820	Y
N-Methyl perfluorooctane sulfonamidoethanol	5.607		276607	1.3015	Y
N-Ethyl perfluorooctane sulfonamidoethanol	5.738		276474	1.2362	Y
N-Methyl perfluorooctane sulfonamidoacetic acid	5.026		71127	1.1262	Y
N-Ethyl perfluorooctane sulfonamidoacetic acid	5.125		57630	1.0069	Y
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	4.188		239341	1.0701	Y
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	4.552		166635	1.0141	Y
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	4.919		81114	0.9971	Y
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	5.290		44129	0.9310	Y
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.282		382150	0.9590	Y

U: Undetected at or above MDL  
 J: Analyte detected above MDL, but below MRL  
 B: Hit above MRL also found in Method Blank  
 E: Analyte concentration above high point of ICAL  
 N: Presumptive evidence of compound

D: Result from dilution  
 m: Manual integration performed  
 d: Compound manually deleted  
 NR: Analyte not reported from this analysis

\*: Result fails acceptance criteria  
 #: Acceptance criteria not applicable  
 ?: Insufficient information to determine acceptance  
 e: Result >= MRL, but MRL less than low point of ICAL  
 c: check for co-elution



210421\_019

Sample ID: PFC CCV @ 1.0 PPB  
 Date Acquired: 4/21/2021 12:23:20 PM  
 Acquired by: System Administrator  
 Data File: 210421\_019  
 Vial: 4 | Inj. Volume: 15.000uL | Tray: 0

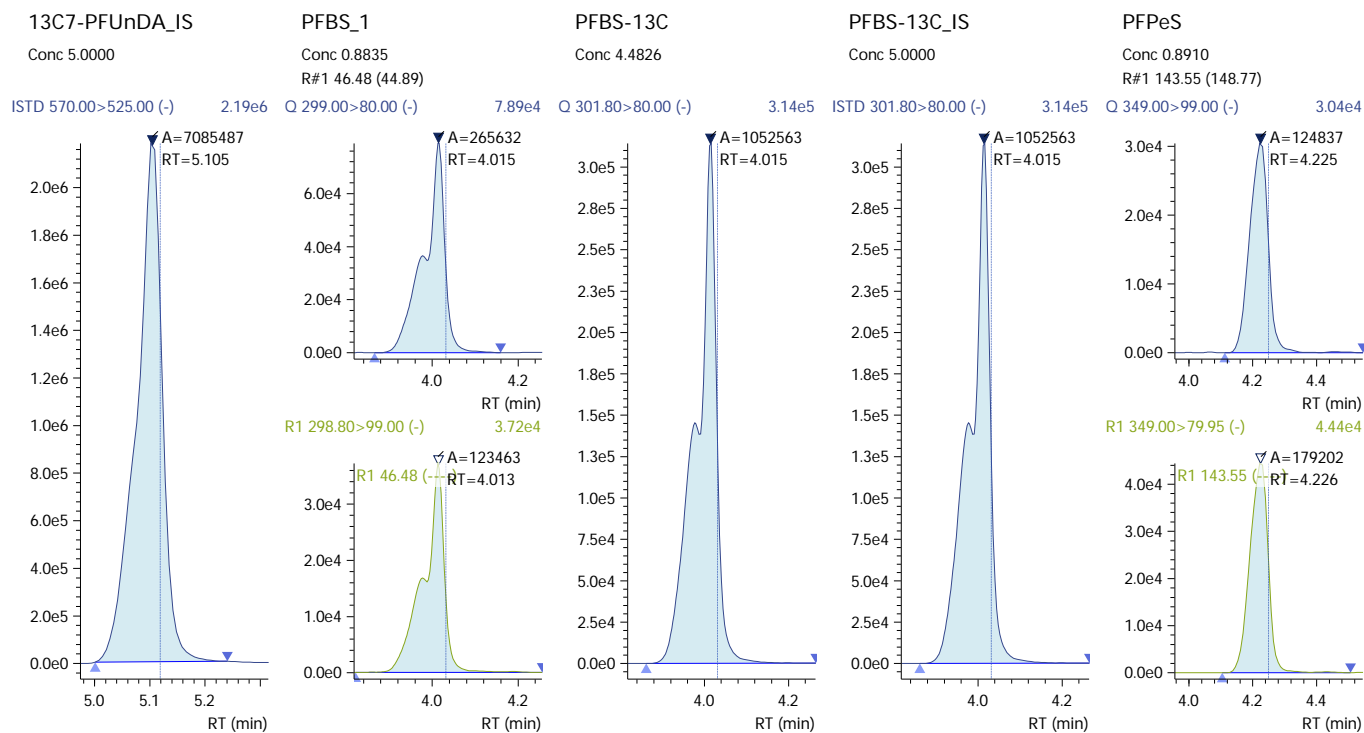
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.105	7085487	7085487	----	5.0000	5.0000	ng/mL
PFBS_1	Auto	4.015	265632	1052563	PFBS-13C_IS	0.8874	0.8835	ng/mL
PFBS-13C	Auto	4.015	1052563	7085487	13C7-PFUnDA_IS	5.0000	4.4826	ng/mL
PFBS-13C_IS	Auto	4.015	1052563	1052563	----	5.0000	5.0000	ng/mL
PFPeS	Auto	4.225	124837	1052563	PFBS-13C_IS	0.9409	0.8910	ng/mL
PFHxS_1	Auto	4.388	163029	525540	PFHxS-18O_IS	0.9131	0.9202	ng/mL
PFHxS-18O	Auto	4.392	525540	7085487	13C7-PFUnDA_IS	5.0000	4.5150	ng/mL
PFHxS-18O_IS	Auto	4.392	525540	525540	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.556	241926	525540	PFHxS-18O_IS	0.9534	1.1073	ng/mL
PFOS_1	Auto	4.724	121749	764879	PFOS-13C_IS	0.9292	0.9606	ng/mL
PFOS-13C	Auto	4.724	764879	7085487	13C7-PFUnDA_IS	5.0000	4.4089	ng/mL
PFOS-13C_IS	Auto	4.724	764879	764879	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.902	125176	764879	PFOS-13C_IS	0.9616	1.1307	ng/mL
PFDS_1	Auto	5.082	163941	764879	PFOS-13C_IS	0.9647	1.0588	ng/mL
PFBA	Auto	3.396	853148	3612677	PFBA-13C_IS	1.0000	1.0941	ng/mL
PFBA-13C	Auto	3.395	3612677	7085487	13C7-PFUnDA_IS	5.0000	4.3755	ng/mL
PFBA-13C_IS	Auto	3.395	3612677	3612677	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.923	1484976	3457325	PFPeA-13C_IS	1.0000	1.0304	ng/mL
PFPeA-13C	Auto	3.922	3457325	7085487	13C7-PFUnDA_IS	5.0000	4.7199	ng/mL
PFPeA-13C_IS	Auto	3.922	3457325	3457325	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.215	1651191	8477708	PFHxA-13C_IS	1.0000	0.9403	ng/mL
PFHxA-13C	Auto	4.215	8477708	7085487	13C7-PFUnDA_IS	5.0000	5.3505	ng/mL
PFHxA-13C_IS	Auto	4.215	8477708	8477708	----	5.0000	5.0000	ng/mL
PFHpA	Auto	4.392	1365026	6503944	PFHpA-13C_IS	1.0000	1.0507	ng/mL
PFHpA-13C	Auto	4.392	6503944	7085487	13C7-PFUnDA_IS	5.0000	4.2080	ng/mL
PFHpA-13C_IS	Auto	4.392	6503944	6503944	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.565	1780817	6623326	PFOA-13C_IS	1.0000	1.0067	ng/mL
PFOA-13C	Auto	4.566	6623326	7085487	13C7-PFUnDA_IS	5.0000	4.6514	ng/mL
PFOA-13C_IS	Auto	4.566	6623326	6623326	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.739	1295530	5626255	PFNA-13C_IS	1.0000	1.1406	ng/mL
PFNA-13C	Auto	4.739	5626255	7085487	13C7-PFUnDA_IS	5.0000	4.7051	ng/mL
PFNA-13C_IS	Auto	4.739	5626255	5626255	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.921	951421	3574058	PFDA-13C_IS	1.0000	1.0591	ng/mL
PFDA-13C	Auto	4.921	3574058	7085487	13C7-PFUnDA_IS	5.0000	4.5346	ng/mL
PFDA-13C_IS	Auto	4.921	3574058	3574058	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.105	1084351	4343693	PFUnA-13C_IS	1.0000	1.0896	ng/mL
PFUnA-13C	Auto	5.105	4343693	7085487	13C7-PFUnDA_IS	5.0000	4.4923	ng/mL
PFUnA-13C_IS	Auto	5.105	4343693	4343693	----	5.0000	5.0000	ng/mL
PFDaA	M	5.283	783784	4348644	PFDaA-13C_IS	1.0000	1.1114	ng/mL
PFDaA-13C	Auto	5.283	4348644	7085487	13C7-PFUnDA_IS	5.0000	4.1863	ng/mL
PFDaA-13C_IS	Auto	5.283	4348644	4348644	----	5.0000	5.0000	ng/mL
PFTeDA	Auto	5.450	827158	2659698	PFTeDA-13C_IS	1.0000	1.2002	ng/mL
PFTeDA	Auto	5.608	673467	2659698	PFTeDA-13C_IS	1.0000	1.1347	ng/mL
PFTeDA-13C	Auto	5.608	2659698	7085487	13C7-PFUnDA_IS	5.0000	3.9193	ng/mL
PFTeDA-13C_IS	Auto	5.608	2659698	2659698	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.231	637422	2457841	FOSA-13C_IS	1.0000	1.0084	ng/mL
FOSA-13C	Auto	5.231	2457841	7085487	13C7-PFUnDA_IS	5.0000	4.5925	ng/mL
FOSA-13C_IS	Auto	5.231	2457841	2457841	----	5.0000	5.0000	ng/mL
N-MeFOSA	Auto	5.630	203185	640269	N-MeFOSA-d3_IS	1.0000	1.0261	ng/mL
N-MeFOSA-d3	Auto	5.627	640269	7085487	13C7-PFUnDA_IS	5.0000	4.8136	ng/mL
N-MeFOSA-d3_IS	Auto	5.627	640269	640269	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.767	42297	782452	N-EtFOSA-d9_IS	1.0000	1.0820	ng/mL
N-EtFOSA-d9	Auto	5.761	782452	7085487	13C7-PFUnDA_IS	5.0000	4.4867	ng/mL
N-EtFOSA-d9_IS	Auto	5.761	782452	782452	----	5.0000	5.0000	ng/mL



210421\_019 (continued)

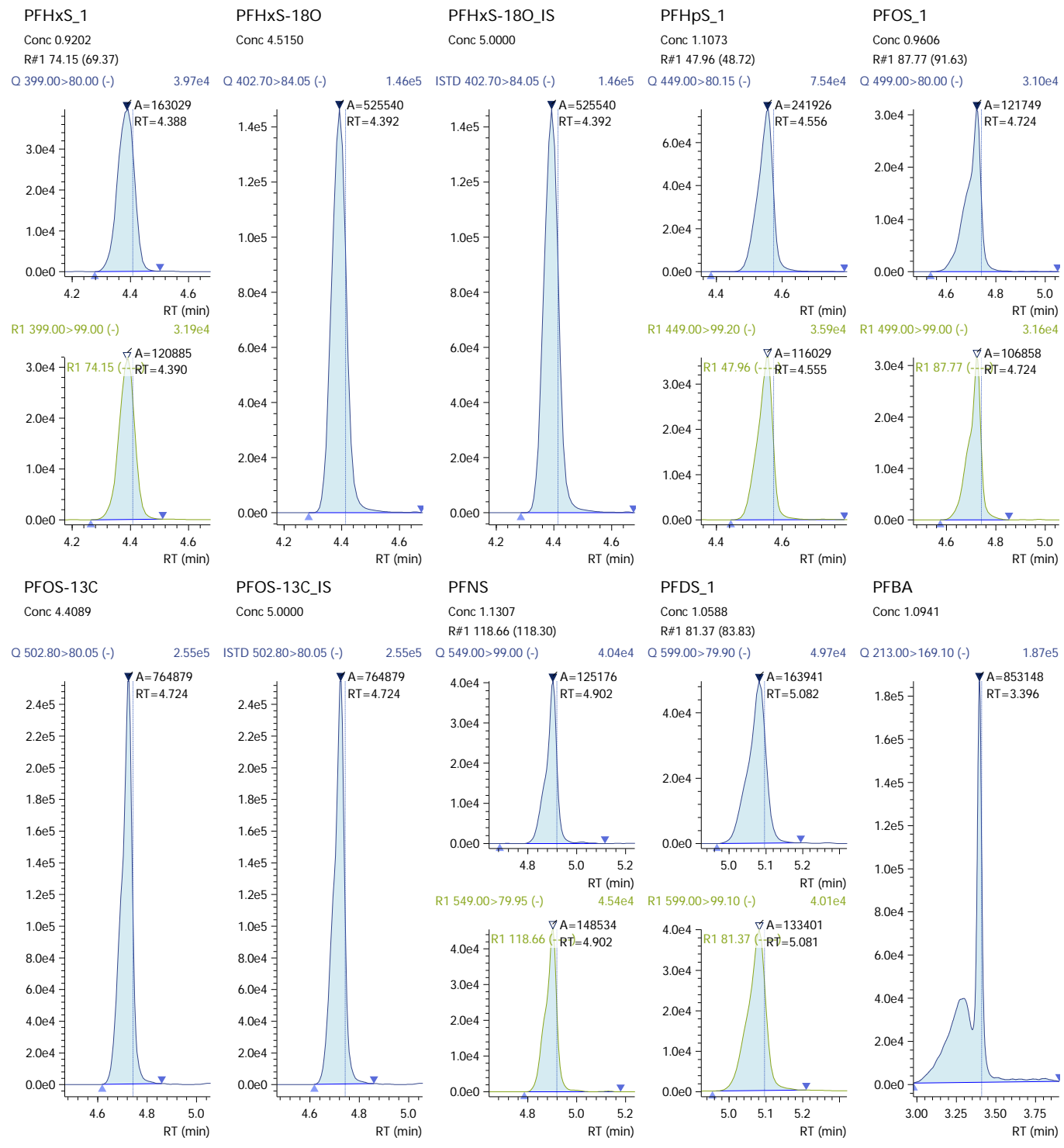
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.607	276607	454093	N-MeFOSE-d7_IS	1.0000	1.3015	ng/mL
N-MeFOSE-d7	Auto	5.598	454093	7085487	13C7-PFUnDA_IS	5.0000	3.6845	ng/mL
N-MeFOSE-d7_IS	Auto	5.598	454093	454093	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.738	276474	487450	N-EtFOSE-d9_IS	1.0000	1.2362	ng/mL
N-EtFOSE-d9	Auto	5.727	487450	7085487	13C7-PFUnDA_IS	5.0000	3.5601	ng/mL
N-EtFOSE-d9_IS	Auto	5.727	487450	487450	----	5.0000	5.0000	ng/mL
N-MeFOSAA	Auto	5.026	71127	364798	N-MeFOSAA-d3_IS	1.0000	1.1262	ng/mL
N-MeFOSAA-d3	Auto	5.023	364798	7085487	13C7-PFUnDA_IS	5.0000	4.2535	ng/mL
N-MeFOSAA-d3_IS	Auto	5.023	364798	364798	----	5.0000	5.0000	ng/mL
N-EtFOSAA	M	5.125	57630	332639	N-EtFOSAA-d5_IS	1.0000	1.0069	ng/mL
N-EtFOSAA-d5	Auto	5.121	332639	7085487	13C7-PFUnDA_IS	5.0000	3.9502	ng/mL
N-EtFOSAA-d5_IS	Auto	5.121	332639	332639	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.188	239341	1025979	4_2-FTS-13C_IS	0.9372	1.0701	ng/mL
4_2-FTS-13C	Auto	4.187	1025979	7085487	13C7-PFUnDA_IS	5.0000	3.7811	ng/mL
4_2-FTS-13C_IS	Auto	4.187	1025979	1025979	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.552	166635	671670	6_2-FTS-13C_IS	0.9512	1.0141	ng/mL
6_2-FTS-13C	Auto	4.556	671670	7085487	13C7-PFUnDA_IS	5.0000	4.6112	ng/mL
6_2-FTS-13C_IS	Auto	4.556	671670	671670	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.919	81114	345272	8_2-FTS-13C_IS	0.9600	0.9971	ng/mL
8_2-FTS-13C	Auto	4.920	345272	7085487	13C7-PFUnDA_IS	5.0000	4.8256	ng/mL
8_2-FTS-13C_IS	Auto	4.920	345272	345272	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.290	44129	345272	8_2-FTS-13C_IS	0.9662	0.9310	ng/mL
HFPO_DA	Auto	4.282	382150	2300806	HFPO_DA-13C_IS	1.0000	0.9590	ng/mL
HFPO_DA-13C	Auto	4.282	2300806	7085487	13C7-PFUnDA_IS	5.0000	4.8822	ng/mL
HFPO_DA-13C_IS	Auto	4.282	2300806	2300806	----	5.0000	5.0000	ng/mL





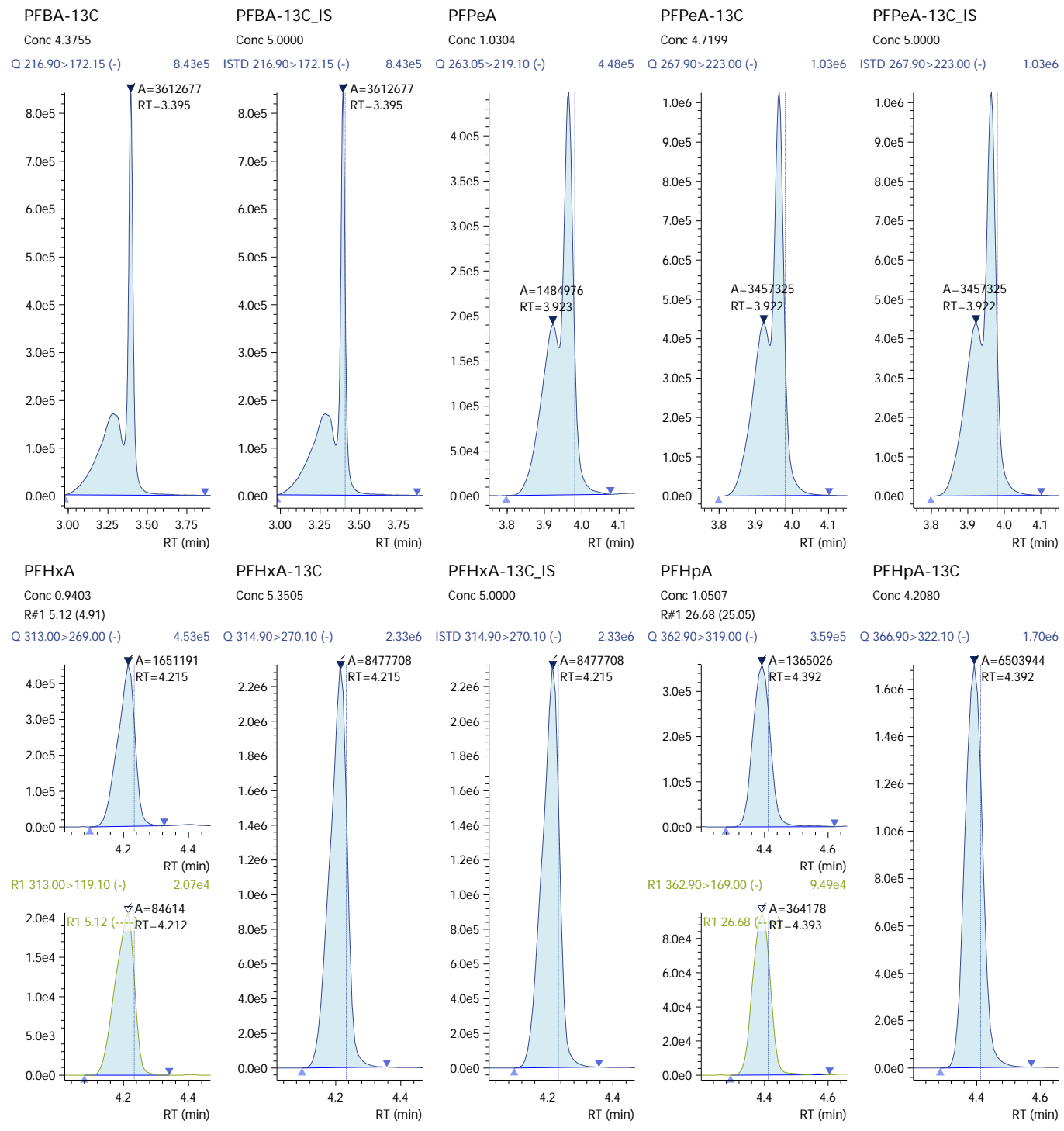
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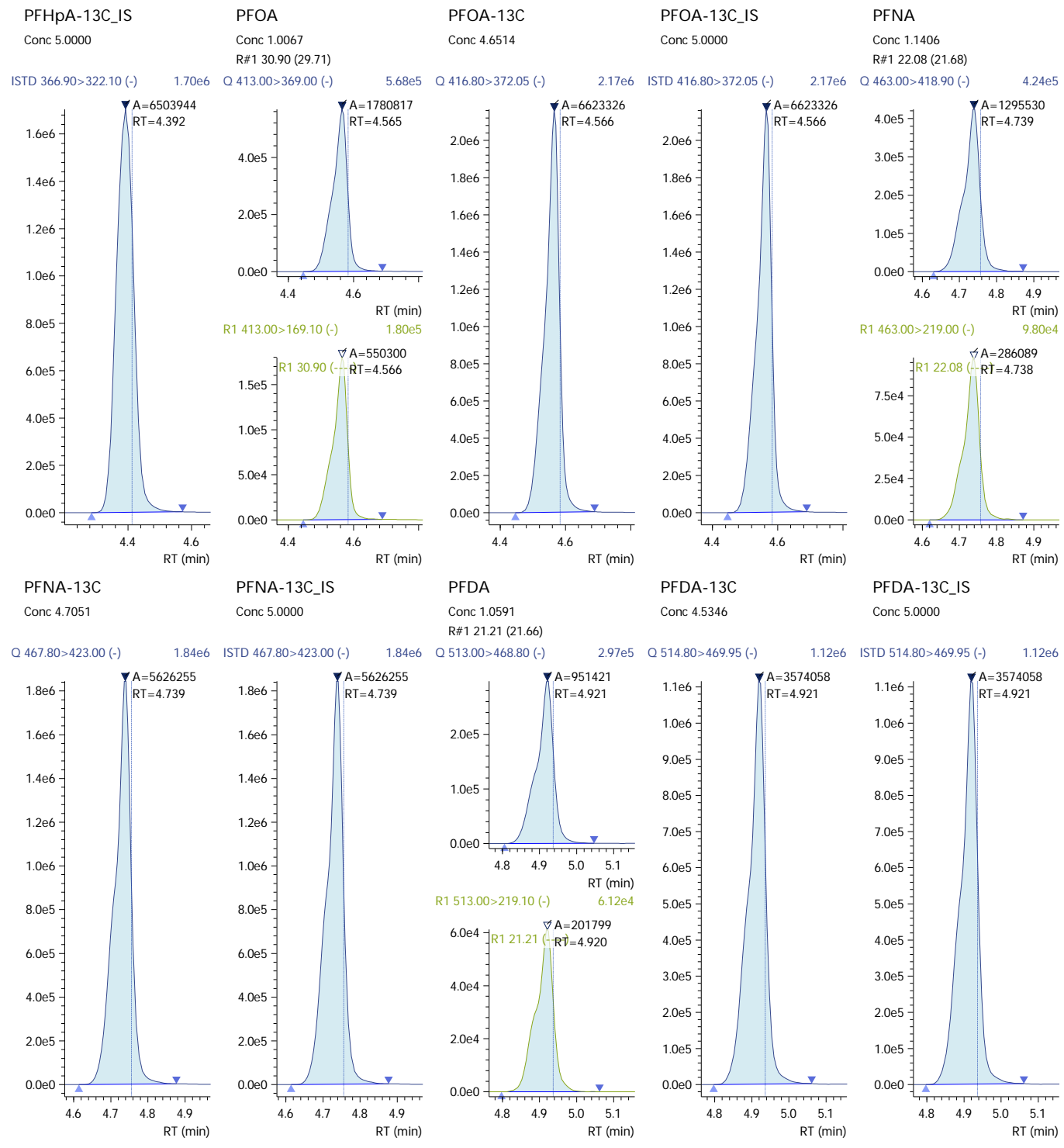


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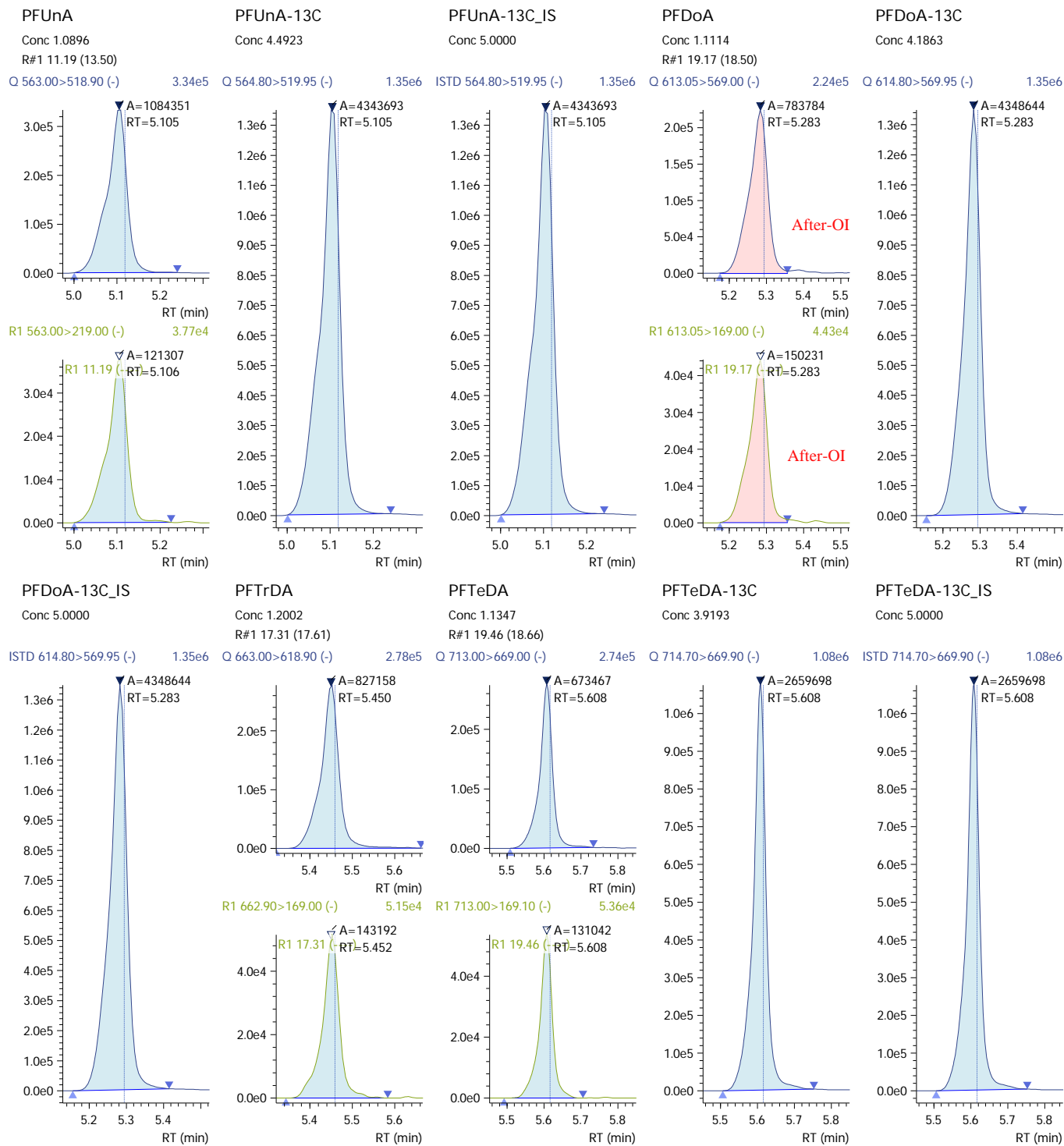


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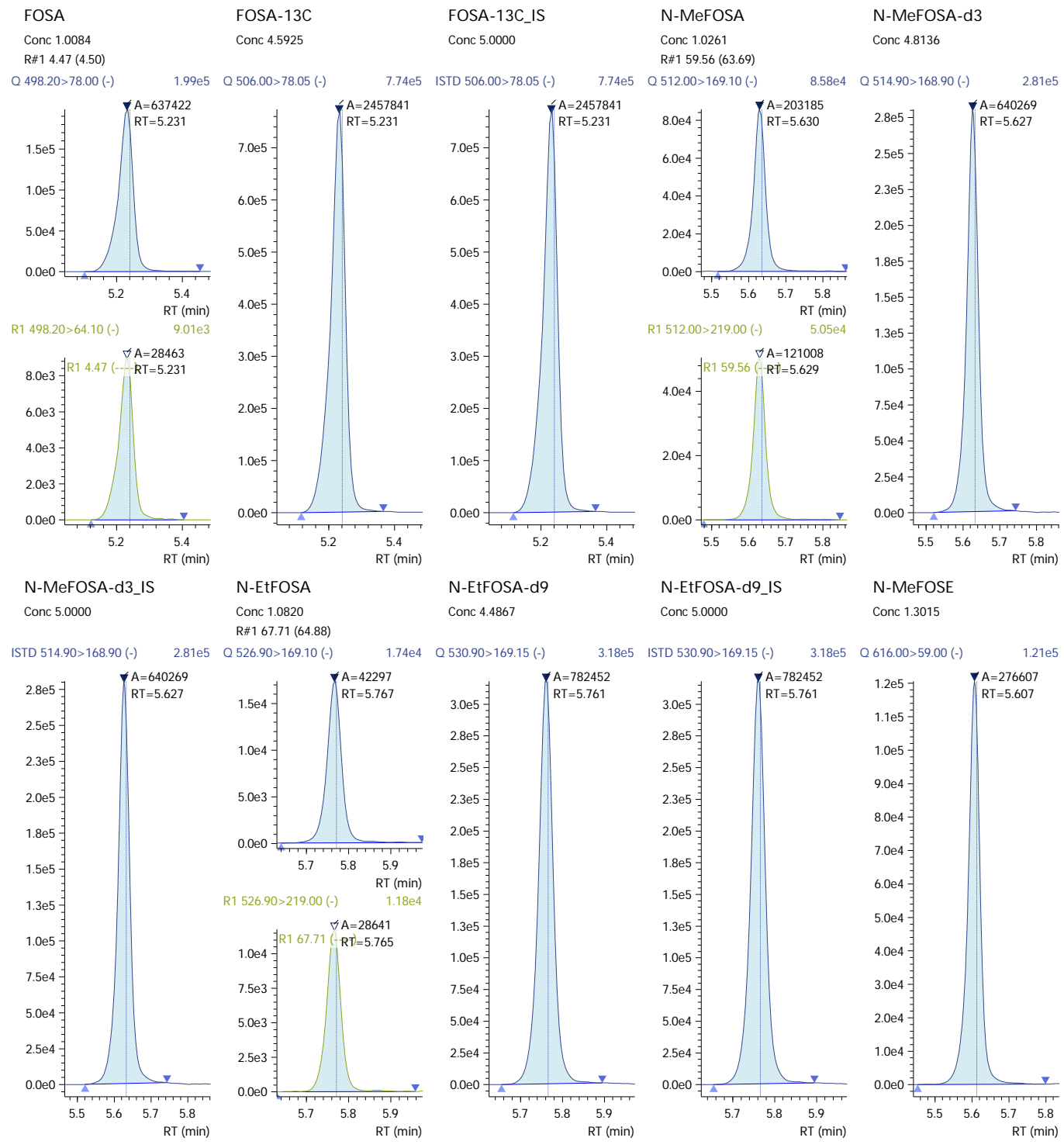


210421\_019 (continued)



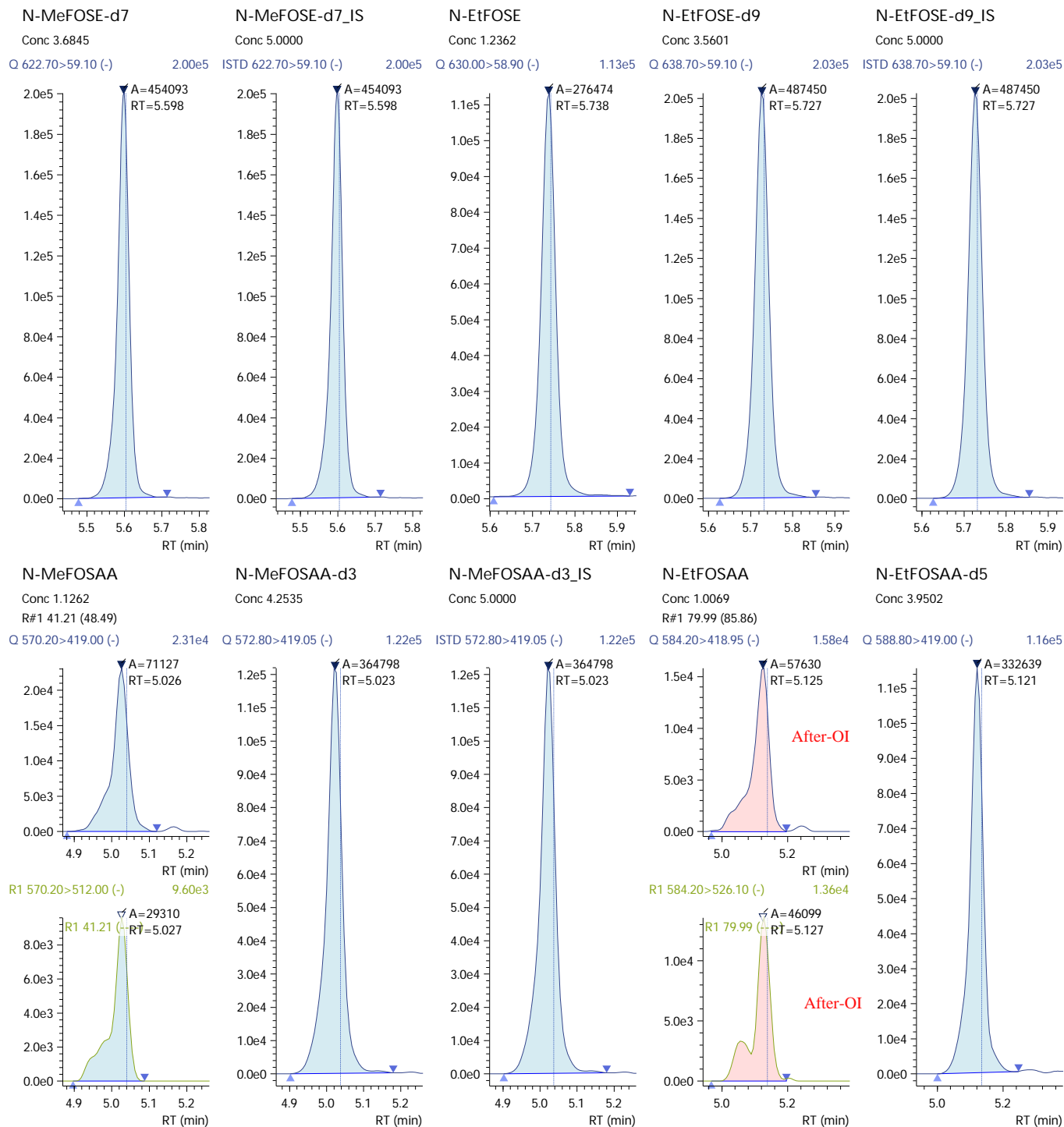


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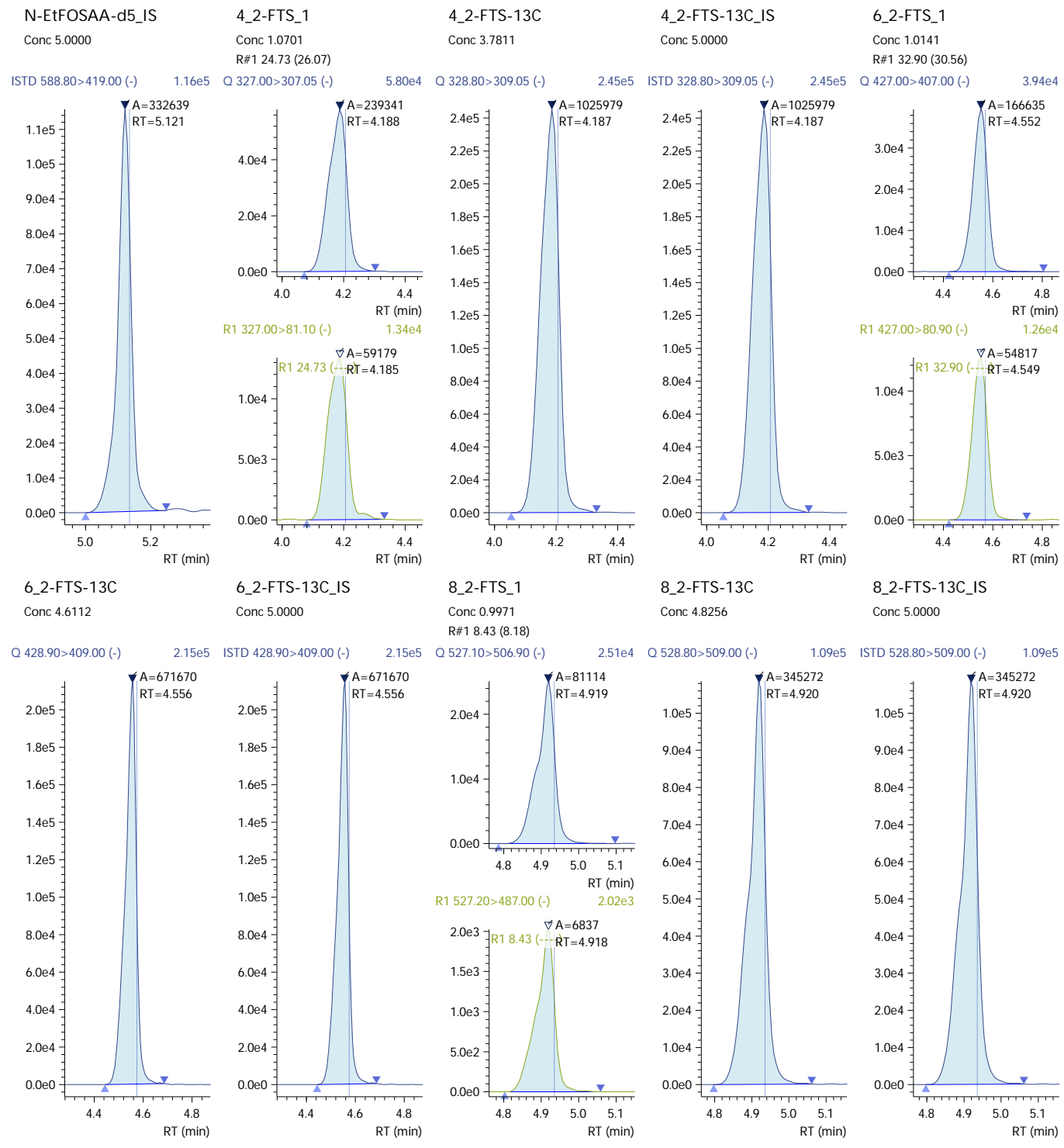


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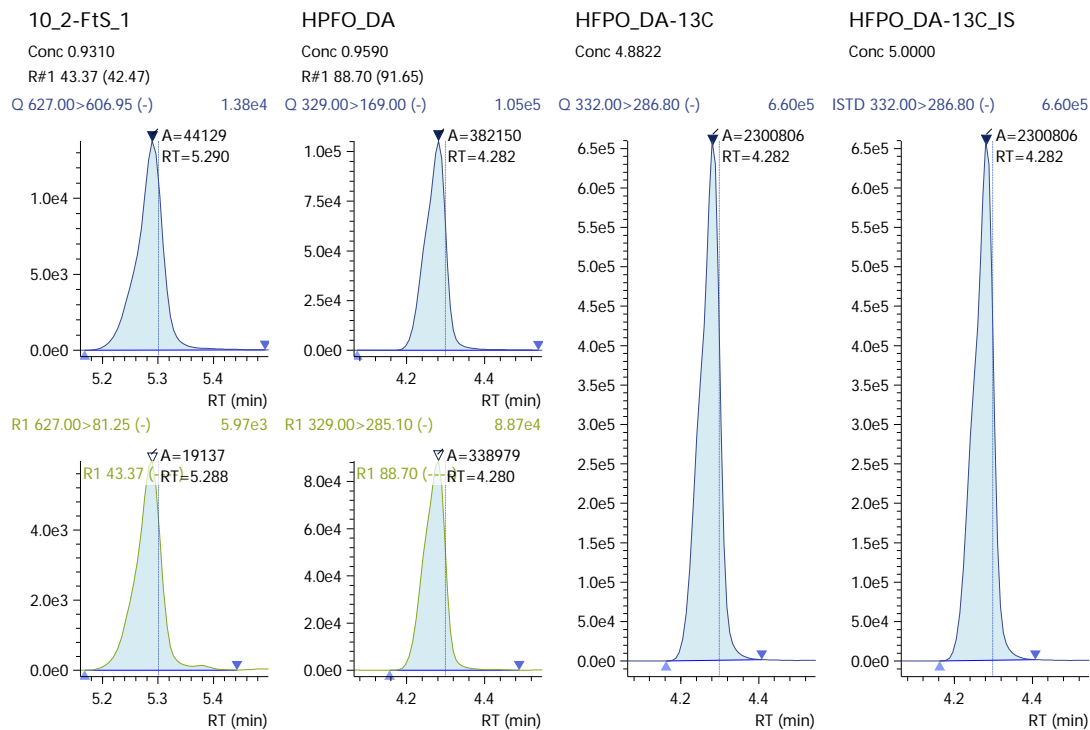


### 210421\_019 (continued)





### 210421\_019 (continued)

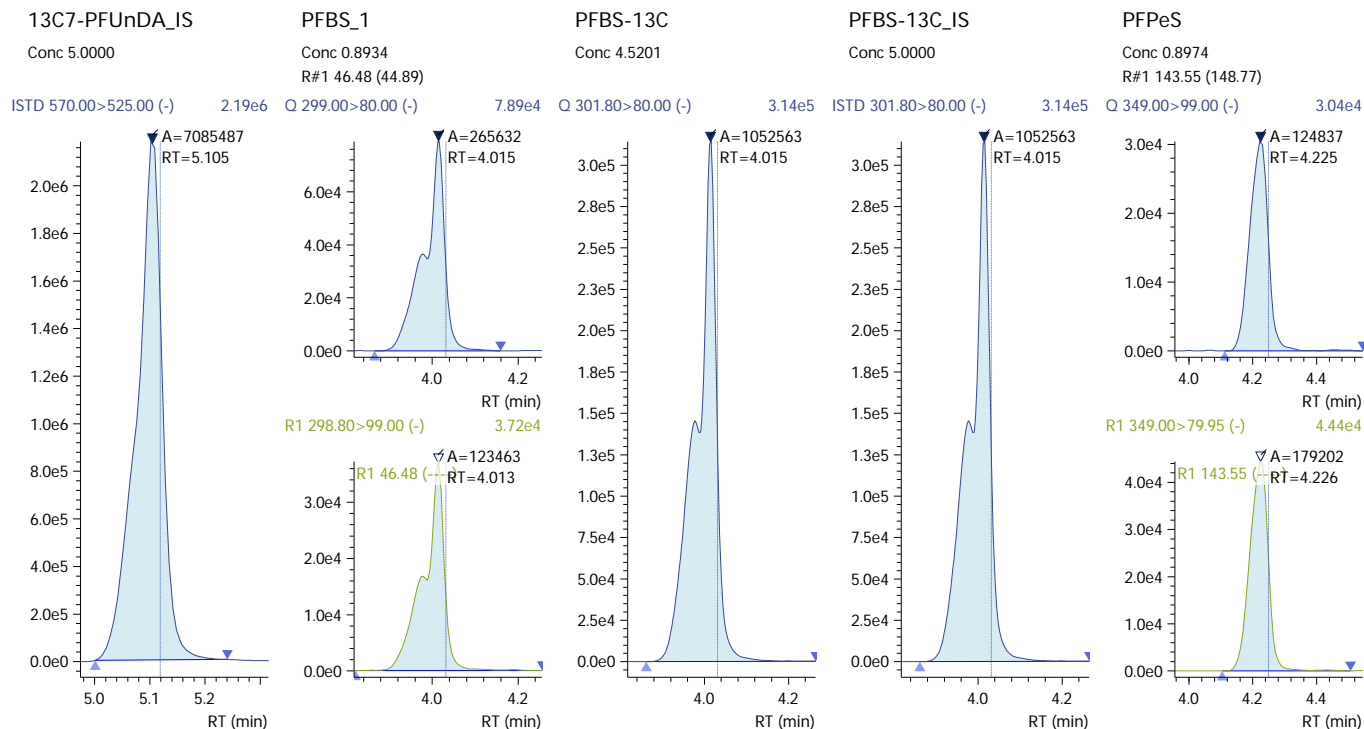






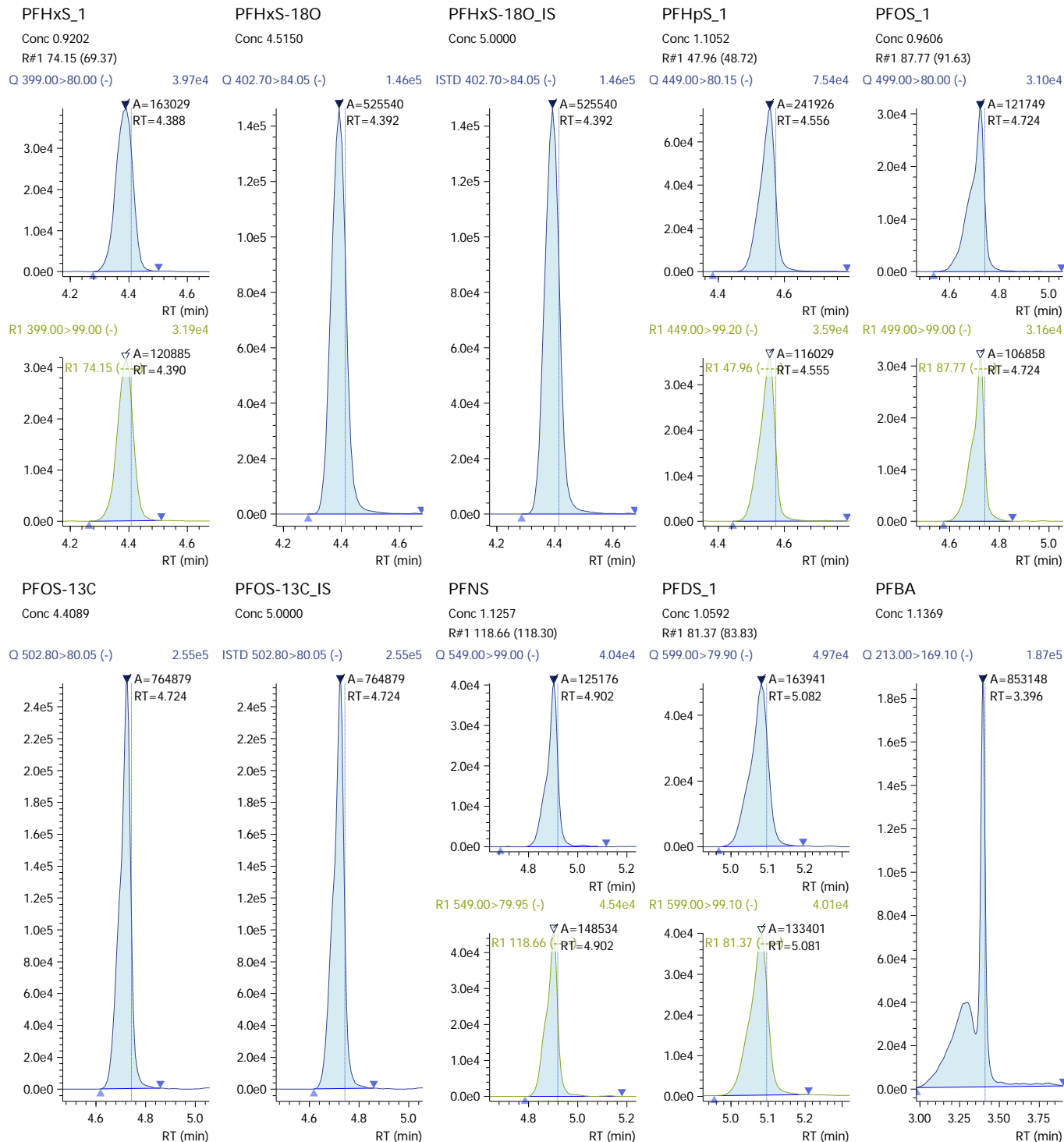
### 210421\_019

Sample ID: PFC CCV @ 1.0 PPB  
Date Acquired: 4/21/2021 12:23:20 PM  
Acquired by: System Administrator  
Data File: 210421\_019  
Vial: 4 | Inj. Volume: 15.0000uL | Tray: 0



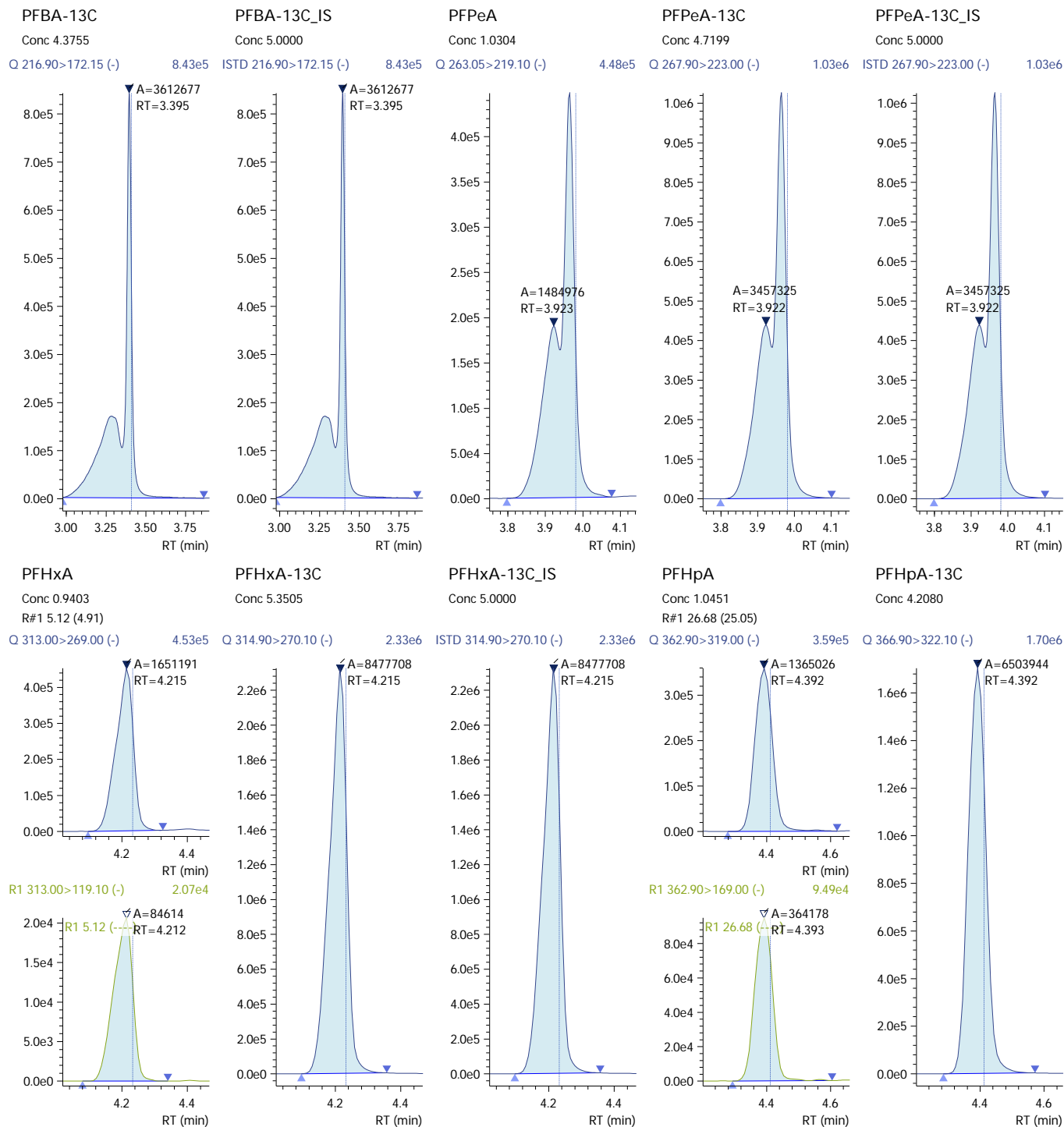


### 210421\_019 (continued)



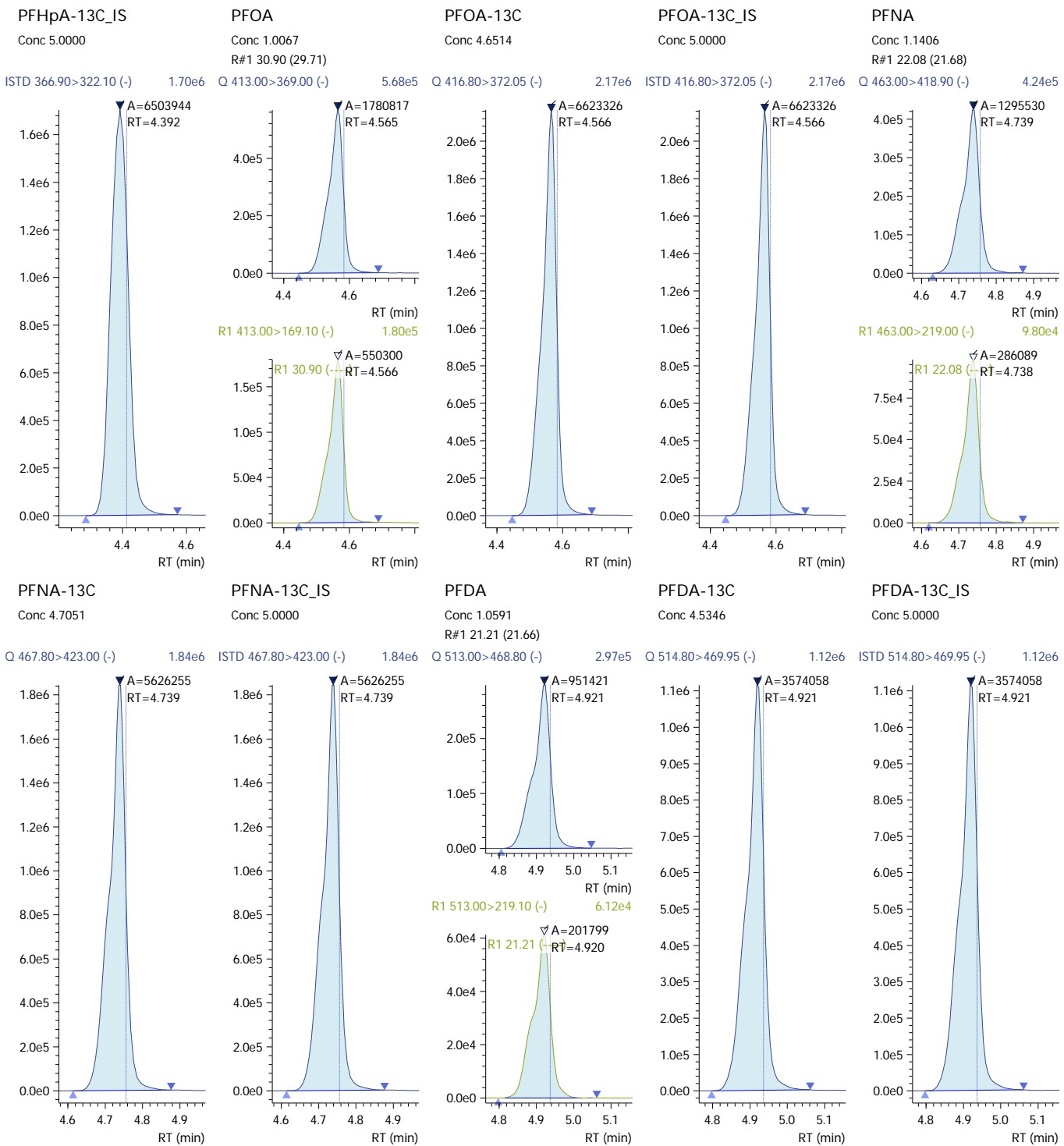


210421\_019 (continued)



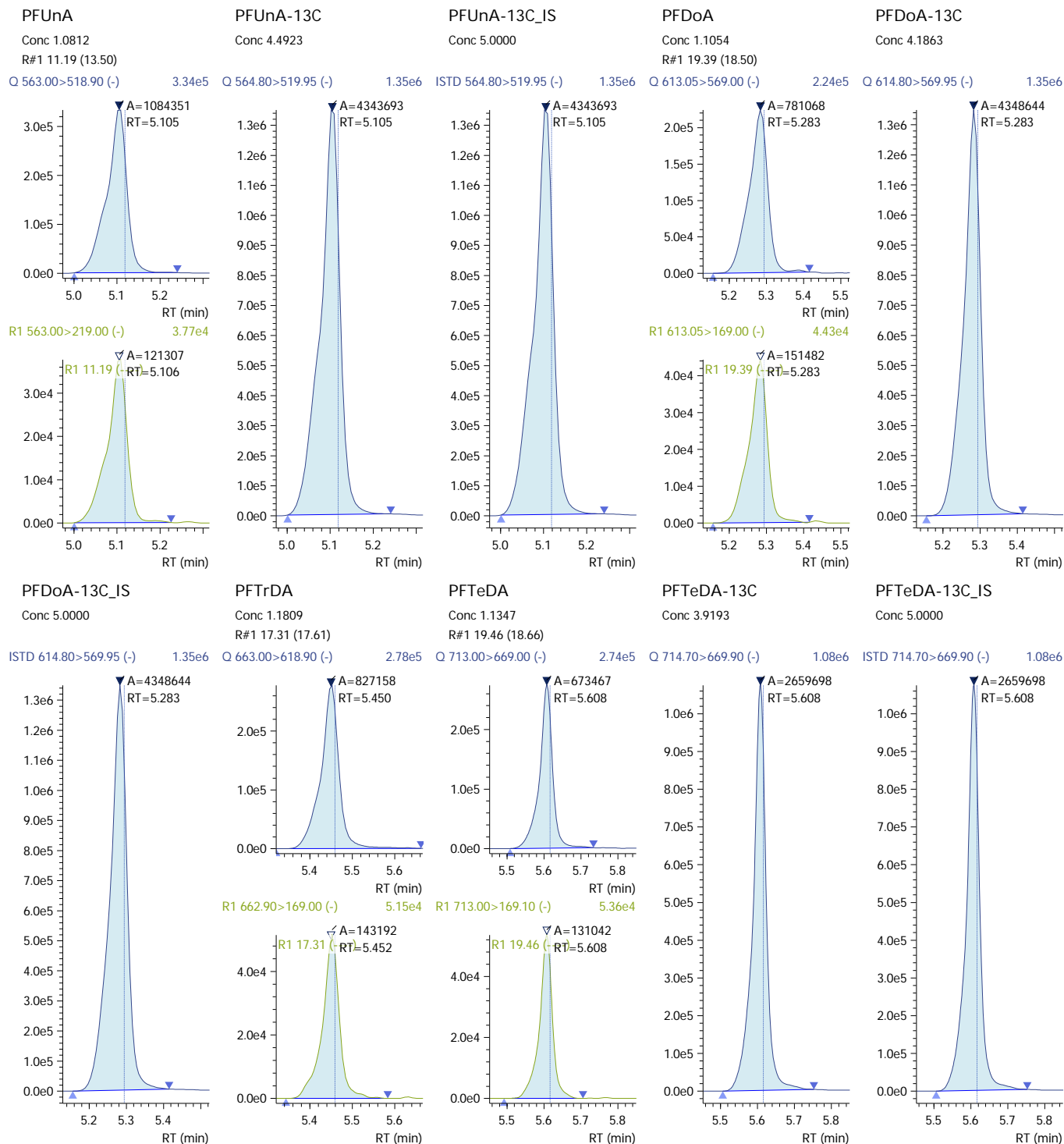


### 210421\_019 (continued)



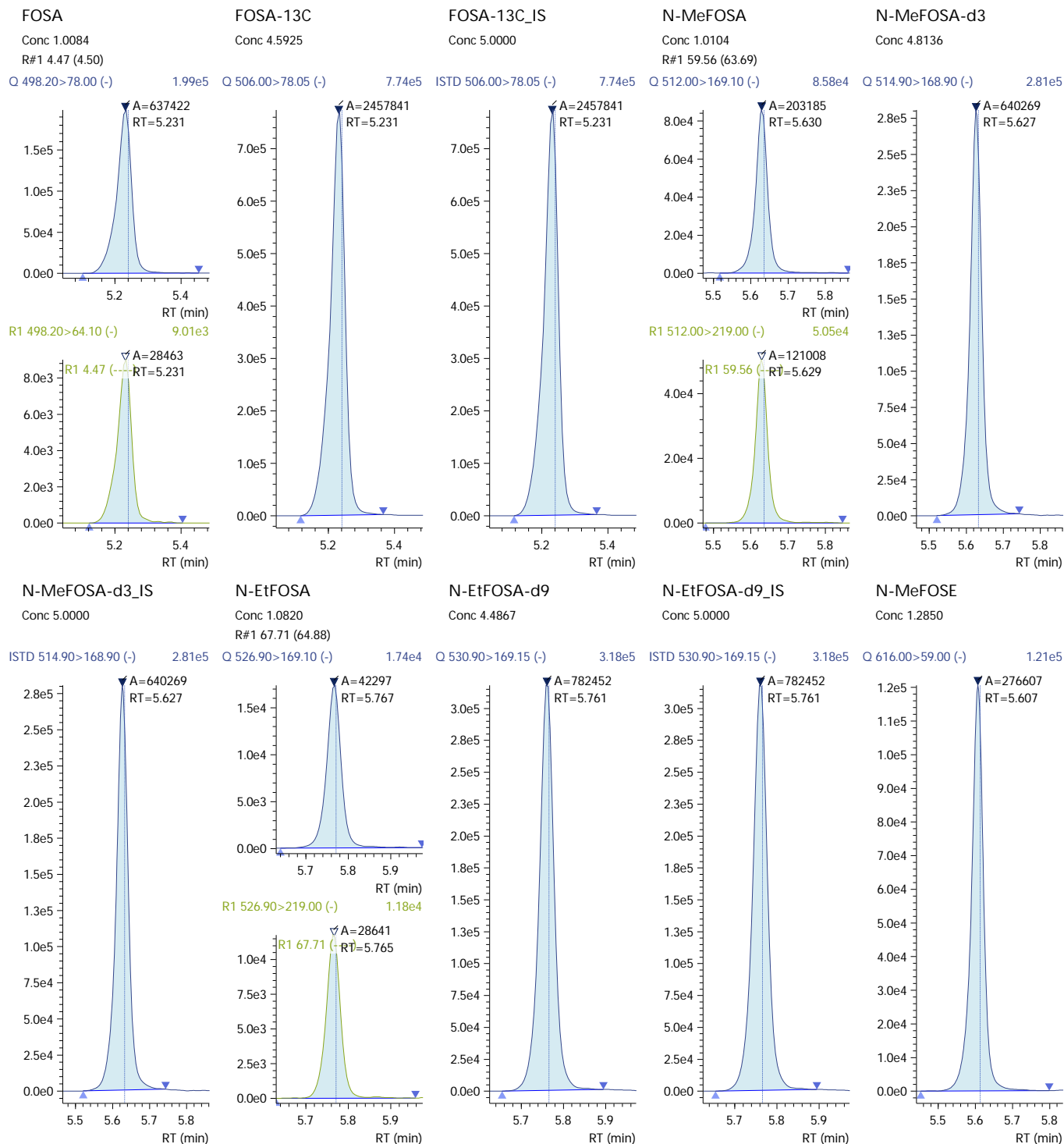


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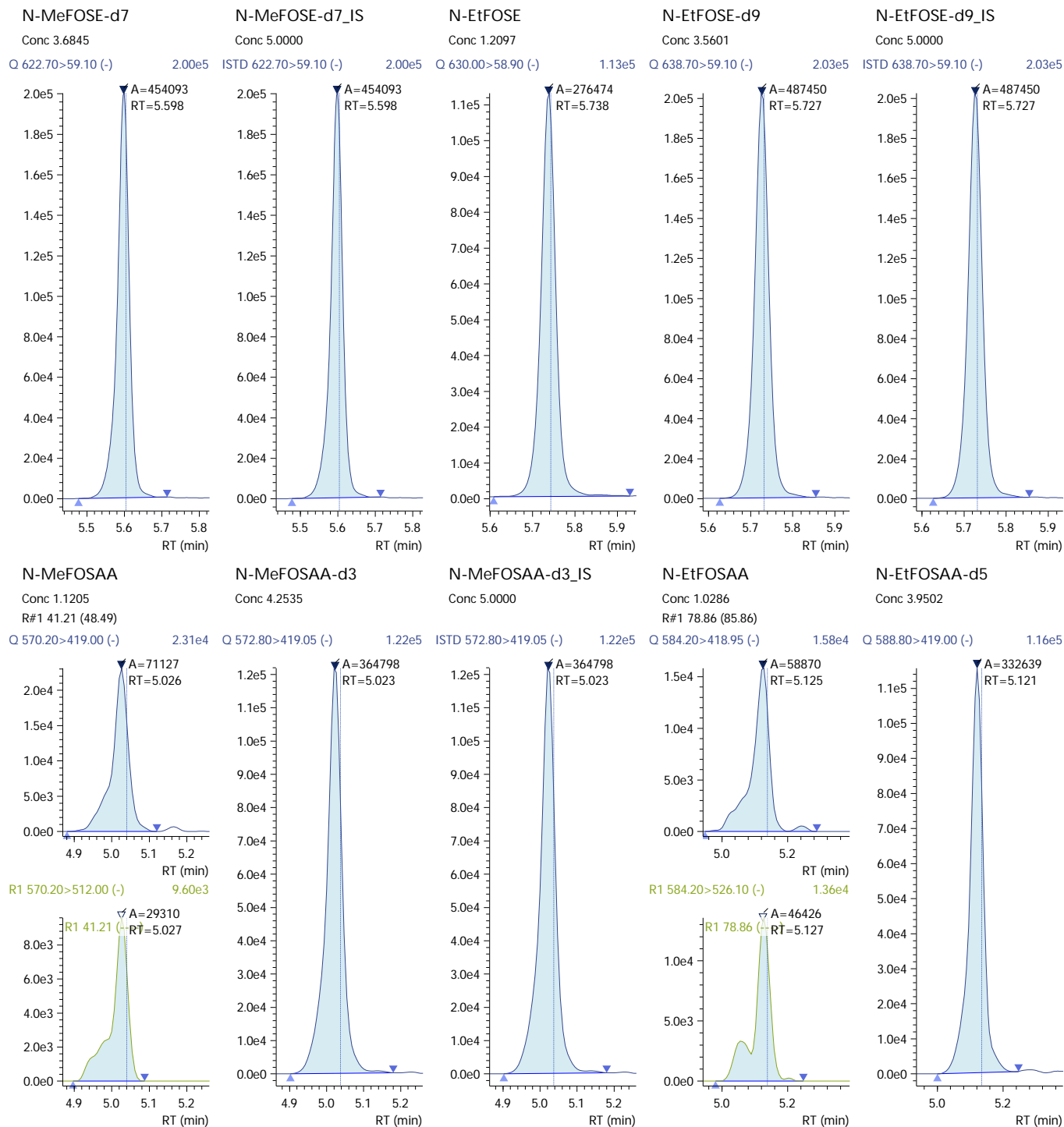


### 210421\_019 (continued)





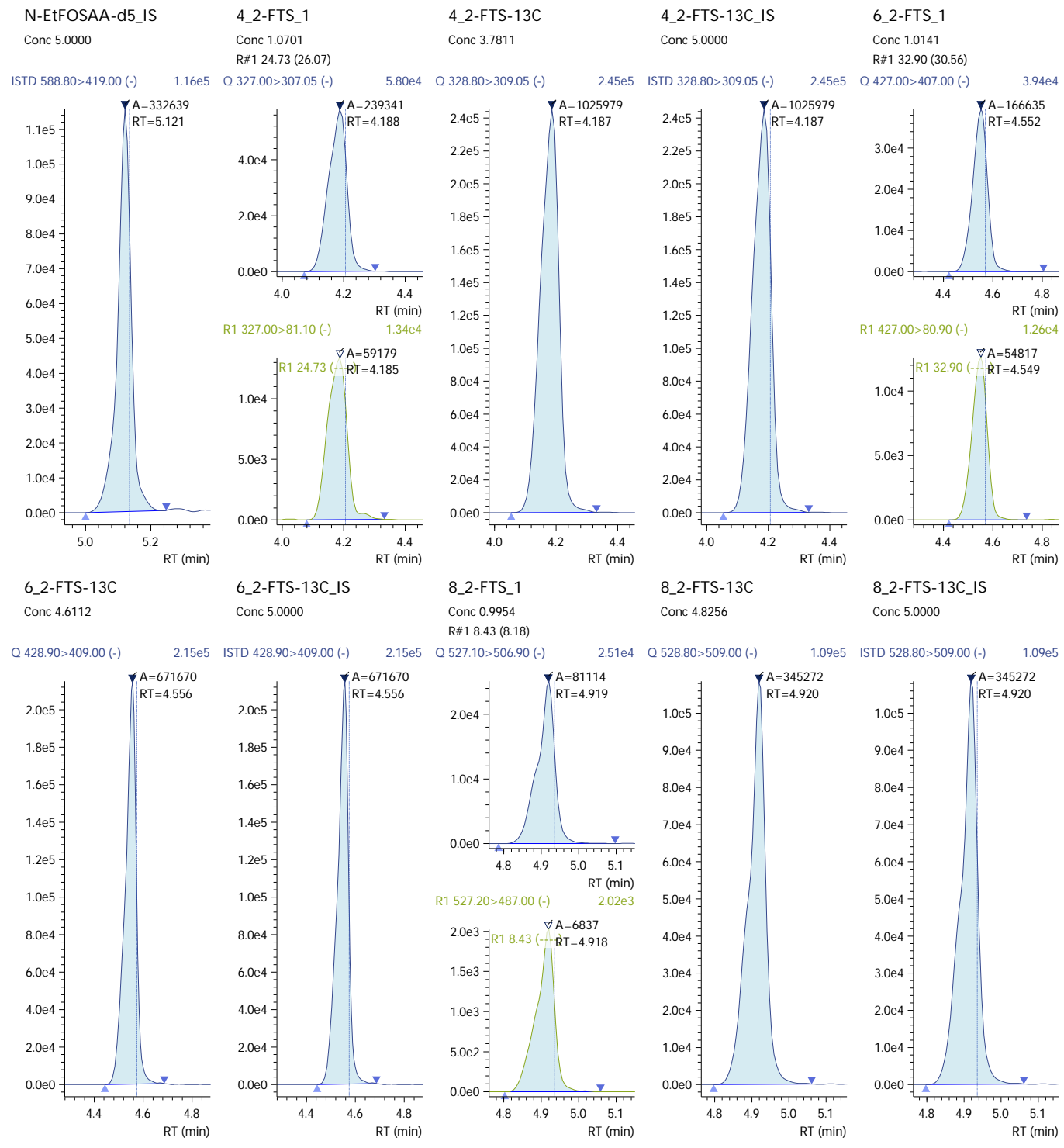
210421\_019 (continued)





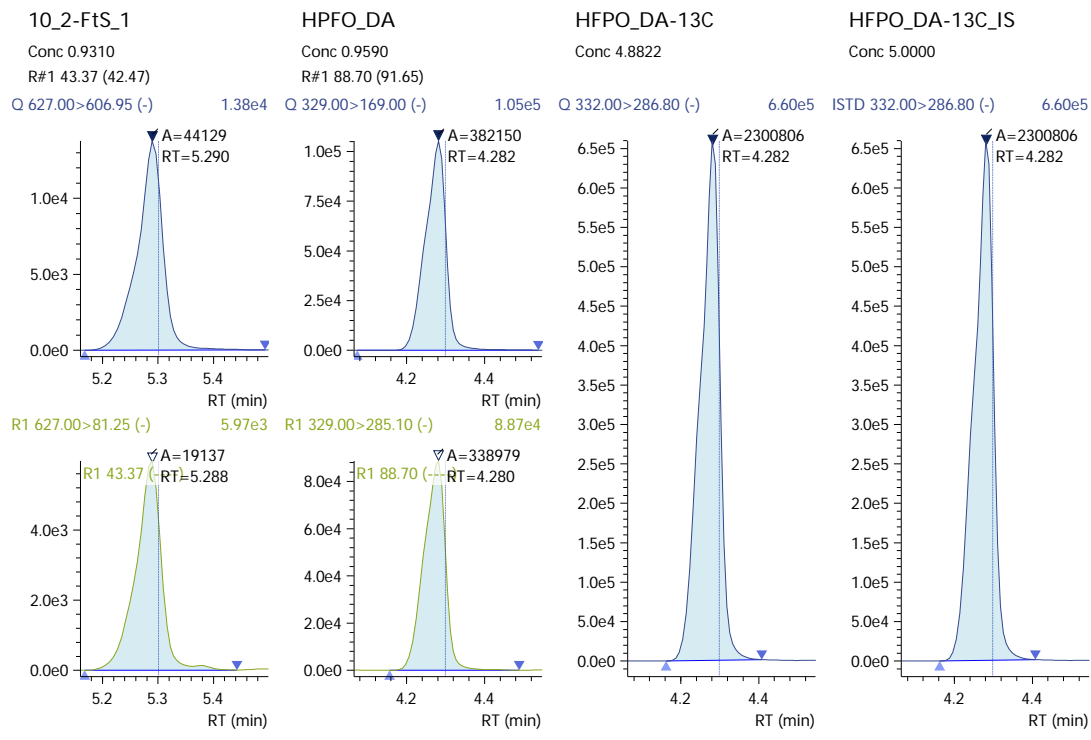


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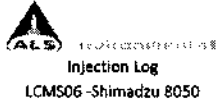




### 210421\_019 (continued)



210413\_curve



ICAL Date: 4/13/2021
Std. xp: 5/24/21 (ICV xp 5/24/21; TPFOA xp 8/16/21)
ICAL ID: KC2100210
LIMS ID: NA

Review: U. Amadioha
mn: Phenomenex EVO-C18 100X4.6 mm S/N: H20-248472

A: 5mM Ammonium Acetate in H2O 20-OLC-03-19G B: 5mM Ammonium Acetate In MeOH 20-OLC-03-19F

Table with columns: Sample Name, File Name, Acquisition Method, Dilution, R. Rows include various sample names like CCB, PFC ICAL 0.05 PPB, etc.

\* EtFOSAA & MeFOSAA > 1/2 mkl in this blank.
Do not report these compds > 10 ppb for
DDD ca 04/15/21

### Sample Information ###

Sample Type: PEG+PPG+Raffinose

Drying Gas Flow :0.00(settings : 10.00) L/min  
 CID Gas Flow :270(settings : 270) kPa  
 Heating Gas Flow :4.98(settings : 5.00) L/Min  
 Interface Bias :+4.00 kV  
 Interface Current :0.85 uA  
 Interface Temp. :99(settings : 100) C  
 DL Temp. :250(settings : 250) C  
 Heat Block Temp. :399(settings : 400) C  
 Q1 RF Gain :4999  
 Q1 RF Offset :5000  
 Q3 RF Gain :---  
 Q3 RF Offset :---  
 Q1 Post-rod Bias :-5.0 V  
 CID CELL Exit Lens :-4.0 V  
 Conversion Dynode :-10.00 kV  
 Detector :-2.20(-2.20) kV  
 Vacuum Pressure(QA) :1.4e+02 Pa  
 Vacuum Pressure(QP) :2.1e-03 Pa

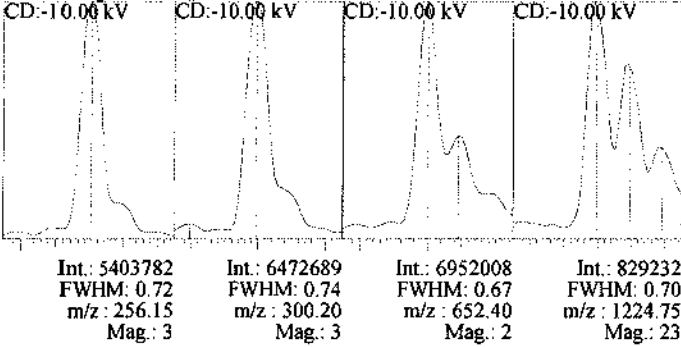
### Tuning Condition ###

Detector Adjustment: On  
 Resolution Adjustment: On  
 FWHM of Spectrum: 0.70  
 Sensitivity Adjustment: On  
 Mass Calibration: On

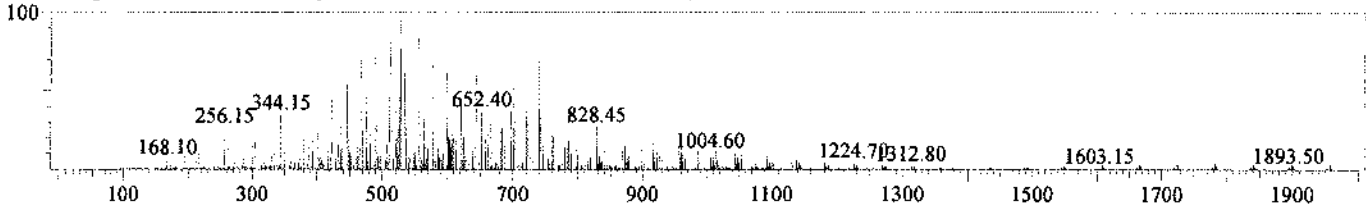
### Tuning Result ###

Model :LCMS-8050  
 Serial Number :O10835355039US  
 Interface :ESI  
 Polarity :Positive  
 Tuning Mode :Auto Tuning  
 Tuning Date :4/13/2021 3:26:31 PM  
 Acquisition Mode :Q1 Scan(Use CID Gas)  
 Nebulizing Gas Flow :1.50(settings : 1.50) L/min

### Tuning Profile ###



Scan Range: 2.00 - 2000.00 Scan Speed: 30 u/s Base Peak: 527.10 (20000000)



m/z(Target)	m/z(Actual)	Difference	Width	Intensity
45.05	45.05	0.00	0.69	5832300
256.15	256.15	0.00	0.72	5403782
300.20	300.15	-0.05	0.74	6472689
652.40	652.40	0.00	0.67	6952008
1224.75	1224.70	-0.05	0.70	829232

WA

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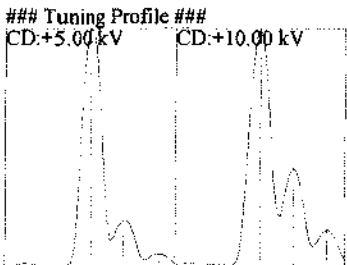
u

LCMS06-210413.LCT

### Tuning Condition ###  
 Detector Adjustment: On  
 Resolution Adjustment: On  
 FWHM of Spectrum: 0.70  
 Sensitivity Adjustment: On  
 Mass Calibration: On

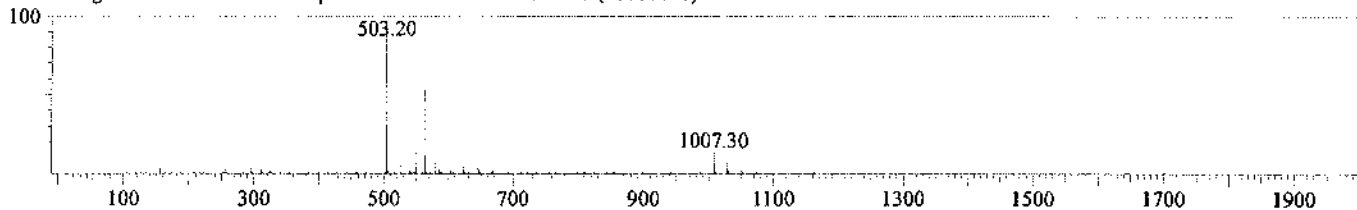
Heating Gas Flow : 3.00(settings : 3.00) L/min  
 Interface Bias : -3.00 kV  
 Interface Current : 0.50 uA  
 Interface Temp. : 99(settings : 100) C  
 DL Temp. : 250(settings : 250) C  
 Heat Block Temp. : 399(settings : 400) C  
 Q1 RF Gain : 5000  
 Q1 RF Offset : 5000  
 Q3 RF Gain : ---  
 Q3 RF Offset : ---  
 Q1 Post-rod Bias : 5.0 V  
 CID CELL Exit Lens : 3.5 V  
 Conversion Dynode : +10.00 kV  
 Detector : -2.20(-2.20) kV  
 Vacuum Pressure(QA) : 1.4e+02 Pa  
 Vacuum Pressure(QP) : 2.0e-03 Pa

### Tuning Result ###  
 Model : LCMS-8050  
 Serial Number : O10835355039US  
 Interface : ESI  
 Polarity : Negative  
 Tuning Mode : Auto Tuning  
 Tuning Date : 4/13/2021 3:30:51 PM  
 Acquisition Mode : Q1 Scan(Use CID Gas)  
 Nebulizing Gas Flow : 1.50(settings : 1.50) L/min



Int.: 14476063      Int.: 2852371  
 FWHM: 0.71      FWHM: 0.69  
 m/z : 503.15      m/z : 1007.30  
 Mag.: 1            Mag.: 7

Scan Range: 2.00 - 2000.00 Scan Speed: 30 u/s Base Peak: 503.20 (20000000)



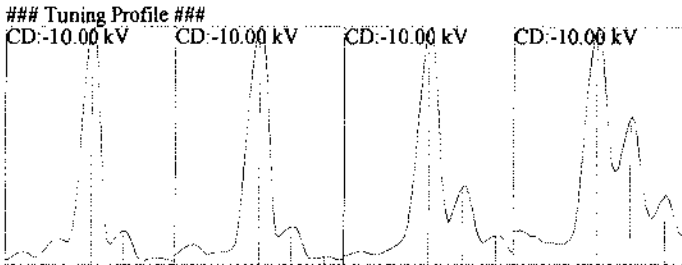
m/z(Target)	m/z(Actual)	Difference	Width	Intensity
503.15	503.20	0.05	0.71	14476063
1007.30	1007.30	0.00	0.69	2852371

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### Tuning Condition ###  
 Detector Adjustment: On  
 Resolution Adjustment: On  
 FWHM of Spectrum: 0.70  
 Sensitivity Adjustment: On  
 Mass Calibration: On

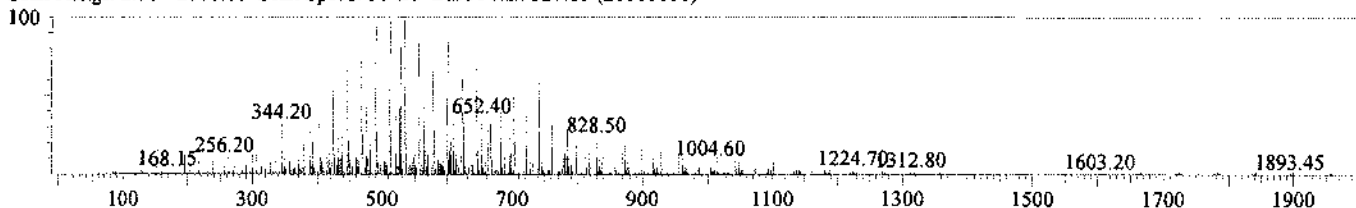
Heating Gas Flow : 3.00(settings : 3.00) L/min  
 Interface Bias : +4.00 kV  
 Interface Current : 1.22 uA  
 Interface Temp. : 99(settings : 100) C  
 DL Temp. : 249(settings : 250) C  
 Heat Block Temp. : 400(settings : 400) C  
 Q1 RF Gain : ---  
 Q1 RF Offset : ---  
 Q3 RF Gain : 4997  
 Q3 RF Offset : 4990  
 Q1 Post-rod Bias : -5.0 V  
 CID CELL Exit Lens : -4.0 V  
 Conversion Dynode : -10.00 kV  
 Detector : -2.20(-2.20) kV  
 Vacuum Pressure(QA) : 1.4e+02 Pa  
 Vacuum Pressure(QP) : 2.0e-03 Pa

### Tuning Result ###  
 Model : LCMS-8050  
 Serial Number : O10835355039US  
 Interface : ESI  
 Polarity : Positive  
 Tuning Mode : Auto Tuning  
 Tuning Date : 4/13/2021 3:34:06 PM  
 Acquisition Mode : Q3 Scan(Use CID Gas)  
 Nebulizing Gas Flow : 1.50(settings : 1.50) L/min



Int.: 2224368	Int.: 5184646	Int.: 7158136	Int.: 532930
FWHM: 0.66	FWHM: 0.70	FWHM: 0.69	FWHM: 0.75
m/z: 256.15	m/z: 300.20	m/z: 652.40	m/z: 1224.75
Mag.: 8	Mag.: 3	Mag.: 2	Mag.: 36

Scan Range: 2.00 - 2000.00 Scan Speed: 30 u/s Base Peak: 527.15 (20000000)



m/z(Target)	m/z(Actual)	Difference	Width	Intensity
45.05	45.10	0.05	0.71	12889242
256.15	256.20	0.05	0.66	2224368
300.20	300.20	0.00	0.70	5184646
652.40	652.40	0.00	0.69	7158136
1224.75	1224.70	-0.05	0.75	532930

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### Tuning Condition ###

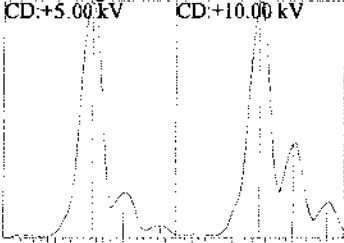
Detector Adjustment: On  
Resolution Adjustment: On  
FWHM of Spectrum: 0.70  
Sensitivity Adjustment: On  
Mass Calibration: On

Heating Gas Flow : 3.00(settings : 3.00) L/min  
Interface Bias : -3.00 kV  
Interface Current : 0.52 uA  
Interface Temp. : 100(settings : 100) C  
DL Temp. : 249(settings : 250) C  
Heat Block Temp. : 400(settings : 400) C  
Q1 RF Gain : ---  
Q1 RF Offset : ---  
Q3 RF Gain : 4999  
Q3 RF Offset : 5000  
Q1 Post-rod Bias : 5.0 V  
CID CELL Exit Lens : 3.5 V  
Conversion Dynode : +10.00 kV  
Detector : -2.20(-2.20) kV  
Vacuum Pressure(QA) : 1.4e+02 Pa  
Vacuum Pressure(QP) : 2.0e-03 Pa

### Tuning Result ###

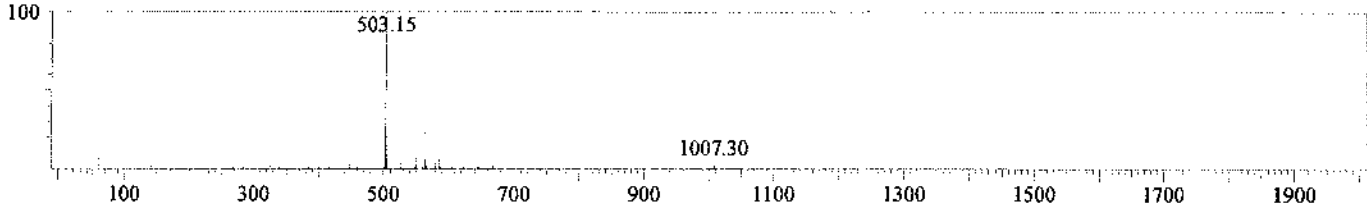
Model : LCMS-8050  
Serial Number : O10835355039US  
Interface : ESI  
Polarity : Negative  
Tuning Mode : Auto Tuning  
Tuning Date : 4/13/2021 3:37:03 PM  
Acquisition Mode : Q3 Scan(Use CID Gas)  
Nebulizing Gas Flow : 1.50(settings : 1.50) L/min

### Tuning Profile ###



Int.: 10869490      Int.: 1132580  
FWHM: 0.76      FWHM: 0.69  
m/z : 503.15      m/z : 1007.30  
Mag.: 1            Mag.: 17

Scan Range: 2.00 - 2000.00 Scan Speed: 30 u/s Base Peak: 503.15 (20000000)



m/z(Target)	m/z(Actual)	Difference	Width	Intensity
503.15	503.15	0.00	0.76	10869490
1007.30	1007.30	0.00	0.69	1132580

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### Tuning Condition ###

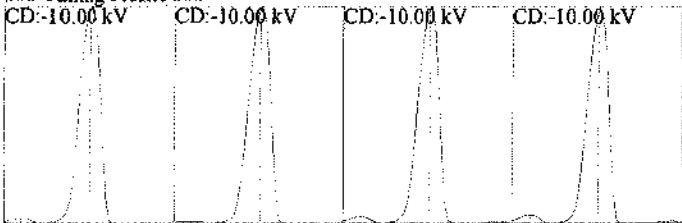
Detector Adjustment: On  
 Resolution Adjustment: On  
 FWHM of Spectrum: 0.70  
 Sensitivity Adjustment: On  
 Mass Calibration: On

Heating Gas Flow : 5.00(settings : 5.00) L/min  
 Interface Bias : +4.00 kV  
 Interface Current : 1.70 uA  
 Interface Temp. : 100(settings : 100) C  
 DL Temp. : 249(settings : 250) C  
 Heat Block Temp. : 400(settings : 400) C  
 Q1 RF Gain : 4999  
 Q1 RF Offset : 5000  
 Q3 RF Gain : 4997  
 Q3 RF Offset : 4989  
 Q1 Post-rod Bias : -5.0 V  
 CID CELL Exit Lens : -1.5 V  
 Conversion Dynode : -10.00 kV  
 Detector : -2.20(-2.20) kV  
 Vacuum Pressure(QA) : 1.4e+02 Pa  
 Vacuum Pressure(QP) : 2.0e-03 Pa

### Tuning Result ###

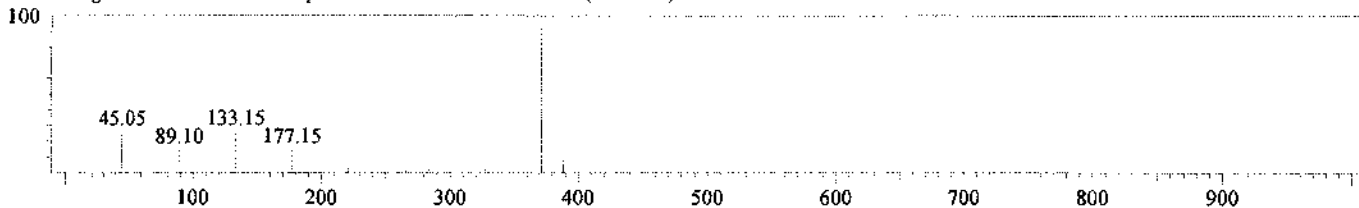
Model : LCMS-8050  
 Serial Number : O10835355039US  
 Interface : ESI  
 Polarity : Positive  
 Tuning Mode : Auto Tuning  
 Tuning Date : 4/13/2021 3:40:41 PM  
 Acquisition Mode : Product Ion Scan  
 Nebulizing Gas Flow : 1.50(settings : 1.50) L/min

### Tuning Profile ###



Int.: 213398	Int.: 331040	Int.: 1166657	Int.: 678840
FWHM: 0.74	FWHM: 0.70	FWHM: 0.69	FWHM: 0.69
m/z: 45.05	m/z: 89.05	m/z: 133.10	m/z: 177.10
Pre m/z: 168.10	Pre m/z: 168.10	Pre m/z: 388.25	Pre m/z: 388.25
Mag.: 92	Mag.: 59	Mag.: 16	Mag.: 28

Scan Range: 2.00 - 438.25 Scan Speed: 30 u/s Base Peak: 371.20 (4441784) Pre m/z: 388.25



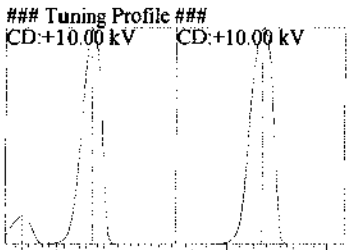
m/z(Target)	m/z(Actual)	Difference	Width	Intensity
168.10 > 45.05	---	---	0.74	213398
168.10 > 89.05	---	---	0.70	331040
388.25 > 133.10	133.15	0.05	0.69	1166657
388.25 > 177.10	177.15	0.05	0.69	678840

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### Tuning Condition ###  
 Detector Adjustment: On  
 Resolution Adjustment: On  
 FWHM of Spectrum: 0.70  
 Sensitivity Adjustment: On  
 Mass Calibration: On

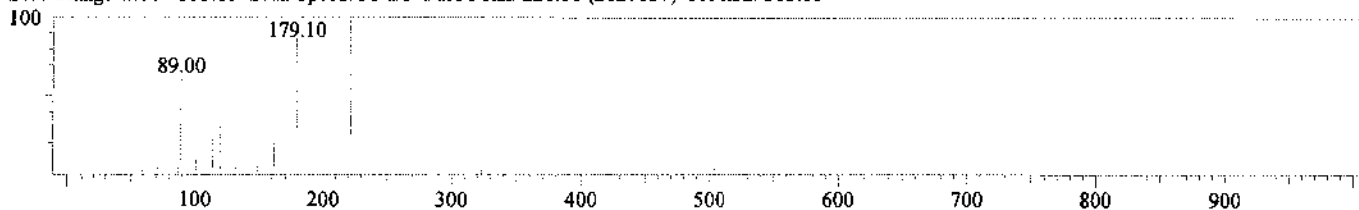
Heating Gas Flow : 3.01(settings : 3.00) L/min  
 Interface Bias : -3.00 kV  
 Interface Current : 0.54 uA  
 Interface Temp. : 100(settings : 100) C  
 DL Temp. : 249(settings : 250) C  
 Heat Block Temp. : 399(settings : 400) C  
 Q1 RF Gain : 5000  
 Q1 RF Offset : 5000  
 Q3 RF Gain : 4999  
 Q3 RF Offset : 5012  
 Q1 Post-rod Bias : 5.0 V  
 CID CELL Exit Lens : -0.3 V  
 Conversion Dynode : +10.00 kV  
 Detector : -2.20(-2.20) kV  
 Vacuum Pressure(QA) : 1.4e+02 Pa  
 Vacuum Pressure(QP) : 2.0e-03 Pa

### Tuning Result ###  
 Model : LCMS-8050  
 Serial Number : O10835355039US  
 Interface : ESI  
 Polarity : Negative  
 Tuning Mode : Auto Tuning  
 Tuning Date : 4/13/2021 3:40:41 PM  
 Acquisition Mode : Product Ion Scan  
 Nebulizing Gas Flow : 1.50(settings : 1.50) L/min



Int.: 1572964	Int.: 2281798
FWHM: 0.69	FWHM: 0.76
m/z: 89.00	m/z: 179.05
Pre m/z: 503.15	Pre m/z: 503.15
Mag: 12	Mag: 8

Scan Range: 2.00 - 553.15 Scan Speed: 30 u/s Base Peak: 221.10 (2627157) Pre m/z: 503.15



m/z(Target)	m/z(Actual)	Difference	Width	Intensity
503.15 > 89.00	89.00	0.00	0.69	1572964
503.15 > 179.05	179.10	0.05	0.76	2281798

WPA

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## 210413\_032

Sample ID: CCB  
 Date Acquired: 4/13/2021 5:18:53 PM  
 Acquired by: System Administrator  
 Data File: 210413\_032  
 Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.118	0.000	----	5559965	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.032	0.000	0.00	989	747	75.53	44.89	22.44-67.33	IRr
PFBS-13C	301.80>80.00	----	4.033	0.001	-1.09	1032564	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.033	0.001	----	1032564	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.248	-0.001	0.22	430	138	32.09	148.77	74.38 -223.15	IRr
PFHxS_1	399.00>80.00	399.00>99.00	4.415	0.007	0.00	1084	2225	205.36	69.37	34.68 -104.05	IRr
PFHxS-18O	402.70>84.05	----	4.416	0.003	-0.70	563669	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.416	0.003	----	563669	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.580	0.005	0.16	125	344	275.20	48.72	24.36-73.08	IRr
PFOS_1	499.00>80.00	499.00>99.00	4.749	0.007	0.01	500	839	167.80	91.63	45.82 -137.45	IRr
PFOS-13C	502.80>80.05	----	4.743	0.001	-0.38	783505	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.743	0.001	----	783505	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	----	----	----	----	0	0.00	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	----	----	----	----	0	0.00	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	----	----	----	----	----	----	----		
PFBA-13C	216.90>172.15	----	3.418	0.009	-1.70	3920209	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.418	0.009	----	3920209	----	----	----		
PFPeA	263.05>219.10	----	3.982	0.001	0.00	37511	----	----	----		
PFPeA-13C	267.90>223.00	----	3.982	0.001	-1.14	3196000	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.982	0.001	----	3196000	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.232	-0.001	0.00	16550	180	1.09	4.91	2.46-7.37	IRr
PFHxA-13C	314.90>270.10	----	4.236	0.004	-0.88	7341313	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.236	0.004	----	7341313	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.405	-0.007	-0.01	6979	1364	19.54	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.416	0.004	-0.70	6953892	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.416	0.004	----	6953892	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.583	-0.001	0.00	6774	2114	31.20	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.585	0.001	-0.53	6363981	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.585	0.001	----	6363981	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	----	----	----	----	0	0.00	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_032 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.757	0.000	-0.36	5037131	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.757	0.000	----	5037131	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.931	-0.006	-0.01	1850	279	15.08	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.937	0.001	-0.18	3600222	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.937	0.001	----	3600222	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.106	-0.013	-0.01	2769	233	8.42	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.118	-0.001	0.00	4372540	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.118	-0.001	----	4372540	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.291	-0.002	0.00	1402	401	28.57	18.50	9.25-27.75	IRr
PFDaA-13C	614.80>569.95	----	5.294	0.000	0.18	4720847	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.294	0.000	----	4720847	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	----	----	----	----	0	0.00	17.61	8.8-26.41	
PFTeDA	713.00>669.00	713.00>169.10	5.620	0.004	0.00	5972	268	4.49	18.66	9.33-27.99	IRr
PFTeDA-13C	714.70>669.90	----	5.619	0.003	0.50	3045962	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.619	0.003	----	3045962	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.242	0.001	0.00	1634	41	2.51	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.238	-0.003	0.12	1973839	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.238	-0.003	----	1973839	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.630	-0.005	0.00	1416	424	29.94	63.69	31.85-95.54	IRr
N-MeFOSA-d3	514.90>168.90	----	5.632	-0.001	0.51	524731	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.632	-0.001	----	524731	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.770	-0.001	0.01	498	225	45.18	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.765	-0.001	0.65	665226	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.765	-0.001	----	665226	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.616	0.003	0.01	355	----	----	----	0-0	
N-MeFOSE-d7	622.70>59.10	----	5.603	-0.001	0.49	421741	----	----	----	0-0	
N-MeFOSE-d7_IS	622.70>59.10	----	5.603	-0.001	----	421741	----	----	----	0-0	
N-EtFOSE	630.00>58.90	----	----	----	----	----	----	----	----	0-0	
N-EtFOSE-d9	638.70>59.10	----	5.731	-0.001	0.61	486981	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.731	-0.001	----	486981	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	----	----	----	----	0	0.00	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.036	-0.001	-0.08	379132	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.036	-0.001	----	379132	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	----	----	----	----	0	0.00	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.133	-0.003	0.01	370305	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.133	-0.003	----	370305	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.218	0.012	0.01	215	828	386.21	26.07	13.03-39.1	IRr
4_2-FTS-13C	328.80>309.05	----	4.210	0.003	-0.91	1020941	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_032 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.210	0.003	----	1020941	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.572	0.003	0.00	608	66	10.86	30.56	15.28-45.84	IRr
6_2-FTS-13C	428.90>409.00	----	4.576	0.002	-0.54	646405	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.576	0.002	----	646405	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.934	-0.001	0.00	162	29	17.90	8.18	4.09-12.27	IRr
8_2-FTS-13C	528.80>509.00	----	4.936	0.001	-0.18	314543	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.936	0.001	----	314543	----	----	----	0-0	
10_2-Fts_1	627.00>606.95	627.00>81.25	----	----	----	----	0	0.00	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.303	0.004	0.00	197	302	153.30	91.65	45.83 -137.48	IRr
HFPO_DA-13C	332.00>286.80	----	4.302	0.003	-0.82	1850361	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.302	0.003	----	1850361	----	----	----		

Flag ID key: IRr: Ion Ratio (Relative)



## 210413\_032

Sample ID: CCB

Date Acquired: 4/13/2021 5:18:53 PM

Acquired by: System Administrator

Data File: 210413\_032

Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.118	5559965	5559965	----	----	5.0000	ng/mL
PFBS_1	M	4.032	989	1032564	PFBS-13C_IS	----	0.0034	ng/mL
PFBS-13C	Auto	4.033	1032564	5559965	13C7-PFUnDA_IS	----	5.6040	ng/mL
PFBS-13C_IS	Auto	4.033	1032564	1032564	----	----	5.0000	ng/mL
PFPeS	M	4.248	430	1032564	PFBS-13C_IS	----	0.0031	ng/mL
PFHxS_1	MI R1	4.415	1084	563669	PFHxS-18O_IS	----	-0.0168	ng/mL
PFHxS-18O	Auto	4.416	563669	5559965	13C7-PFUnDA_IS	----	6.1713	ng/mL
PFHxS-18O_IS	Auto	4.416	563669	563669	----	----	5.0000	ng/mL
PFHpS_1	M	4.580	125	563669	PFHxS-18O_IS	----	0.0005	ng/mL
PFOS_1	MI R1	4.749	500	783505	PFOS-13C_IS	----	0.0039	ng/mL
PFOS-13C	Auto	4.743	783505	5559965	13C7-PFUnDA_IS	----	5.7554	ng/mL
PFOS-13C_IS	Auto	4.743	783505	783505	----	----	5.0000	ng/mL
PFNS	ND(W/B)	----	----	783505	PFOS-13C_IS	----	----	ng/mL
PFDS_1	ND(W/B)	----	----	783505	PFOS-13C_IS	----	----	ng/mL
PFBA	ND(W/B)	----	----	3920209	PFBA-13C_IS	----	----	ng/mL
PFBA-13C	Auto	3.418	3920209	5559965	13C7-PFUnDA_IS	----	6.0507	ng/mL
PFBA-13C_IS	Auto	3.418	3920209	3920209	----	----	5.0000	ng/mL
PFPeA	Auto	3.982	37511	3196000	PFPeA-13C_IS	----	0.0006	ng/mL
PFPeA-13C	Auto	3.982	3196000	5559965	13C7-PFUnDA_IS	----	5.5603	ng/mL
PFPeA-13C_IS	Auto	3.982	3196000	3196000	----	----	5.0000	ng/mL
PFHxA	M	4.232	16550	7341313	PFHxA-13C_IS	----	0.0109	ng/mL
PFHxA-13C	Auto	4.236	7341313	5559965	13C7-PFUnDA_IS	----	5.9046	ng/mL
PFHxA-13C_IS	Auto	4.236	7341313	7341313	----	----	5.0000	ng/mL
PFHpA	M	4.405	6979	6953892	PFHpA-13C_IS	----	0.0050	ng/mL
PFHpA-13C	Auto	4.416	6953892	5559965	13C7-PFUnDA_IS	----	5.7336	ng/mL
PFHpA-13C_IS	Auto	4.416	6953892	6953892	----	----	5.0000	ng/mL
PFOA	MI R1	4.583	6774	6363981	PFOA-13C_IS	----	0.0040	ng/mL
PFOA-13C	Auto	4.585	6363981	5559965	13C7-PFUnDA_IS	----	5.6955	ng/mL
PFOA-13C_IS	Auto	4.585	6363981	6363981	----	----	5.0000	ng/mL
PFNA	ND(W/B)	----	----	5037131	PFNA-13C_IS	----	----	ng/mL
PFNA-13C	Auto	4.757	5037131	5559965	13C7-PFUnDA_IS	----	5.3682	ng/mL
PFNA-13C_IS	Auto	4.757	5037131	5037131	----	----	5.0000	ng/mL
PFDA	M	4.931	1850	3600222	PFDA-13C_IS	----	0.0020	ng/mL
PFDA-13C	Auto	4.937	3600222	5559965	13C7-PFUnDA_IS	----	5.8211	ng/mL
PFDA-13C_IS	Auto	4.937	3600222	3600222	----	----	5.0000	ng/mL
PFUnA	M	5.106	2769	4372540	PFUnA-13C_IS	----	0.0028	ng/mL
PFUnA-13C	Auto	5.118	4372540	5559965	13C7-PFUnDA_IS	----	5.7629	ng/mL
PFUnA-13C_IS	Auto	5.118	4372540	4372540	----	----	5.0000	ng/mL
PFDoA	M	5.291	1402	4720847	PFDoA-13C_IS	----	0.0018	ng/mL
PFDoA-13C	Auto	5.294	4720847	5559965	13C7-PFUnDA_IS	----	5.7915	ng/mL
PFDoA-13C_IS	Auto	5.294	4720847	4720847	----	----	5.0000	ng/mL
PFTeDA	ND(W/B)	----	----	3045962	PFTeDA-13C_IS	----	----	ng/mL
PFTeDA	M	5.620	5972	3045962	PFTeDA-13C_IS	----	0.0088	ng/mL
PFTeDA-13C	Auto	5.619	3045962	5559965	13C7-PFUnDA_IS	----	5.7201	ng/mL
PFTeDA-13C_IS	Auto	5.619	3045962	3045962	----	----	5.0000	ng/mL
FOSA	Auto	5.242	1634	1973839	FOSA-13C_IS	----	0.0032	ng/mL
FOSA-13C	Auto	5.238	1973839	5559965	13C7-PFUnDA_IS	----	4.7000	ng/mL
FOSA-13C_IS	Auto	5.238	1973839	1973839	----	----	5.0000	ng/mL
N-MeFOSA	M	5.630	1416	524731	N-MeFOSA-d3_IS	----	0.0087	ng/mL
N-MeFOSA-d3	Auto	5.632	524731	5559965	13C7-PFUnDA_IS	----	5.0274	ng/mL
N-MeFOSA-d3_IS	Auto	5.632	524731	524731	----	----	5.0000	ng/mL
N-EtFOSA	M	5.770	498	665226	N-EtFOSA-d9_IS	----	-0.0150	ng/mL
N-EtFOSA-d9	Auto	5.765	665226	5559965	13C7-PFUnDA_IS	----	4.8612	ng/mL
N-EtFOSA-d9_IS	Auto	5.765	665226	665226	----	----	5.0000	ng/mL

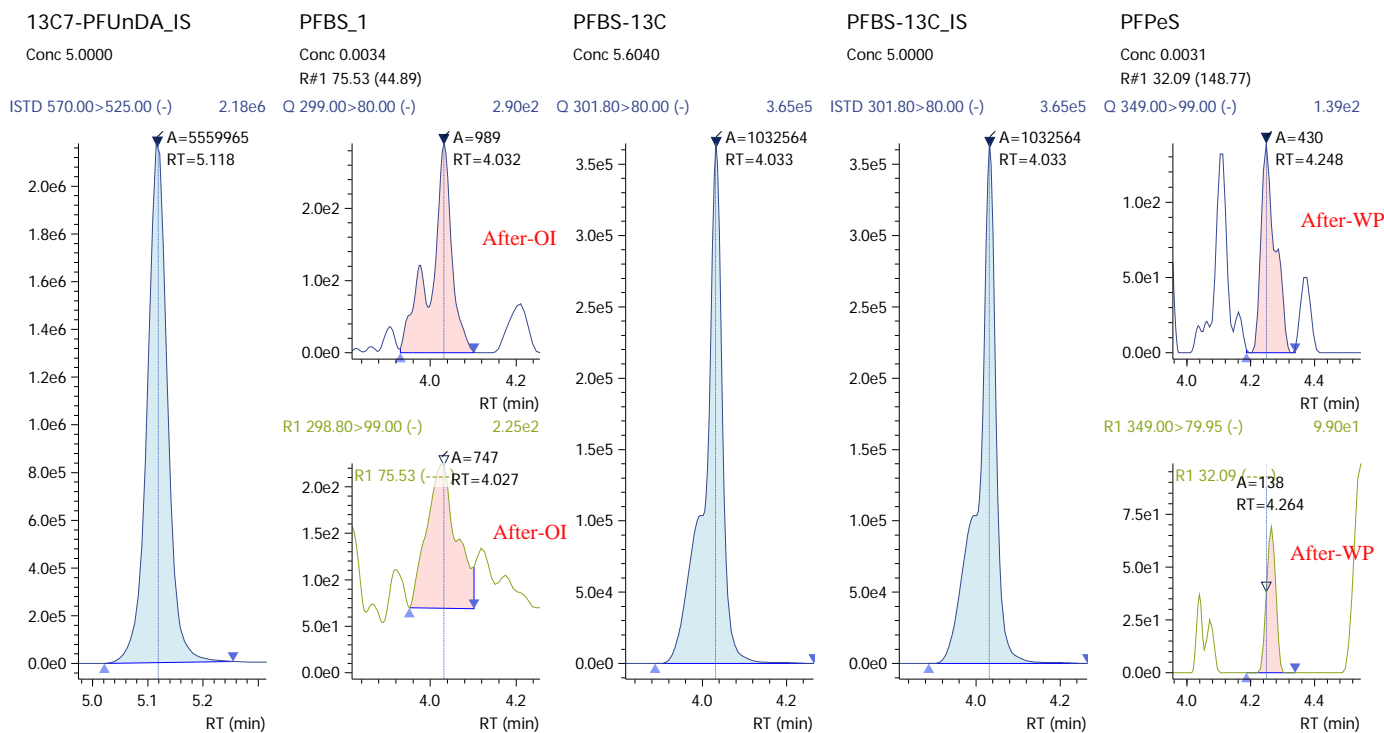




210413\_032 (continued)

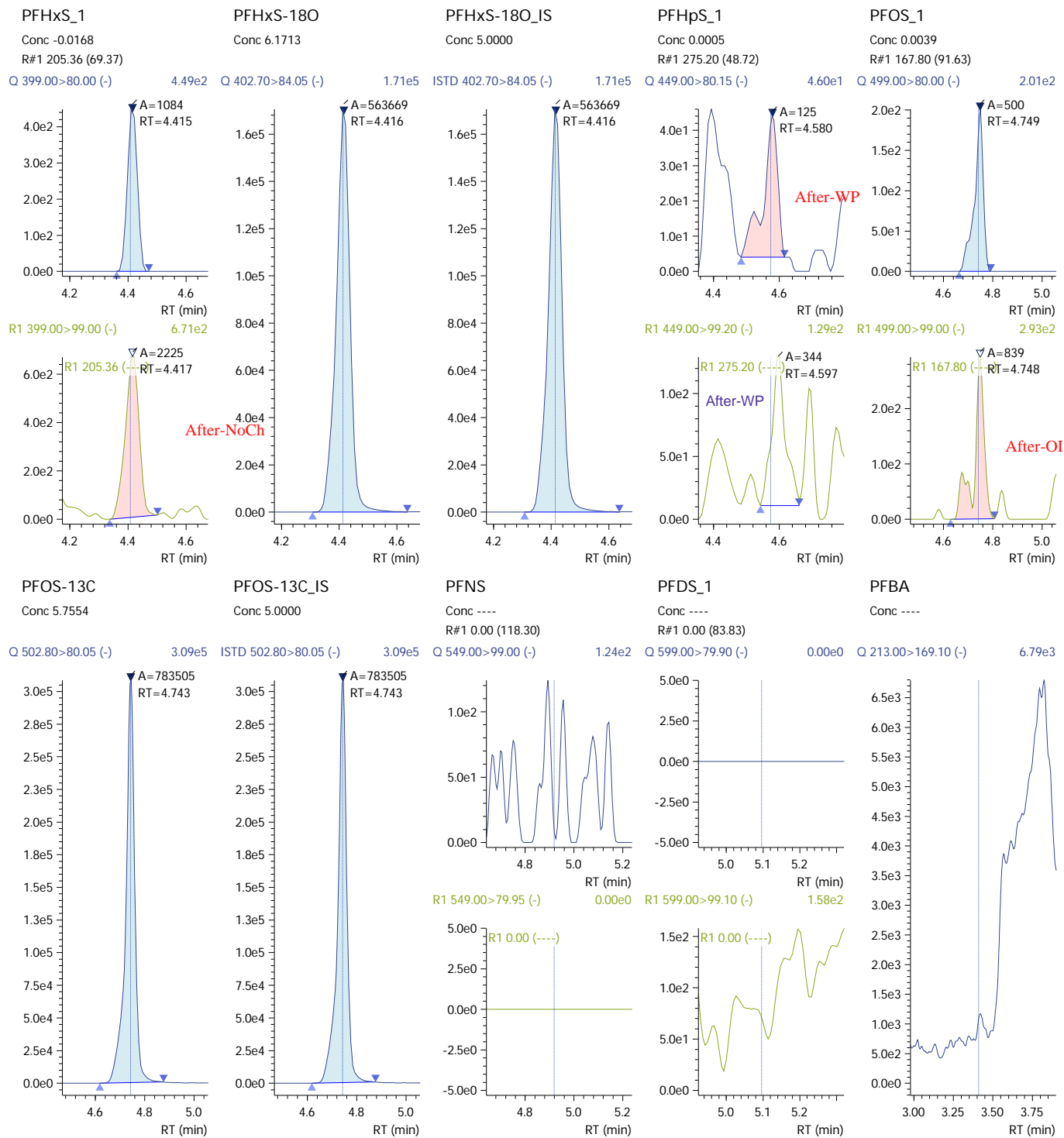
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.616	355	421741	N-MeFOSE-d7_IS	----	0.0018	ng/mL
N-MeFOSE-d7	Auto	5.603	421741	5559965	13C7-PFUnDA_IS	----	4.3609	ng/mL
N-MeFOSE-d7_IS	Auto	5.603	421741	421741	----	----	5.0000	ng/mL
N-EtFOSE	ND(W/B)	----	----	486981	N-EtFOSE-d9_IS	----	----	ng/mL
N-EtFOSE-d9	Auto	5.731	486981	5559965	13C7-PFUnDA_IS	----	4.5326	ng/mL
N-EtFOSE-d9_IS	Auto	5.731	486981	486981	----	----	5.0000	ng/mL
N-MeFOSAA	ND(W/B)	----	----	379132	N-MeFOSAA-d3_IS	----	----	ng/mL
N-MeFOSAA-d3	Auto	5.036	379132	5559965	13C7-PFUnDA_IS	----	5.6336	ng/mL
N-MeFOSAA-d3_IS	Auto	5.036	379132	379132	----	----	5.0000	ng/mL
N-EtFOSAA	ND(W/B)	----	----	370305	N-EtFOSAA-d5_IS	----	----	ng/mL
N-EtFOSAA-d5	Auto	5.133	370305	5559965	13C7-PFUnDA_IS	----	5.6041	ng/mL
N-EtFOSAA-d5_IS	Auto	5.133	370305	370305	----	----	5.0000	ng/mL
4_2-FTS_1	MI R1	4.218	215	1020941	4_2-FTS-13C_IS	----	0.0010	ng/mL
4_2-FTS-13C	Auto	4.210	1020941	5559965	13C7-PFUnDA_IS	----	4.7949	ng/mL
4_2-FTS-13C_IS	Auto	4.210	1020941	1020941	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.572	608	646405	6_2-FTS-13C_IS	----	0.0038	ng/mL
6_2-FTS-13C	Auto	4.576	646405	5559965	13C7-PFUnDA_IS	----	5.6554	ng/mL
6_2-FTS-13C_IS	Auto	4.576	646405	646405	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.934	162	314543	8_2-FTS-13C_IS	----	0.0022	ng/mL
8_2-FTS-13C	Auto	4.936	314543	5559965	13C7-PFUnDA_IS	----	5.6023	ng/mL
8_2-FTS-13C_IS	Auto	4.936	314543	314543	----	----	5.0000	ng/mL
10_2-FTS_1	ND(W/B)	----	----	314543	8_2-FTS-13C_IS	----	----	ng/mL
HPFO_DA	M	4.303	197	1850361	HPFO_DA-13C_IS	----	0.0006	ng/mL
HPFO_DA-13C	Auto	4.302	1850361	5559965	13C7-PFUnDA_IS	----	5.0037	ng/mL
HPFO_DA-13C_IS	Auto	4.302	1850361	1850361	----	----	5.0000	ng/mL



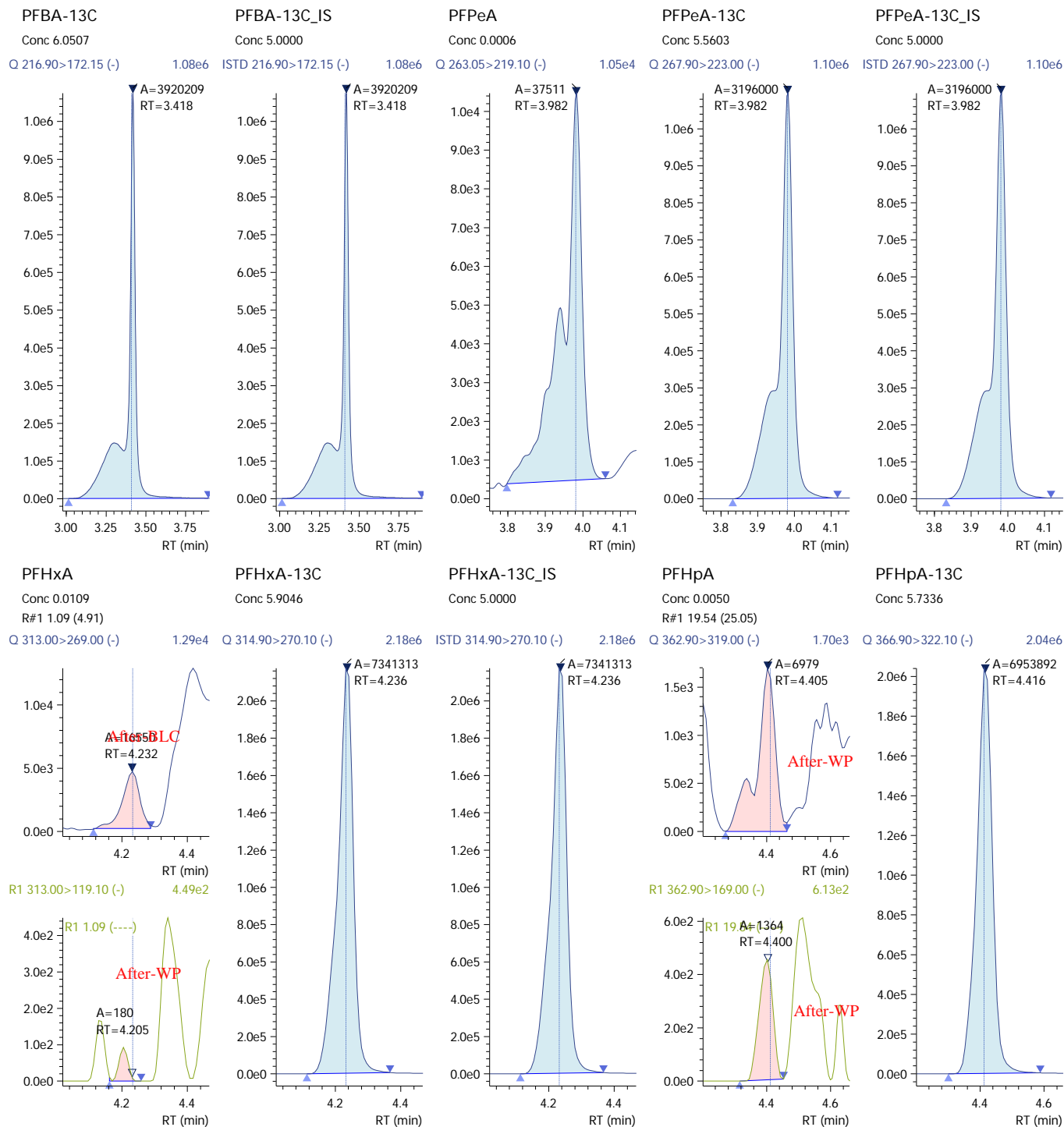


### 210413\_032 (continued)



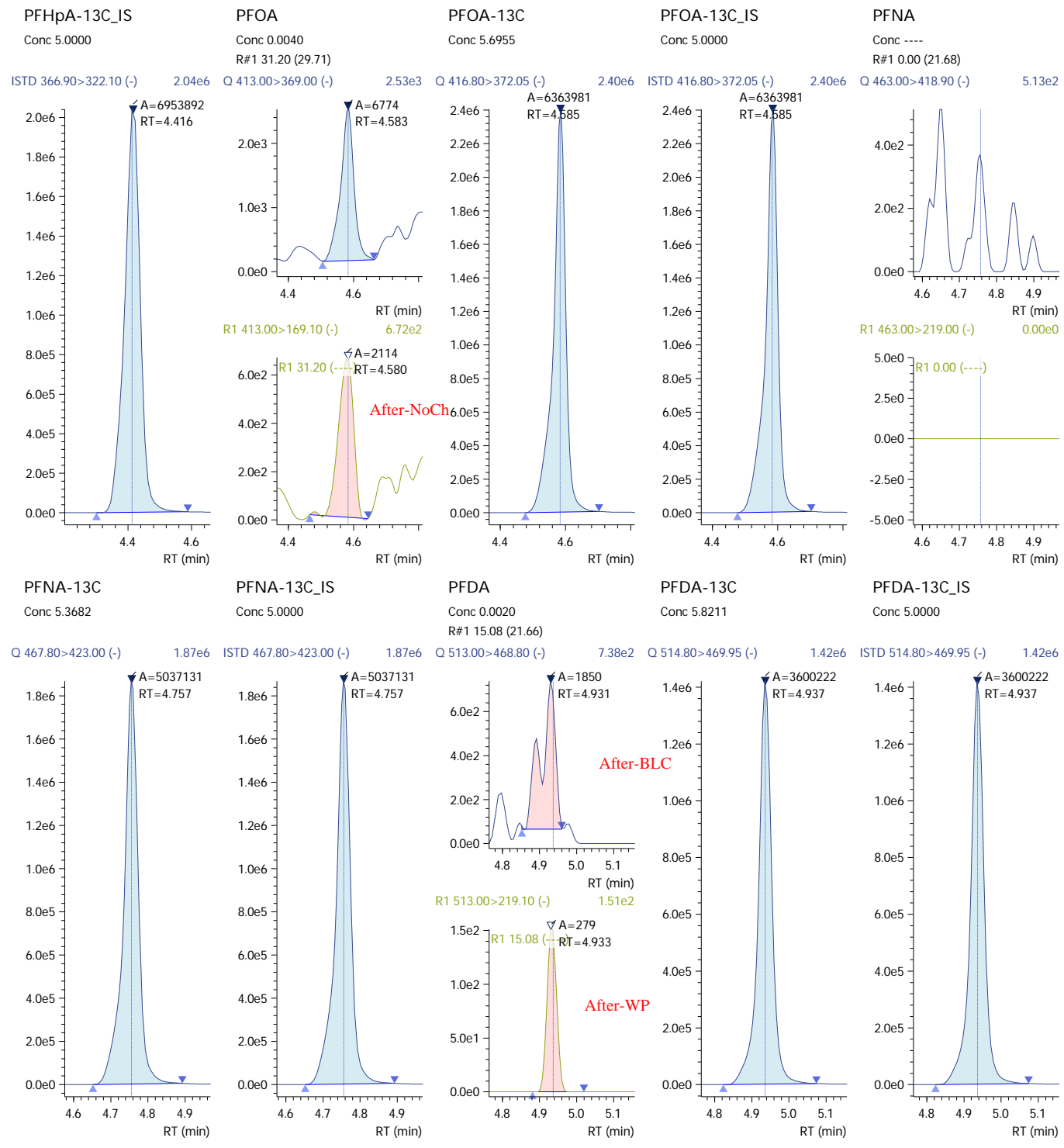


### 210413\_032 (continued)



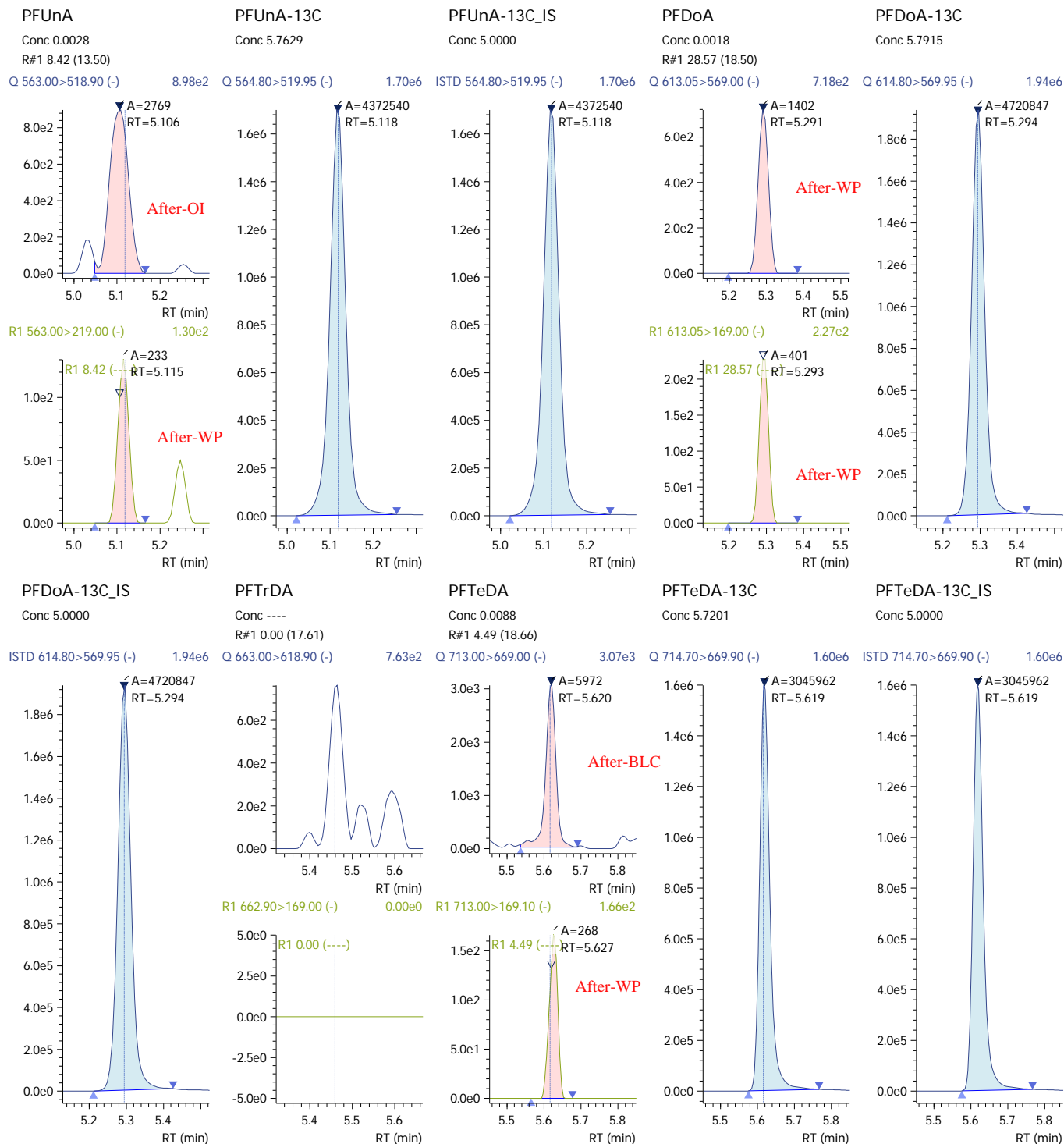


### 210413\_032 (continued)



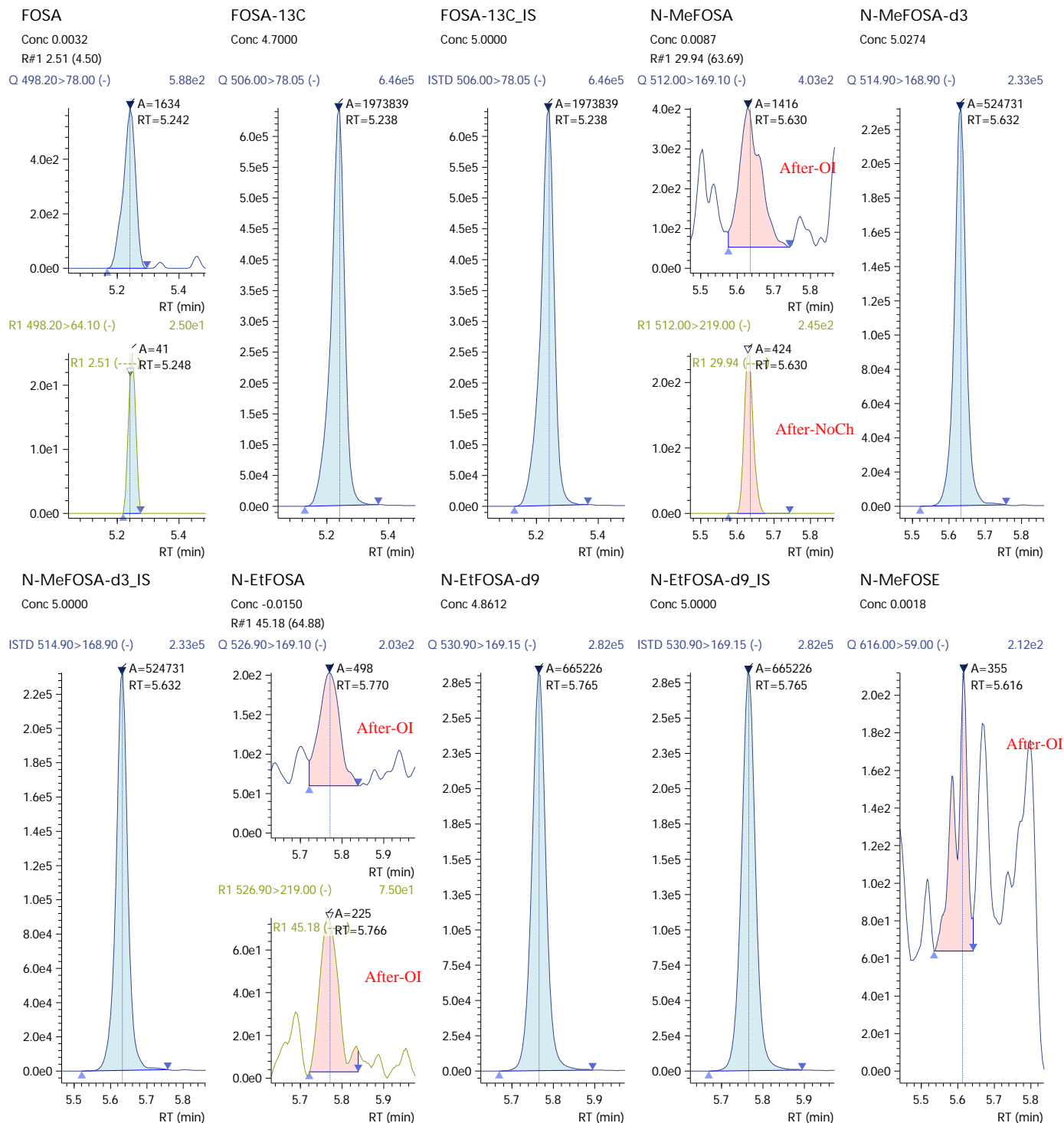


210413\_032 (continued)



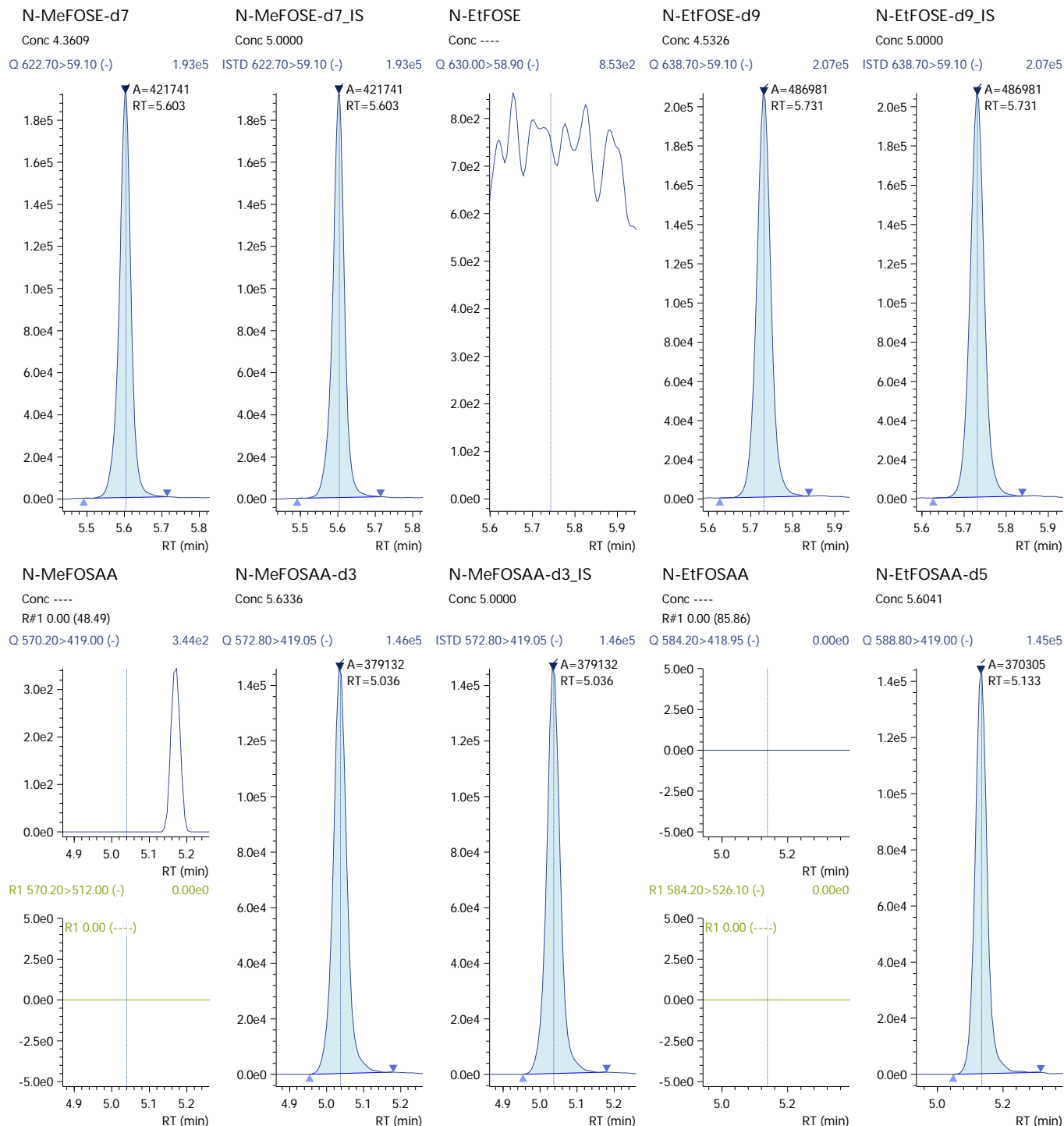


210413\_032 (continued)





### 210413\_032 (continued)







### 210413\_032 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.0010  
R#1 386.21 (26.07)

4\_2-FTS-13C  
Conc 4.7949

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.0038  
R#1 10.86 (30.56)

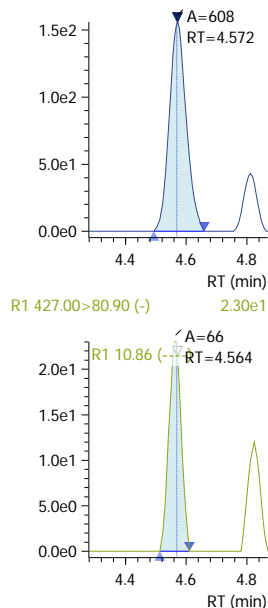
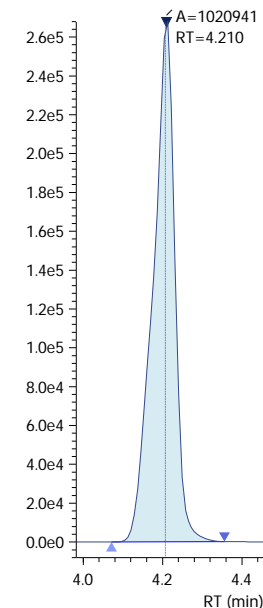
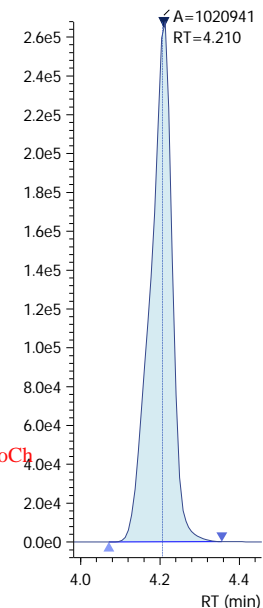
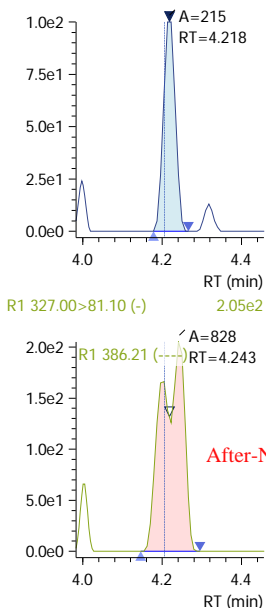
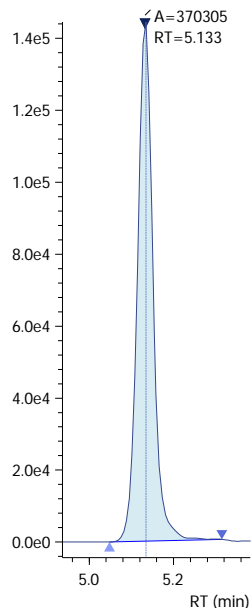
ISTD 588.80>419.00 (-) 1.45e5

Q 327.00>307.05 (-) 1.00e2

Q 328.80>309.05 (-) 2.68e5

ISTD 328.80>309.05 (-) 2.68e5

Q 427.00>407.00 (-) 1.56e2



6\_2-FTS-13C  
Conc 5.6554

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.0022  
R#1 17.90 (8.18)

8\_2-FTS-13C  
Conc 5.6023

8\_2-FTS-13C\_IS  
Conc 5.0000

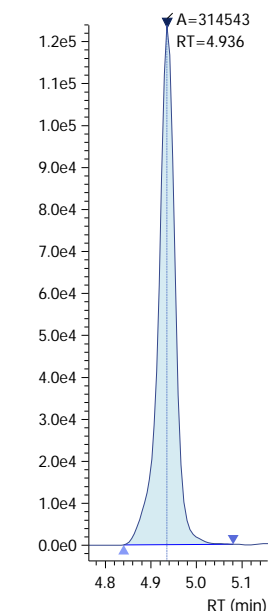
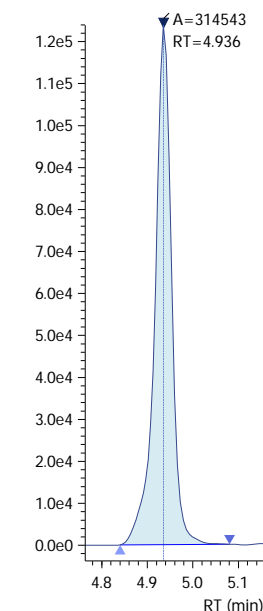
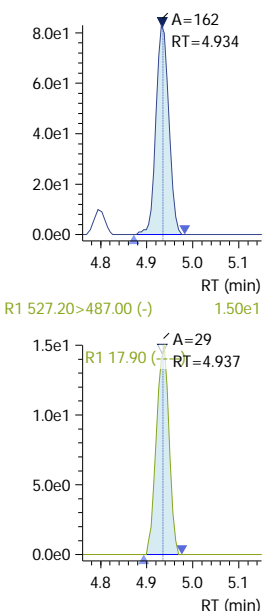
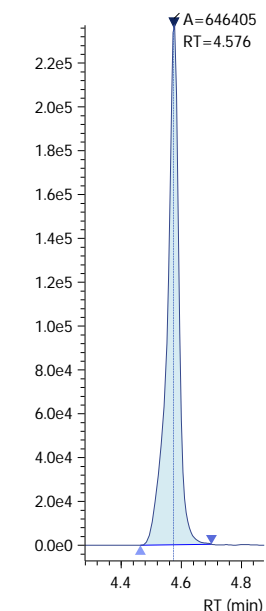
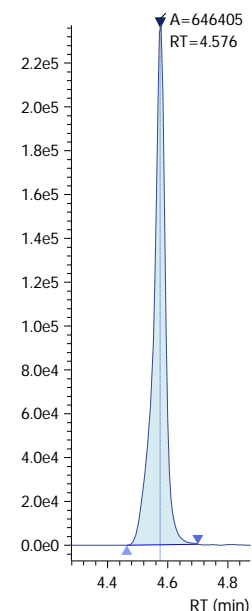
Q 428.90>409.00 (-) 2.37e5

ISTD 428.90>409.00 (-) 2.37e5

Q 527.10>506.90 (-) 8.30e1

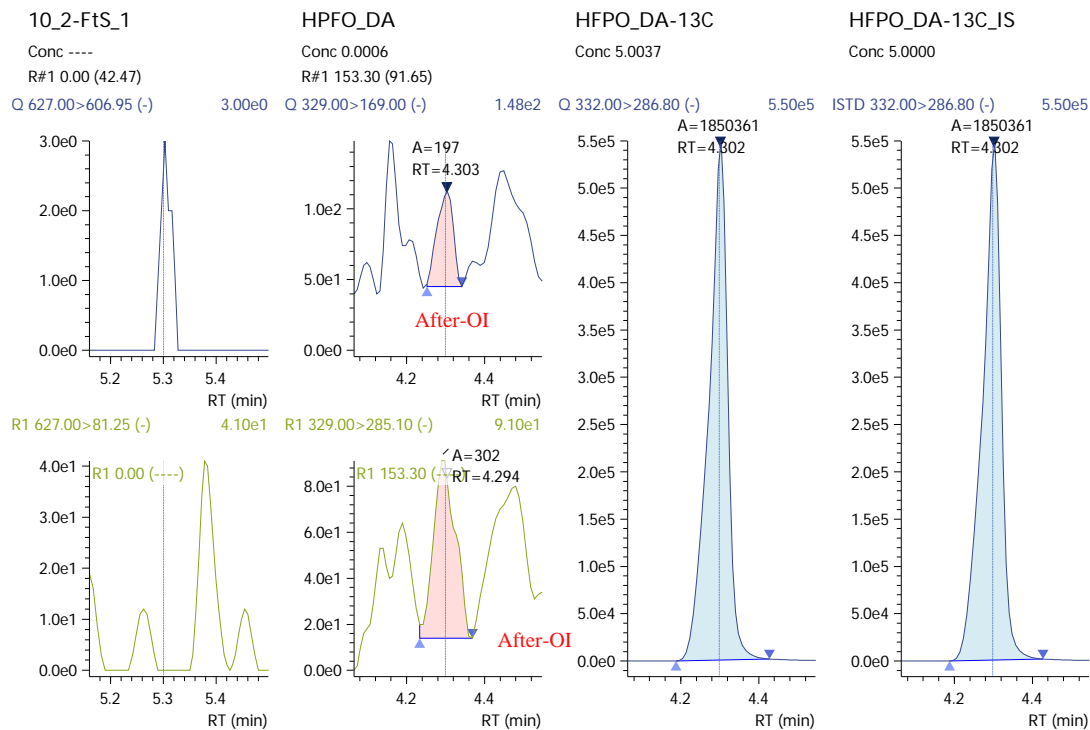
Q 528.80>509.00 (-) 1.24e5

ISTD 528.80>509.00 (-) 1.24e5





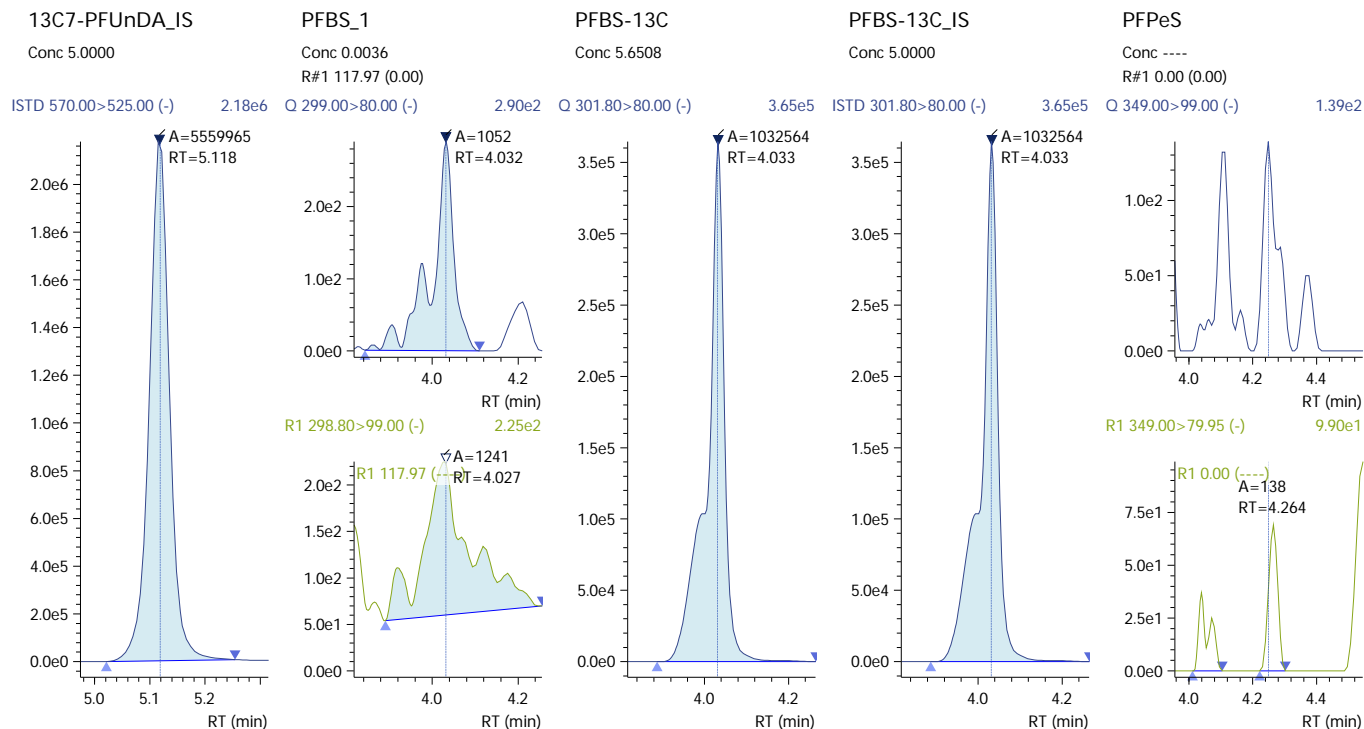
### 210413\_032 (continued)





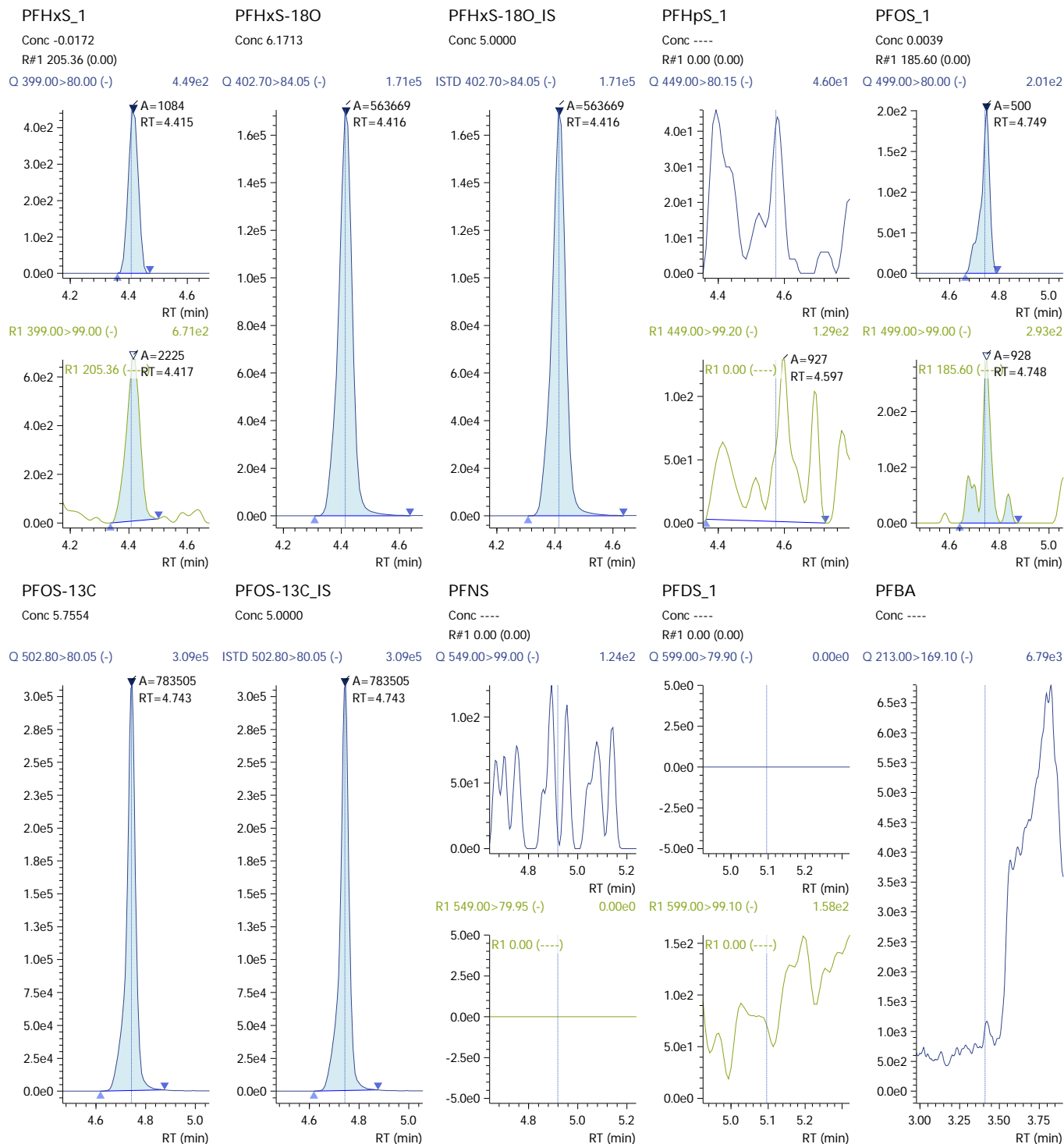
# 210413\_032

Sample ID: CCB  
Date Acquired: 4/13/2021 5:18:53 PM  
Acquired by: System Administrator  
Data File: 210413\_032  
Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1



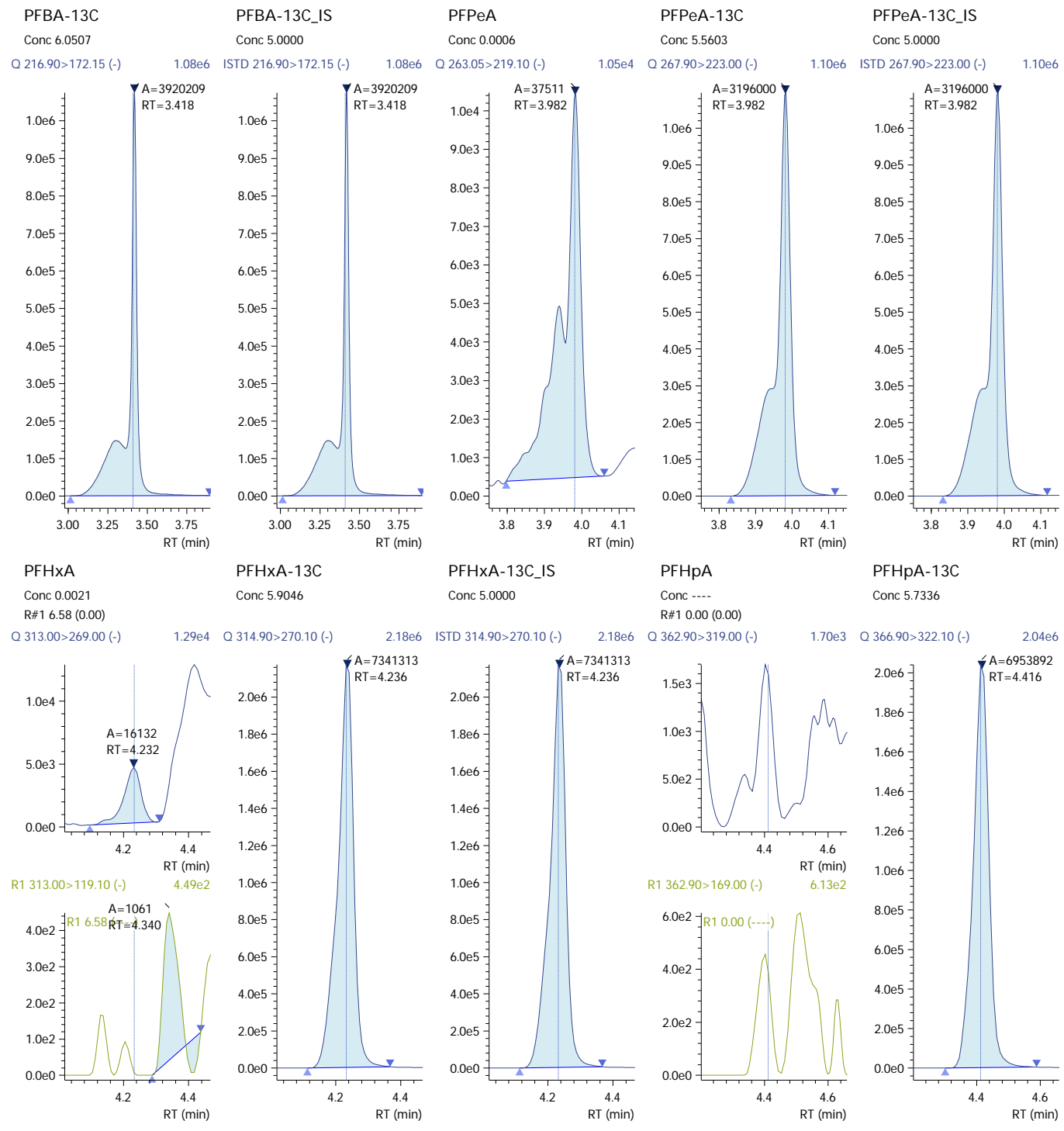


### 210413\_032 (continued)



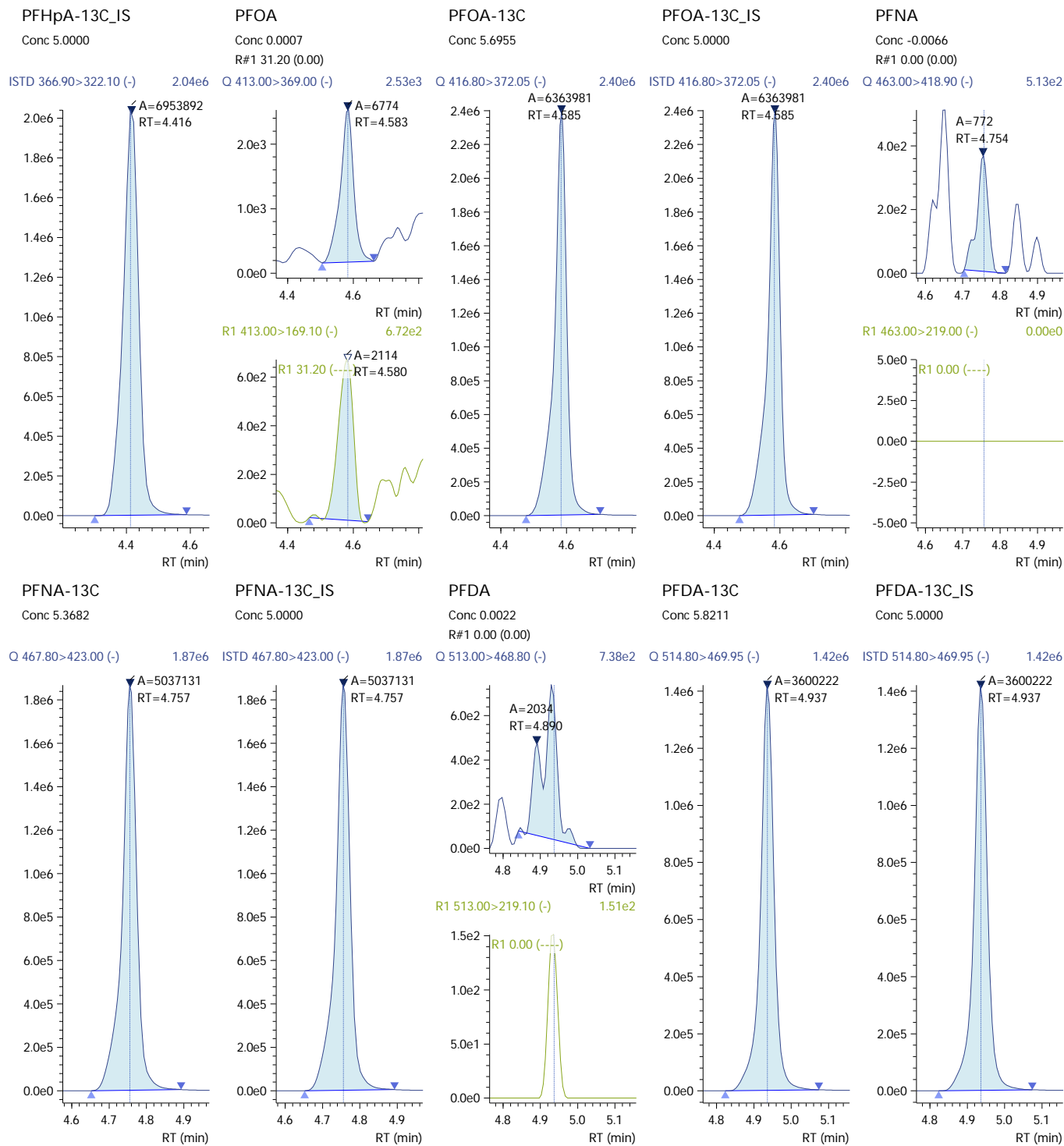


### 210413\_032 (continued)



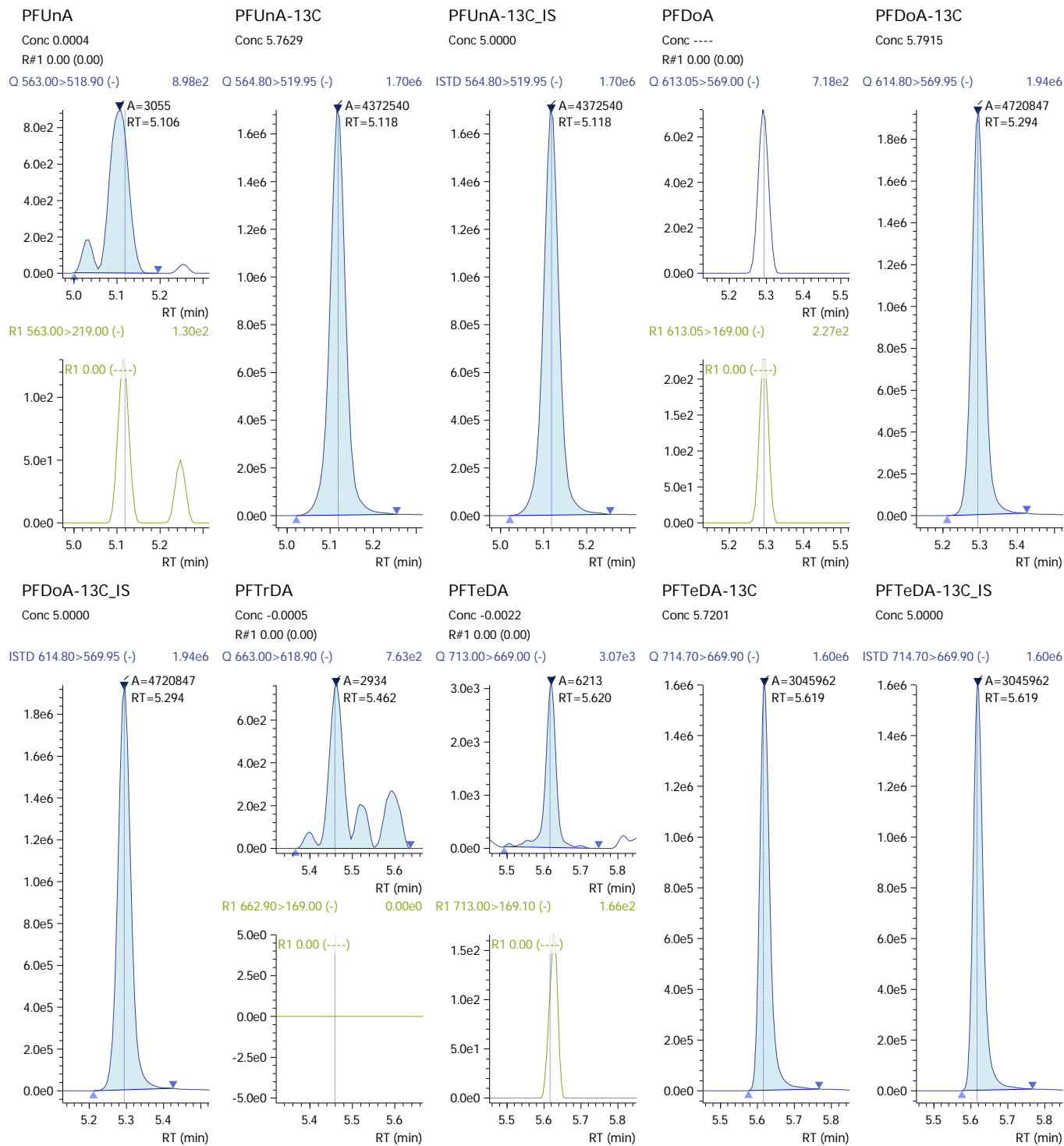


### 210413\_032 (continued)





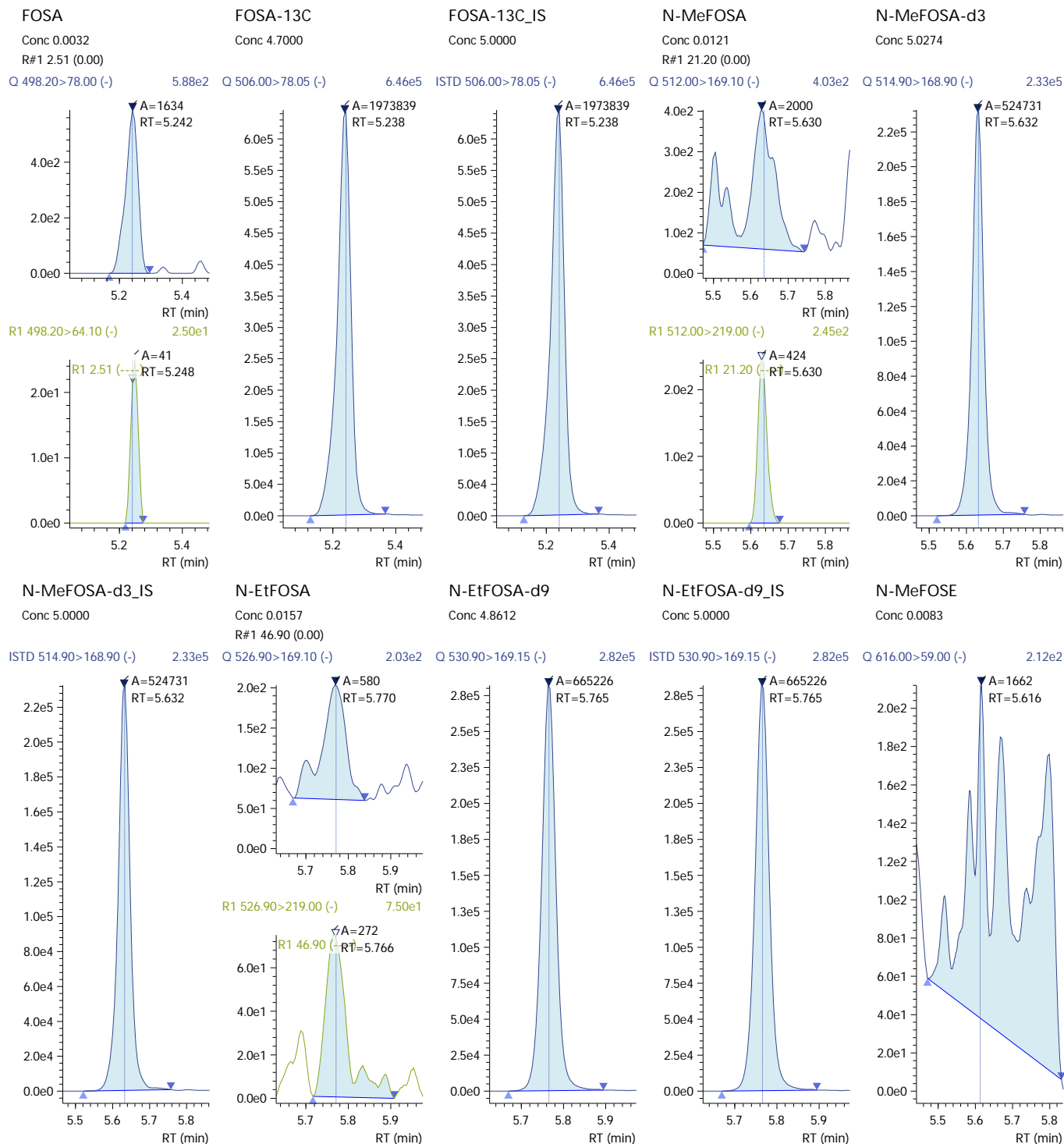
### 210413\_032 (continued)





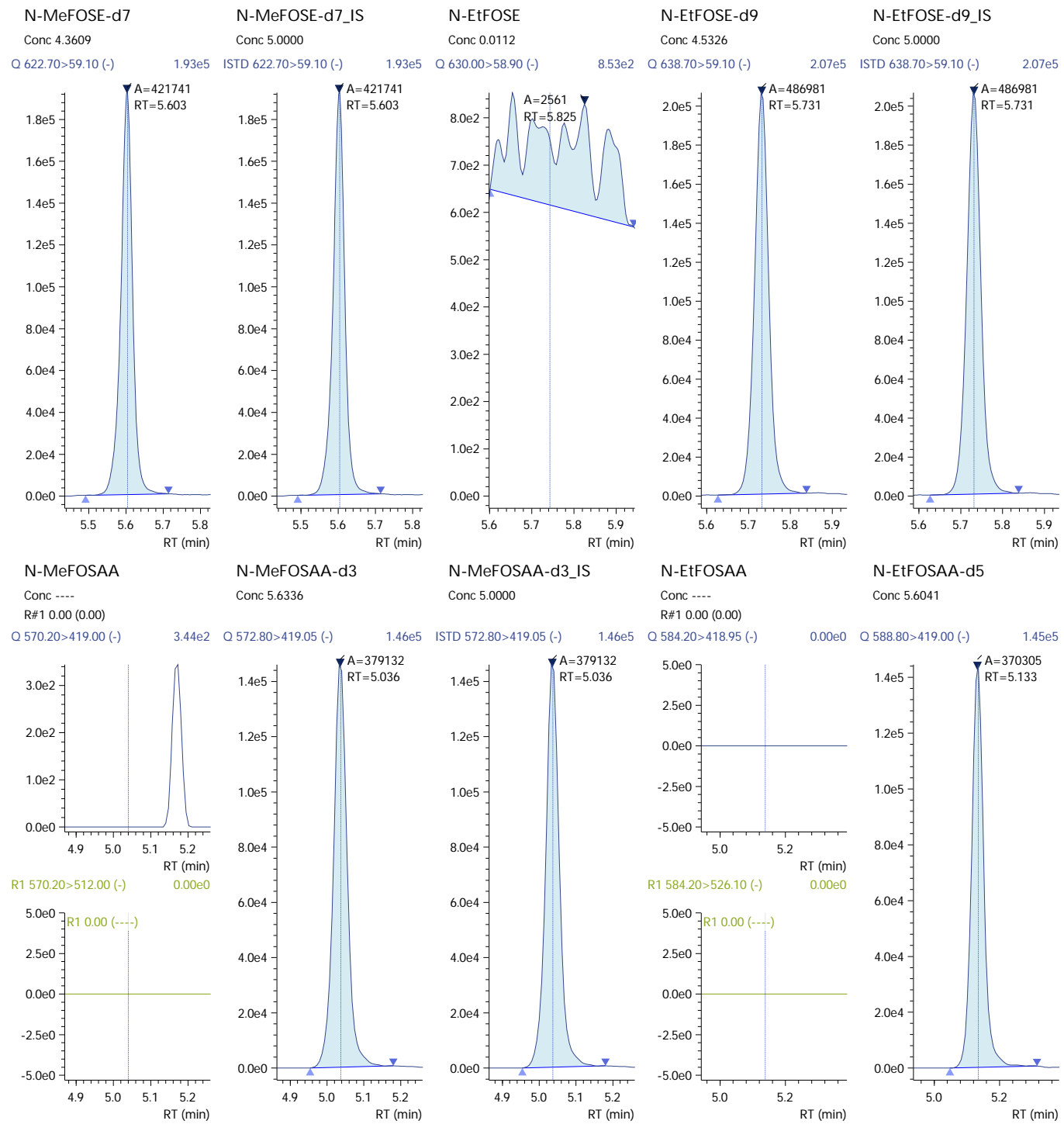


### 210413\_032 (continued)





### 210413\_032 (continued)





### 210413\_032 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.0009  
R#1 386.21 (0.00)

4\_2-FTS-13C  
Conc 4.7949

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.0038  
R#1 10.86 (0.00)

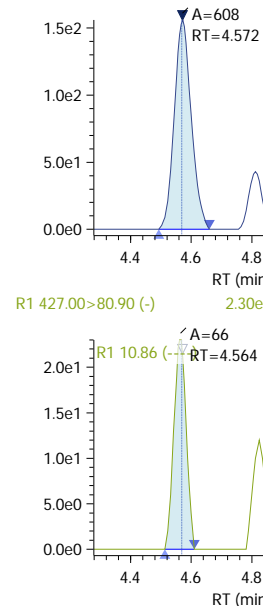
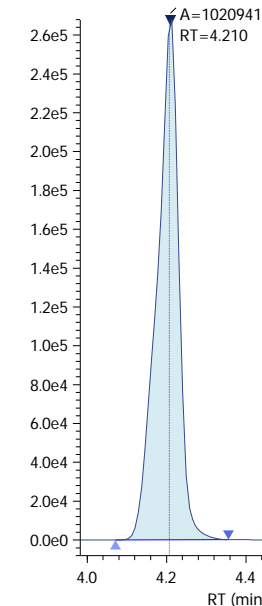
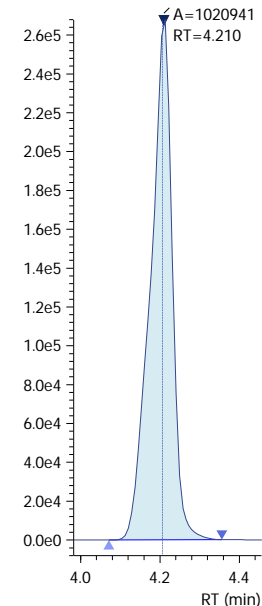
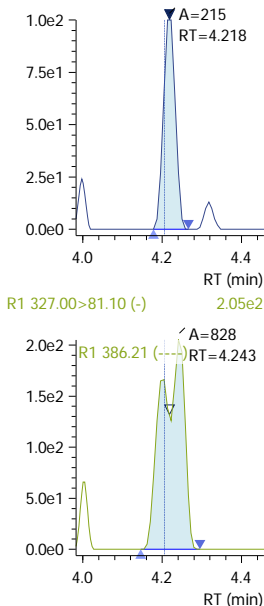
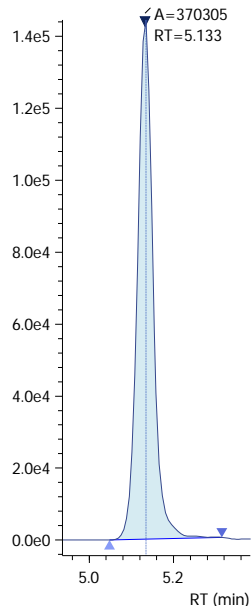
ISTD 588.80>419.00 (-) 1.45e5

Q 327.00>307.05 (-) 1.00e2

Q 328.80>309.05 (-) 2.68e5

ISTD 328.80>309.05 (-) 2.68e5

Q 427.00>407.00 (-) 1.56e2



6\_2-FTS-13C  
Conc 5.6554

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.0022  
R#1 17.90 (0.00)

8\_2-FTS-13C  
Conc 5.6023

8\_2-FTS-13C\_IS  
Conc 5.0000

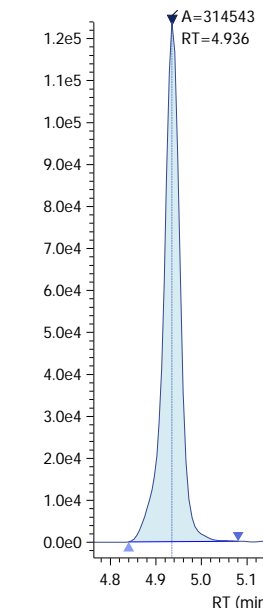
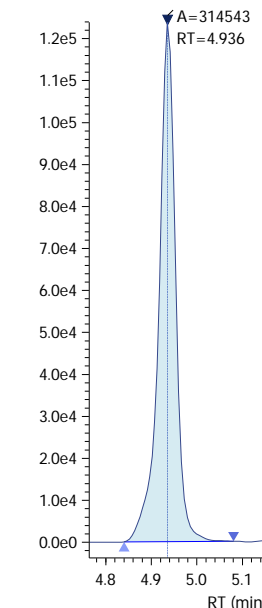
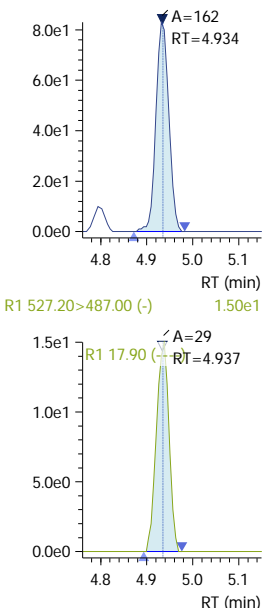
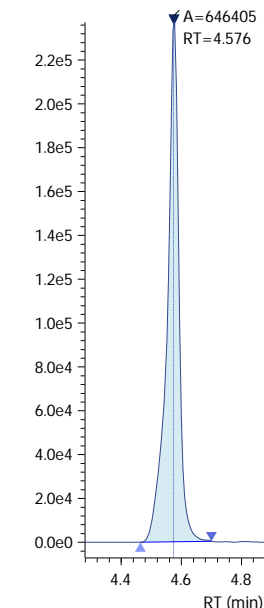
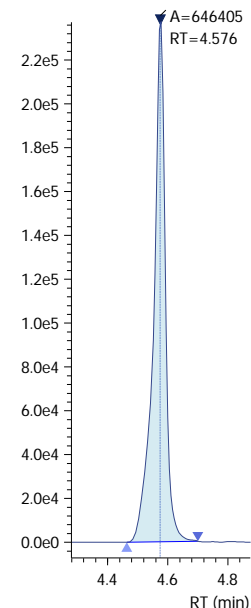
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ISTD 428.90>409.00 (-) 2.37e5

Q 527.10>506.90 (-) 8.30e1

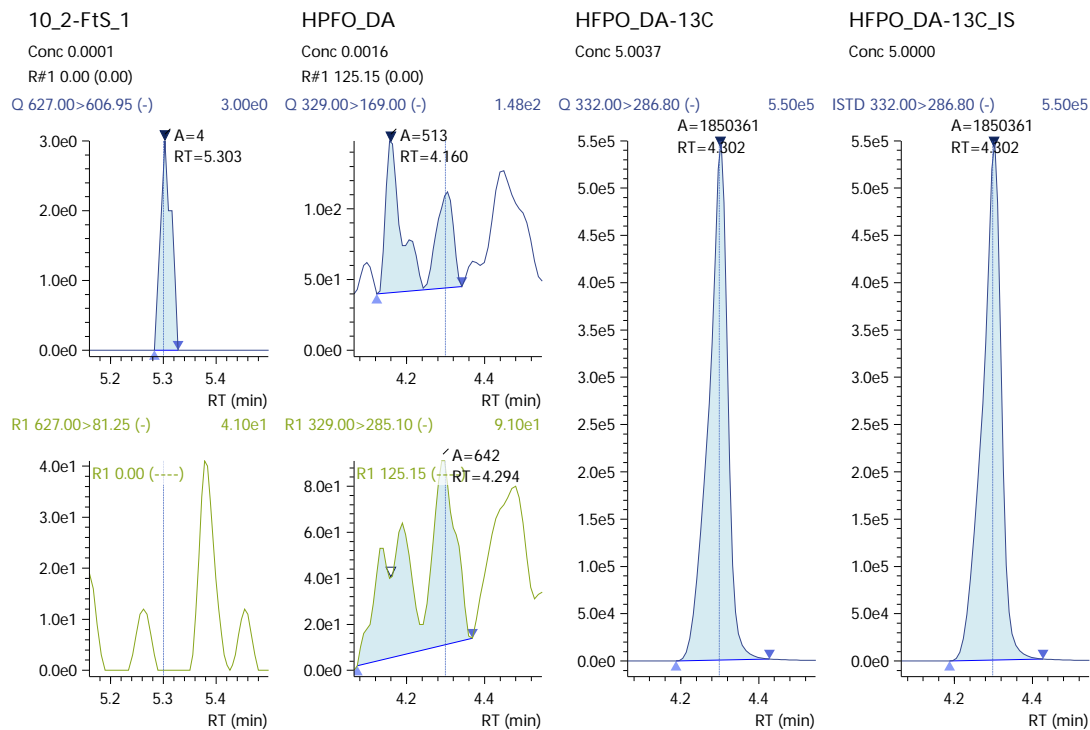
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ISTD 528.80>509.00 (-) 1.24e5





### 210413\_032 (continued)





210413\_033

Sample ID: PFC ICAL 0.05 PPB  
 Date Acquired: 4/13/2021 5:29:22 PM  
 Acquired by: System Administrator  
 Data File: 210413\_033  
 Vial: 1 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.123	0.005	----	6627530	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.034	0.002	0.00	16169	7077	43.77	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.034	0.002	-1.09	1179965	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.034	0.002	----	1160997	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.254	0.005	0.22	7899	10861	137.50	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.414	0.006	0.00	13089	7898	60.34	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.417	0.004	-0.71	589028	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.417	0.004	----	589028	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.577	0.002	0.16	10230	5121	50.06	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.747	0.004	0.00	7337	6900	94.04	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.747	0.005	-0.38	855585	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.747	0.005	----	855585	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.924	0.006	0.18	4752	6849	144.13	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.099	0.003	0.35	8915	7496	84.09	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.421	0.011	0.00	47400	----	----	----		
PFBA-13C	216.90>172.15	----	3.420	0.011	-1.70	4227132	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.420	0.011	----	4227132	----	----	----		
PFPeA	263.05>219.10	----	3.984	0.003	0.00	113380	----	----	----		
PFPeA-13C	267.90>223.00	----	3.983	0.002	-1.14	3613328	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.983	0.002	----	3613328	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.236	0.003	0.00	94857	4548	4.79	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.237	0.005	-0.89	7987031	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.237	0.005	----	7987031	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.415	0.003	0.00	82964	22384	26.98	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.418	0.006	-0.71	7227852	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.418	0.006	----	7227852	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.586	0.002	0.00	100426	28820	28.70	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.587	0.003	-0.54	7055879	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.587	0.003	----	7055879	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.757	0.001	0.00	58875	11952	20.30	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_033 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.759	0.003	-0.36	5471532	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.759	0.003	----	5471532	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.943	0.006	0.00	50563	11336	22.42	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.941	0.005	-0.18	3897225	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.941	0.005	----	3897225	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.123	0.004	0.00	54977	8987	16.35	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.123	0.004	0.00	4625237	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.123	0.004	----	4625237	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.300	0.007	0.00	42296	6480	15.32	18.50	9.25-27.75	
PFDaA-13C	614.80>569.95	----	5.300	0.006	0.18	5267143	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.300	0.006	----	5267143	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	5.466	0.007	-0.16	41339	6361	15.39	17.61	8.8-26.41	
PFTeDA	713.00>669.00	713.00>169.10	5.622	0.006	0.00	42345	5774	13.64	18.66	9.33-27.99	
PFTeDA-13C	714.70>669.90	----	5.622	0.006	0.50	3285326	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.622	0.006	----	3285326	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.242	0.001	0.00	33349	1240	3.72	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.243	0.002	0.12	2640340	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.243	0.002	----	2640340	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.639	0.004	0.00	10690	5916	55.34	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.636	0.003	0.51	644281	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.636	0.003	----	644281	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.776	0.005	0.01	3029	1533	50.61	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.770	0.004	0.65	863939	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.770	0.004	----	863939	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.616	0.003	0.01	14148	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.607	0.003	0.48	612076	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.607	0.003	----	612076	----	----	----		
N-EtFOSE	630.00>58.90	----	5.748	0.006	0.01	17382	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.736	0.004	0.61	671111	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.736	0.004	----	671111	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.040	0.000	0.00	2684	413	15.39	48.49	24.24-72.73	IRr
N-MeFOSAA-d3	572.80>419.05	----	5.043	0.006	-0.08	425404	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.043	0.006	----	425404	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.150	0.012	0.01	3392	605	17.84	85.86	42.93 -128.79	IRr
N-EtFOSAA-d5	588.80>419.00	----	5.140	0.005	0.02	427003	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.140	0.005	----	427003	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.211	0.005	0.00	13723	6173	44.99	26.07	13.03-39.1	IRr
4_2-FTS-13C	328.80>309.05	----	4.212	0.005	-0.91	1194438	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_033 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.212	0.005	----	1194438	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.576	0.007	0.00	9639	3009	31.22	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.578	0.004	-0.55	697205	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.578	0.004	----	697205	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.940	0.005	0.00	4165	361	8.67	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.940	0.005	-0.18	327626	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.940	0.005	----	327626	----	----	----	0-0	
10_2-Fts_1	627.00>606.95	627.00>81.25	5.306	0.005	0.37	2353	1136	48.28	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.304	0.005	0.00	19136	19429	101.53	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.304	0.005	-0.82	2183309	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.304	0.005	----	2183309	----	----	----		

Flag ID key: IRr: Ion Ratio (Relative)





## 210413\_033

Sample ID: PFC ICAL 0.05 PPB  
 Date Acquired: 4/13/2021 5:29:22 PM  
 Acquired by: System Administrator  
 Data File: 210413\_033  
 Vial: 1 | Inj. Volume: 15.0000uL | Tray: 0

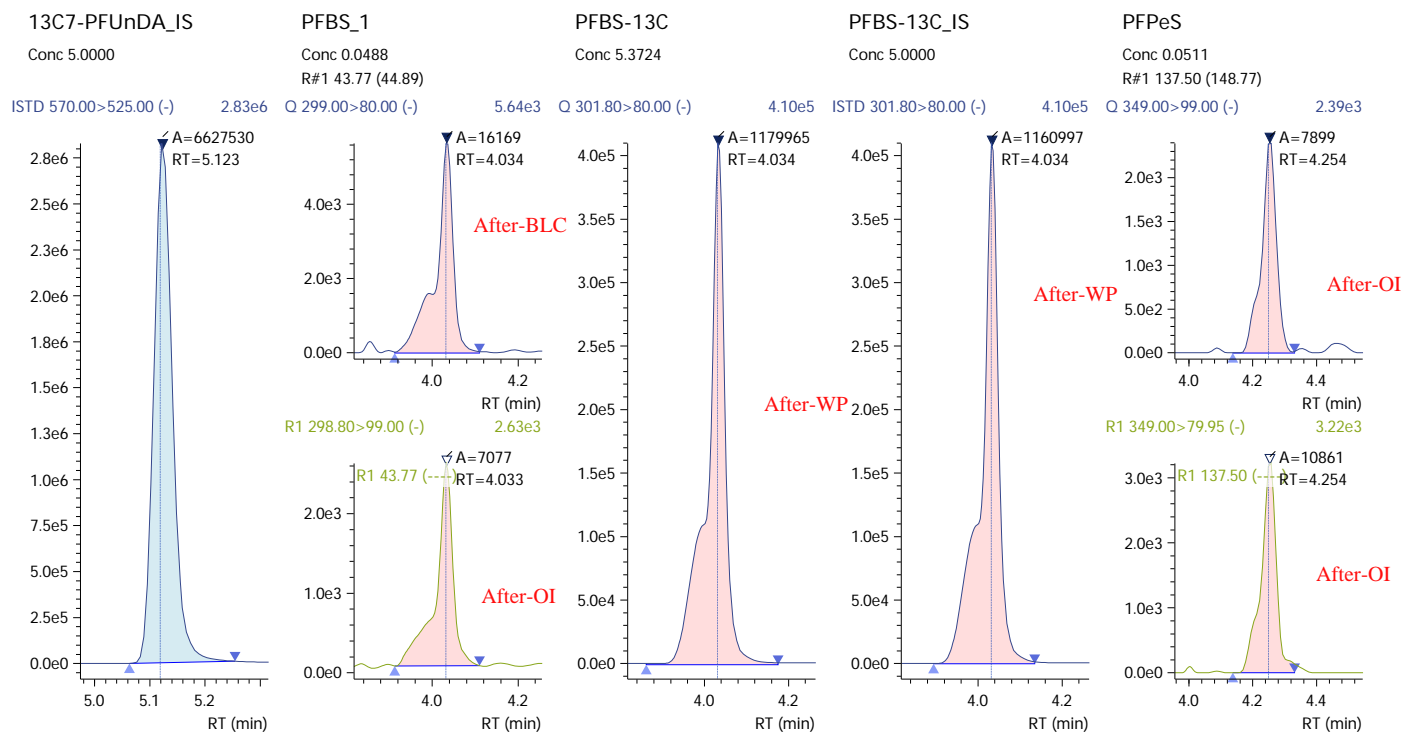
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.123	6627530	6627530	----	5.0000	5.0000	ng/mL
PFBS_1	M	4.034	16169	1160997	PFBS-13C_IS	0.0444	0.0488	ng/mL
PFBS-13C	M	4.034	1179965	6627530	13C7-PFUnDA_IS	5.0000	5.3724	ng/mL
PFBS-13C_IS	M	4.034	1160997	1160997	----	5.0000	5.0000	ng/mL
PFPeS	M	4.254	7899	1160997	PFBS-13C_IS	0.0470	0.0511	ng/mL
PFHxS_1	Auto	4.414	13089	589028	PFHxS-18O_IS	0.0457	0.0449	ng/mL
PFHxS-18O	Auto	4.417	589028	6627530	13C7-PFUnDA_IS	5.0000	5.4101	ng/mL
PFHxS-18O_IS	Auto	4.417	589028	589028	----	5.0000	5.0000	ng/mL
PFHpS_1	M	4.577	10230	589028	PFHxS-18O_IS	0.0477	0.0418	ng/mL
PFOS_1	Auto	4.747	7337	855585	PFOS-13C_IS	0.0465	0.0517	ng/mL
PFOS-13C	Auto	4.747	855585	6627530	13C7-PFUnDA_IS	5.0000	5.2725	ng/mL
PFOS-13C_IS	Auto	4.747	855585	855585	----	5.0000	5.0000	ng/mL
PFNS	M	4.924	4752	855585	PFOS-13C_IS	0.0481	0.0384	ng/mL
PFDS_1	Auto	5.099	8915	855585	PFOS-13C_IS	0.0482	0.0515	ng/mL
PFBA	M	3.421	47400	4227132	PFBA-13C_IS	0.0500	0.0520	ng/mL
PFBA-13C	Auto	3.420	4227132	6627530	13C7-PFUnDA_IS	5.0000	5.4735	ng/mL
PFBA-13C_IS	Auto	3.420	4227132	4227132	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.984	113380	3613328	PFPeA-13C_IS	0.0500	0.0490	ng/mL
PFPeA-13C	Auto	3.983	3613328	6627530	13C7-PFUnDA_IS	5.0000	5.2738	ng/mL
PFPeA-13C_IS	Auto	3.983	3613328	3613328	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.236	94857	7987031	PFHxA-13C_IS	0.0500	0.0573	ng/mL
PFHxA-13C	Auto	4.237	7987031	6627530	13C7-PFUnDA_IS	5.0000	5.3892	ng/mL
PFHxA-13C_IS	Auto	4.237	7987031	7987031	----	5.0000	5.0000	ng/mL
PFHpA	M	4.415	82964	7227852	PFHpA-13C_IS	0.0500	0.0575	ng/mL
PFHpA-13C	Auto	4.418	7227852	6627530	13C7-PFUnDA_IS	5.0000	4.9995	ng/mL
PFHpA-13C_IS	Auto	4.418	7227852	7227852	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.586	100426	7055879	PFOA-13C_IS	0.0500	0.0533	ng/mL
PFOA-13C	Auto	4.587	7055879	6627530	13C7-PFUnDA_IS	5.0000	5.2975	ng/mL
PFOA-13C_IS	Auto	4.587	7055879	7055879	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.757	58875	5471532	PFNA-13C_IS	0.0500	0.0533	ng/mL
PFNA-13C	Auto	4.759	5471532	6627530	13C7-PFUnDA_IS	5.0000	4.8919	ng/mL
PFNA-13C_IS	Auto	4.759	5471532	5471532	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.943	50563	3897225	PFDA-13C_IS	0.0500	0.0516	ng/mL
PFDA-13C	Auto	4.941	3897225	6627530	13C7-PFUnDA_IS	5.0000	5.2863	ng/mL
PFDA-13C_IS	Auto	4.941	3897225	3897225	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.123	54977	4625237	PFUnA-13C_IS	0.0500	0.0519	ng/mL
PFUnA-13C	Auto	5.123	4625237	6627530	13C7-PFUnDA_IS	5.0000	5.1140	ng/mL
PFUnA-13C_IS	Auto	5.123	4625237	4625237	----	5.0000	5.0000	ng/mL
PFDoA	Auto	5.300	42296	5267143	PFDoA-13C_IS	0.0500	0.0495	ng/mL
PFDoA-13C	Auto	5.300	5267143	6627530	13C7-PFUnDA_IS	5.0000	5.4208	ng/mL
PFDoA-13C_IS	Auto	5.300	5267143	5267143	----	5.0000	5.0000	ng/mL
PFTeDA	M	5.466	41339	3285326	PFTeDA-13C_IS	0.0500	0.0486	ng/mL
PFTeDA	Auto	5.622	42345	3285326	PFTeDA-13C_IS	0.0500	0.0578	ng/mL
PFTeDA-13C	Auto	5.622	3285326	6627530	13C7-PFUnDA_IS	5.0000	5.1758	ng/mL
PFTeDA-13C_IS	Auto	5.622	3285326	3285326	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.242	33349	2640340	FOSA-13C_IS	0.0500	0.0491	ng/mL
FOSA-13C	Auto	5.243	2640340	6627530	13C7-PFUnDA_IS	5.0000	5.2744	ng/mL
FOSA-13C_IS	Auto	5.243	2640340	2640340	----	5.0000	5.0000	ng/mL
N-MeFOSA	M	5.639	10690	644281	N-MeFOSA-d3_IS	0.0500	0.0536	ng/mL
N-MeFOSA-d3	Auto	5.636	644281	6627530	13C7-PFUnDA_IS	5.0000	5.1784	ng/mL
N-MeFOSA-d3_IS	Auto	5.636	644281	644281	----	5.0000	5.0000	ng/mL
N-EtFOSA	MI R1	5.776	3029	863939	N-EtFOSA-d9_IS	0.0500	0.0418	ng/mL
N-EtFOSA-d9	Auto	5.770	863939	6627530	13C7-PFUnDA_IS	5.0000	5.2963	ng/mL
N-EtFOSA-d9_IS	Auto	5.770	863939	863939	----	5.0000	5.0000	ng/mL



210413\_033 (continued)

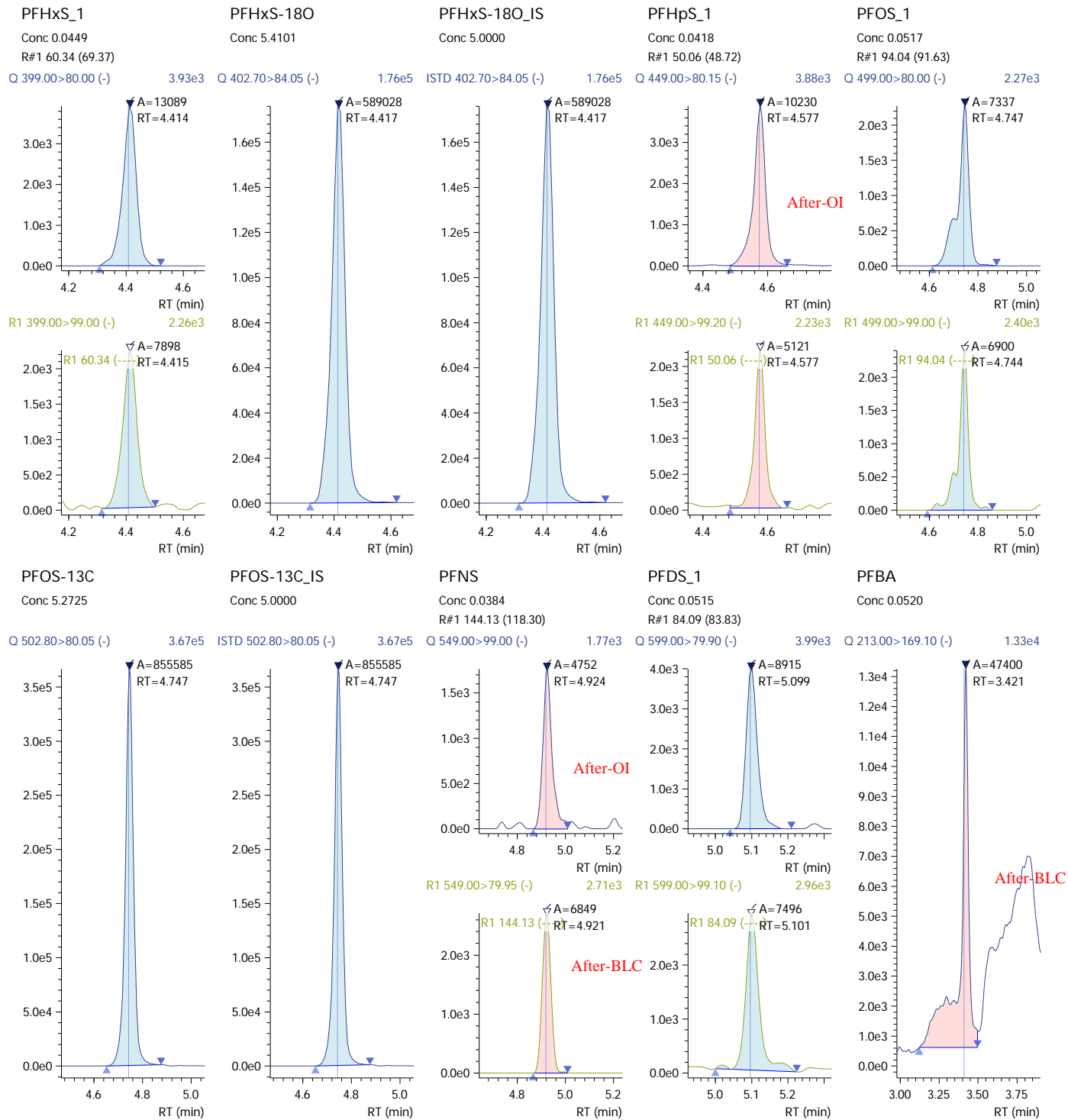
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.616	14148	612076	N-MeFOSE-d7_IS	0.0500	0.0494	ng/mL
N-MeFOSE-d7	Auto	5.607	612076	6627530	13C7-PFUnDA_IS	5.0000	5.3095	ng/mL
N-MeFOSE-d7_IS	Auto	5.607	612076	612076	----	5.0000	5.0000	ng/mL
N-EtFOSE	M	5.748	17382	671111	N-EtFOSE-d9_IS	0.0500	0.0565	ng/mL
N-EtFOSE-d9	Auto	5.736	671111	6627530	13C7-PFUnDA_IS	5.0000	5.2402	ng/mL
N-EtFOSE-d9_IS	Auto	5.736	671111	671111	----	5.0000	5.0000	ng/mL
N-MeFOSAA	Auto	5.040	2684	425404	N-MeFOSAA-d3_IS	0.0500	0.0625	ng/mL
N-MeFOSAA-d3	Auto	5.043	425404	6627530	13C7-PFUnDA_IS	5.0000	5.3029	ng/mL
N-MeFOSAA-d3_IS	Auto	5.043	425404	425404	----	5.0000	5.0000	ng/mL
N-EtFOSAA	Auto	5.150	3392	427003	N-EtFOSAA-d5_IS	0.0500	0.0462	ng/mL
N-EtFOSAA-d5	Auto	5.140	427003	6627530	13C7-PFUnDA_IS	5.0000	5.4212	ng/mL
N-EtFOSAA-d5_IS	Auto	5.140	427003	427003	----	5.0000	5.0000	ng/mL
4_2-FTS_1	MI R1	4.211	13723	1194438	4_2-FTS-13C_IS	0.0469	0.0527	ng/mL
4_2-FTS-13C	Auto	4.212	1194438	6627530	13C7-PFUnDA_IS	5.0000	4.7061	ng/mL
4_2-FTS-13C_IS	Auto	4.212	1194438	1194438	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.576	9639	697205	6_2-FTS-13C_IS	0.0476	0.0565	ng/mL
6_2-FTS-13C	Auto	4.578	697205	6627530	13C7-PFUnDA_IS	5.0000	5.1172	ng/mL
6_2-FTS-13C_IS	Auto	4.578	697205	697205	----	5.0000	5.0000	ng/mL
8_2-FTS_1	M	4.940	4165	327626	8_2-FTS-13C_IS	0.0480	0.0540	ng/mL
8_2-FTS-13C	Auto	4.940	327626	6627530	13C7-PFUnDA_IS	5.0000	4.8953	ng/mL
8_2-FTS-13C_IS	Auto	4.940	327626	327626	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.306	2353	327626	8_2-FTS-13C_IS	0.0483	0.0523	ng/mL
HPFO_DA	Auto	4.304	19136	2183309	HPFO_DA-13C_IS	0.0500	0.0506	ng/mL
HPFO_DA-13C	Auto	4.304	2183309	6627530	13C7-PFUnDA_IS	5.0000	4.9530	ng/mL
HPFO_DA-13C_IS	Auto	4.304	2183309	2183309	----	5.0000	5.0000	ng/mL



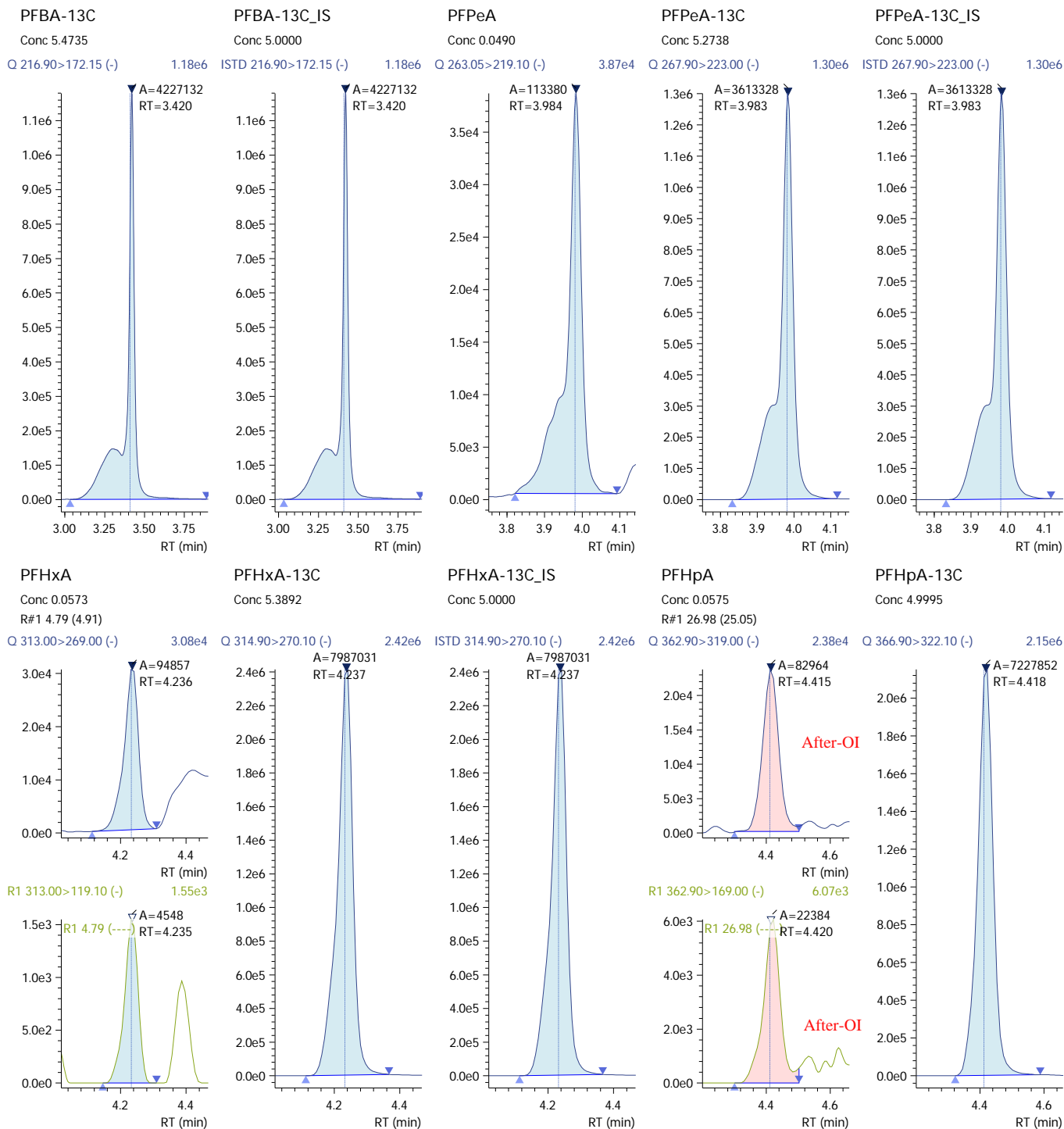


### 210413\_033 (continued)





### 210413\_033 (continued)



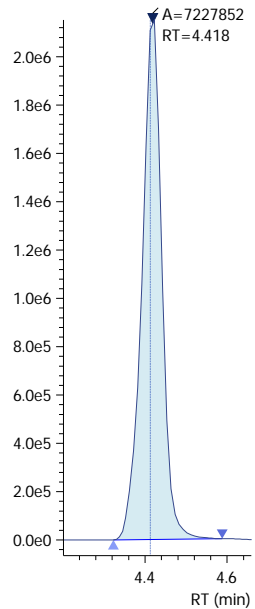


### 210413\_033 (continued)

PFHpA-13C\_IS

Conc 5.0000

ISTD 366.90>322.10 (-) 2.15e6

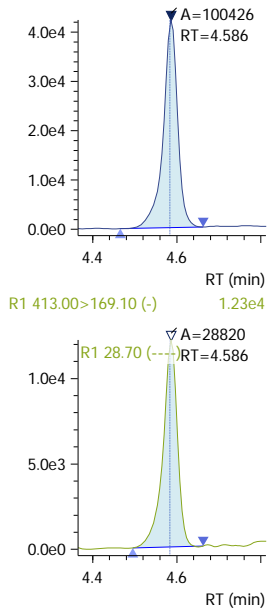


PFOA

Conc 0.0533

R#1 28.70 (29.71)

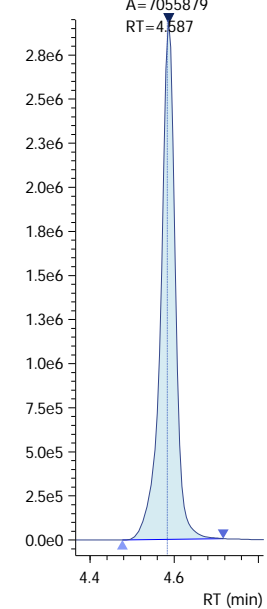
Q 413.00>369.00 (-) 4.25e4



PFOA-13C

Conc 5.2975

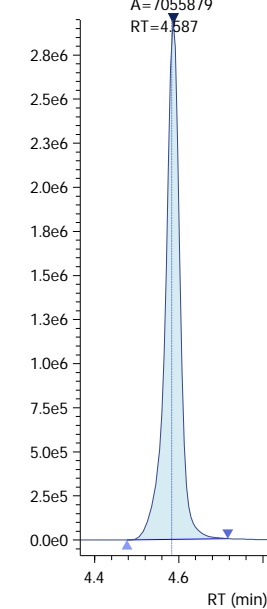
Q 416.80>372.05 (-) 2.95e6



PFOA-13C\_IS

Conc 5.0000

ISTD 416.80>372.05 (-) 2.95e6

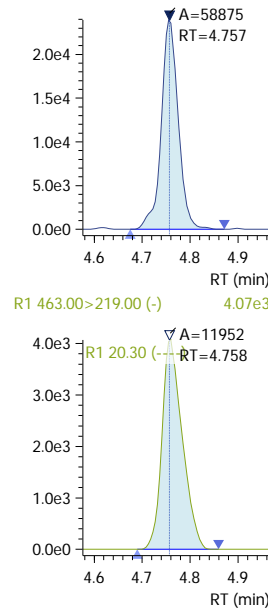


PFNA

Conc 0.0533

R#1 20.30 (21.68)

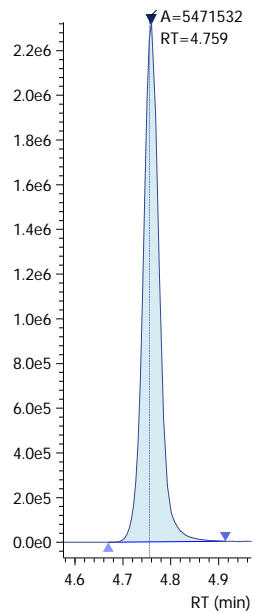
Q 463.00>418.90 (-) 2.39e4



PFNA-13C

Conc 4.8919

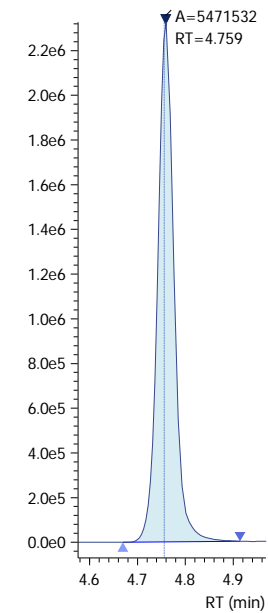
Q 467.80>423.00 (-) 2.33e6



PFNA-13C\_IS

Conc 5.0000

ISTD 467.80>423.00 (-) 2.33e6

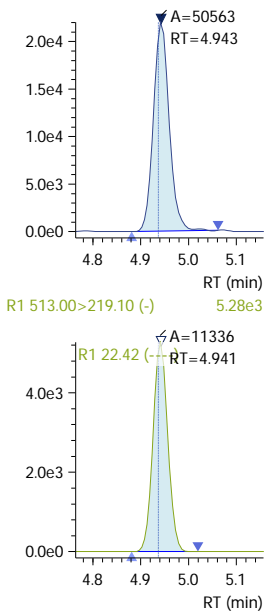


PFDA

Conc 0.0516

R#1 22.42 (21.66)

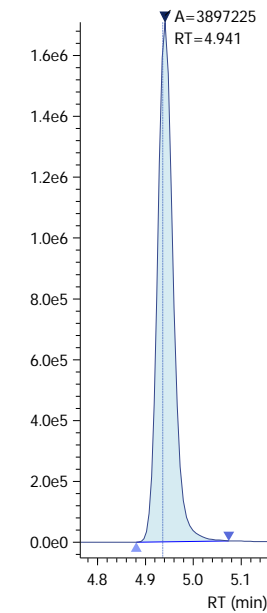
Q 513.00>468.80 (-) 2.20e4



PFDA-13C

Conc 5.2863

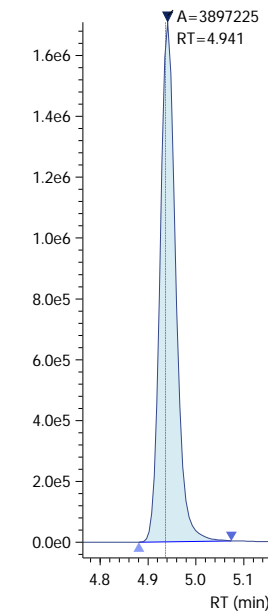
Q 514.80>469.95 (-) 1.71e6



PFDA-13C\_IS

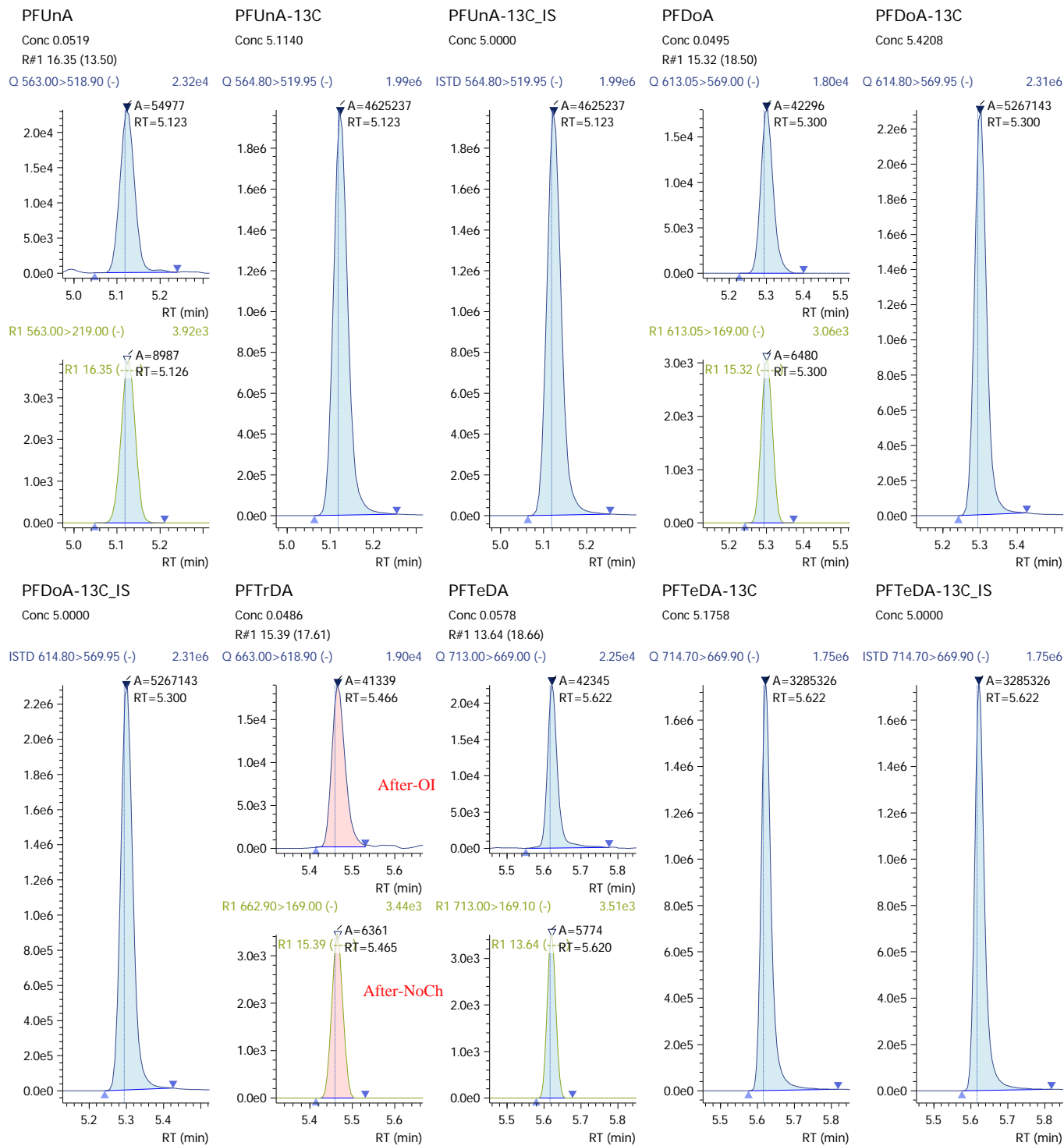
Conc 5.0000

ISTD 514.80>469.95 (-) 1.71e6



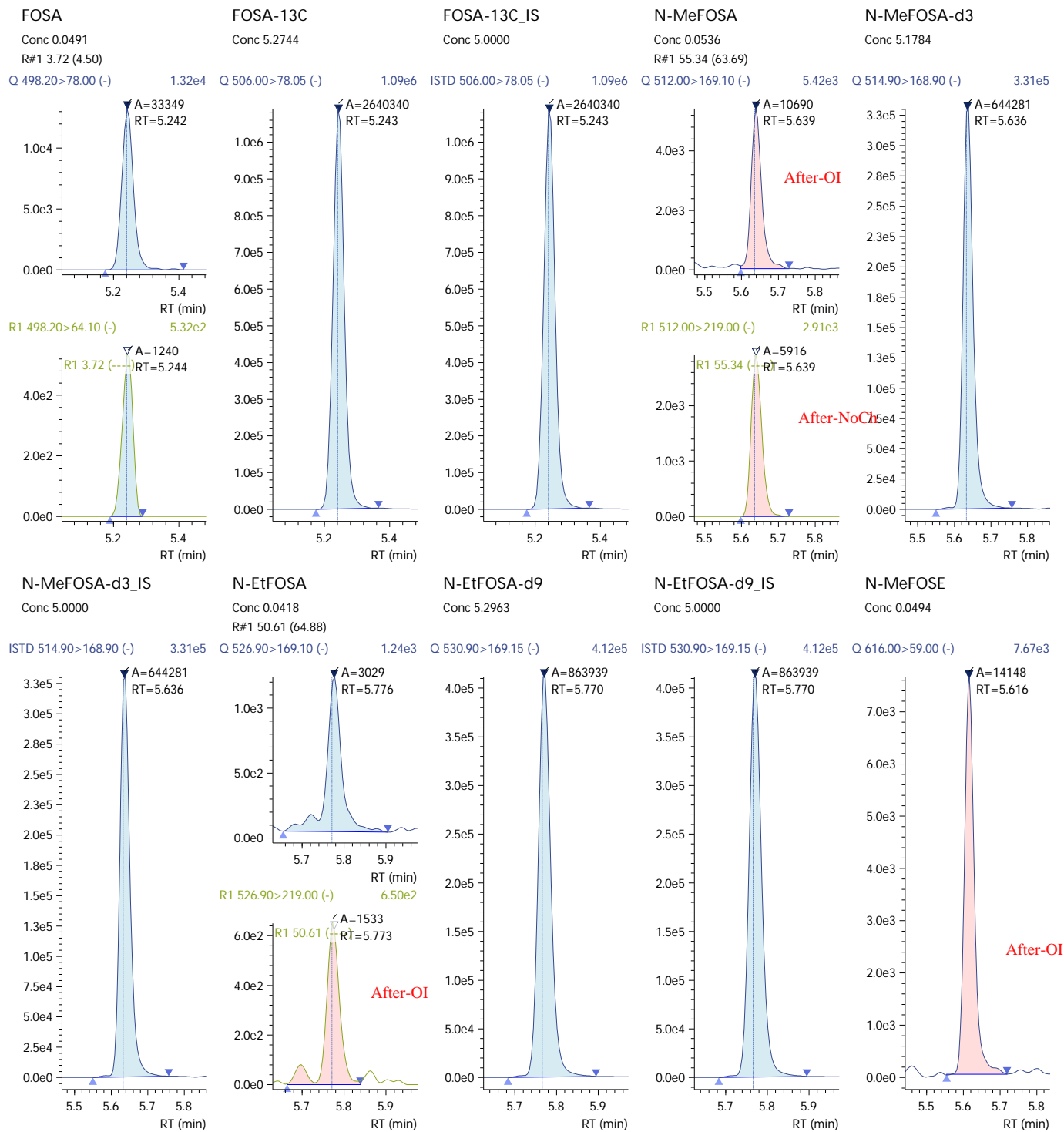


210413\_033 (continued)





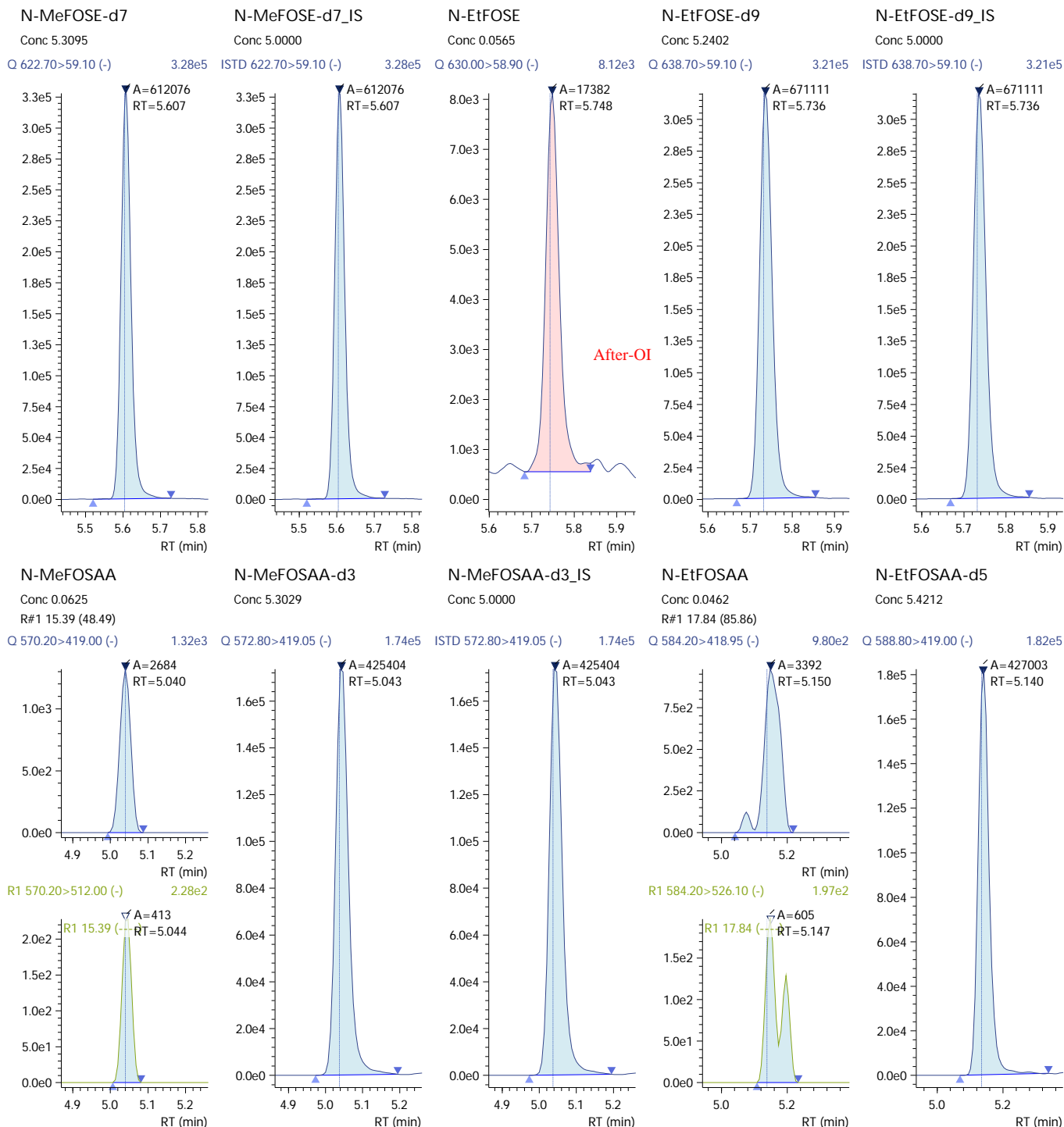
210413\_033 (continued)







210413\_033 (continued)





### 210413\_033 (continued)

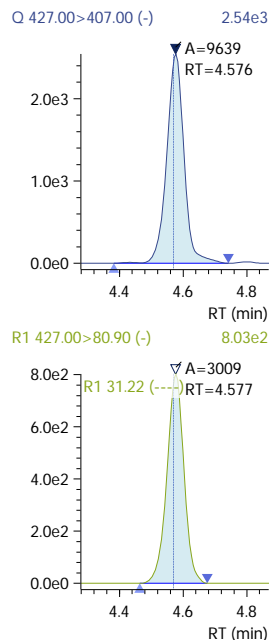
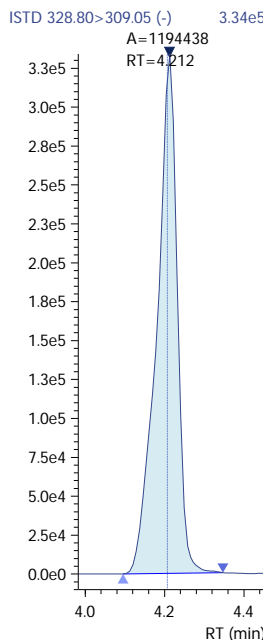
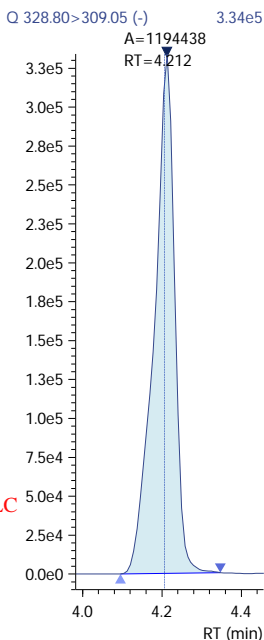
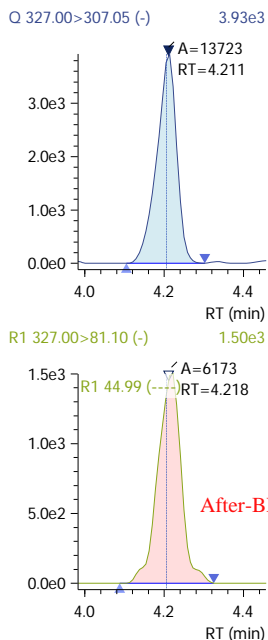
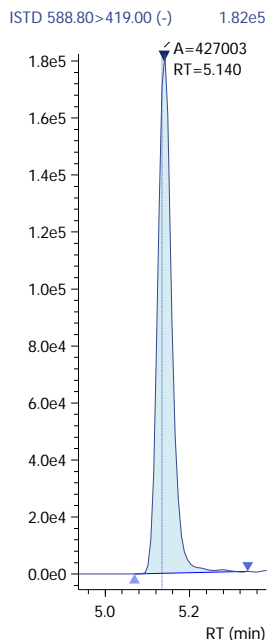
N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.0527  
R#1 44.99 (26.07)

4\_2-FTS-13C  
Conc 4.7061

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.0565  
R#1 31.22 (30.56)



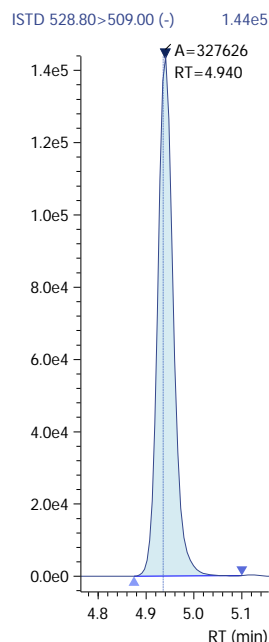
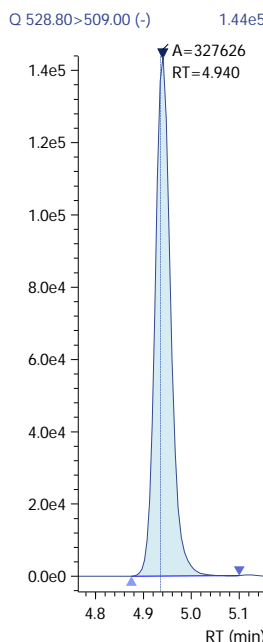
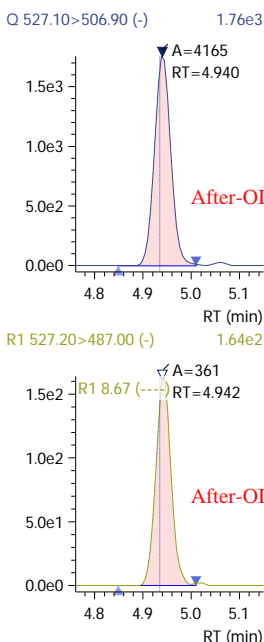
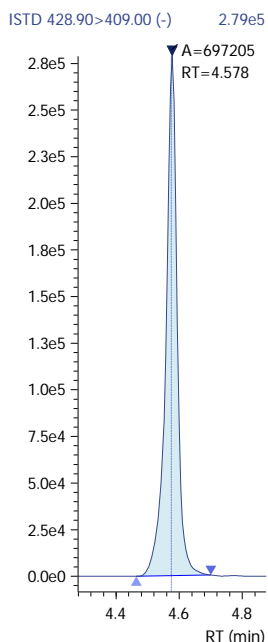
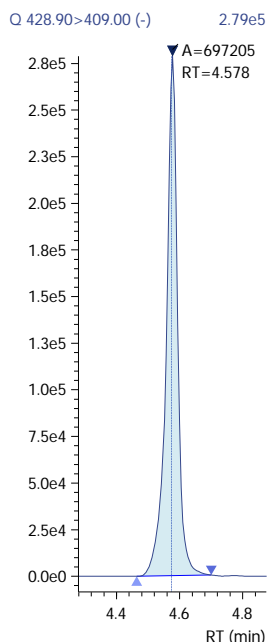
6\_2-FTS-13C  
Conc 5.1172

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.0540  
R#1 8.67 (8.18)

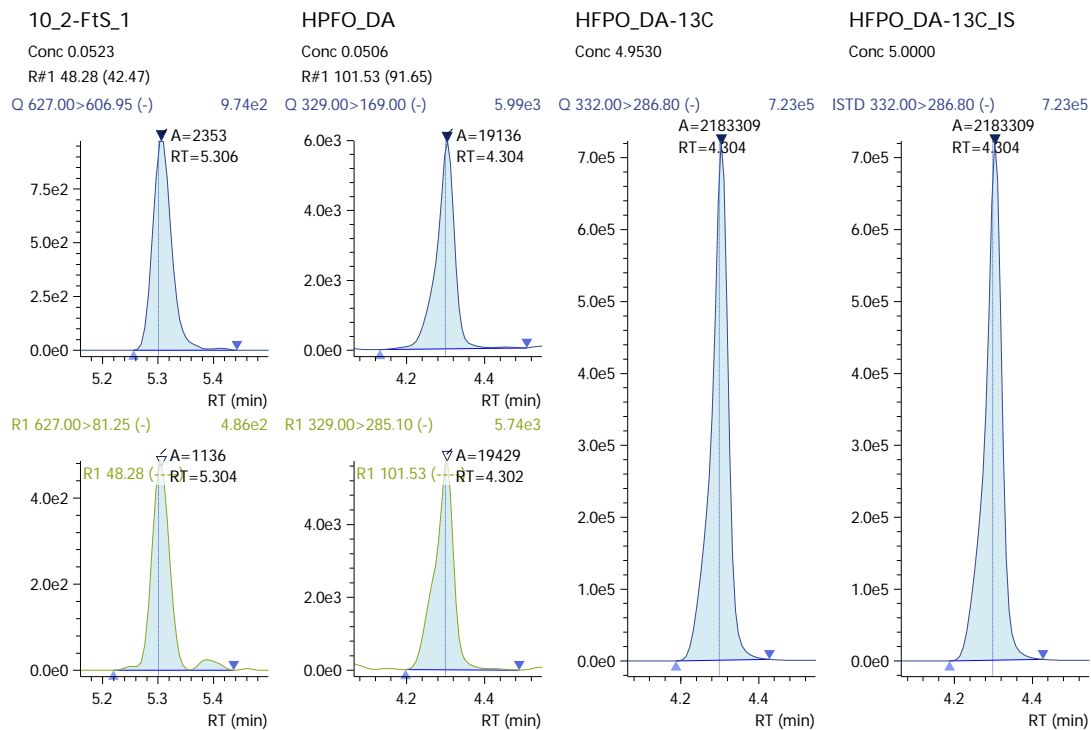
8\_2-FTS-13C  
Conc 4.8953

8\_2-FTS-13C\_IS  
Conc 5.0000





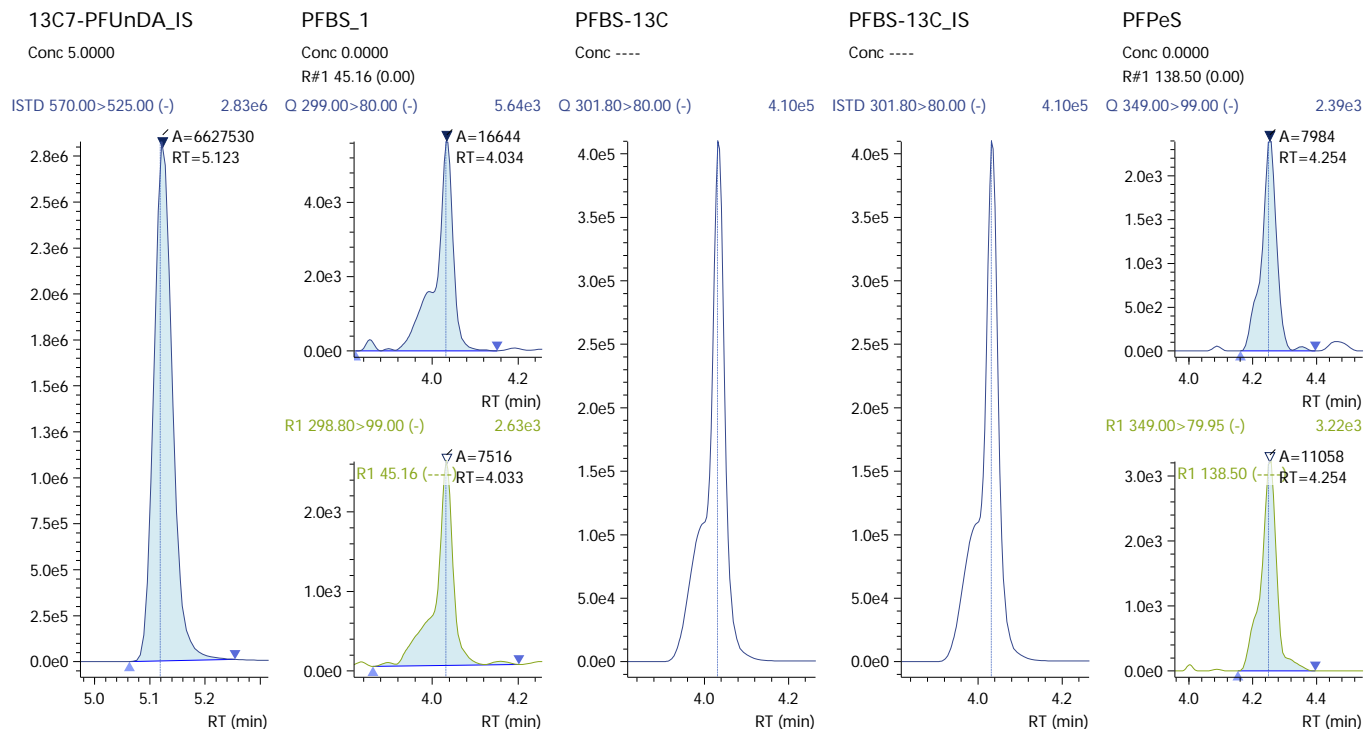
### 210413\_033 (continued)





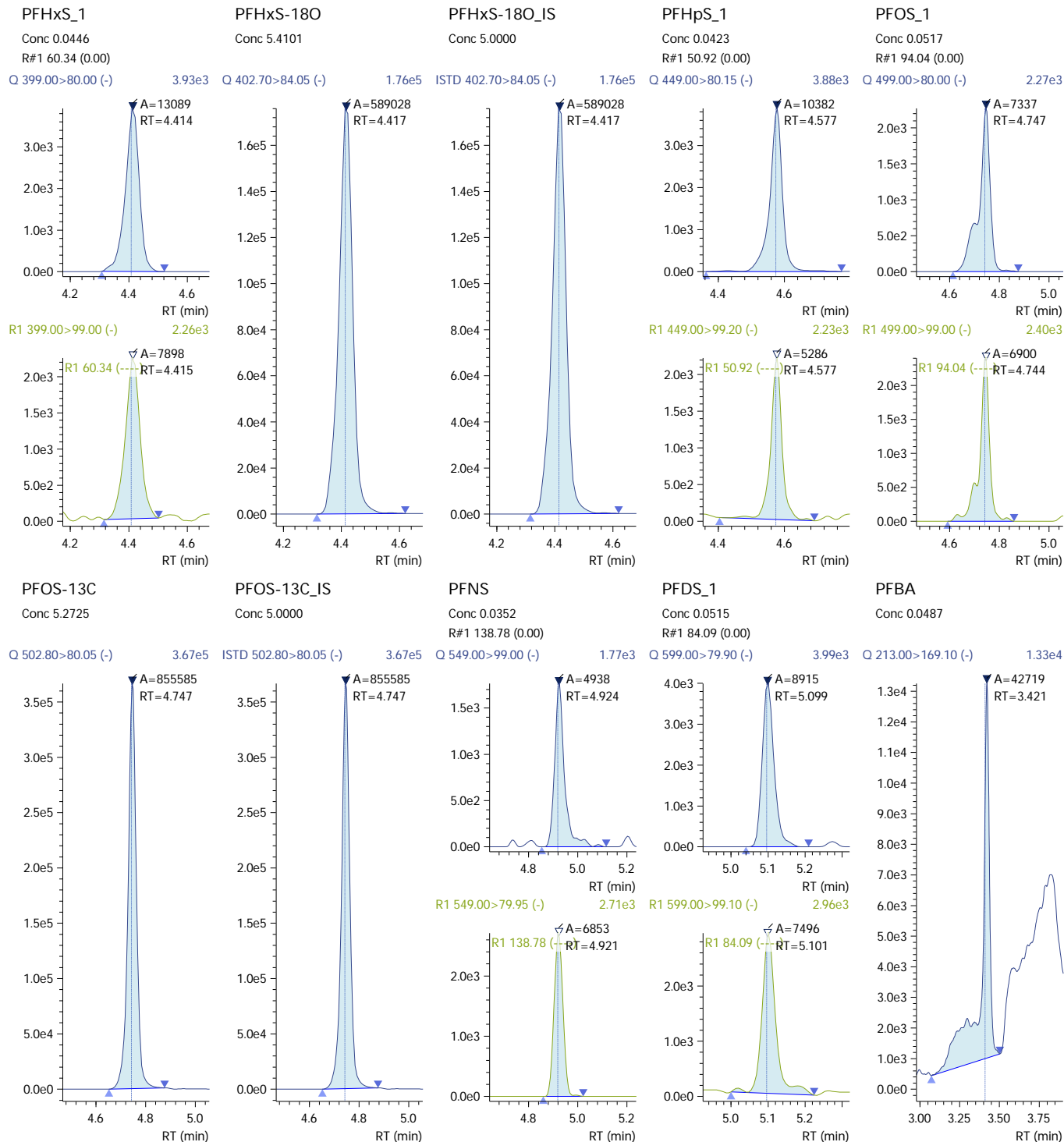
### 210413\_033

Sample ID: PFC ICAL 0.05 PPB  
Date Acquired: 4/13/2021 5:29:22 PM  
Acquired by: System Administrator  
Data File: 210413\_033  
Vial: 1 | Inj. Volume: 15.0000uL | Tray: 0



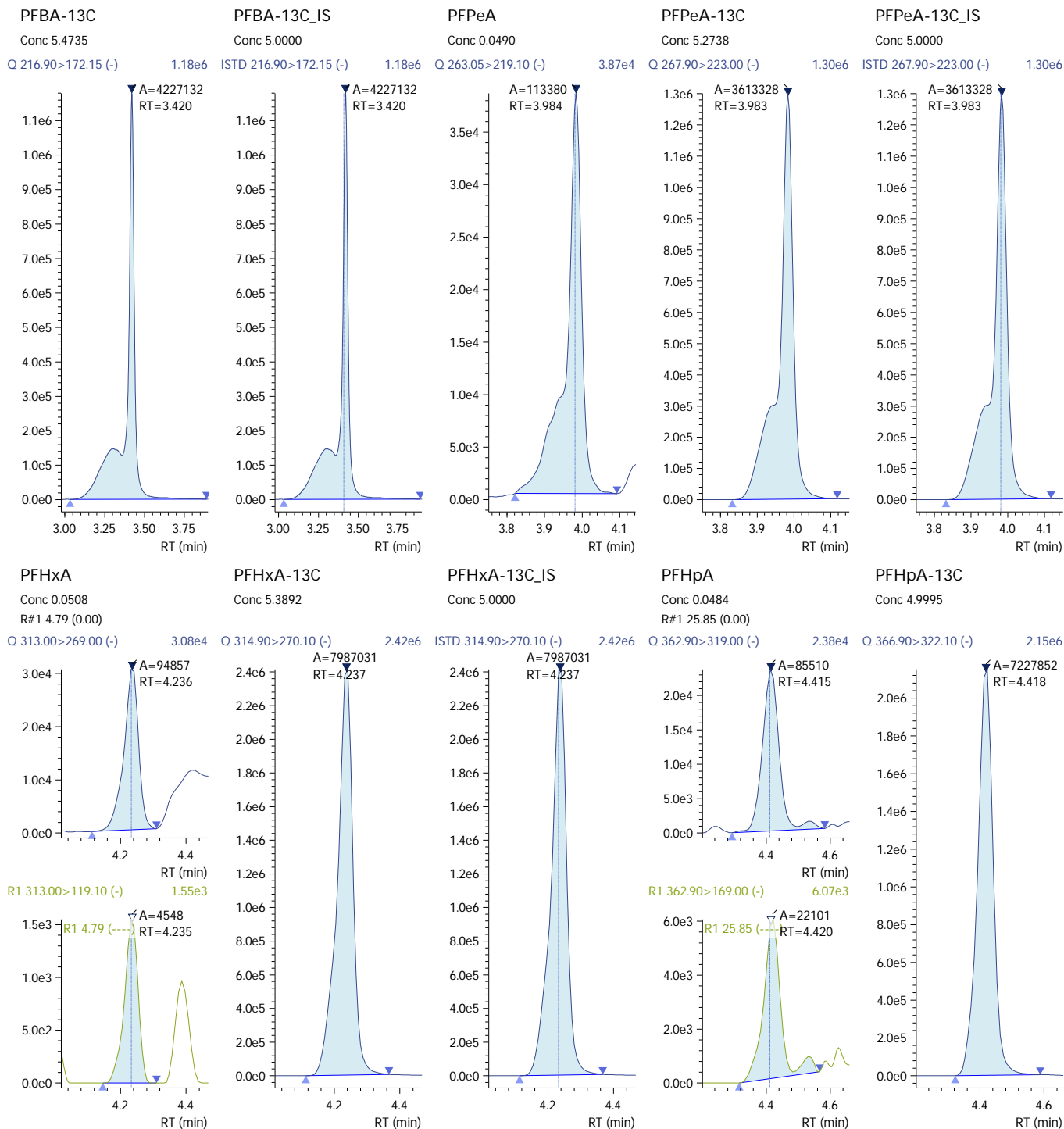


### 210413\_033 (continued)





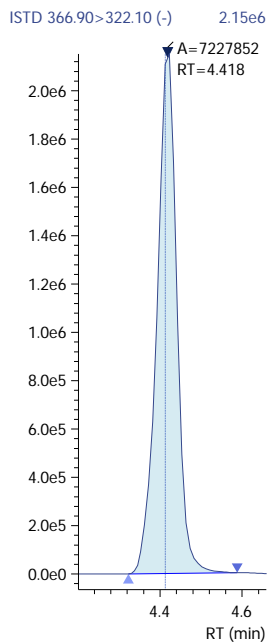
### 210413\_033 (continued)



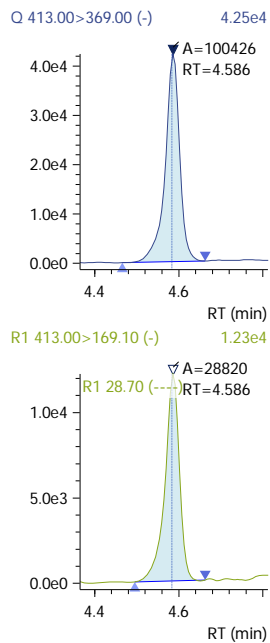


### 210413\_033 (continued)

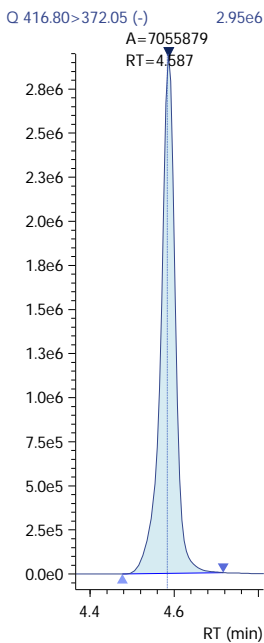
PFHpA-13C\_IS  
Conc 5.0000



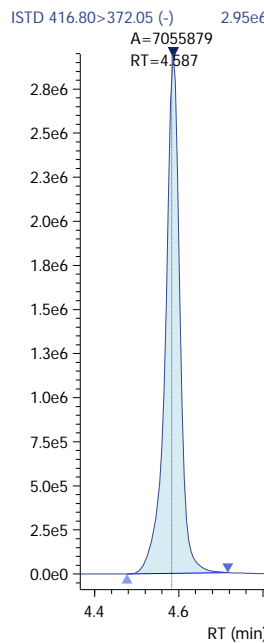
PFOA  
Conc 0.0508  
R#1 28.70 (0.00)



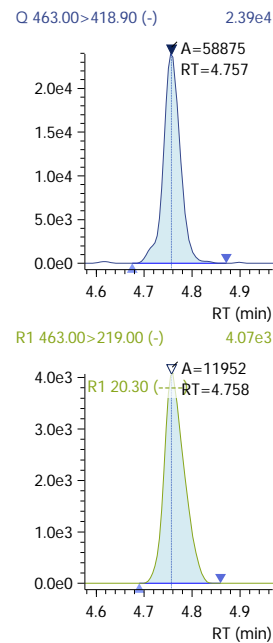
PFOA-13C  
Conc 5.2975



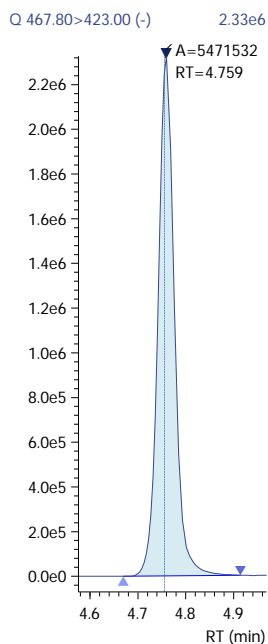
PFOA-13C\_IS  
Conc 5.0000



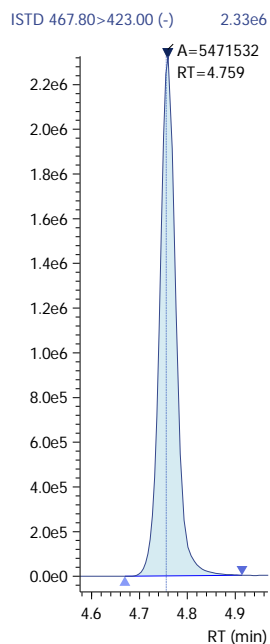
PFNA  
Conc 0.0478  
R#1 20.30 (0.00)



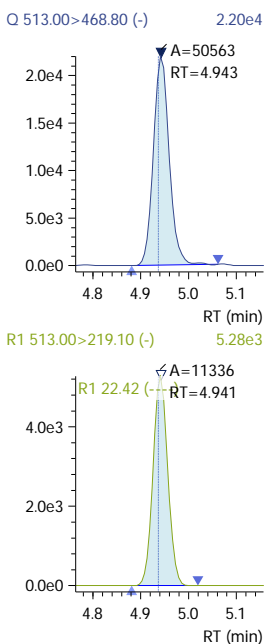
PFNA-13C  
Conc 4.8919



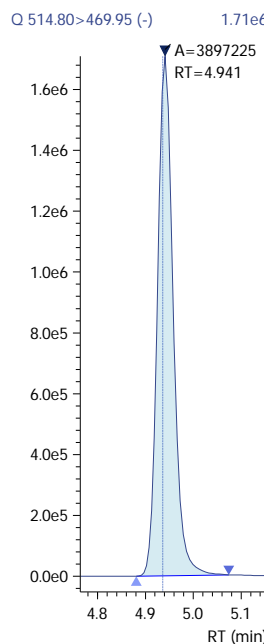
PFNA-13C\_IS  
Conc 5.0000



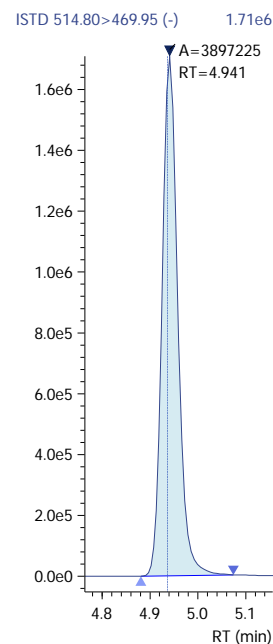
PFDA  
Conc 0.0516  
R#1 22.42 (0.00)



PFDA-13C  
Conc 5.2863



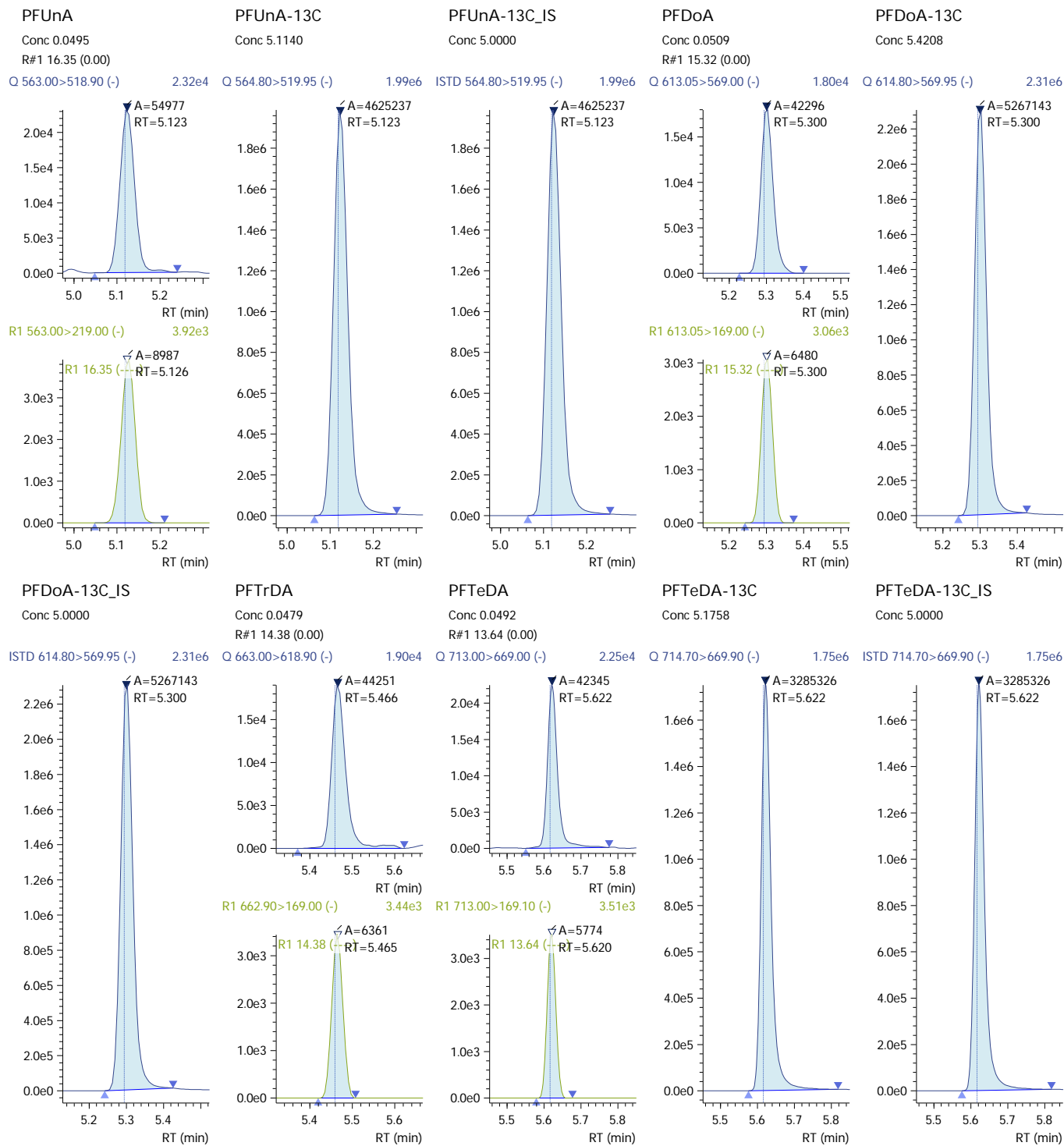
PFDA-13C\_IS  
Conc 5.0000





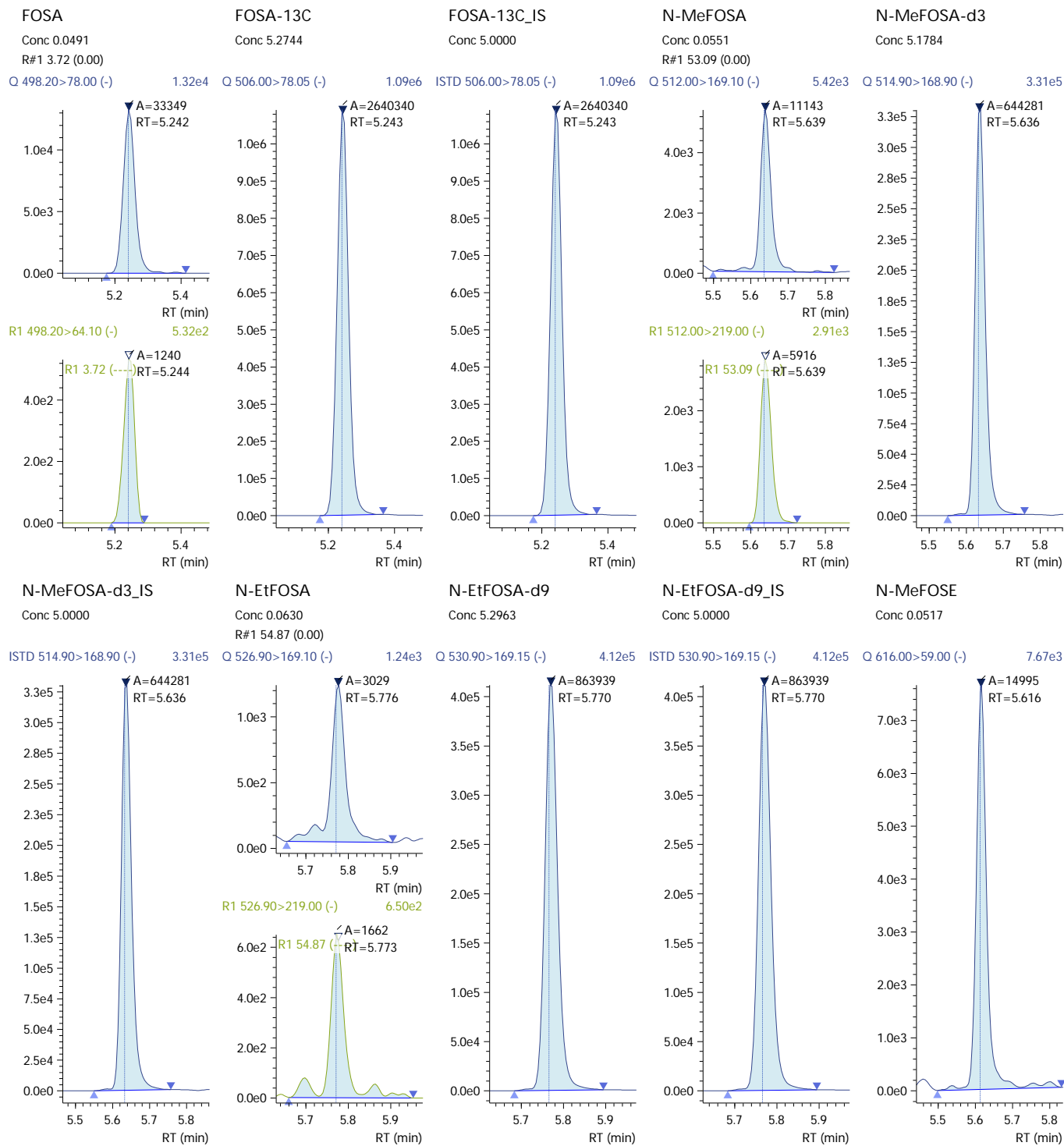


### 210413\_033 (continued)



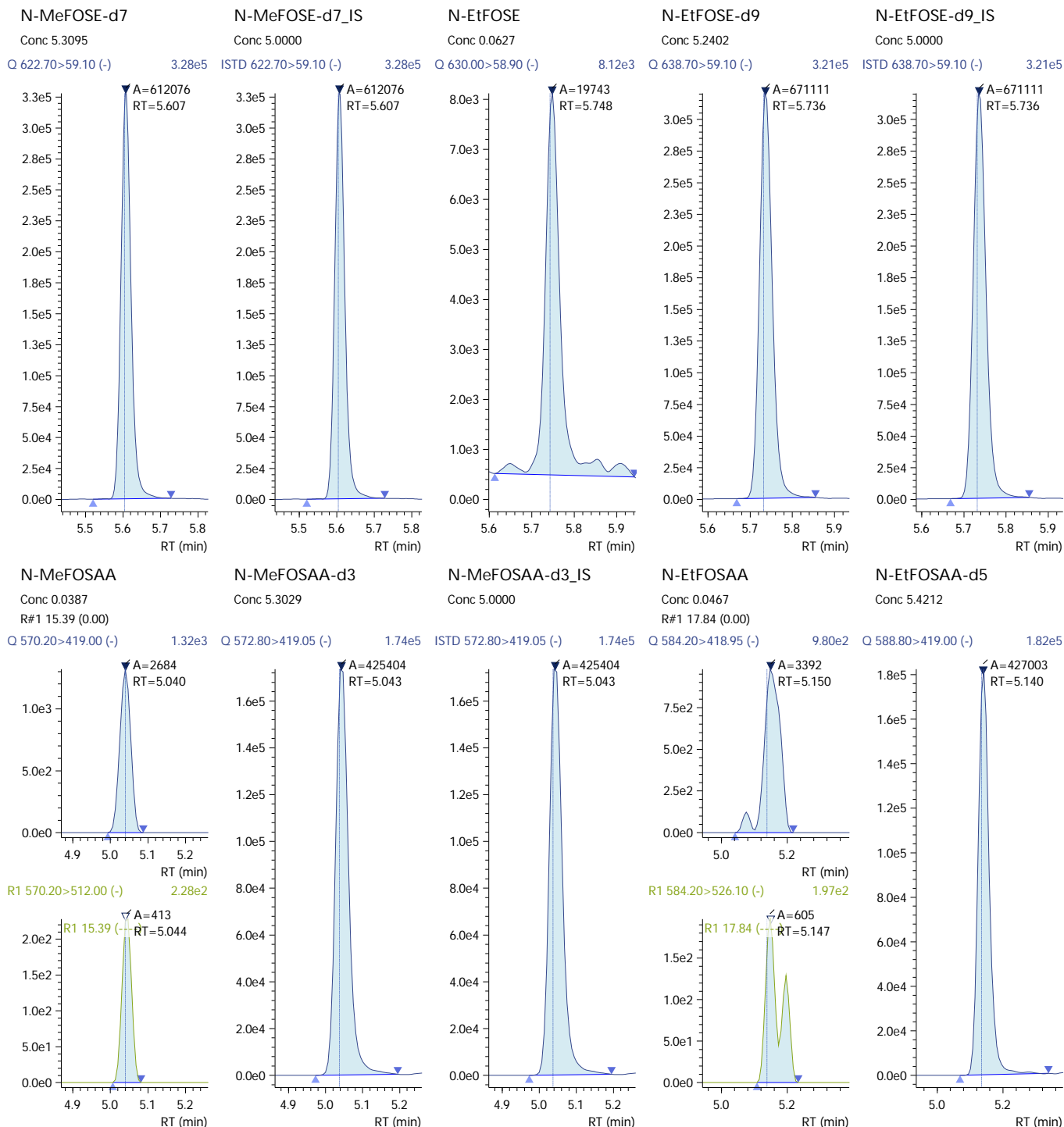


210413\_033 (continued)





### 210413\_033 (continued)





### 210413\_033 (continued)

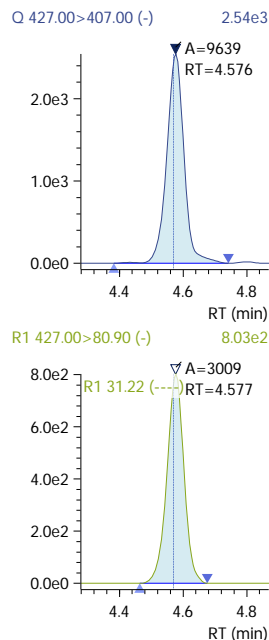
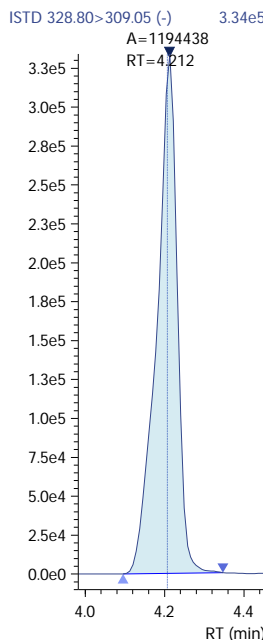
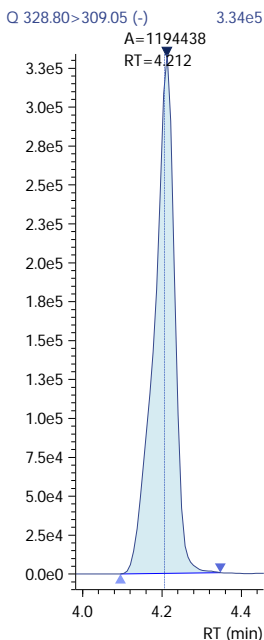
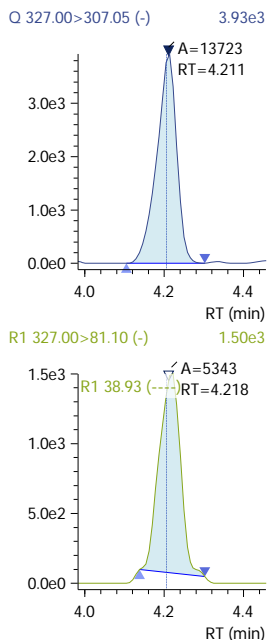
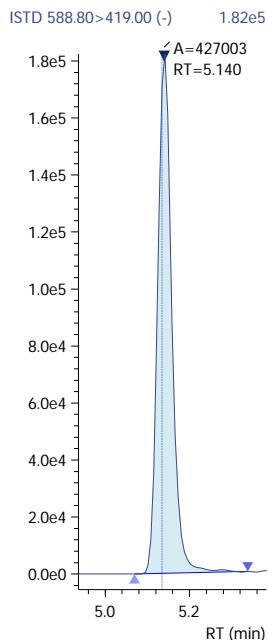
N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.0518  
R#1 38.93 (0.00)

4\_2-FTS-13C  
Conc 4.7061

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.0565  
R#1 31.22 (0.00)



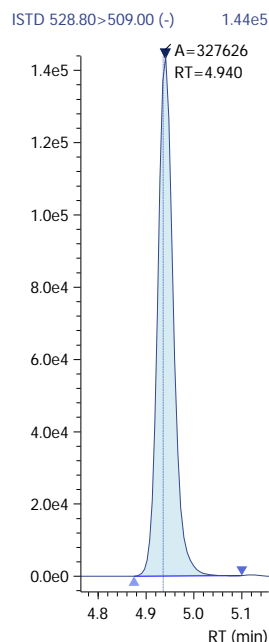
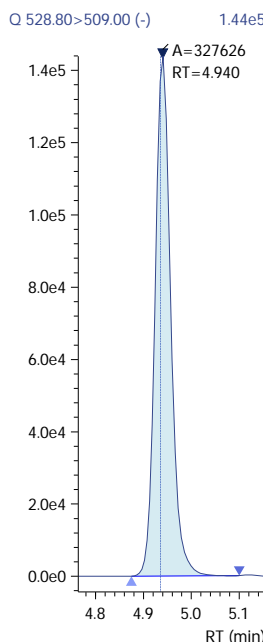
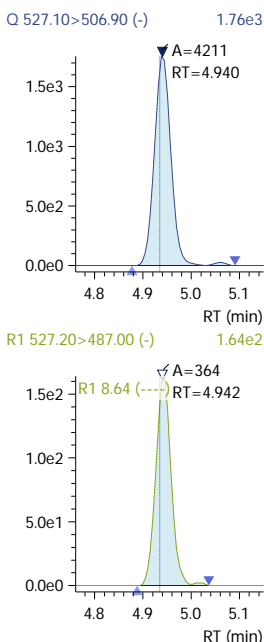
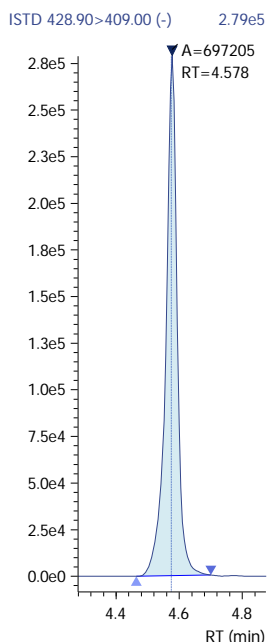
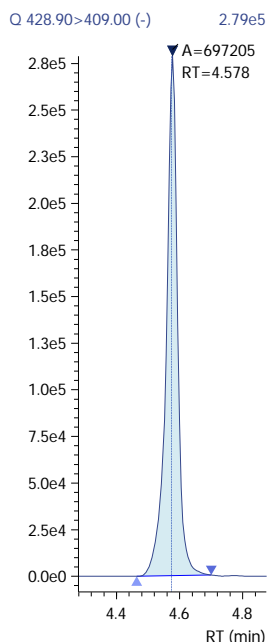
6\_2-FTS-13C  
Conc 5.1172

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.0545  
R#1 8.64 (0.00)

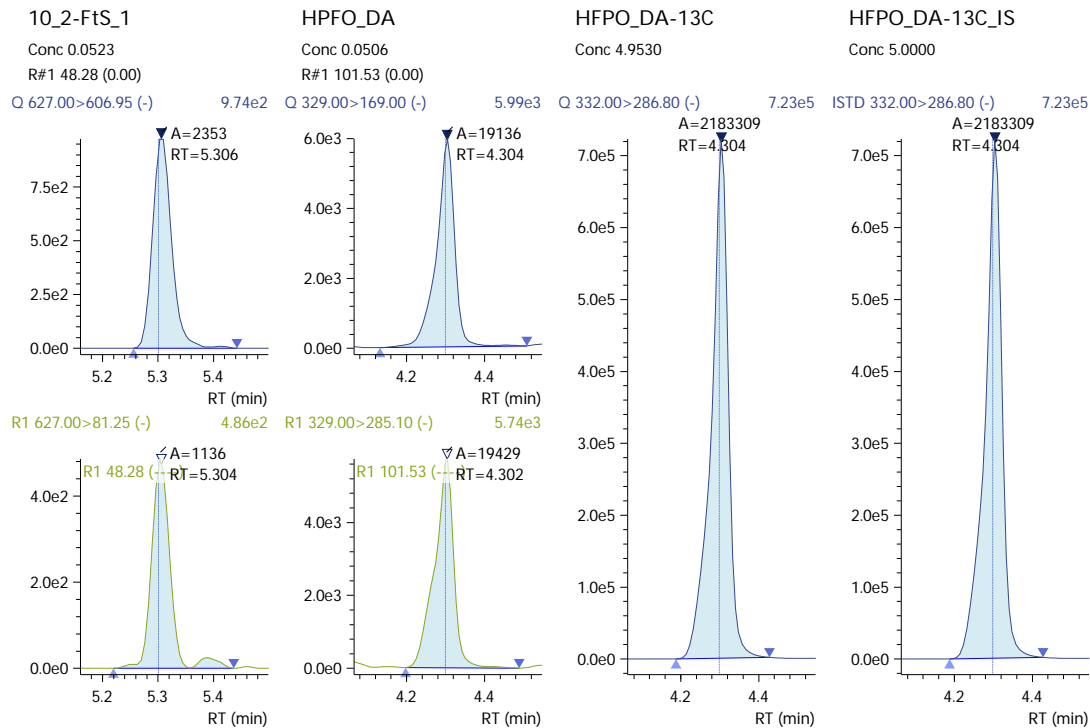
8\_2-FTS-13C  
Conc 4.8953

8\_2-FTS-13C\_IS  
Conc 5.0000





### 210413\_033 (continued)





## 210413\_034

Sample ID: PFC ICAL 0.1 PPB

Date Acquired: 4/13/2021 5:39:49 PM

Acquired by: System Administrator

Data File: 210413\_034

Vial: 2 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.113	-0.005	----	7029099	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.028	-0.004	0.00	32365	14545	44.94	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.028	-0.004	-1.09	1188047	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.028	-0.004	----	1188047	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.243	-0.006	0.22	14423	20294	140.71	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.409	0.001	0.00	21989	15292	69.55	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.412	-0.001	-0.70	567055	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.412	-0.001	----	567055	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.571	-0.004	0.16	24410	12432	50.93	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.740	-0.002	0.00	13811	12394	89.74	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.739	-0.003	-0.37	883795	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.739	-0.003	----	883795	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.915	-0.003	0.18	14352	13304	92.70	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.088	-0.008	0.35	18062	14502	80.29	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.416	0.006	0.00	100340	----	----	----		
PFBA-13C	216.90>172.15	----	3.415	0.006	-1.70	4368228	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.415	0.006	----	4368228	----	----	----		
PFPeA	263.05>219.10	----	3.978	-0.003	0.00	199296	----	----	----		
PFPeA-13C	267.90>223.00	----	3.977	-0.004	-1.14	3757989	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.977	-0.004	----	3757989	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.233	0.000	0.00	178432	10668	5.98	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.233	0.001	-0.88	8059120	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.233	0.001	----	8059120	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.414	0.002	0.00	181857	39177	21.54	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.415	0.002	-0.70	8295428	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.415	0.002	----	8295428	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.581	-0.003	0.00	195851	62418	31.87	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.581	-0.003	-0.53	7413091	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.581	-0.003	----	7413091	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.753	-0.003	0.00	132762	23823	17.94	21.68	10.84-32.52	

J:\LCMS06\Data\210413\_Curve\210413\_Curve.DAML

Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_034 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.752	-0.004	-0.36	6393487	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.752	-0.004	----	6393487	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.932	-0.005	0.00	105498	23919	22.67	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.932	-0.004	-0.18	4099642	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.932	-0.004	----	4099642	----	----	----	0-0	
PfUnA	563.00>518.90	563.00>219.00	5.113	-0.006	0.00	114229	16968	14.85	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.113	-0.006	0.00	5023864	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.113	-0.006	----	5023864	----	----	----	0-0	
PfDoA	613.05>569.00	613.05>169.00	5.290	-0.003	0.00	77078	16740	21.72	18.50	9.25-27.75	
PfDoA-13C	614.80>569.95	----	5.290	-0.004	0.18	5154246	----	----	----	0-0	
PfDoA-13C_IS	614.80>569.95	----	5.290	-0.004	----	5154246	----	----	----	0-0	
PfTrDA	663.00>618.90	662.90>169.00	5.456	-0.003	-0.16	89394	20256	22.66	17.61	8.8-26.41	
PfTeDA	713.00>669.00	713.00>169.10	5.613	-0.003	0.00	83397	18647	22.36	18.66	9.33-27.99	
PfTeDA-13C	714.70>669.90	----	5.613	-0.003	0.50	3470350	----	----	----	0-0	
PfTeDA-13C_IS	714.70>669.90	----	5.613	-0.003	----	3470350	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.234	-0.007	0.00	70645	3002	4.25	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.234	-0.007	0.12	2670464	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.234	-0.007	----	2670464	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.629	-0.006	0.00	20110	13998	69.61	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.627	-0.006	0.51	689990	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.627	-0.006	----	689990	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.766	-0.005	0.01	6513	4222	64.82	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.760	-0.006	0.65	900081	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.760	-0.006	----	900081	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.606	-0.007	0.01	30106	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.598	-0.006	0.49	626841	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.598	-0.006	----	626841	----	----	----		
N-EtFOSE	630.00>58.90	----	5.737	-0.005	0.01	33246	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.727	-0.005	0.61	691338	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.727	-0.005	----	691338	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.038	-0.002	0.01	4907	2658	54.17	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.032	-0.005	-0.08	429076	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.032	-0.005	----	429076	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.132	-0.006	0.00	9037	6698	74.12	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.130	-0.005	0.02	433813	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.130	-0.005	----	433813	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.207	0.001	0.00	31483	9725	30.89	26.07	13.03-39.1	
4_2-FTS-13C	328.80>309.05	----	4.208	0.001	-0.91	1412853	----	----	----	0-0	

J:\LCMS06\Data\210413\_Curve\210413\_Curve.DAML

Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.





210413\_034 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.208	0.001	----	1412853	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.568	-0.001	0.00	17678	5427	30.70	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.571	-0.003	-0.54	774757	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.571	-0.003	----	774757	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.931	-0.004	0.00	8709	738	8.47	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.932	-0.003	-0.18	359400	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.932	-0.003	----	359400	----	----	----	0-0	
10_2-FTS_1	627.00>606.95	627.00>81.25	5.297	-0.004	0.37	4766	1888	39.61	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.299	0.000	0.00	45080	39111	86.76	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.299	0.000	-0.81	2482061	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.299	0.000	----	2482061	----	----	----		



## 210413\_034

Sample ID: PFC ICAL 0.1 PPB  
 Date Acquired: 4/13/2021 5:39:49 PM  
 Acquired by: System Administrator  
 Data File: 210413\_034  
 Vial: 2 | Inj. Volume: 15.000uL | Tray: 0

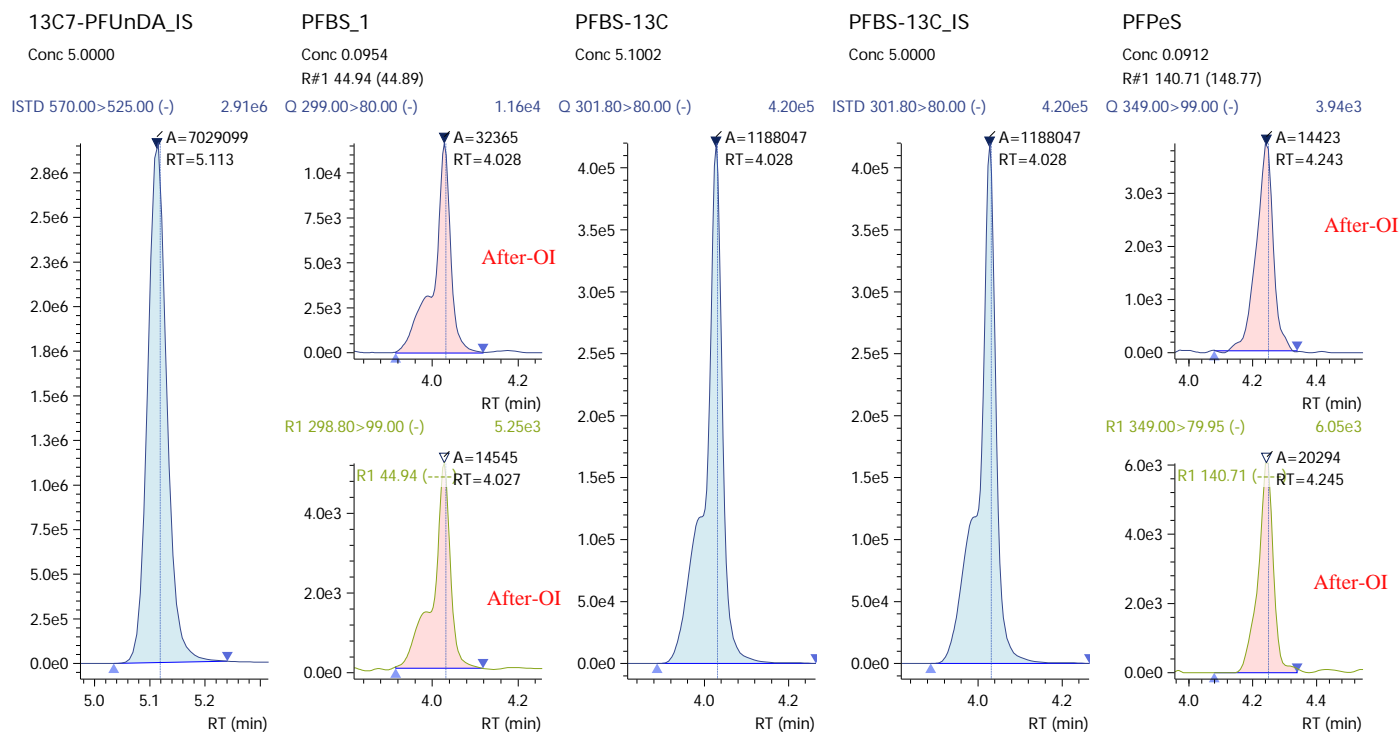
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.113	7029099	7029099	----	5.0000	5.0000	ng/mL
PFBS_1	M	4.028	32365	1188047	PFBS-13C_IS	0.0887	0.0954	ng/mL
PFBS-13C	Auto	4.028	1188047	7029099	13C7-PFUnDA_IS	5.0000	5.1002	ng/mL
PFBS-13C_IS	Auto	4.028	1188047	1188047	----	5.0000	5.0000	ng/mL
PFPeS	M	4.243	14423	1188047	PFBS-13C_IS	0.0941	0.0912	ng/mL
PFHxS_1	Auto	4.409	21989	567055	PFHxS-18O_IS	0.0913	0.0952	ng/mL
PFHxS-18O	Auto	4.412	567055	7029099	13C7-PFUnDA_IS	5.0000	4.9107	ng/mL
PFHxS-18O_IS	Auto	4.412	567055	567055	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.571	24410	567055	PFHxS-18O_IS	0.0953	0.1035	ng/mL
PFOS_1	Auto	4.740	13811	883795	PFOS-13C_IS	0.0929	0.0943	ng/mL
PFOS-13C	Auto	4.739	883795	7029099	13C7-PFUnDA_IS	5.0000	5.1352	ng/mL
PFOS-13C_IS	Auto	4.739	883795	883795	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.915	14352	883795	PFOS-13C_IS	0.0962	0.1122	ng/mL
PFDS_1	Auto	5.088	18062	883795	PFOS-13C_IS	0.0965	0.1010	ng/mL
PFBA	M	3.416	100340	4368228	PFBA-13C_IS	0.1000	0.1064	ng/mL
PFBA-13C	Auto	3.415	4368228	7029099	13C7-PFUnDA_IS	5.0000	5.3331	ng/mL
PFBA-13C_IS	Auto	3.415	4368228	4368228	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.978	199296	3757989	PFPeA-13C_IS	0.1000	0.1024	ng/mL
PFPeA-13C	Auto	3.977	3757989	7029099	13C7-PFUnDA_IS	5.0000	5.1716	ng/mL
PFPeA-13C_IS	Auto	3.977	3757989	3757989	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.233	178432	8059120	PFHxA-13C_IS	0.1000	0.1069	ng/mL
PFHxA-13C	Auto	4.233	8059120	7029099	13C7-PFUnDA_IS	5.0000	5.1271	ng/mL
PFHxA-13C_IS	Auto	4.233	8059120	8059120	----	5.0000	5.0000	ng/mL
PFHpA	M	4.414	181857	8295428	PFHpA-13C_IS	0.1000	0.1097	ng/mL
PFHpA-13C	Auto	4.415	8295428	7029099	13C7-PFUnDA_IS	5.0000	5.4101	ng/mL
PFHpA-13C_IS	Auto	4.415	8295428	8295428	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.581	195851	7413091	PFOA-13C_IS	0.1000	0.0989	ng/mL
PFOA-13C	Auto	4.581	7413091	7029099	13C7-PFUnDA_IS	5.0000	5.2477	ng/mL
PFOA-13C_IS	Auto	4.581	7413091	7413091	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.753	132762	6393487	PFNA-13C_IS	0.1000	0.1029	ng/mL
PFNA-13C	Auto	4.752	6393487	7029099	13C7-PFUnDA_IS	5.0000	5.3896	ng/mL
PFNA-13C_IS	Auto	4.752	6393487	6393487	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.932	105498	4099642	PFDA-13C_IS	0.1000	0.1024	ng/mL
PFDA-13C	Auto	4.932	4099642	7029099	13C7-PFUnDA_IS	5.0000	5.2431	ng/mL
PFDA-13C_IS	Auto	4.932	4099642	4099642	----	5.0000	5.0000	ng/mL
PFUnA	M	5.113	114229	5023864	PFUnA-13C_IS	0.1000	0.0992	ng/mL
PFUnA-13C	Auto	5.113	5023864	7029099	13C7-PFUnDA_IS	5.0000	5.2374	ng/mL
PFUnA-13C_IS	Auto	5.113	5023864	5023864	----	5.0000	5.0000	ng/mL
PFDaA	M	5.290	77078	5154246	PFDaA-13C_IS	0.1000	0.0922	ng/mL
PFDaA-13C	Auto	5.290	5154246	7029099	13C7-PFUnDA_IS	5.0000	5.0016	ng/mL
PFDaA-13C_IS	Auto	5.290	5154246	5154246	----	5.0000	5.0000	ng/mL
PFTeDA	M	5.456	89394	3470350	PFTeDA-13C_IS	0.1000	0.0994	ng/mL
PFTeDA	Auto	5.613	83397	3470350	PFTeDA-13C_IS	0.1000	0.1077	ng/mL
PFTeDA-13C	Auto	5.613	3470350	7029099	13C7-PFUnDA_IS	5.0000	5.1549	ng/mL
PFTeDA-13C_IS	Auto	5.613	3470350	3470350	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.234	70645	2670464	FOSA-13C_IS	0.1000	0.1029	ng/mL
FOSA-13C	Auto	5.234	2670464	7029099	13C7-PFUnDA_IS	5.0000	5.0298	ng/mL
FOSA-13C_IS	Auto	5.234	2670464	2670464	----	5.0000	5.0000	ng/mL
N-MeFOSA	M	5.629	20110	689990	N-MeFOSA-d3_IS	0.1000	0.0942	ng/mL
N-MeFOSA-d3	Auto	5.627	689990	7029099	13C7-PFUnDA_IS	5.0000	5.2290	ng/mL
N-MeFOSA-d3_IS	Auto	5.627	689990	689990	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.766	6513	900081	N-EtFOSA-d9_IS	0.1000	0.1185	ng/mL
N-EtFOSA-d9	Auto	5.760	900081	7029099	13C7-PFUnDA_IS	5.0000	5.2026	ng/mL
N-EtFOSA-d9_IS	Auto	5.760	900081	900081	----	5.0000	5.0000	ng/mL



### 210413\_034 (continued)

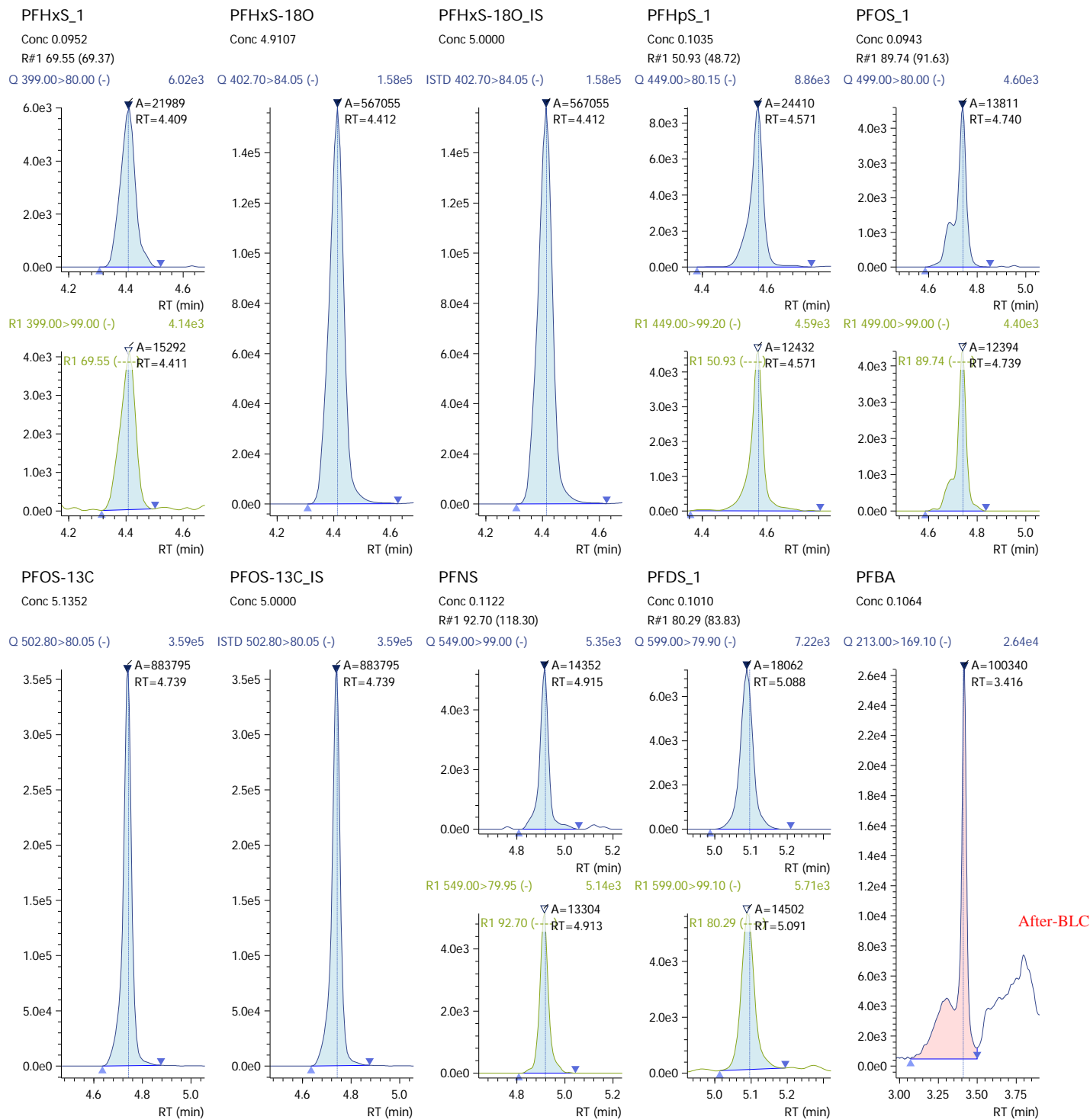
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.606	30106	626841	N-MeFOSE-d7_IS	0.1000	0.1026	ng/mL
N-MeFOSE-d7	Auto	5.598	626841	7029099	13C7-PFUnDA_IS	5.0000	5.1269	ng/mL
N-MeFOSE-d7_IS	Auto	5.598	626841	626841	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.737	33246	691338	N-EtFOSE-d9_IS	0.1000	0.1048	ng/mL
N-EtFOSE-d9	Auto	5.727	691338	7029099	13C7-PFUnDA_IS	5.0000	5.0898	ng/mL
N-EtFOSE-d9_IS	Auto	5.727	691338	691338	----	5.0000	5.0000	ng/mL
N-MeFOSAA	M	5.038	4907	429076	N-MeFOSAA-d3_IS	0.1000	0.0914	ng/mL
N-MeFOSAA-d3	Auto	5.032	429076	7029099	13C7-PFUnDA_IS	5.0000	5.0431	ng/mL
N-MeFOSAA-d3_IS	Auto	5.032	429076	429076	----	5.0000	5.0000	ng/mL
N-EtFOSAA	Auto	5.132	9037	433813	N-EtFOSAA-d5_IS	0.1000	0.1211	ng/mL
N-EtFOSAA-d5	Auto	5.130	433813	7029099	13C7-PFUnDA_IS	5.0000	5.1930	ng/mL
N-EtFOSAA-d5_IS	Auto	5.130	433813	433813	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.207	31483	1412853	4_2-FTS-13C_IS	0.0937	0.1022	ng/mL
4_2-FTS-13C	Auto	4.208	1412853	7029099	13C7-PFUnDA_IS	5.0000	5.2487	ng/mL
4_2-FTS-13C_IS	Auto	4.208	1412853	1412853	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.568	17678	774757	6_2-FTS-13C_IS	0.0951	0.0933	ng/mL
6_2-FTS-13C	Auto	4.571	774757	7029099	13C7-PFUnDA_IS	5.0000	5.3616	ng/mL
6_2-FTS-13C_IS	Auto	4.571	774757	774757	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.931	8709	359400	8_2-FTS-13C_IS	0.0960	0.1029	ng/mL
8_2-FTS-13C	Auto	4.932	359400	7029099	13C7-PFUnDA_IS	5.0000	5.0633	ng/mL
8_2-FTS-13C_IS	Auto	4.932	359400	359400	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.297	4766	359400	8_2-FTS-13C_IS	0.0966	0.0966	ng/mL
HPFO_DA	Auto	4.299	45080	2482061	HPFO_DA-13C_IS	0.1000	0.1049	ng/mL
HPFO_DA-13C	Auto	4.299	2482061	7029099	13C7-PFUnDA_IS	5.0000	5.3091	ng/mL
HPFO_DA-13C_IS	Auto	4.299	2482061	2482061	----	5.0000	5.0000	ng/mL



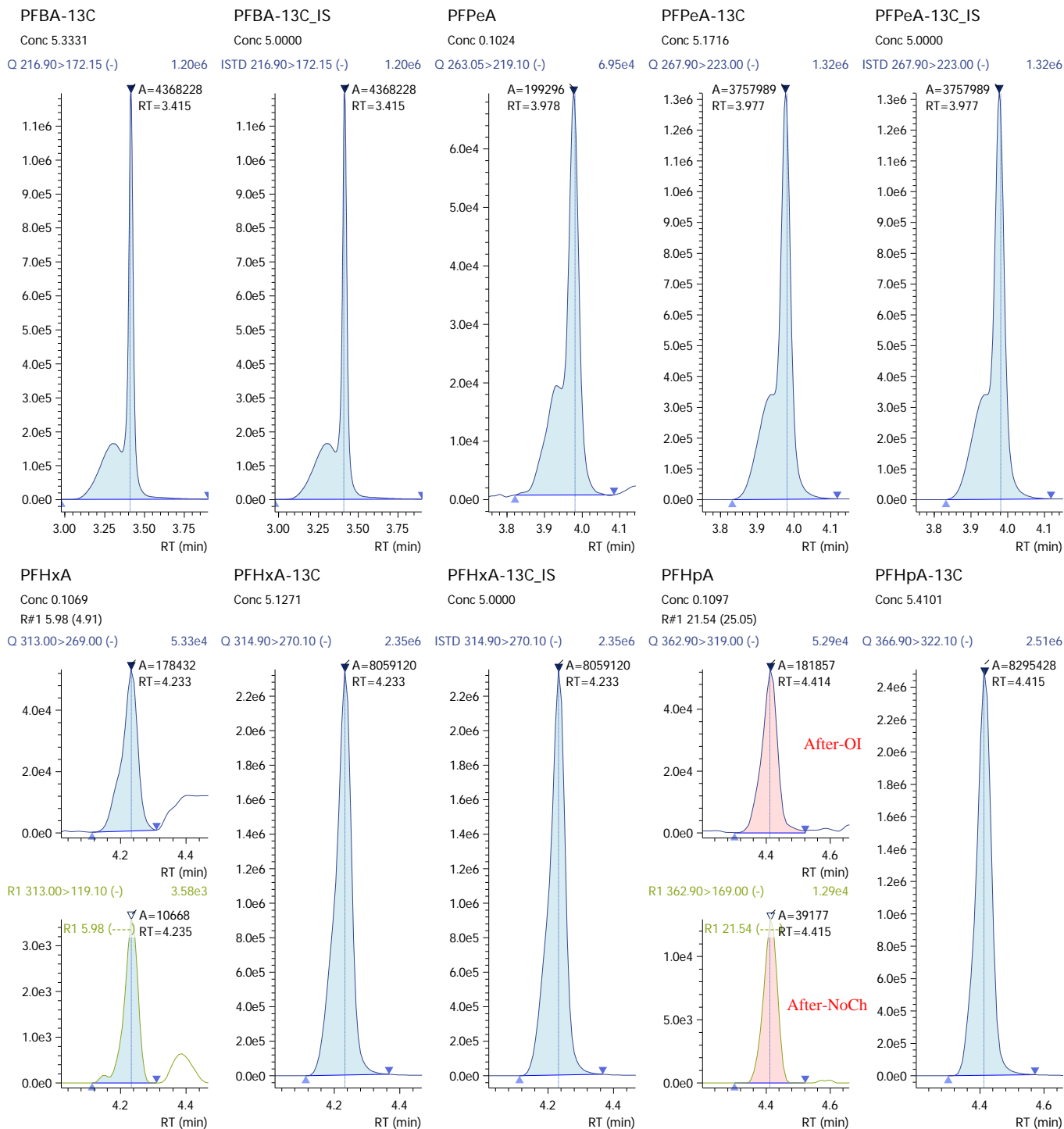


### 210413\_034 (continued)



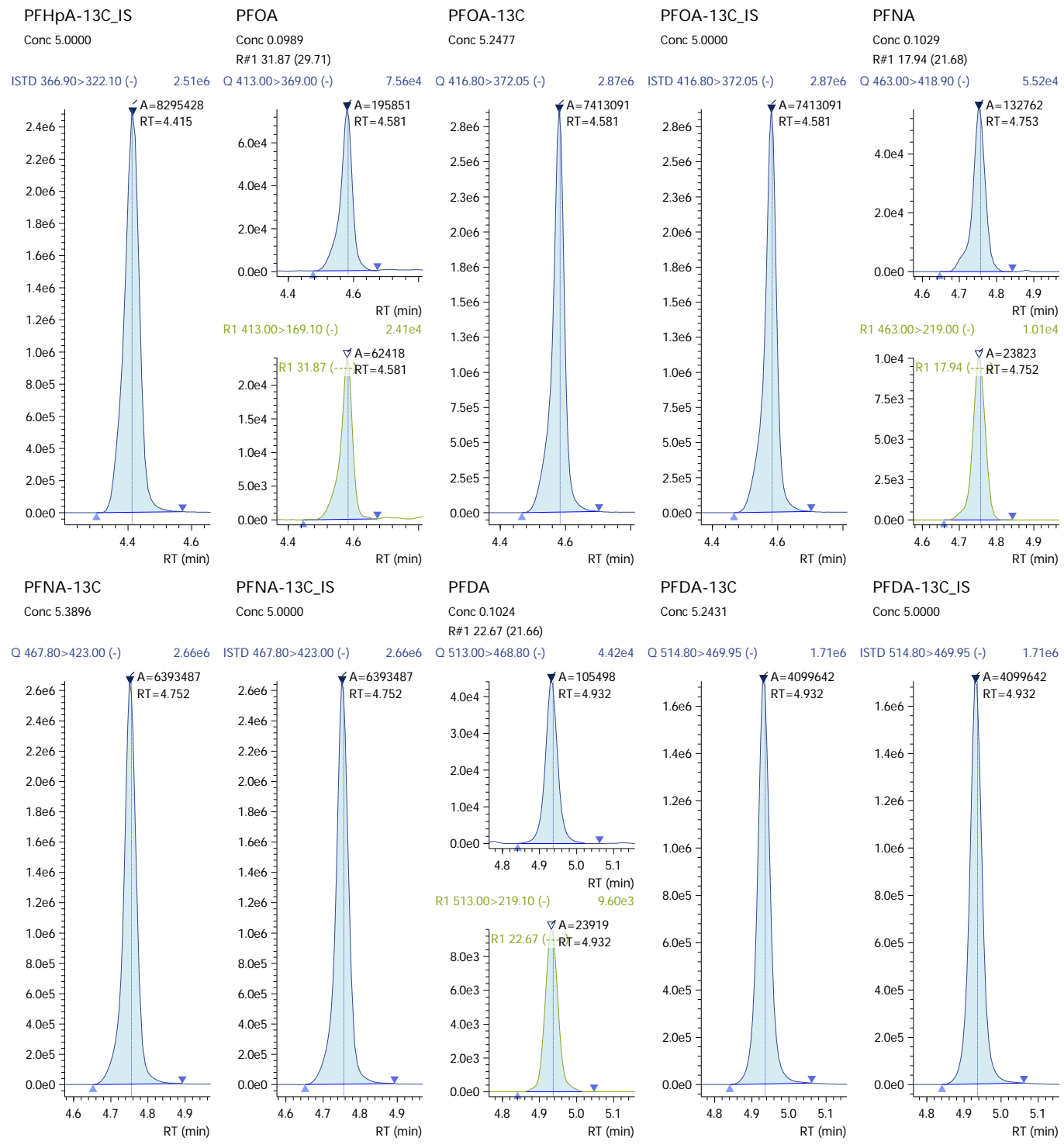


### 210413\_034 (continued)



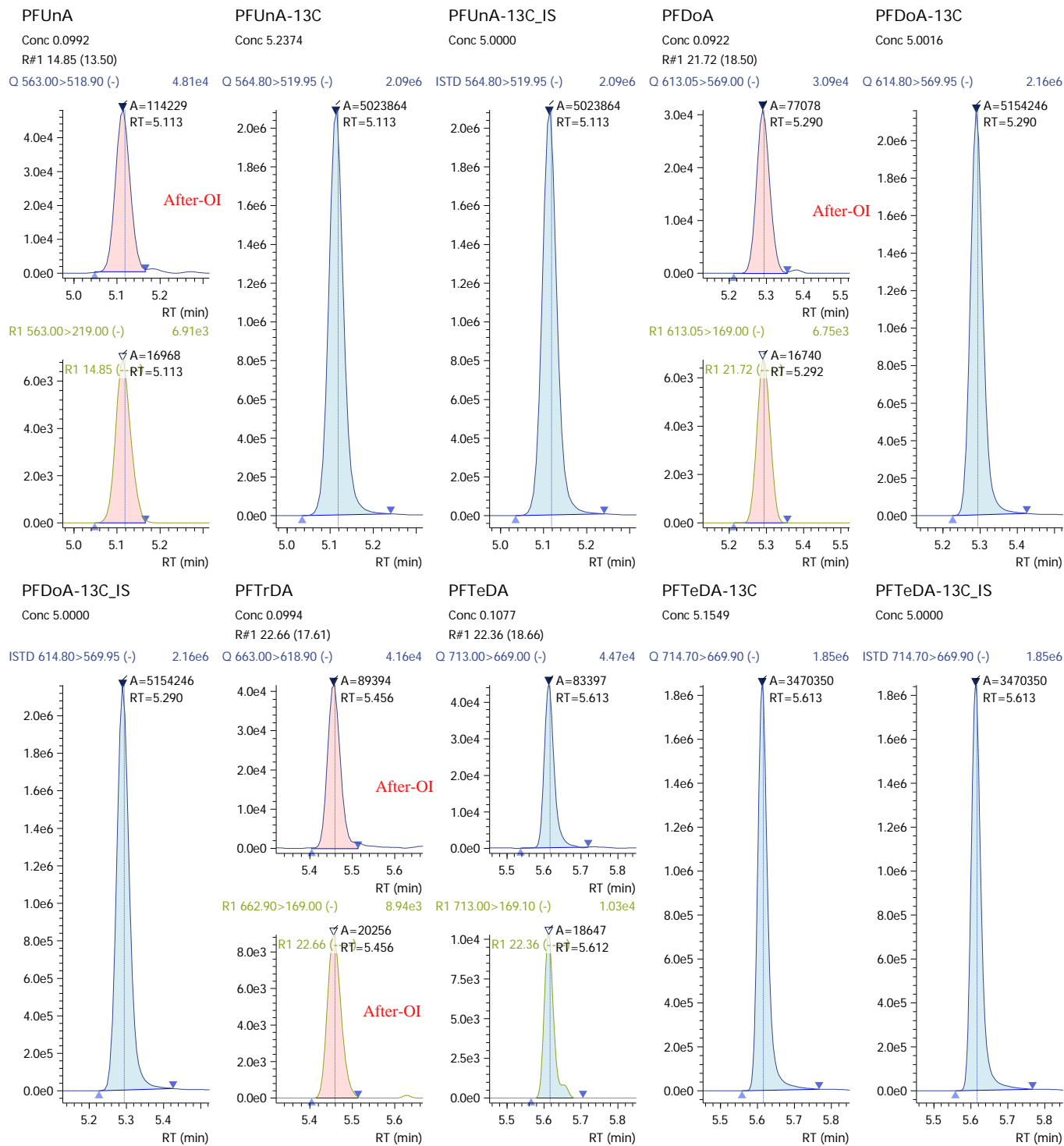


### 210413\_034 (continued)





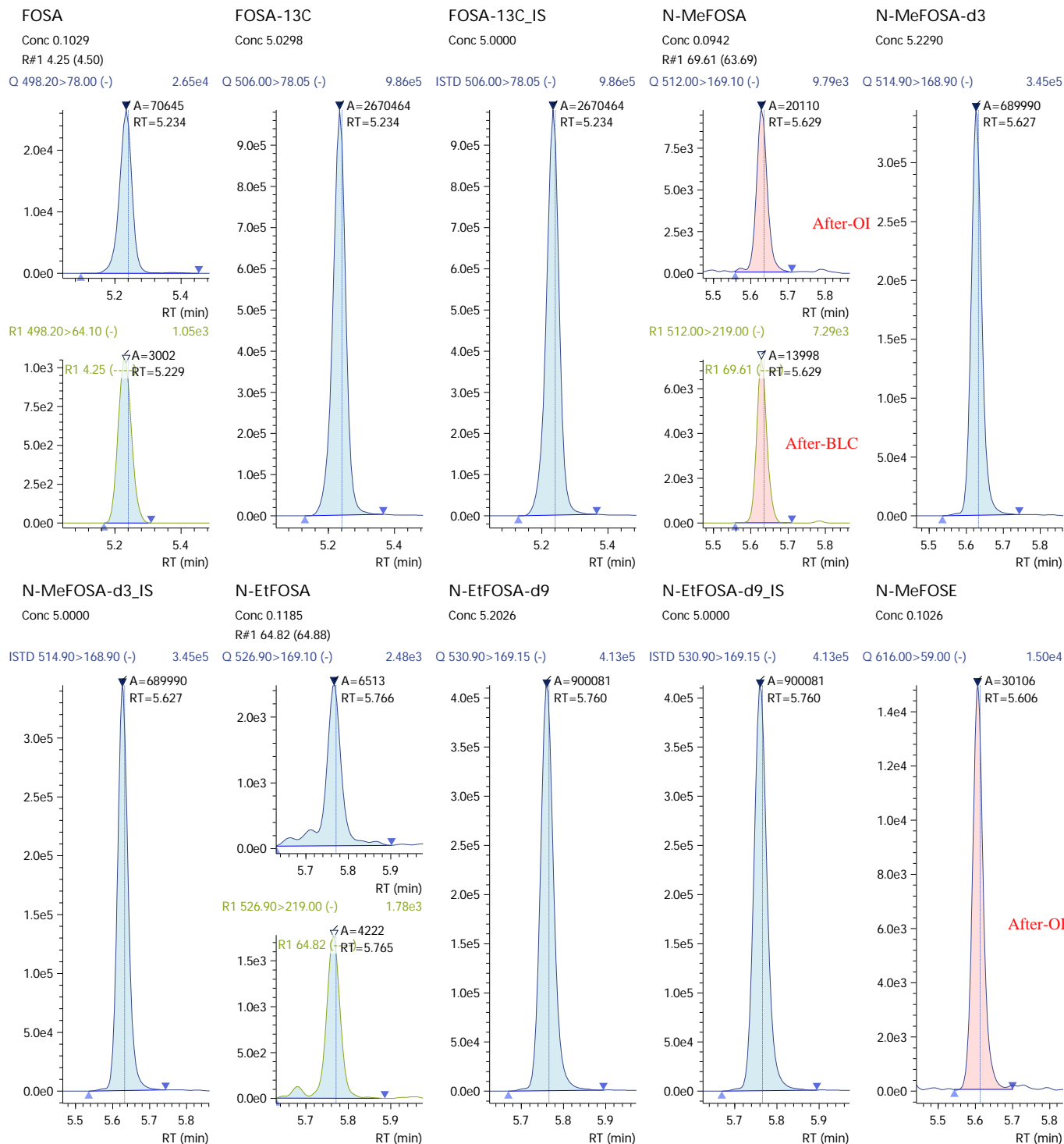
### 210413\_034 (continued)





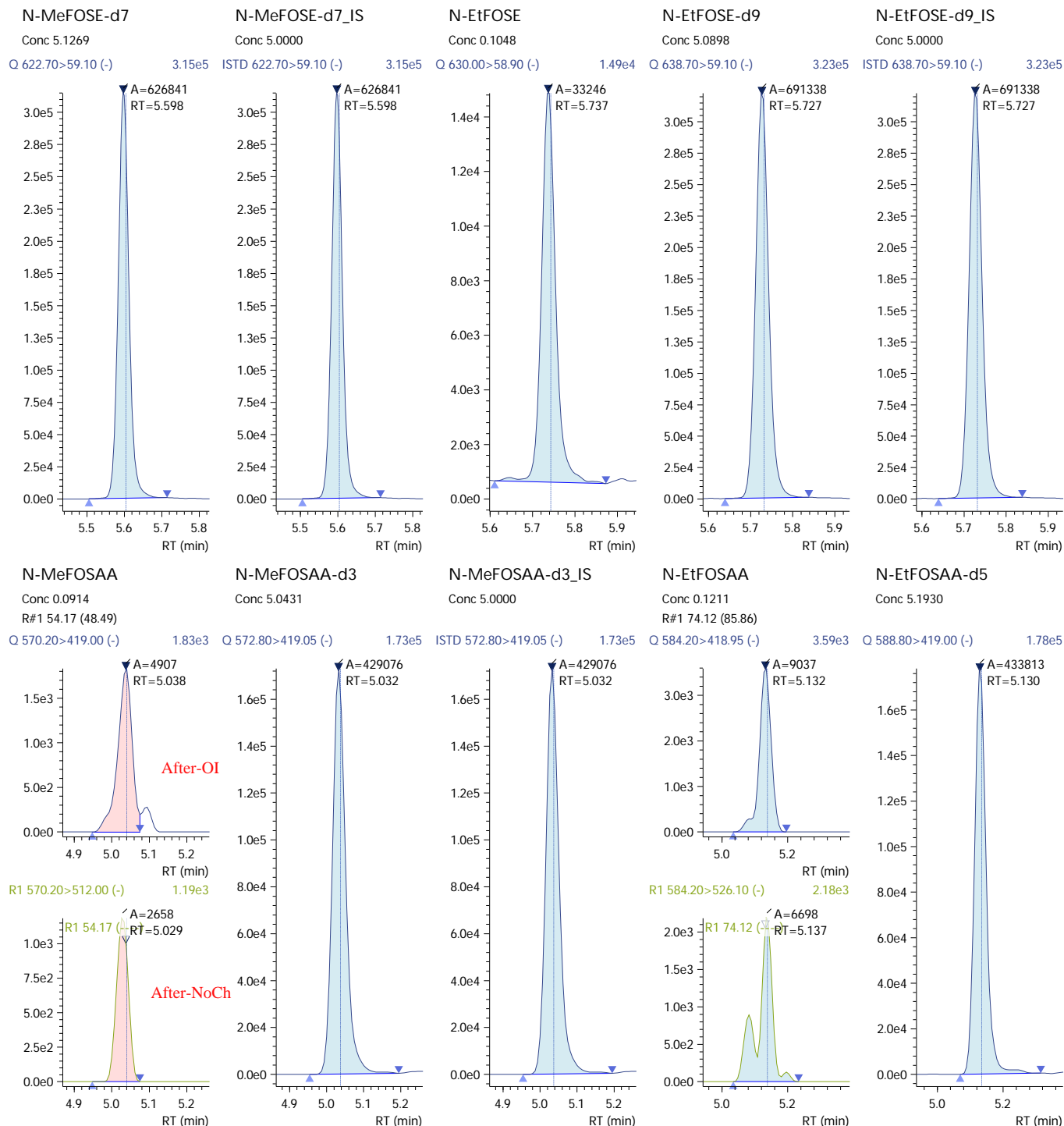


### 210413\_034 (continued)





210413\_034 (continued)





### 210413\_034 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.1022  
R#1 30.89 (26.07)

4\_2-FTS-13C  
Conc 5.2487

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.0933  
R#1 30.70 (30.56)

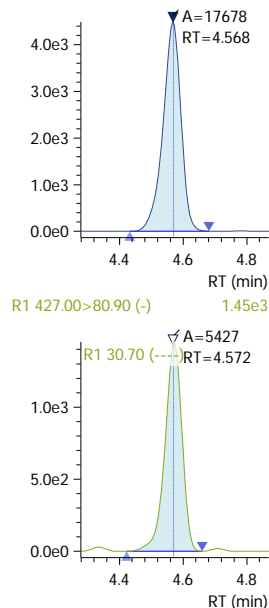
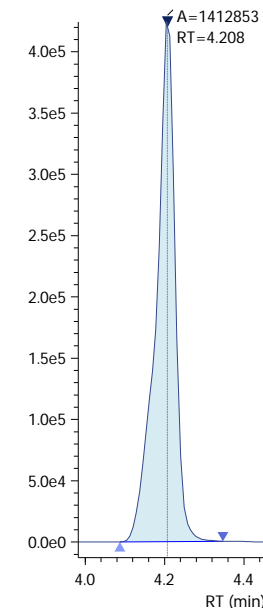
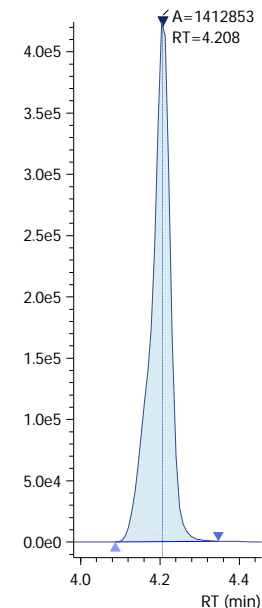
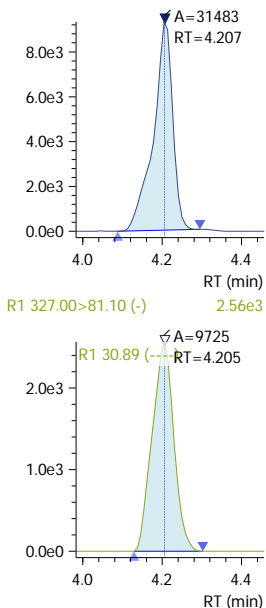
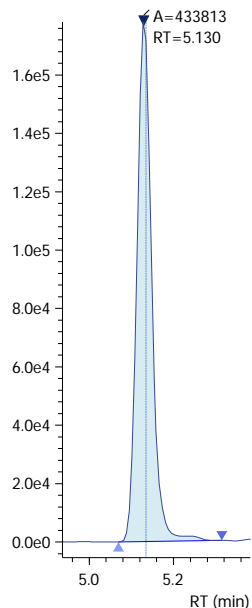
ISTD 588.80>419.00 (-) 1.78e5

Q 327.00>307.05 (-) 9.33e3

Q 328.80>309.05 (-) 4.24e5

ISTD 328.80>309.05 (-) 4.24e5

Q 427.00>407.00 (-) 4.49e3



6\_2-FTS-13C  
Conc 5.3616

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.1029  
R#1 8.47 (8.18)

8\_2-FTS-13C  
Conc 5.0633

8\_2-FTS-13C\_IS  
Conc 5.0000

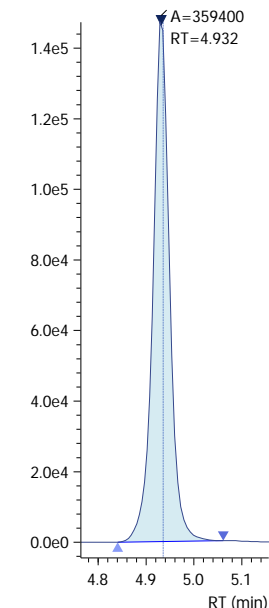
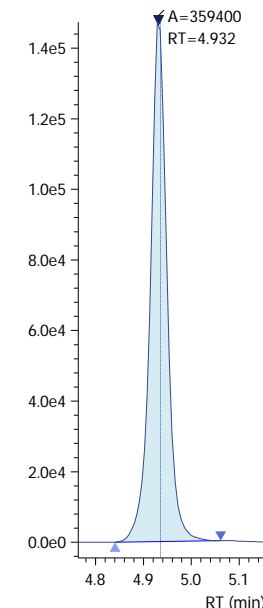
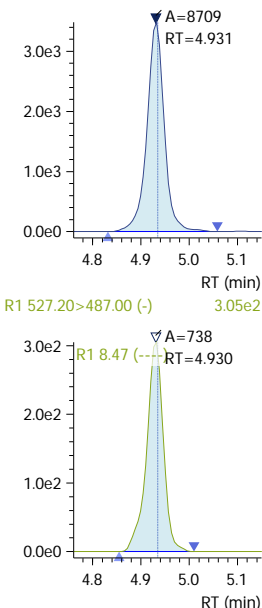
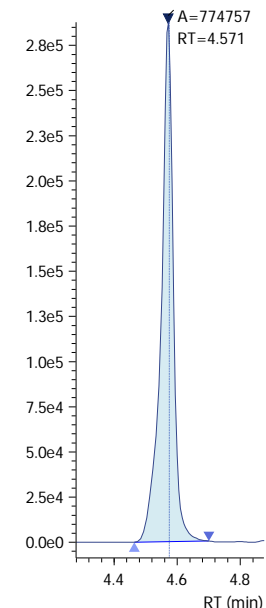
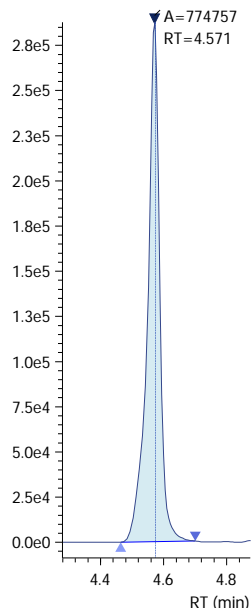
Q 428.90>409.00 (-) 2.88e5

ISTD 428.90>409.00 (-) 2.88e5

Q 527.10>506.90 (-) 3.48e3

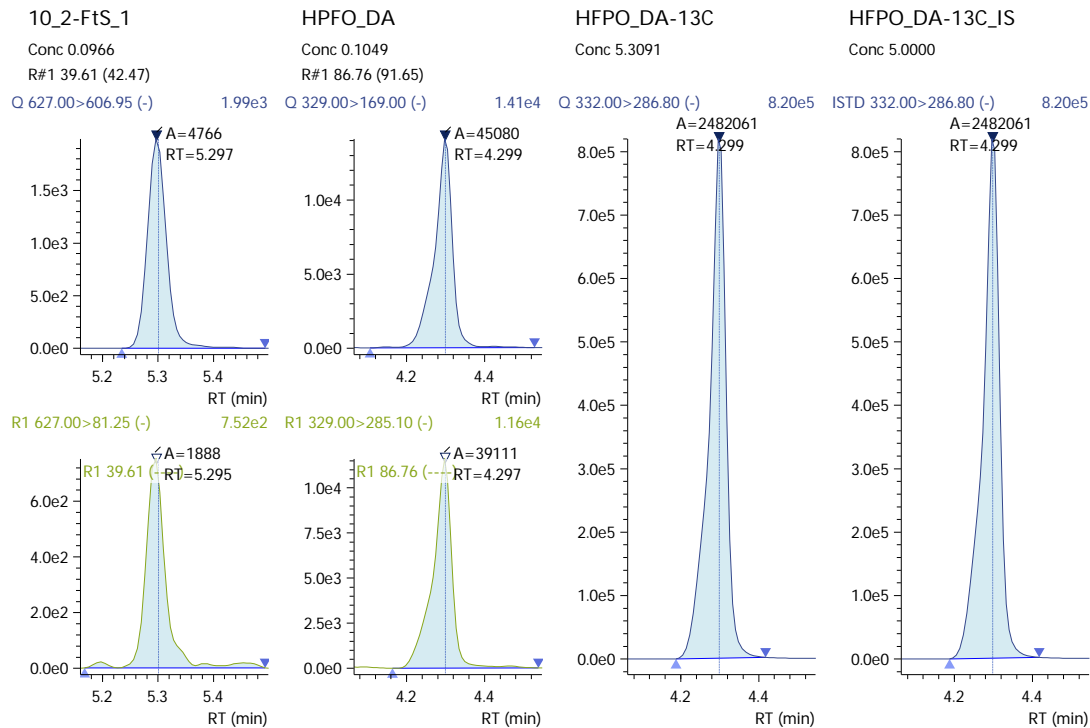
Q 528.80>509.00 (-) 1.47e5

ISTD 528.80>509.00 (-) 1.47e5





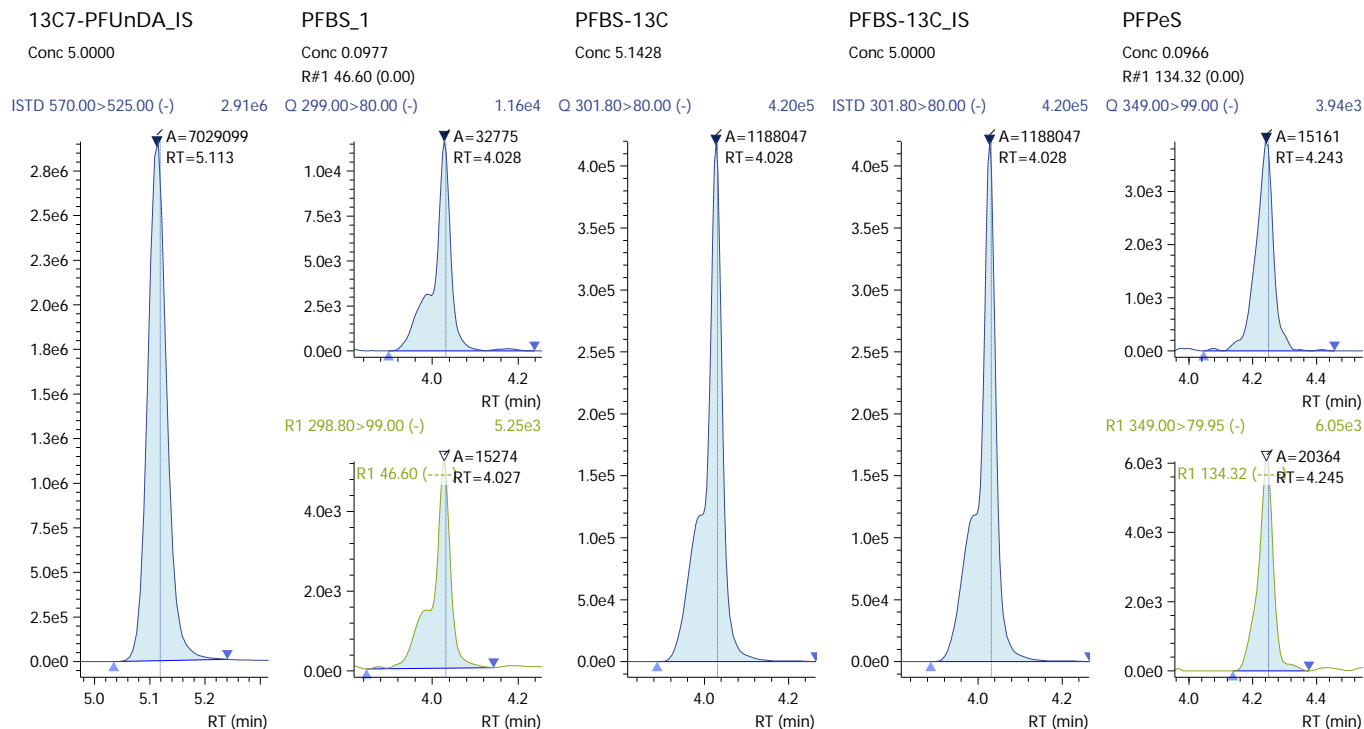
210413\_034 (continued)





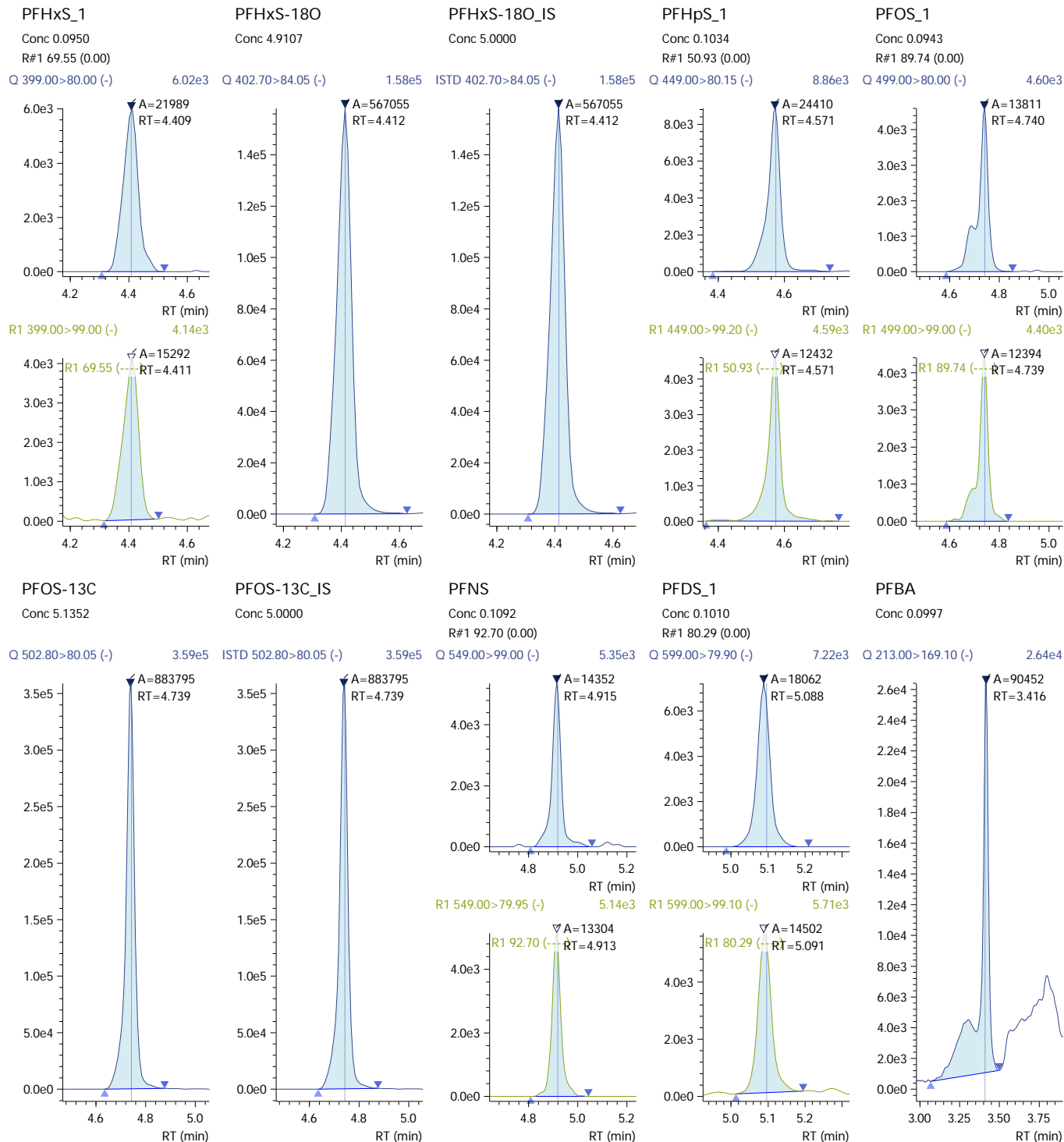
### 210413\_034

Sample ID: PFC ICAL 0.1 PPB  
Date Acquired: 4/13/2021 5:39:49 PM  
Acquired by: System Administrator  
Data File: 210413\_034  
Vial: 2 | Inj. Volume: 15.0000uL | Tray: 0



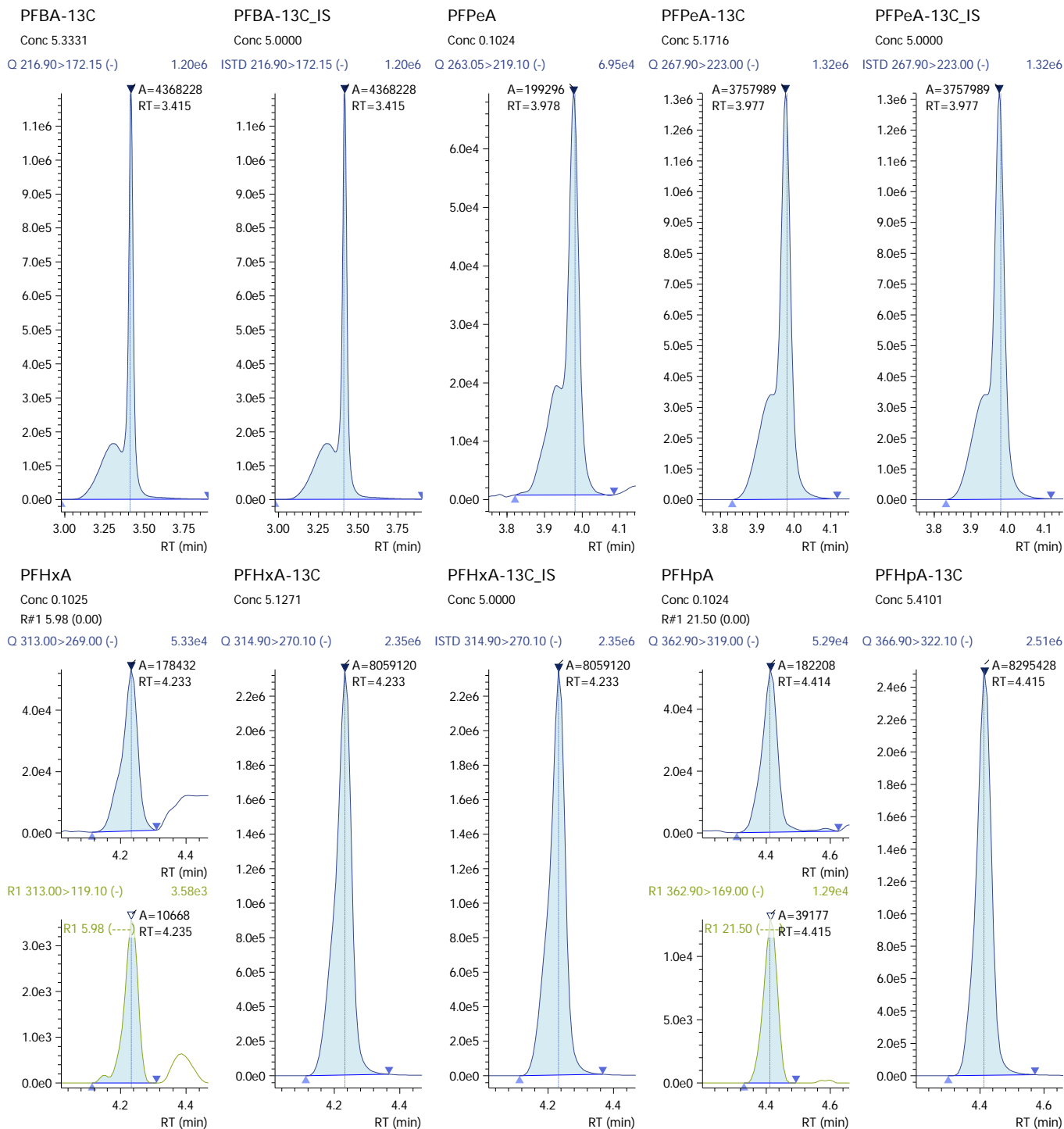


### 210413\_034 (continued)





### 210413\_034 (continued)



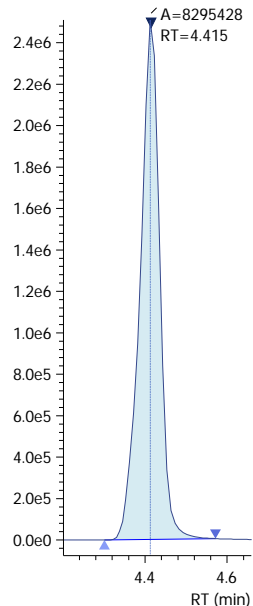




### 210413\_034 (continued)

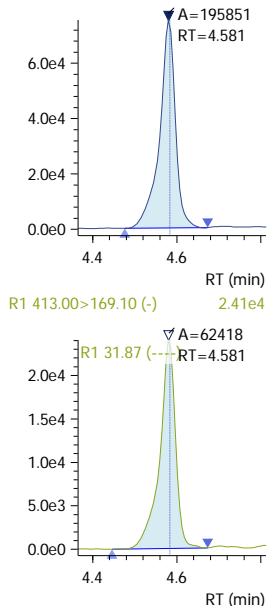
PFHpA-13C\_IS  
Conc 5.0000

ISTD 366.90>322.10 (-) 2.51e6



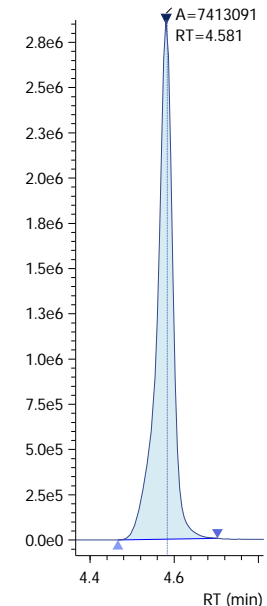
PFOA  
Conc 0.0972  
R#1 31.87 (0.00)

Q 413.00>369.00 (-) 7.56e4



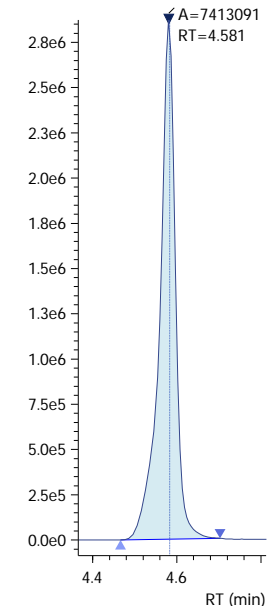
PFOA-13C  
Conc 5.2477

Q 416.80>372.05 (-) 2.87e6



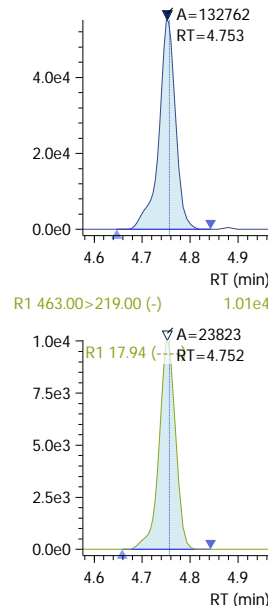
PFOA-13C\_IS  
Conc 5.0000

ISTD 416.80>372.05 (-) 2.87e6



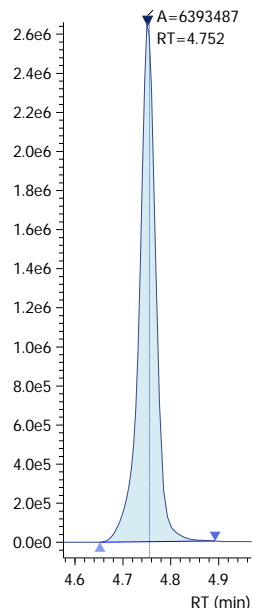
PFNA  
Conc 0.0991  
R#1 17.94 (0.00)

Q 463.00>418.90 (-) 5.52e4



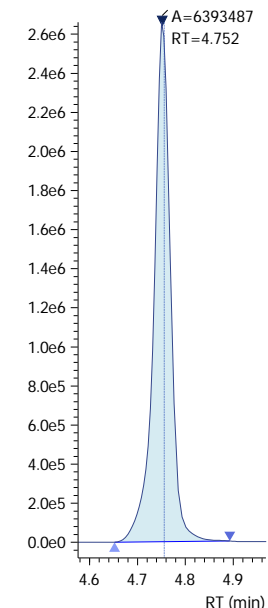
PFNA-13C  
Conc 5.3896

Q 467.80>423.00 (-) 2.66e6



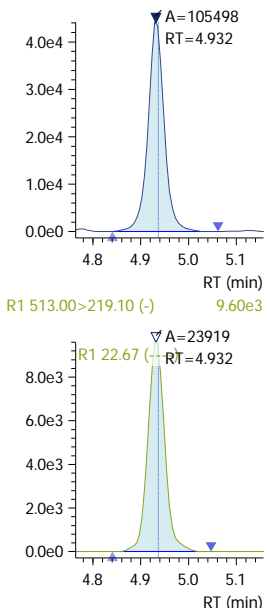
PFNA-13C\_IS  
Conc 5.0000

ISTD 467.80>423.00 (-) 2.66e6



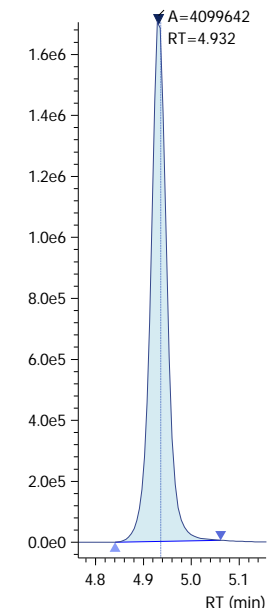
PFDA  
Conc 0.1024  
R#1 22.67 (0.00)

Q 513.00>468.80 (-) 4.42e4



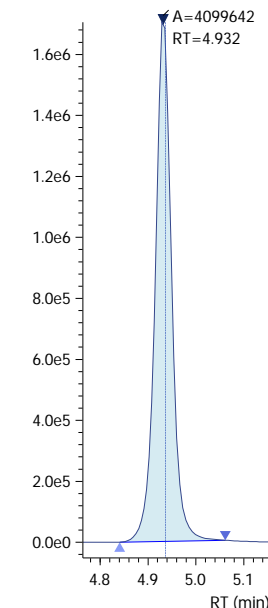
PFDA-13C  
Conc 5.2431

Q 514.80>469.95 (-) 1.71e6



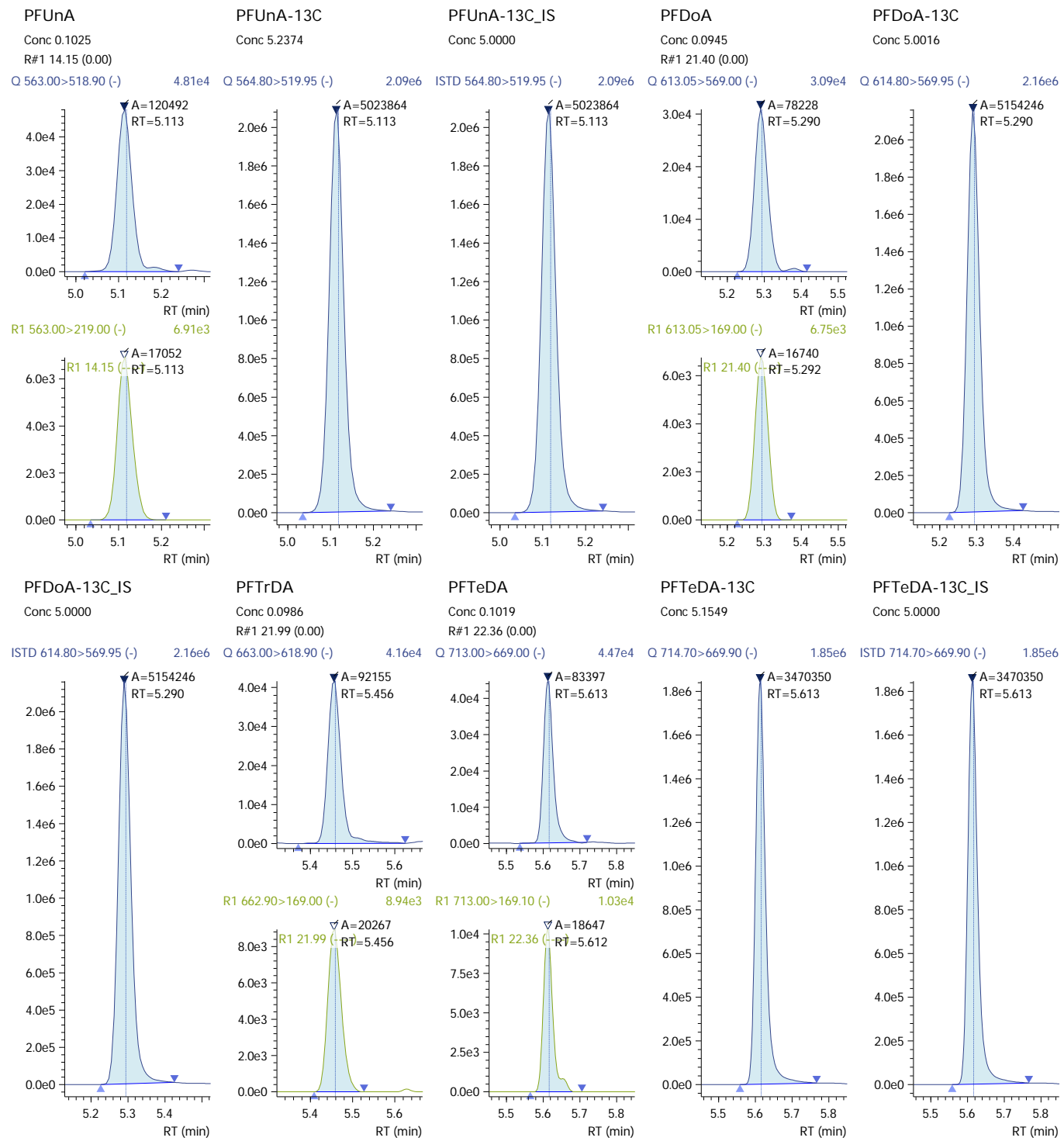
PFDA-13C\_IS  
Conc 5.0000

ISTD 514.80>469.95 (-) 1.71e6



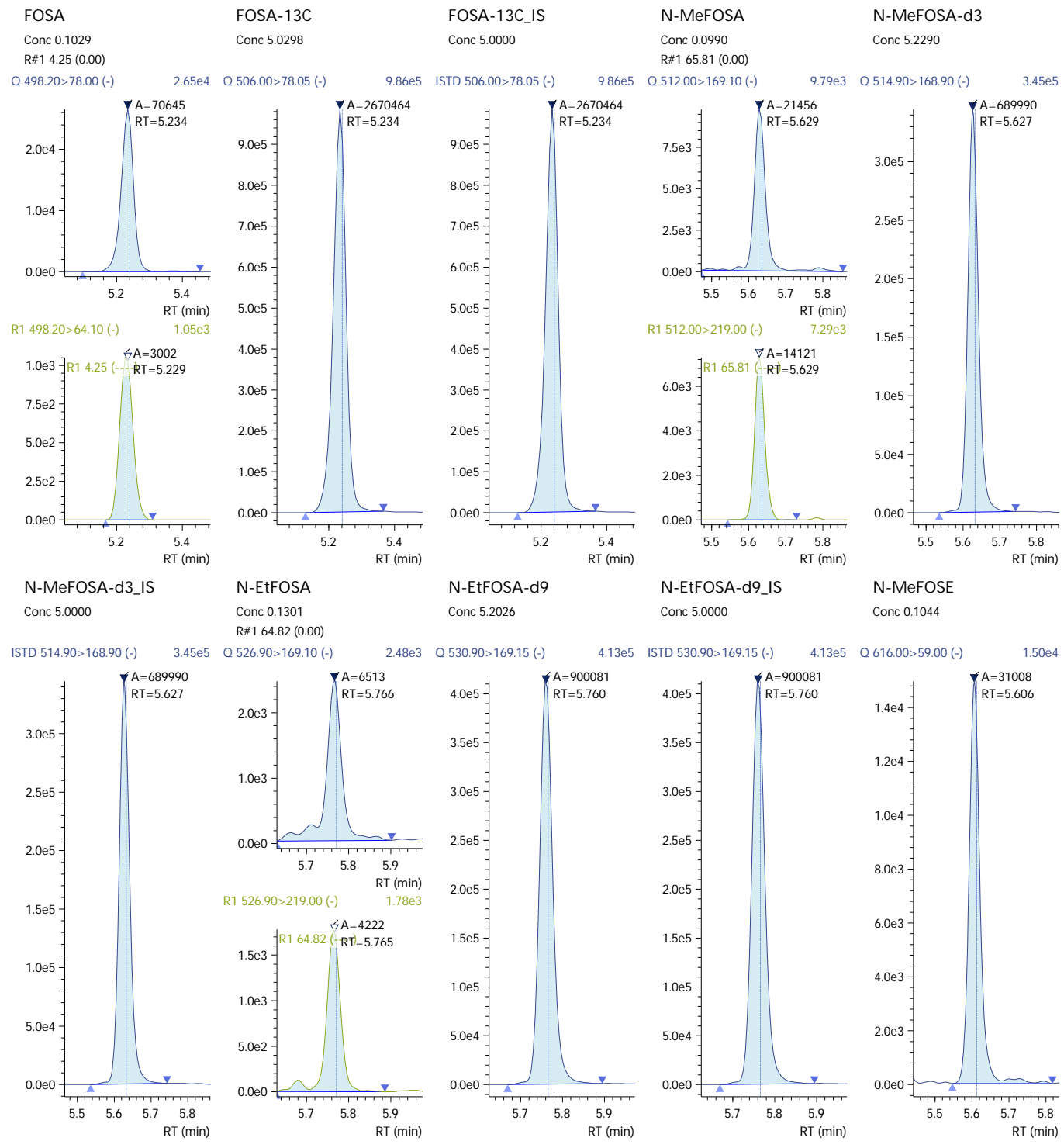


### 210413\_034 (continued)



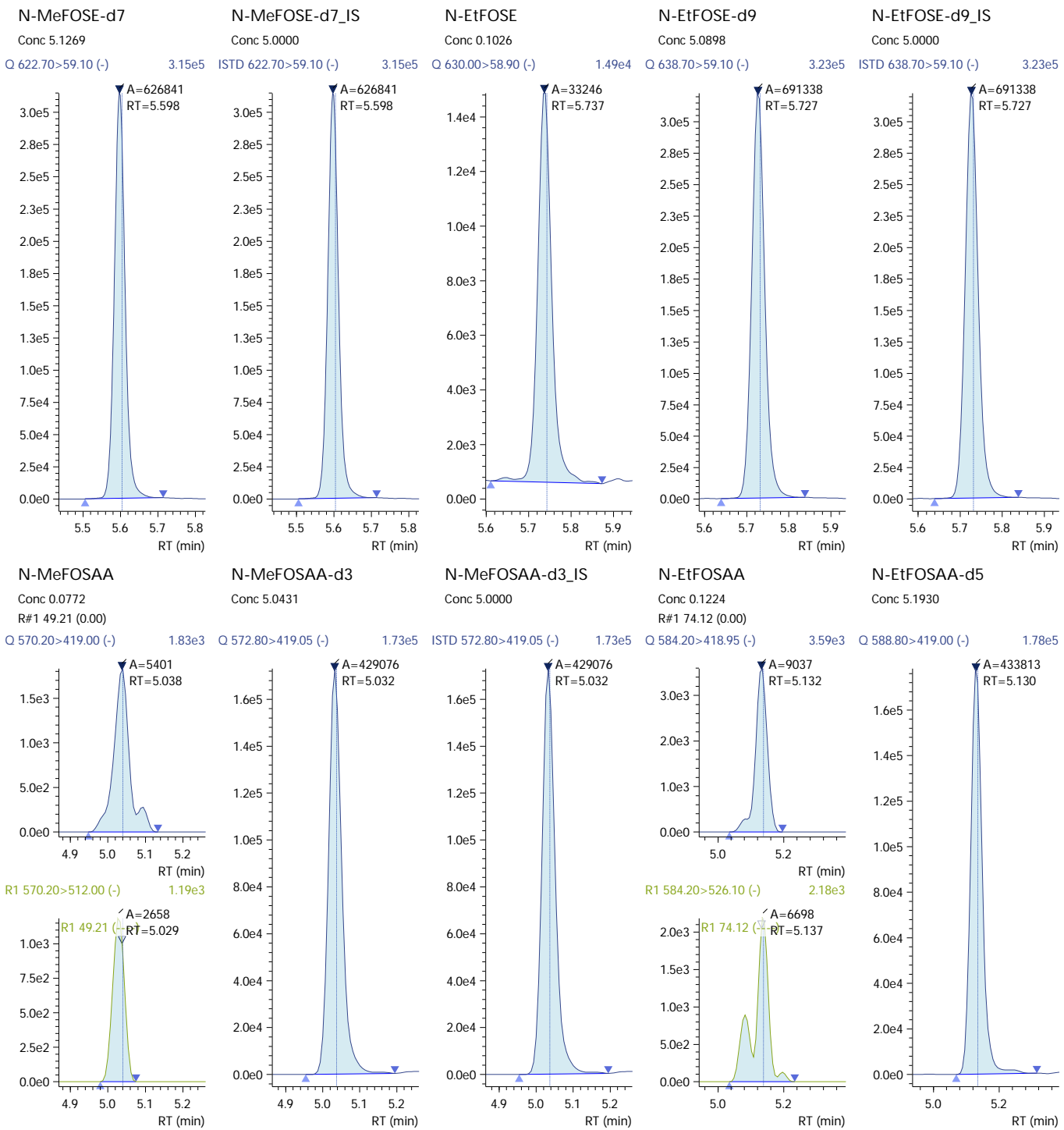


### 210413\_034 (continued)





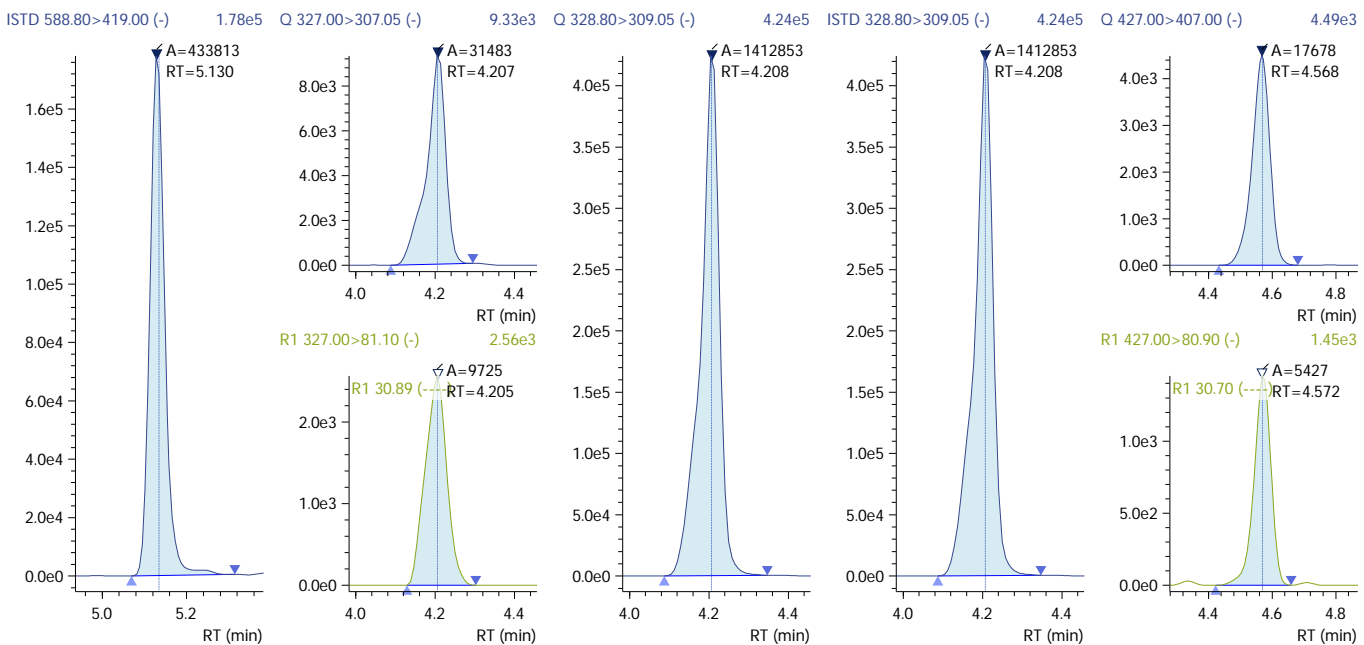
### 210413\_034 (continued)



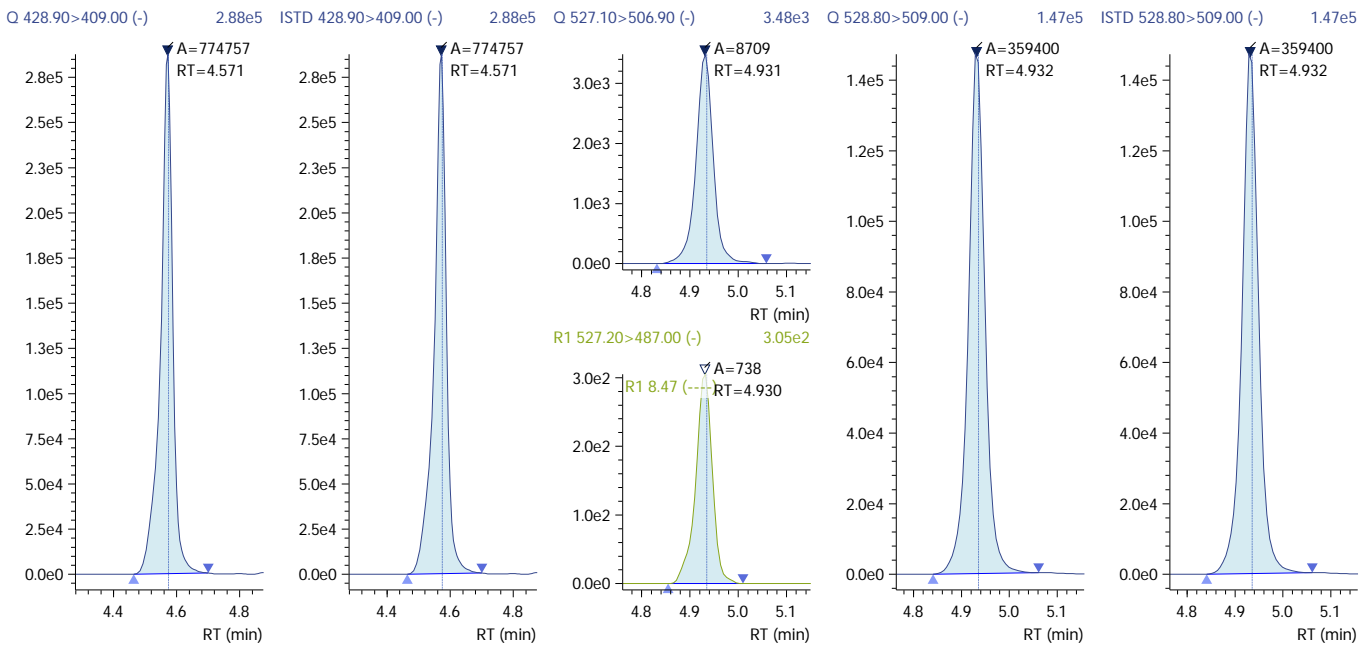


### 210413\_034 (continued)

<b>N-EtFOSAA-d5_IS</b> Conc 5.0000	<b>4_2-FTS_1</b> Conc 0.1004 R#1 30.89 (0.00)	<b>4_2-FTS-13C</b> Conc 5.2487	<b>4_2-FTS-13C_IS</b> Conc 5.0000	<b>6_2-FTS_1</b> Conc 0.0933 R#1 30.70 (0.00)
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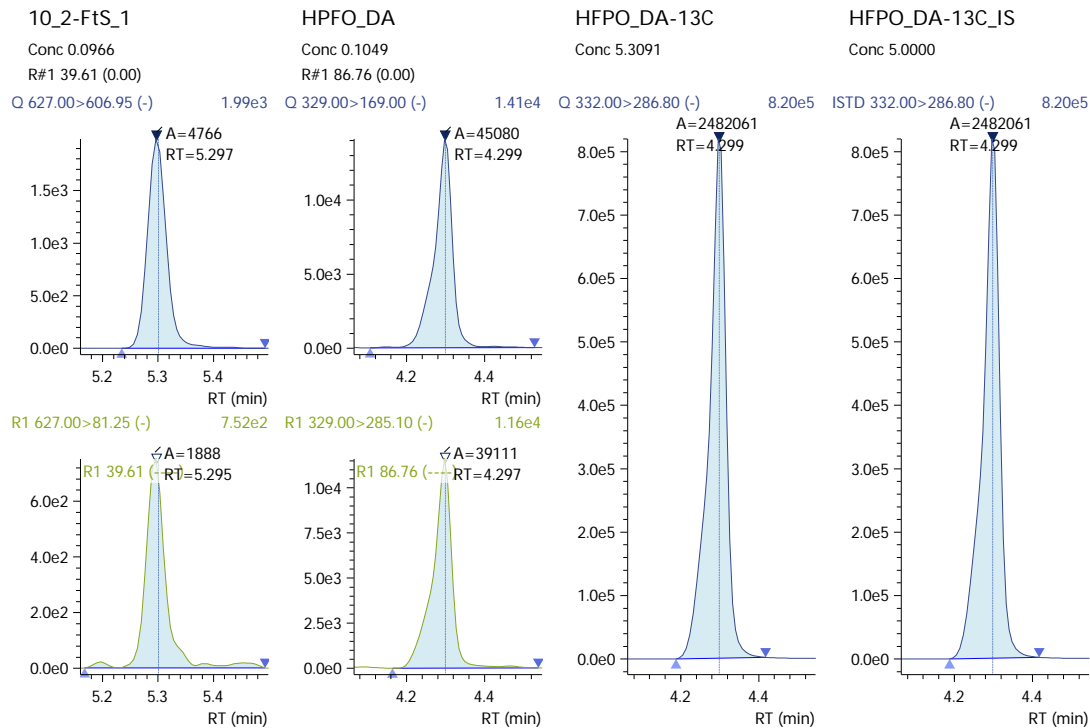


<b>6_2-FTS-13C</b> Conc 5.3616	<b>6_2-FTS-13C_IS</b> Conc 5.0000	<b>8_2-FTS_1</b> Conc 0.1027 R#1 8.47 (0.00)	<b>8_2-FTS-13C</b> Conc 5.0633	<b>8_2-FTS-13C_IS</b> Conc 5.0000
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### 210413\_034 (continued)





210413\_035

Sample ID: PFC ICAL 0.5 PPB  
 Date Acquired: 4/13/2021 5:50:15 PM  
 Acquired by: System Administrator  
 Data File: 210413\_035  
 Vial: 3 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.113	-0.005	----	7244045	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.029	-0.003	0.00	147718	66994	45.35	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.029	-0.003	-1.08	1161192	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.029	-0.003	----	1161192	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.245	-0.004	0.22	73402	110526	150.58	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.411	0.003	0.00	91203	60829	66.70	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.412	-0.001	-0.70	539577	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.412	-0.001	----	539577	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.571	-0.004	0.16	116461	56449	48.47	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.739	-0.003	0.00	68908	63998	92.88	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.739	-0.003	-0.37	855799	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.739	-0.003	----	855799	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.914	-0.004	0.18	62486	75784	121.28	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.090	-0.006	0.35	84609	68879	81.41	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.415	0.005	0.00	462146	----	----	----		
PFBA-13C	216.90>172.15	----	3.415	0.006	-1.70	4225767	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.415	0.006	----	4225767	----	----	----		
PFPeA	263.05>219.10	----	3.978	-0.003	0.00	797546	----	----	----		
PFPeA-13C	267.90>223.00	----	3.978	-0.003	-1.14	3650171	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.978	-0.003	----	3650171	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.233	0.000	0.00	793101	40308	5.08	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.233	0.001	-0.88	7776495	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.233	0.001	----	7776495	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.413	0.001	0.00	793193	178576	22.51	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.414	0.002	-0.70	7743686	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.414	0.002	----	7743686	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.580	-0.004	0.00	938492	283929	30.25	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.581	-0.003	-0.53	7074911	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.581	-0.003	----	7074911	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.753	-0.003	0.00	641370	136752	21.32	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.





210413\_035 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.752	-0.004	-0.36	6197726	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.752	-0.004	----	6197726	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.933	-0.004	0.00	503577	108485	21.54	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.933	-0.003	-0.18	4025917	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.933	-0.003	----	4025917	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.113	-0.006	0.00	558455	69931	12.52	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.113	-0.006	0.00	4909279	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.113	-0.006	----	4909279	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.289	-0.004	0.00	456082	77138	16.91	18.50	9.25-27.75	
PFDaA-13C	614.80>569.95	----	5.288	-0.006	0.18	5161779	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.288	-0.006	----	5161779	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	5.455	-0.004	-0.16	457587	70988	15.51	17.61	8.8-26.41	
PFTeDA	713.00>669.00	713.00>169.10	5.614	-0.002	0.00	371800	74703	20.09	18.66	9.33-27.99	
PFTeDA-13C	714.70>669.90	----	5.614	-0.002	0.50	3407136	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.614	-0.002	----	3407136	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.233	-0.008	0.00	337439	16573	4.91	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.233	-0.008	0.12	2595826	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.233	-0.008	----	2595826	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.631	-0.004	0.00	103932	67891	65.32	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.627	-0.006	0.51	666974	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.627	-0.006	----	666974	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.766	-0.005	0.01	22315	15445	69.21	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.761	-0.005	0.65	877971	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.761	-0.005	----	877971	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.607	-0.006	0.01	148972	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.599	-0.006	0.49	622290	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.599	-0.006	----	622290	----	----	----		
N-EtFOSE	630.00>58.90	----	5.737	-0.005	0.01	158291	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.727	-0.005	0.61	673261	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.727	-0.005	----	673261	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.034	-0.006	0.00	371105	19066	51.38	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.032	-0.005	-0.08	423003	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.032	-0.005	----	423003	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.132	-0.006	0.00	33765	33604	99.52	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.128	-0.007	0.02	402874	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.128	-0.007	----	402874	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.208	0.002	0.00	153315	39507	25.77	26.07	13.03-39.1	
4_2-FTS-13C	328.80>309.05	----	4.208	0.001	-0.91	1357776	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_035 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.208	0.001	----	1357776	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.570	0.001	0.00	90891	28030	30.84	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.571	-0.003	-0.54	752885	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.571	-0.003	----	752885	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.931	-0.004	0.00	41909	3282	7.83	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.932	-0.003	-0.18	362565	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.932	-0.003	----	362565	----	----	----	0-0	
10_2-FTS_1	627.00>606.95	627.00>81.25	5.295	-0.006	0.36	24869	10204	41.03	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.299	0.000	0.00	209038	179758	85.99	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.299	-0.001	-0.82	2396062	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.299	-0.001	----	2396062	----	----	----		



210413\_035

Sample ID: PFC ICAL 0.5 PPB  
Date Acquired: 4/13/2021 5:50:15 PM  
Acquired by: System Administrator  
Data File: 210413\_035  
Vial: 3 | Inj. Volume: 15.000uL | Tray: 0

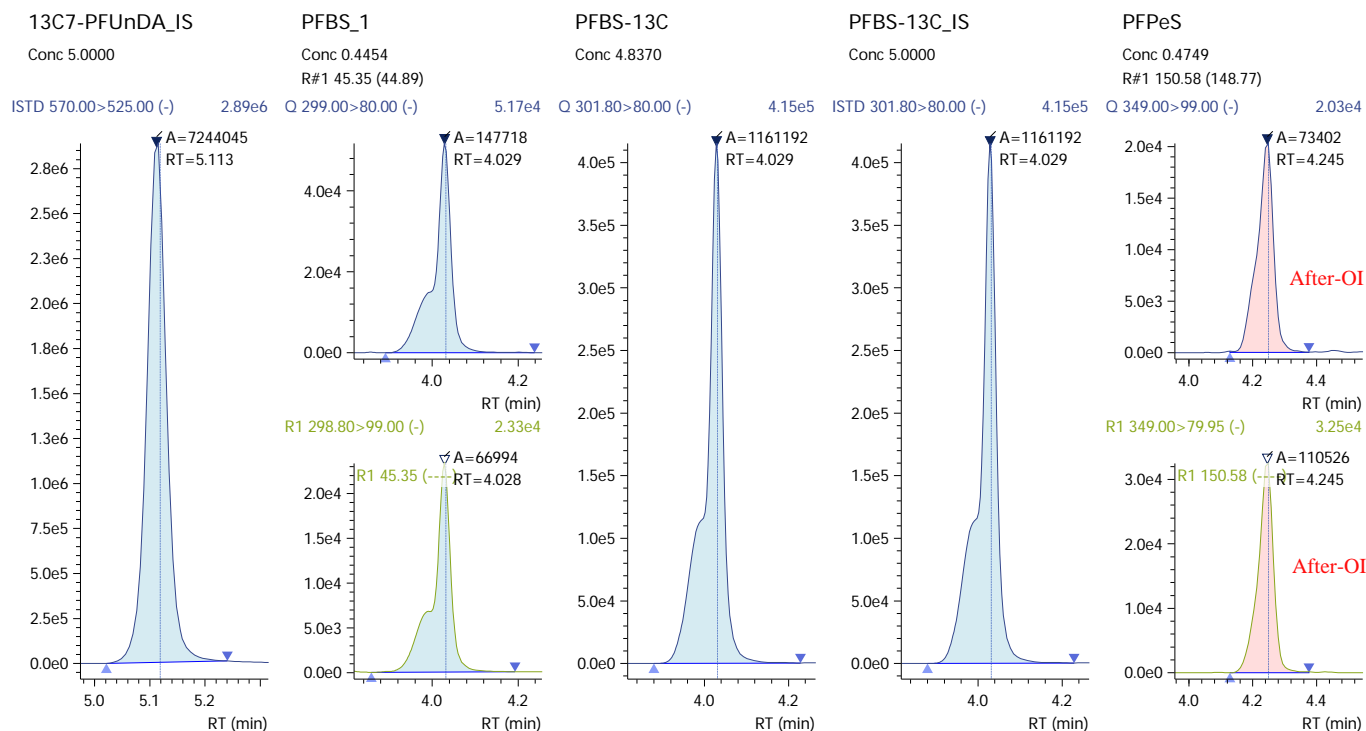
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.113	7244045	7244045	----	5.0000	5.0000	ng/mL
PFBS_1	Auto	4.029	147718	1161192	PFBS-13C_IS	0.4437	0.4454	ng/mL
PFBS-13C	Auto	4.029	1161192	7244045	13C7-PFUnDA_IS	5.0000	4.8370	ng/mL
PFBS-13C_IS	Auto	4.029	1161192	1161192	----	5.0000	5.0000	ng/mL
PFPeS	M	4.245	73402	1161192	PFBS-13C_IS	0.4705	0.4749	ng/mL
PFHxS_1	Auto	4.411	91203	539577	PFHxS-18O_IS	0.4565	0.4911	ng/mL
PFHxS-18O	Auto	4.412	539577	7244045	13C7-PFUnDA_IS	5.0000	4.5341	ng/mL
PFHxS-18O_IS	Auto	4.412	539577	539577	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.571	116461	539577	PFHxS-18O_IS	0.4767	0.5192	ng/mL
PFOS_1	Auto	4.739	68908	855799	PFOS-13C_IS	0.4646	0.4859	ng/mL
PFOS-13C	Auto	4.739	855799	7244045	13C7-PFUnDA_IS	5.0000	4.8250	ng/mL
PFOS-13C_IS	Auto	4.739	855799	855799	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.914	62486	855799	PFOS-13C_IS	0.4808	0.5045	ng/mL
PFDS_1	Auto	5.090	84609	855799	PFOS-13C_IS	0.4823	0.4884	ng/mL
PFBA	M	3.415	462146	4225767	PFBA-13C_IS	0.5000	0.5067	ng/mL
PFBA-13C	Auto	3.415	4225767	7244045	13C7-PFUnDA_IS	5.0000	5.0060	ng/mL
PFBA-13C_IS	Auto	3.415	4225767	4225767	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.978	797546	3650171	PFPeA-13C_IS	0.5000	0.5102	ng/mL
PFPeA-13C	Auto	3.978	3650171	7244045	13C7-PFUnDA_IS	5.0000	4.8741	ng/mL
PFPeA-13C_IS	Auto	3.978	3650171	3650171	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.233	793101	7776495	PFHxA-13C_IS	0.5000	0.4924	ng/mL
PFHxA-13C	Auto	4.233	7776495	7244045	13C7-PFUnDA_IS	5.0000	4.8005	ng/mL
PFHxA-13C_IS	Auto	4.233	7776495	7776495	----	5.0000	5.0000	ng/mL
PFHpA	Auto	4.413	793193	7743686	PFHpA-13C_IS	0.5000	0.5128	ng/mL
PFHpA-13C	Auto	4.414	7743686	7244045	13C7-PFUnDA_IS	5.0000	4.9004	ng/mL
PFHpA-13C_IS	Auto	4.414	7743686	7743686	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.580	938492	7074911	PFOA-13C_IS	0.5000	0.4967	ng/mL
PFOA-13C	Auto	4.581	7074911	7244045	13C7-PFUnDA_IS	5.0000	4.8597	ng/mL
PFOA-13C_IS	Auto	4.581	7074911	7074911	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.753	641370	6197726	PFNA-13C_IS	0.5000	0.5126	ng/mL
PFNA-13C	Auto	4.752	6197726	7244045	13C7-PFUnDA_IS	5.0000	5.0696	ng/mL
PFNA-13C_IS	Auto	4.752	6197726	6197726	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.933	503577	4025917	PFDA-13C_IS	0.5000	0.4976	ng/mL
PFDA-13C	Auto	4.933	4025917	7244045	13C7-PFUnDA_IS	5.0000	4.9961	ng/mL
PFDA-13C_IS	Auto	4.933	4025917	4025917	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.113	558455	4909279	PFUnA-13C_IS	0.5000	0.4965	ng/mL
PFUnA-13C	Auto	5.113	4909279	7244045	13C7-PFUnDA_IS	5.0000	4.9661	ng/mL
PFUnA-13C_IS	Auto	5.113	4909279	4909279	----	5.0000	5.0000	ng/mL
PFDaA	Auto	5.289	456082	5161779	PFDaA-13C_IS	0.5000	0.5448	ng/mL
PFDaA-13C	Auto	5.288	5161779	7244045	13C7-PFUnDA_IS	5.0000	4.8603	ng/mL
PFDaA-13C_IS	Auto	5.288	5161779	5161779	----	5.0000	5.0000	ng/mL
PFTeDA	M	5.455	457587	3407136	PFTeDA-13C_IS	0.5000	0.5183	ng/mL
PFTeDA	Auto	5.614	371800	3407136	PFTeDA-13C_IS	0.5000	0.4890	ng/mL
PFTeDA-13C	Auto	5.614	3407136	7244045	13C7-PFUnDA_IS	5.0000	4.9108	ng/mL
PFTeDA-13C_IS	Auto	5.614	3407136	3407136	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.233	337439	2595826	FOSA-13C_IS	0.5000	0.5054	ng/mL
FOSA-13C	Auto	5.233	2595826	7244045	13C7-PFUnDA_IS	5.0000	4.7441	ng/mL
FOSA-13C_IS	Auto	5.233	2595826	2595826	----	5.0000	5.0000	ng/mL
N-MeFOSA	Auto	5.631	103932	666974	N-MeFOSA-d3_IS	0.5000	0.5039	ng/mL
N-MeFOSA-d3	Auto	5.627	666974	7244045	13C7-PFUnDA_IS	5.0000	4.9046	ng/mL
N-MeFOSA-d3_IS	Auto	5.627	666974	666974	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.766	22315	877971	N-EtFOSA-d9_IS	0.5000	0.4926	ng/mL
N-EtFOSA-d9	Auto	5.761	877971	7244045	13C7-PFUnDA_IS	5.0000	4.9243	ng/mL
N-EtFOSA-d9_IS	Auto	5.761	877971	877971	----	5.0000	5.0000	ng/mL



210413\_035 (continued)

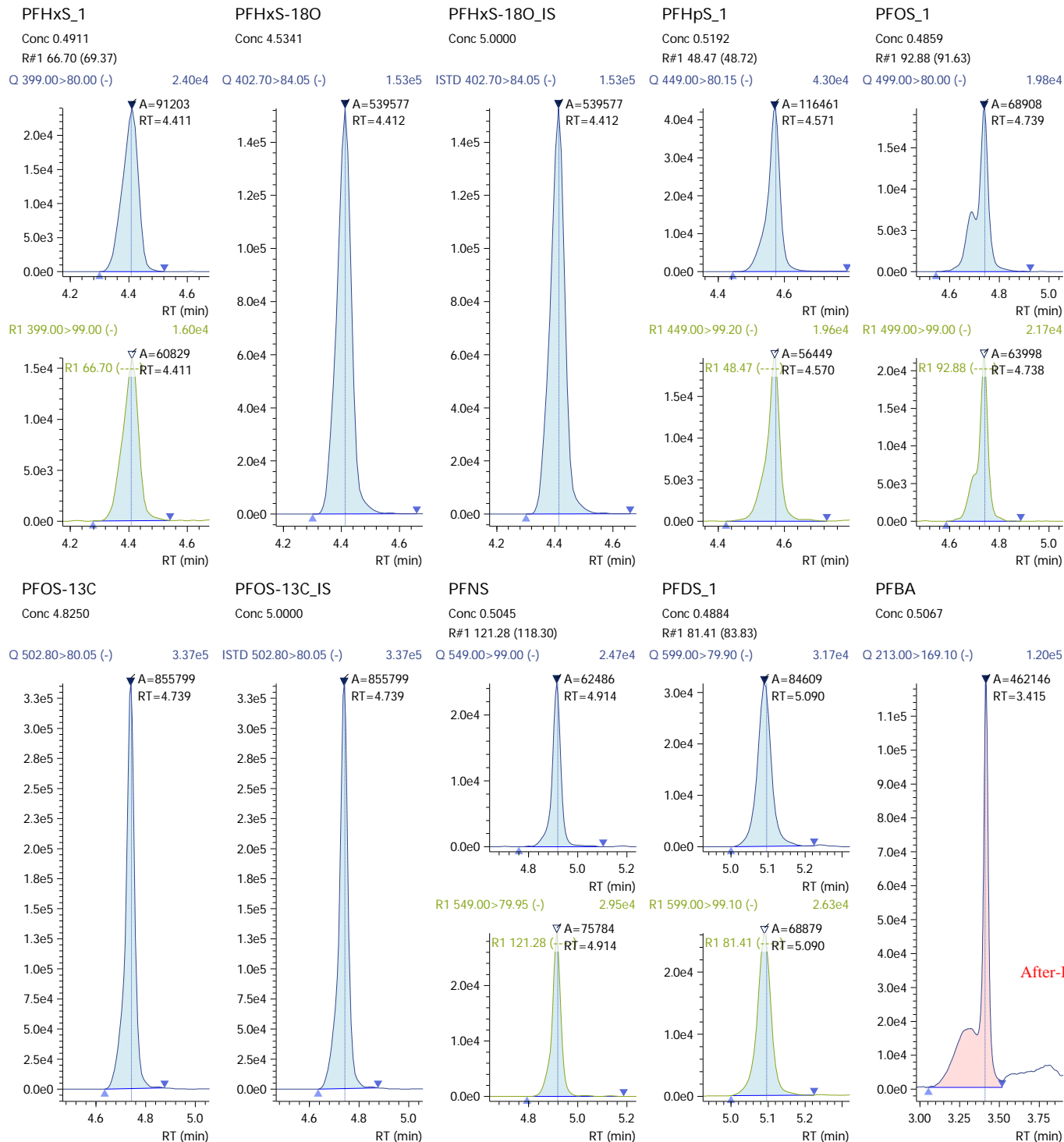
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.607	148972	622290	N-MeFOSE-d7_IS	0.5000	0.5115	ng/mL
N-MeFOSE-d7	Auto	5.599	622290	7244045	13C7-PFUnDA_IS	5.0000	4.9387	ng/mL
N-MeFOSE-d7_IS	Auto	5.599	622290	622290	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.737	158291	673261	N-EtFOSE-d9_IS	0.5000	0.5125	ng/mL
N-EtFOSE-d9	Auto	5.727	673261	7244045	13C7-PFUnDA_IS	5.0000	4.8096	ng/mL
N-EtFOSE-d9_IS	Auto	5.727	673261	673261	----	5.0000	5.0000	ng/mL
N-MeFOSAA	M	5.034	37105	423003	N-MeFOSAA-d3_IS	0.5000	0.5215	ng/mL
N-MeFOSAA-d3	Auto	5.032	423003	7244045	13C7-PFUnDA_IS	5.0000	4.8242	ng/mL
N-MeFOSAA-d3_IS	Auto	5.032	423003	423003	----	5.0000	5.0000	ng/mL
N-EtFOSAA	Auto	5.132	33765	402874	N-EtFOSAA-d5_IS	0.5000	0.4871	ng/mL
N-EtFOSAA-d5	Auto	5.128	402874	7244045	13C7-PFUnDA_IS	5.0000	4.6796	ng/mL
N-EtFOSAA-d5_IS	Auto	5.128	402874	402874	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.208	153315	1357776	4_2-FTS-13C_IS	0.4686	0.5180	ng/mL
4_2-FTS-13C	Auto	4.208	1357776	7244045	13C7-PFUnDA_IS	5.0000	4.8944	ng/mL
4_2-FTS-13C_IS	Auto	4.208	1357776	1357776	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.570	90891	752885	6_2-FTS-13C_IS	0.4756	0.4935	ng/mL
6_2-FTS-13C	Auto	4.571	752885	7244045	13C7-PFUnDA_IS	5.0000	5.0556	ng/mL
6_2-FTS-13C_IS	Auto	4.571	752885	752885	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.931	41909	362565	8_2-FTS-13C_IS	0.4800	0.4906	ng/mL
8_2-FTS-13C	Auto	4.932	362565	7244045	13C7-PFUnDA_IS	5.0000	4.9563	ng/mL
8_2-FTS-13C_IS	Auto	4.932	362565	362565	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.295	24869	362565	8_2-FTS-13C_IS	0.4831	0.4997	ng/mL
HPFO_DA	Auto	4.299	209038	2396062	HPFO_DA-13C_IS	0.5000	0.5037	ng/mL
HPFO_DA-13C	Auto	4.299	2396062	7244045	13C7-PFUnDA_IS	5.0000	4.9730	ng/mL
HPFO_DA-13C_IS	Auto	4.299	2396062	2396062	----	5.0000	5.0000	ng/mL





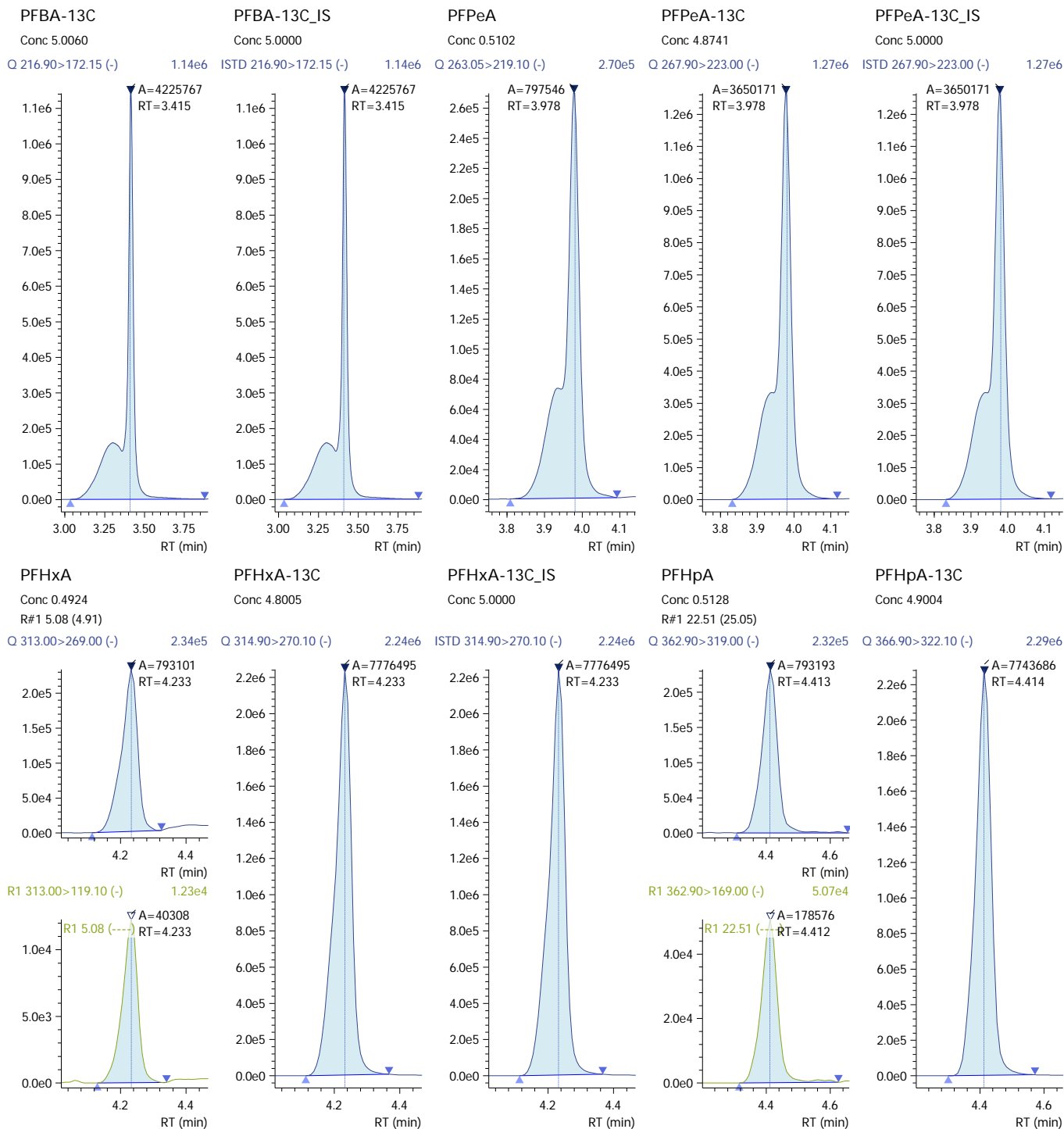
### 210413\_035 (continued)



After-BLC



210413\_035 (continued)

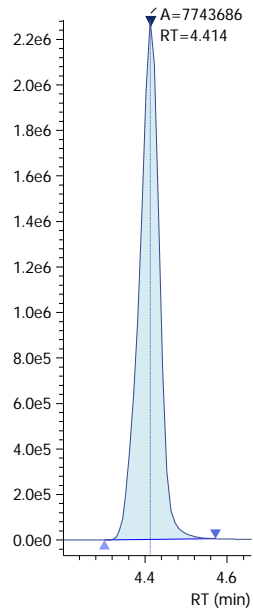




### 210413\_035 (continued)

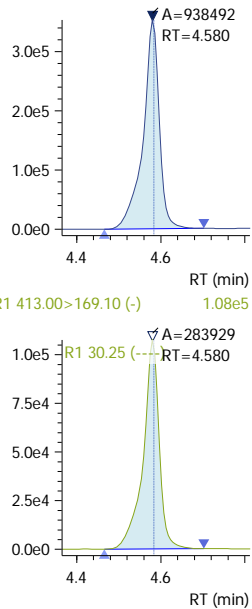
PFHpA-13C\_IS  
Conc 5.0000

ISTD 366.90>322.10 (-) 2.29e6



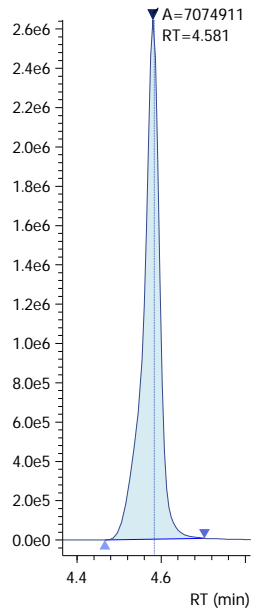
PFOA  
Conc 0.4967  
R#1 30.25 (29.71)

Q 413.00>369.00 (-) 3.54e5



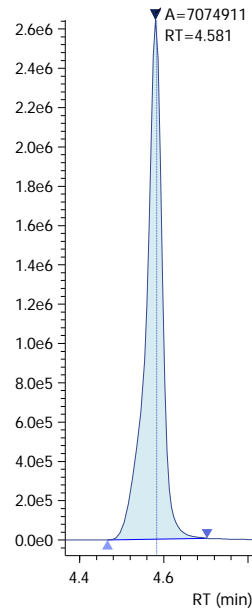
PFOA-13C  
Conc 4.8597

Q 416.80>372.05 (-) 2.65e6



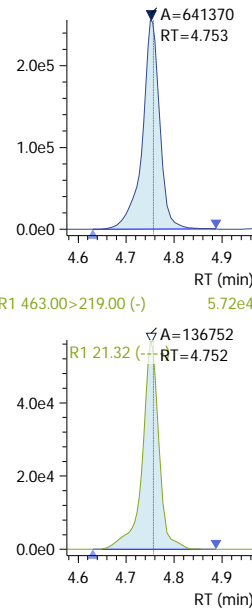
PFOA-13C\_IS  
Conc 5.0000

ISTD 416.80>372.05 (-) 2.65e6



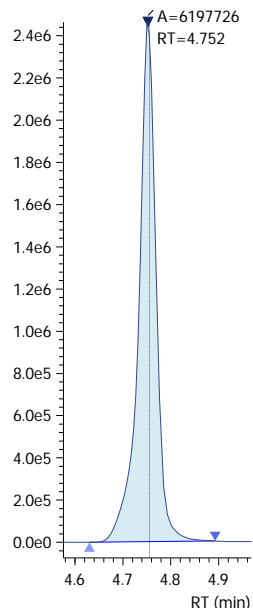
PFNA  
Conc 0.5126  
R#1 21.32 (21.68)

Q 463.00>418.90 (-) 2.56e5



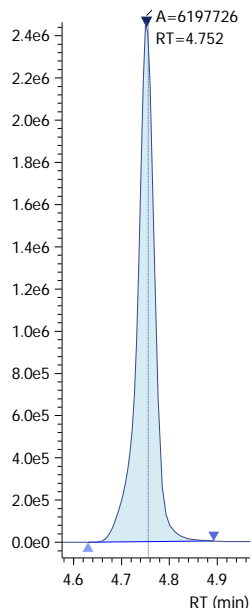
PFNA-13C  
Conc 5.0696

Q 467.80>423.00 (-) 2.46e6



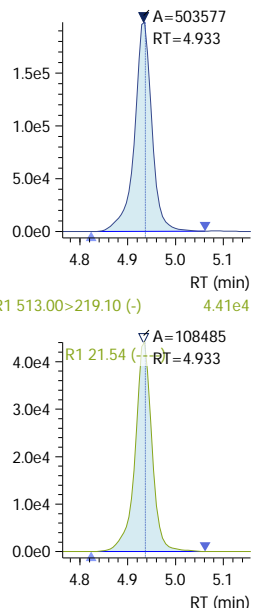
PFNA-13C\_IS  
Conc 5.0000

ISTD 467.80>423.00 (-) 2.46e6



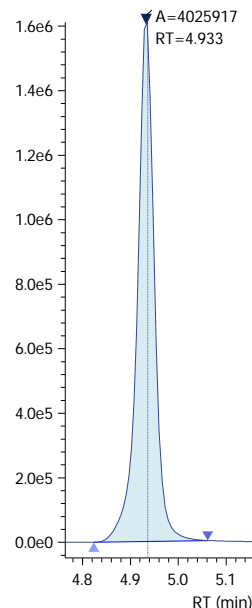
PFDA  
Conc 0.4976  
R#1 21.54 (21.66)

Q 513.00>468.80 (-) 1.98e5



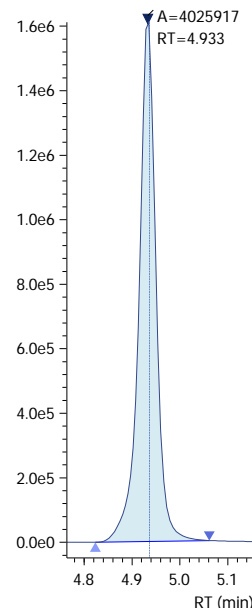
PFDA-13C  
Conc 4.9961

Q 514.80>469.95 (-) 1.61e6



PFDA-13C\_IS  
Conc 5.0000

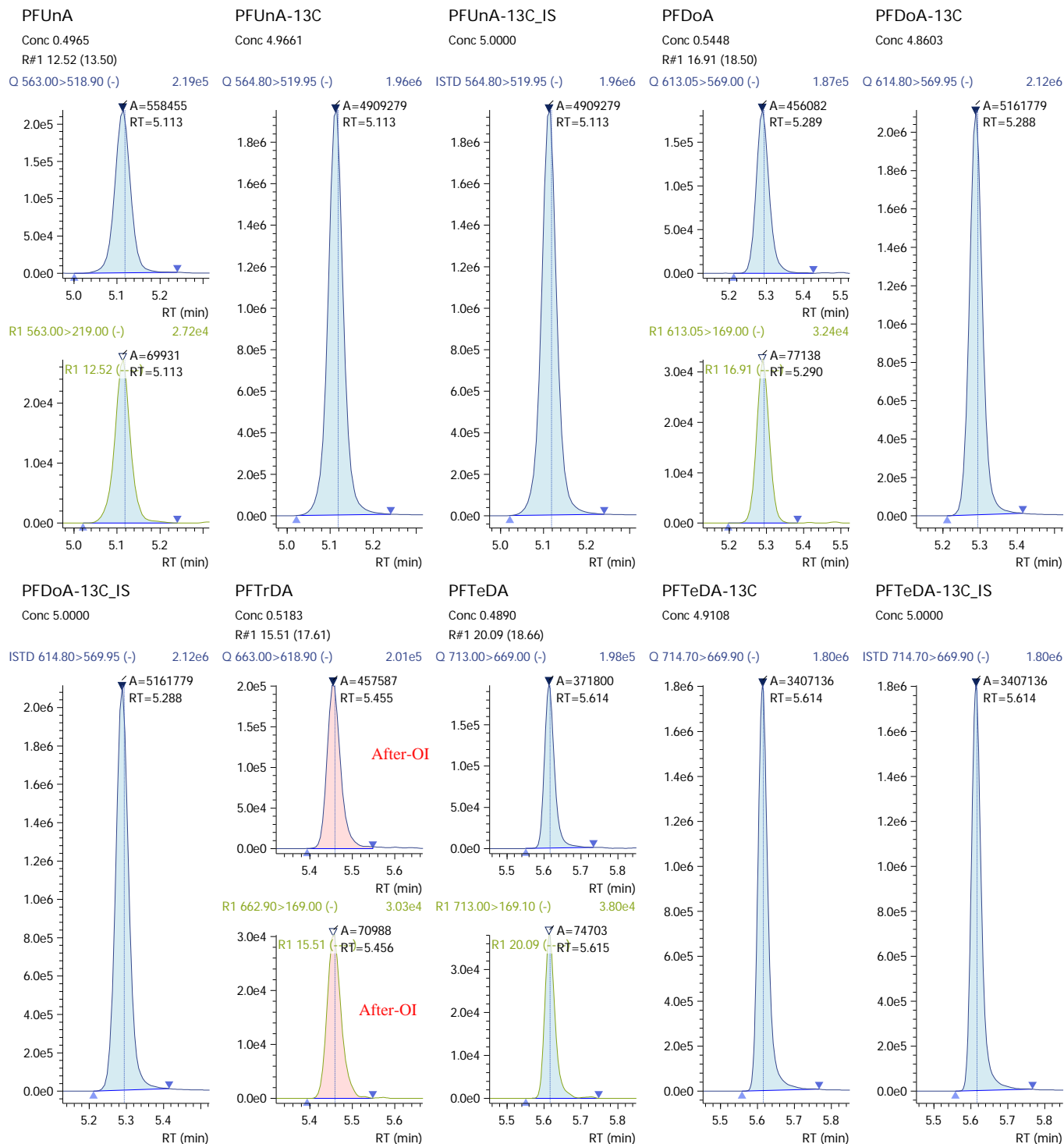
ISTD 514.80>469.95 (-) 1.61e6





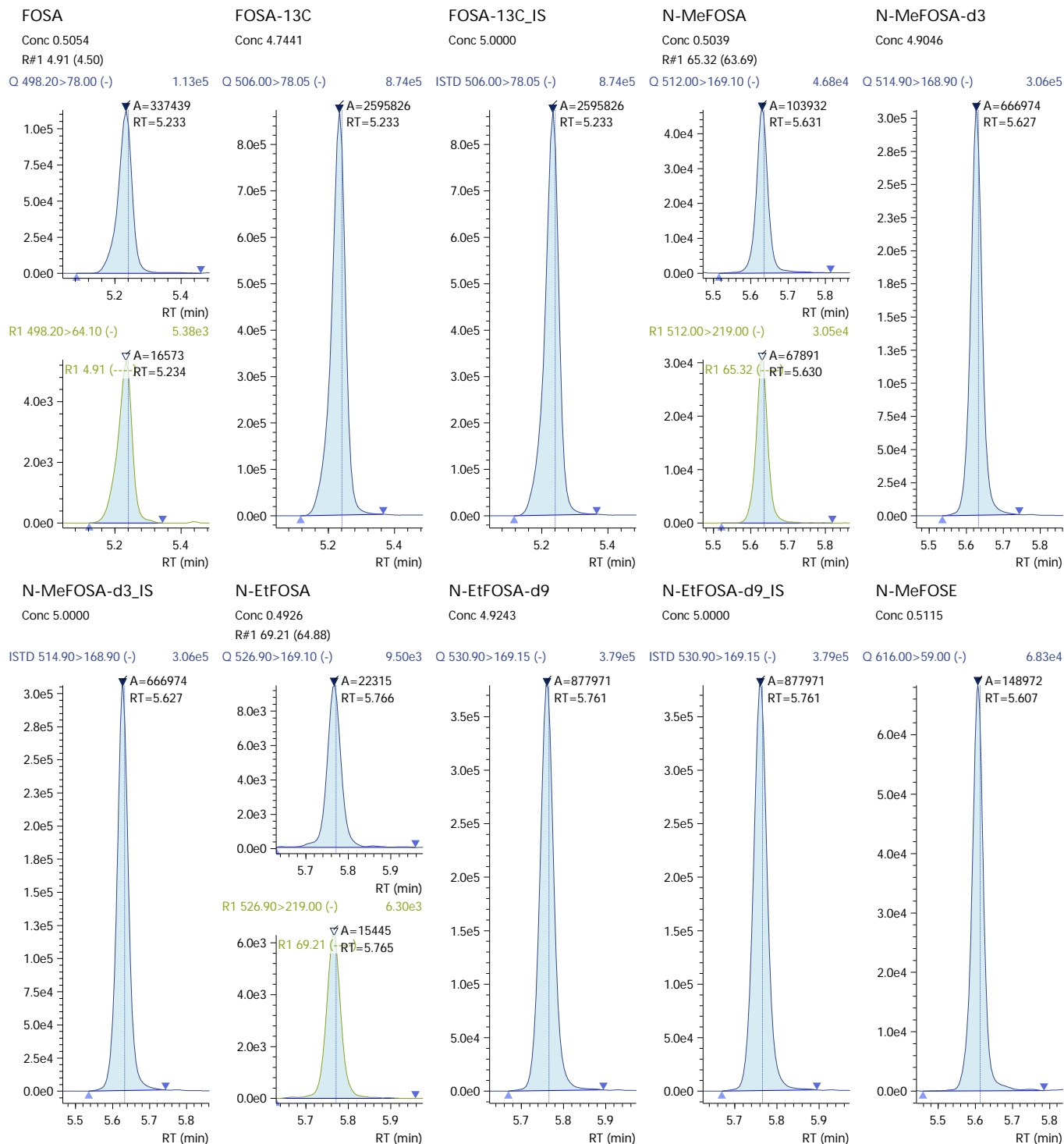


210413\_035 (continued)



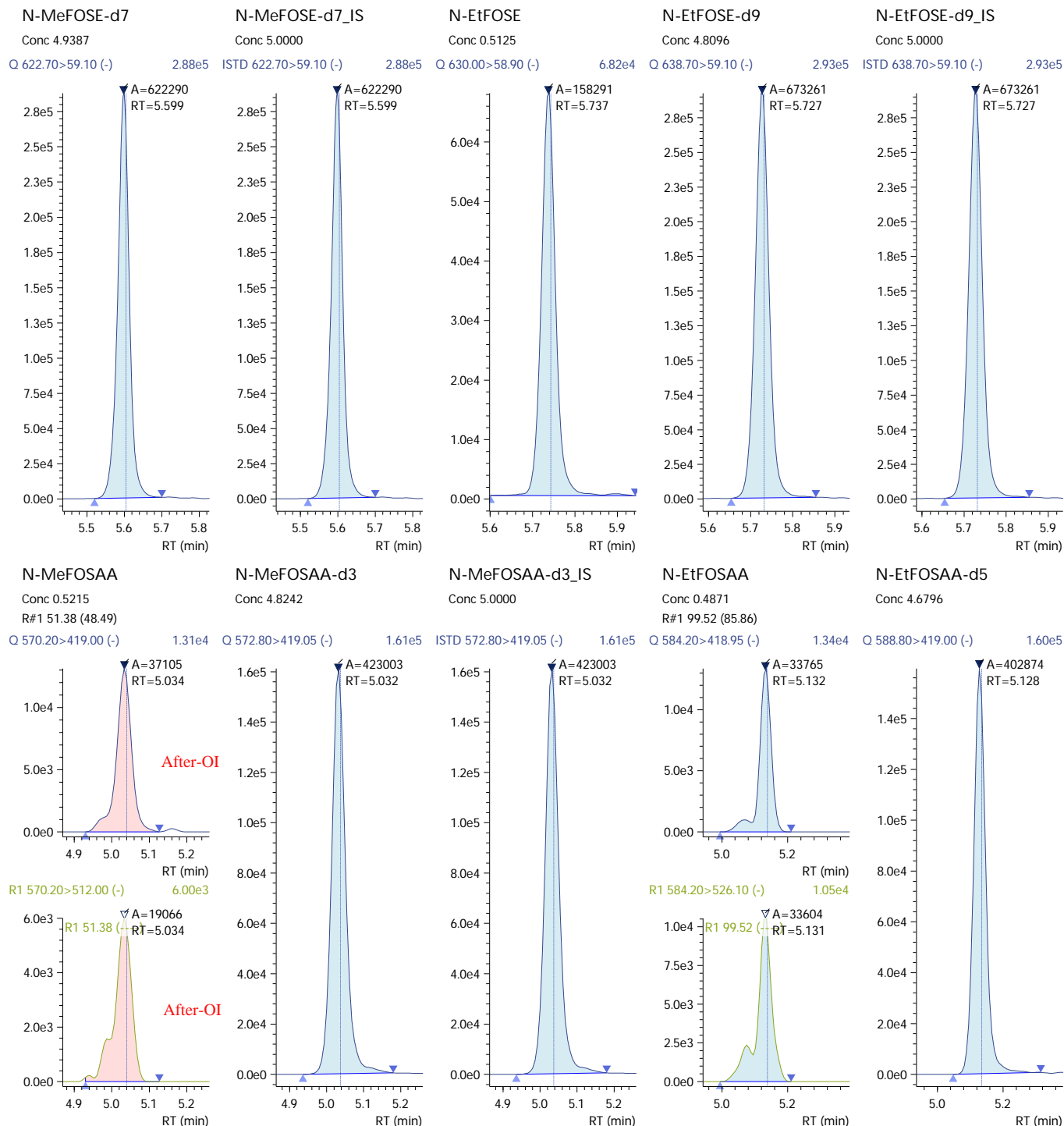


210413\_035 (continued)



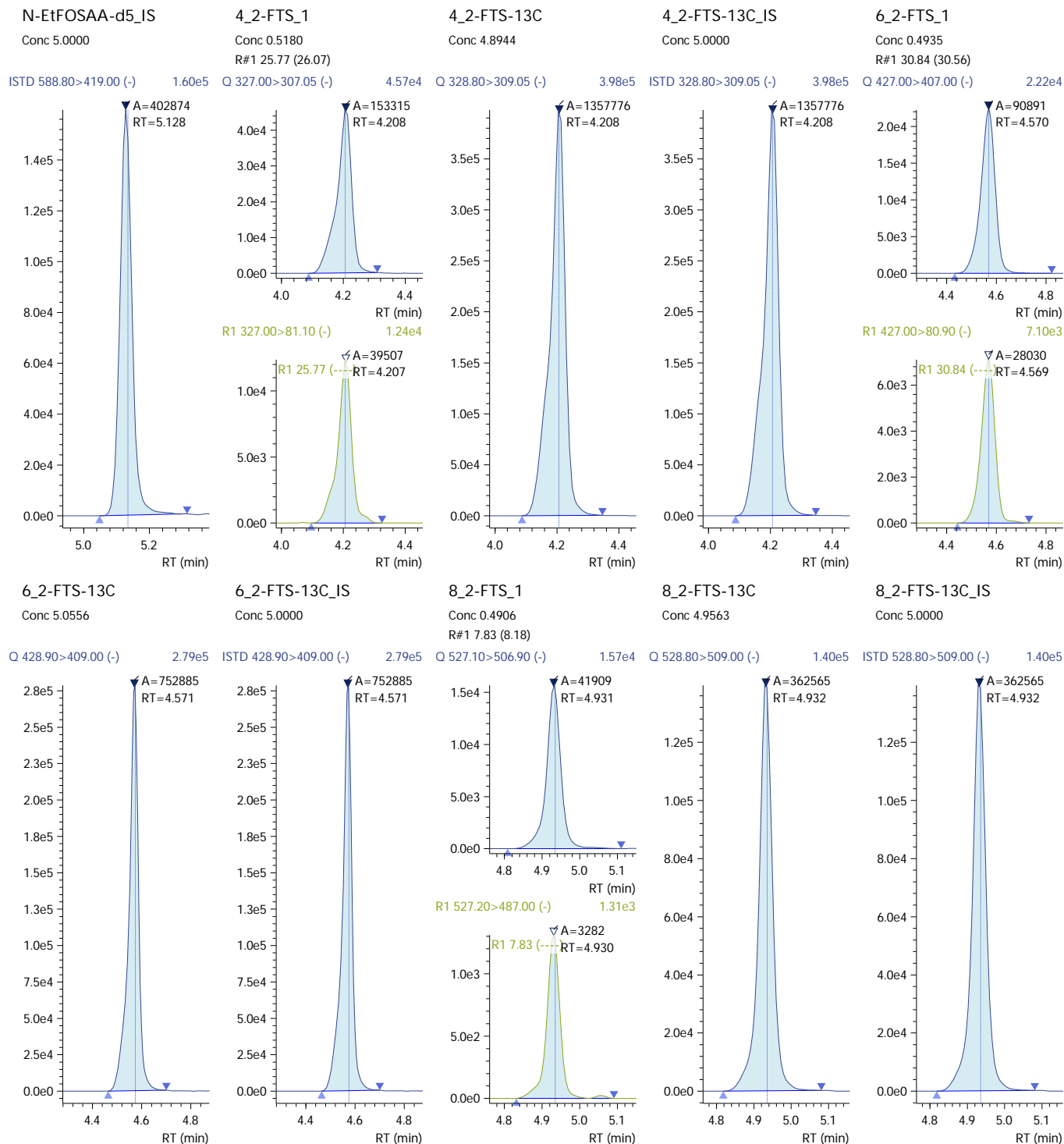


210413\_035 (continued)



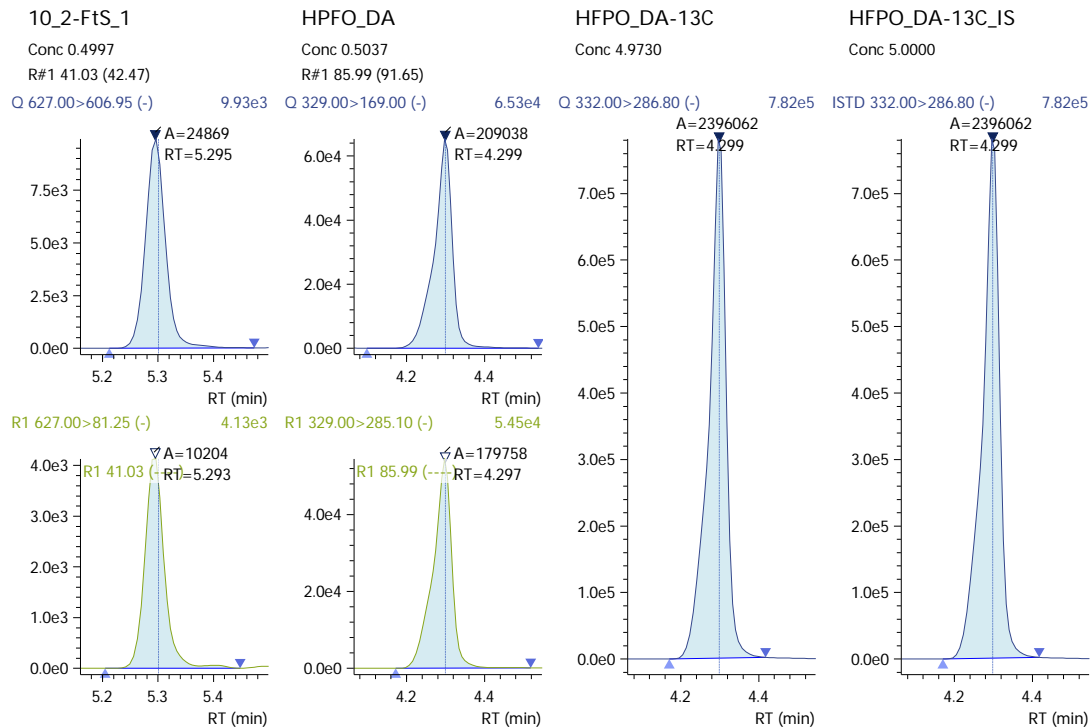


### 210413\_035 (continued)





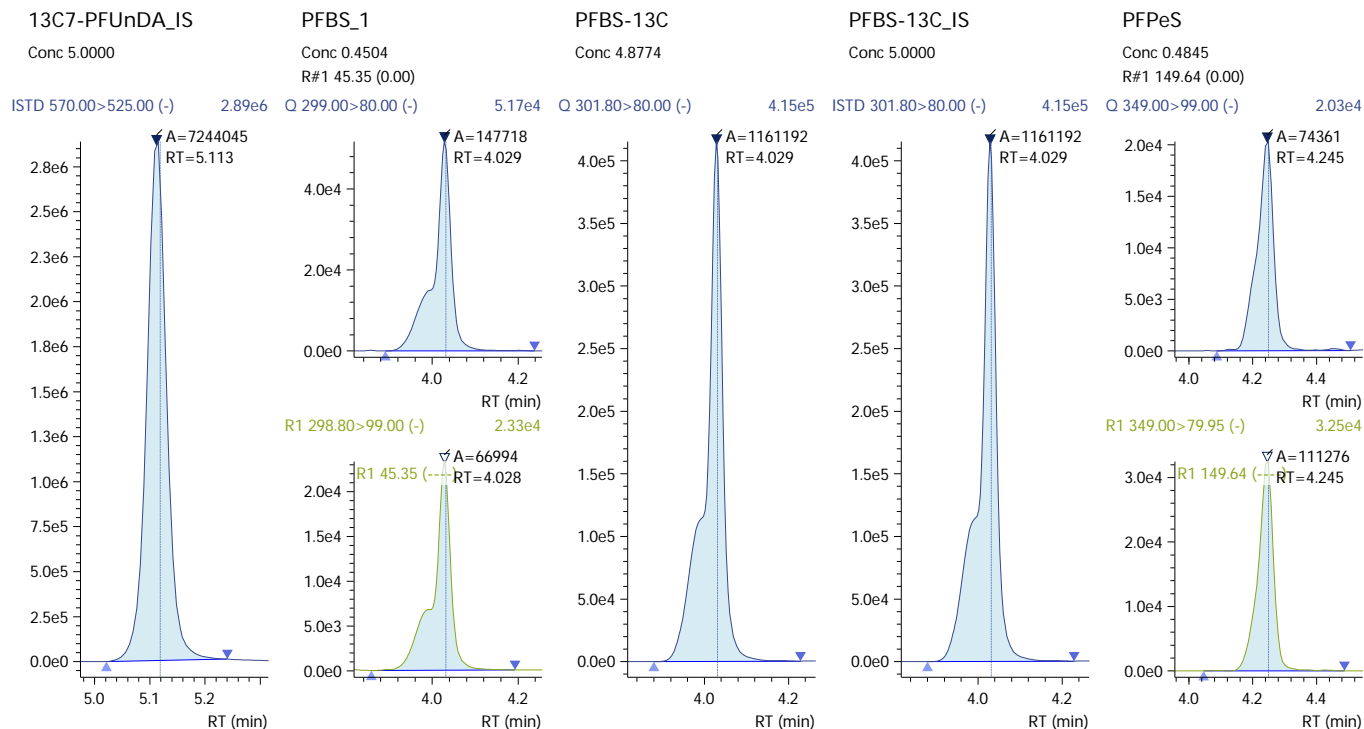
### 210413\_035 (continued)





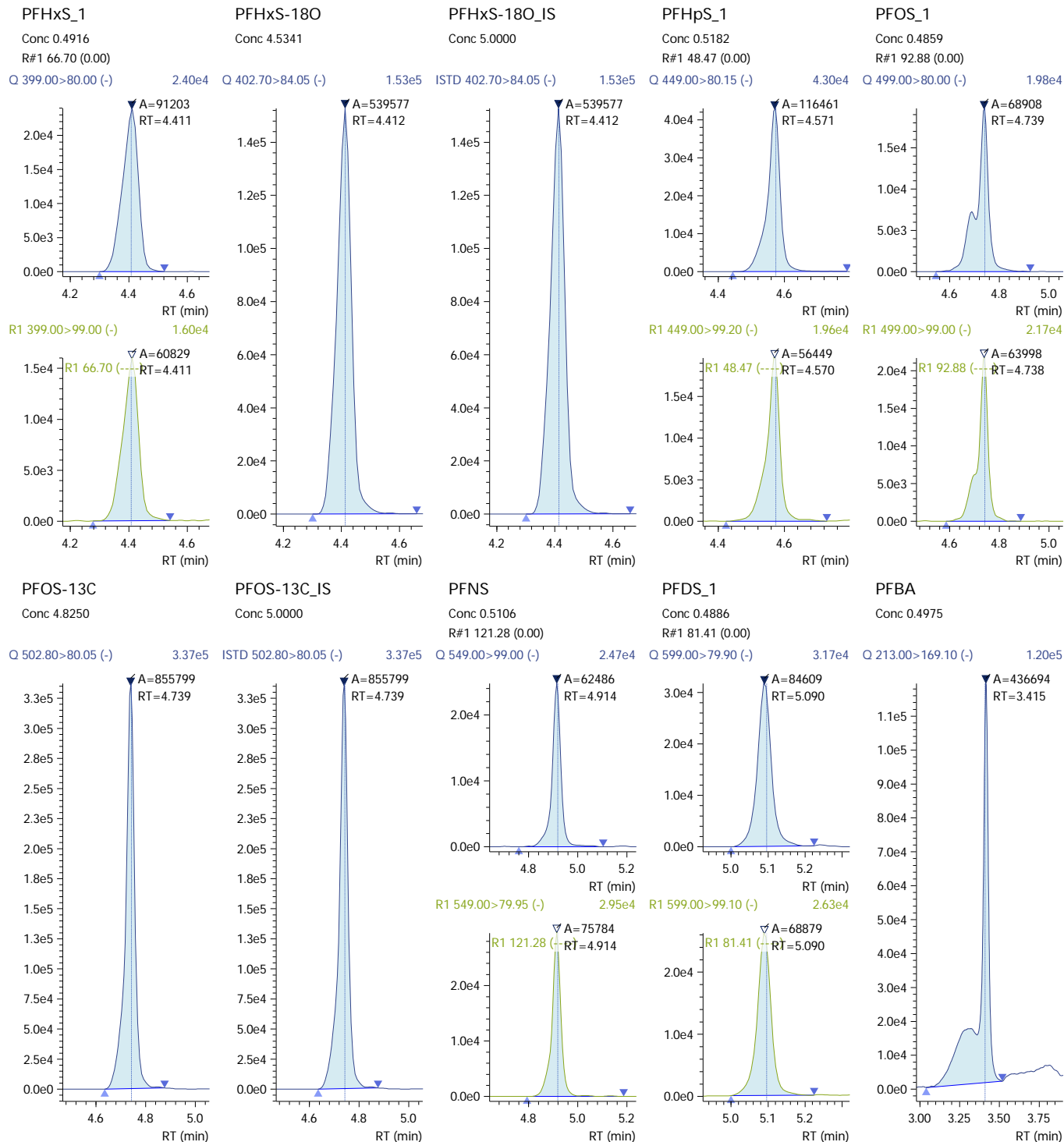
### 210413\_035

Sample ID: PFC ICAL 0.5 PPB  
Date Acquired: 4/13/2021 5:50:15 PM  
Acquired by: System Administrator  
Data File: 210413\_035  
Vial: 3 | Inj. Volume: 15.0000uL | Tray: 0





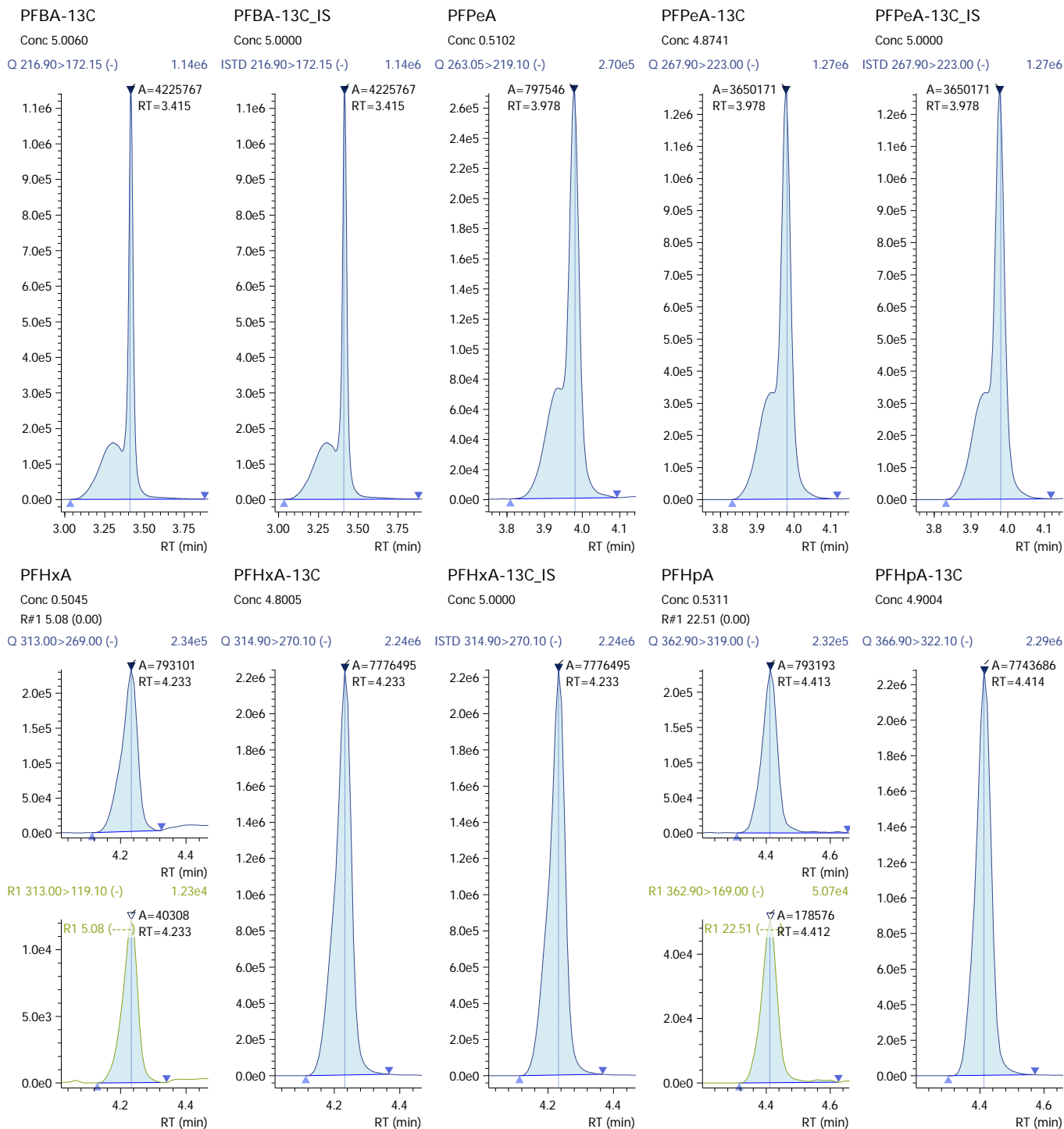
### 210413\_035 (continued)





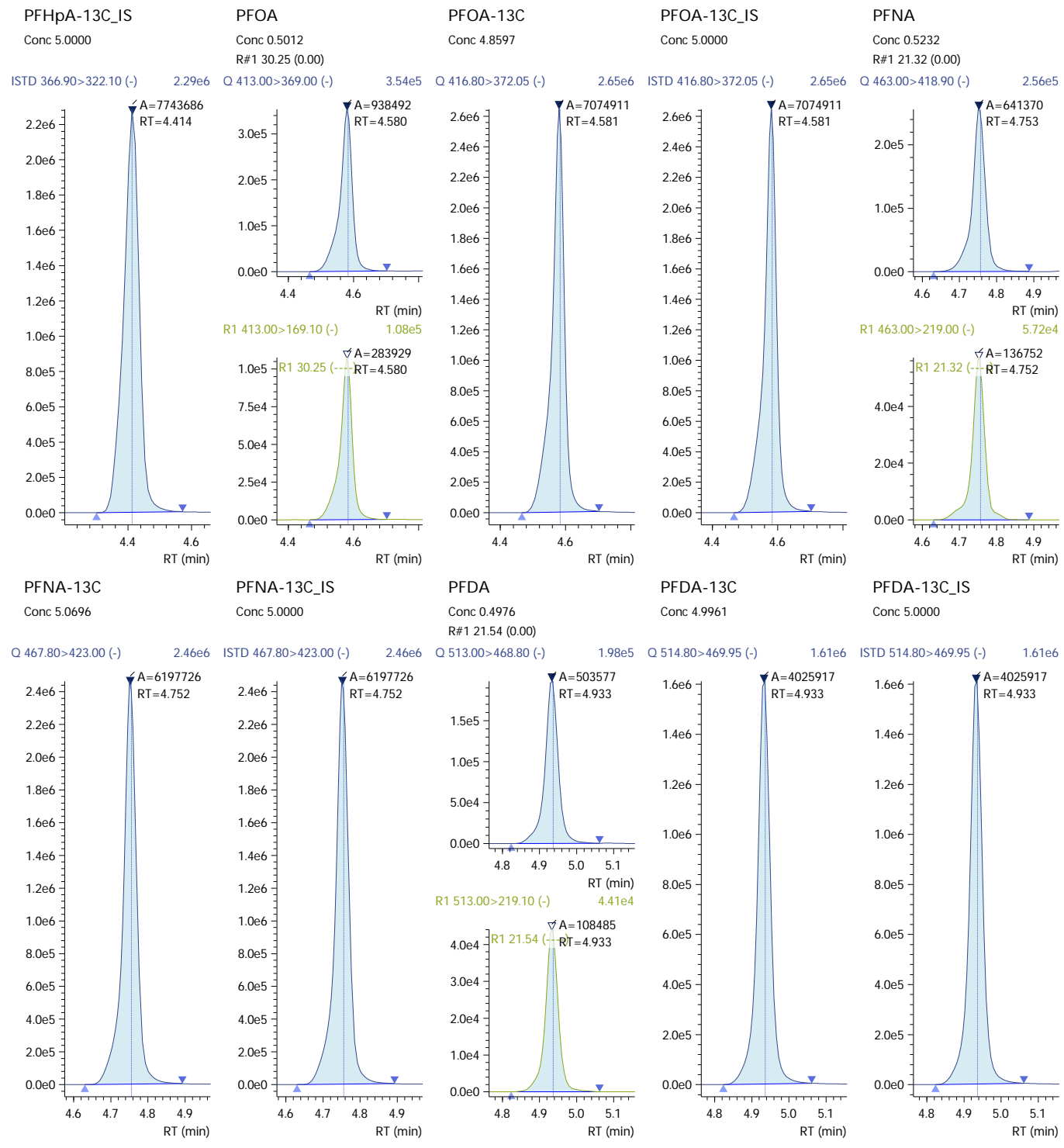


### 210413\_035 (continued)



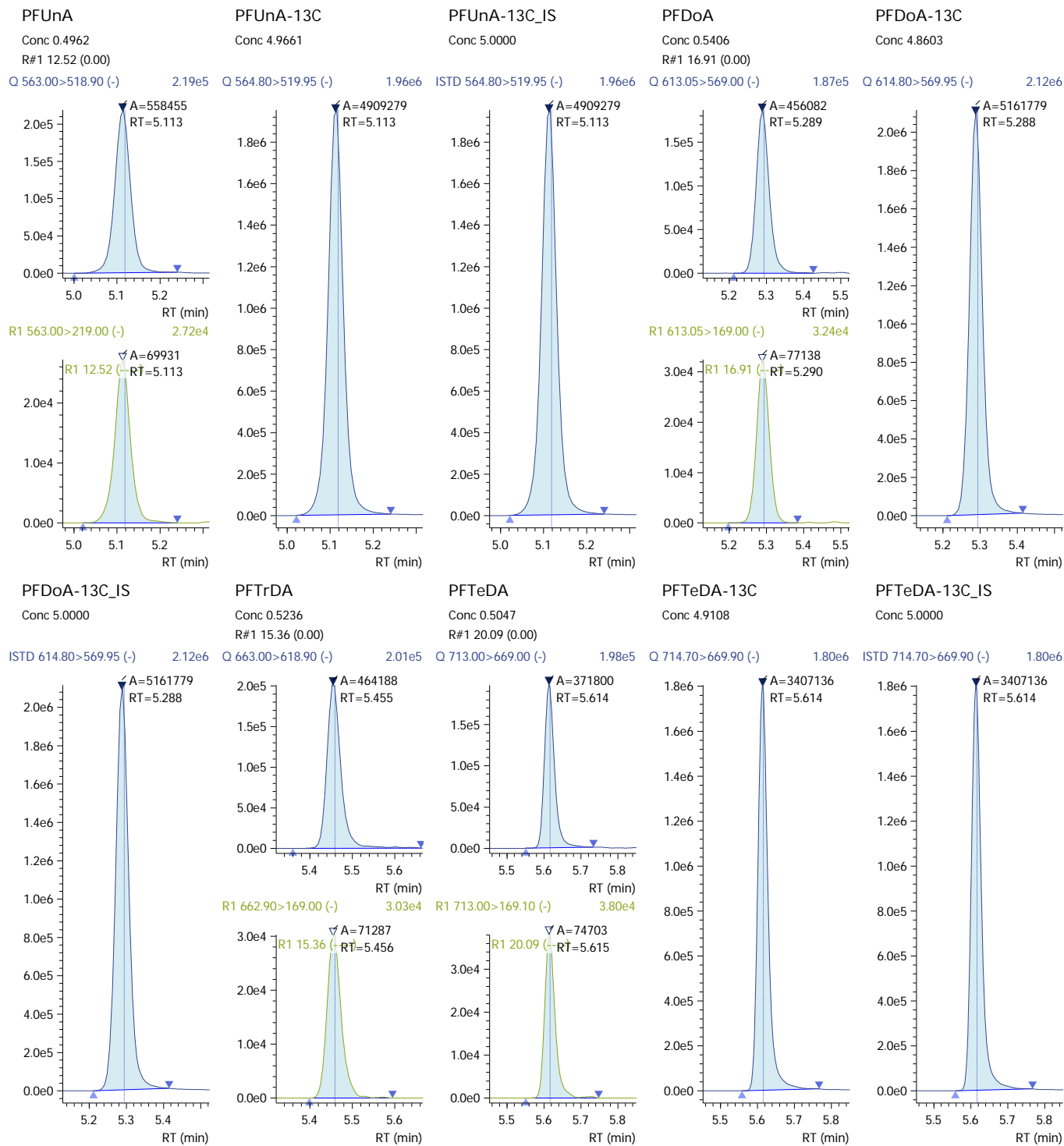


### 210413\_035 (continued)



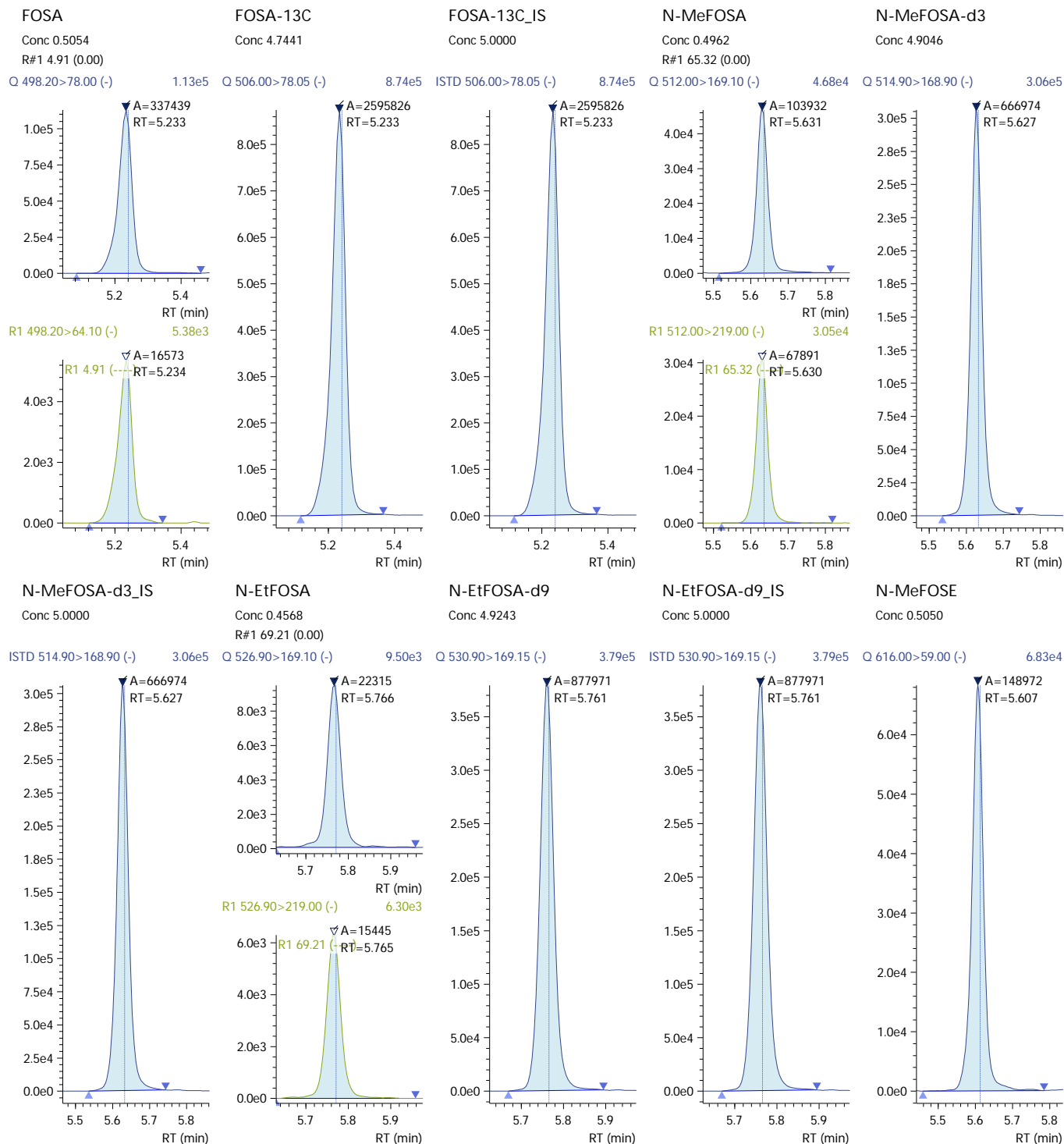


### 210413\_035 (continued)



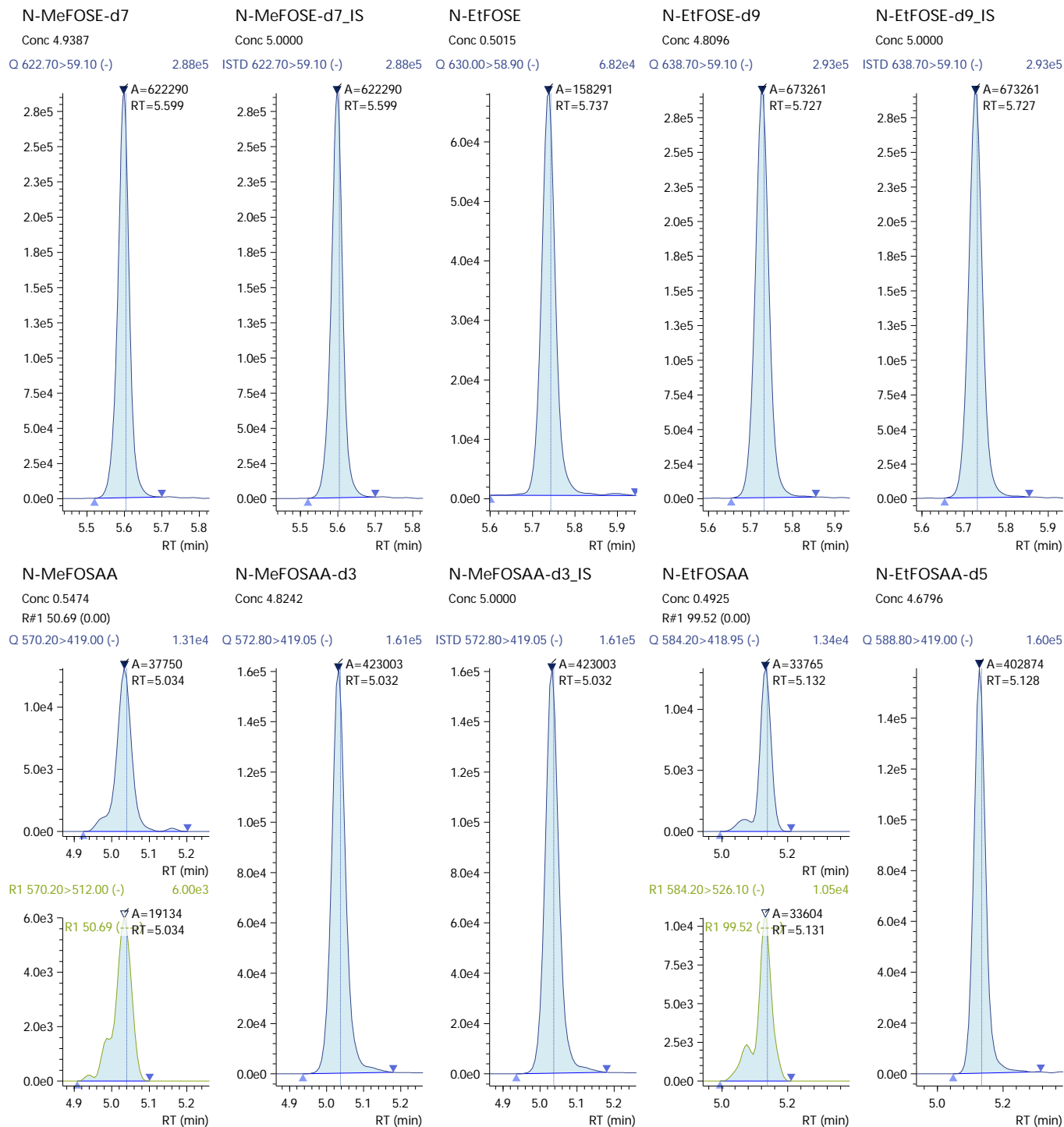


210413\_035 (continued)





210413\_035 (continued)





### 210413\_035 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.5089  
R#1 25.77 (0.00)

4\_2-FTS-13C  
Conc 4.8944

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.4935  
R#1 30.84 (0.00)

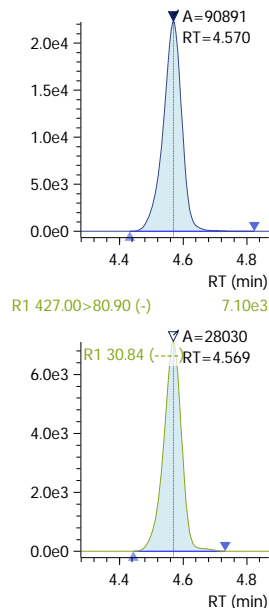
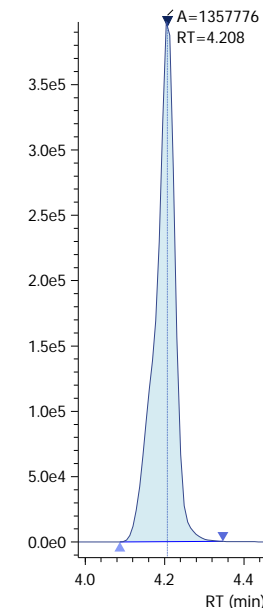
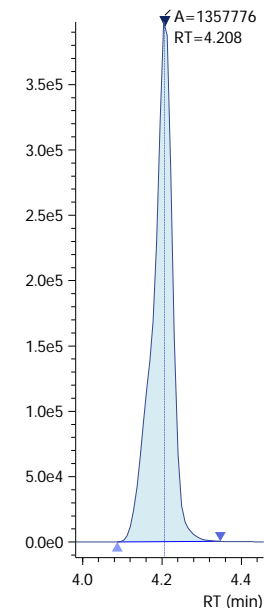
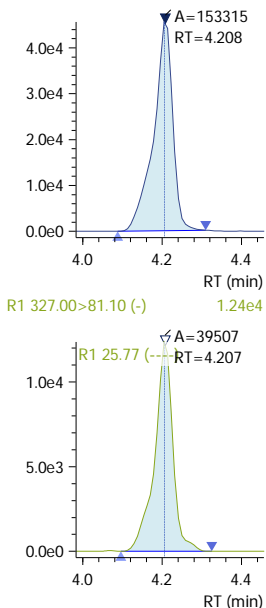
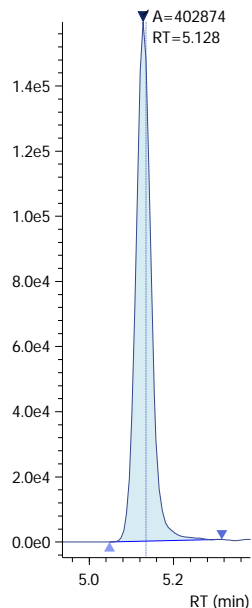
ISTD 588.80>419.00 (-) 1.60e5

Q 327.00>307.05 (-) 4.57e4

Q 328.80>309.05 (-) 3.98e5

ISTD 328.80>309.05 (-) 3.98e5

Q 427.00>407.00 (-) 2.22e4



6\_2-FTS-13C  
Conc 5.0556

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.4898  
R#1 7.83 (0.00)

8\_2-FTS-13C  
Conc 4.9563

8\_2-FTS-13C\_IS  
Conc 5.0000

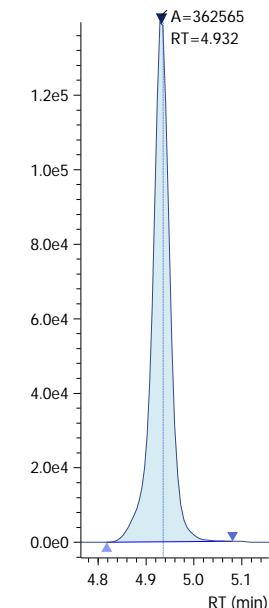
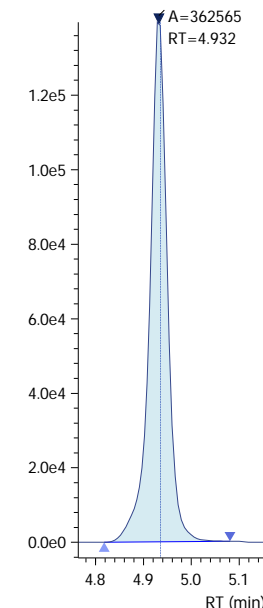
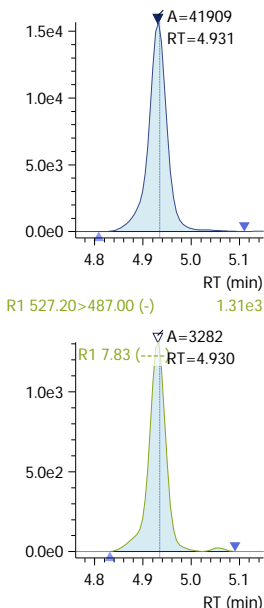
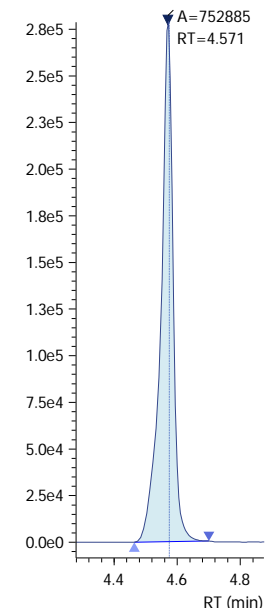
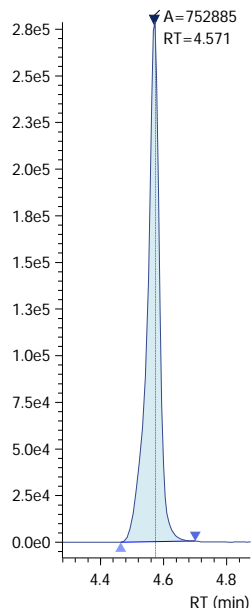
Q 428.90>409.00 (-) 2.79e5

ISTD 428.90>409.00 (-) 2.79e5

Q 527.10>506.90 (-) 1.57e4

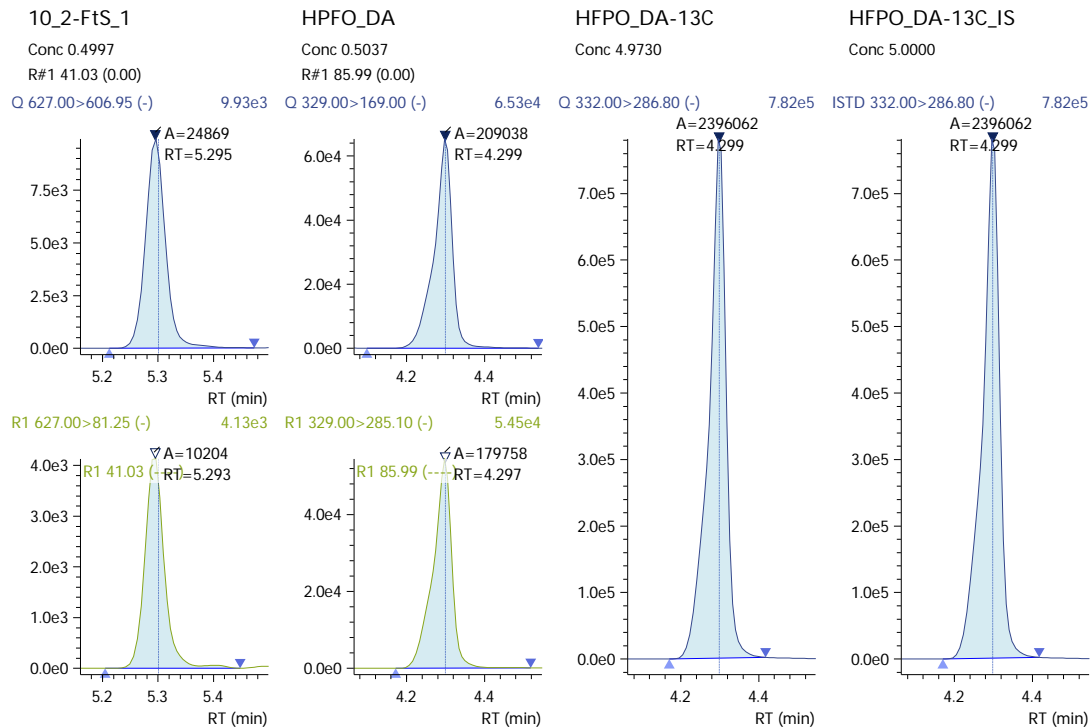
Q 528.80>509.00 (-) 1.40e5

ISTD 528.80>509.00 (-) 1.40e5





### 210413\_035 (continued)







## 210413\_036

Sample ID: PFC ICAL 1.0 PPB

Date Acquired: 4/13/2021 6:00:40 PM

Acquired by: System Administrator

Data File: 210413\_036

Vial: 4 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.118	0.000	----	7176447	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.032	0.000	0.00	266809	121875	45.68	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.032	0.000	-1.09	1090006	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.032	0.000	----	1090006	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.249	0.000	0.22	134203	209071	155.79	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.408	0.000	-0.01	176721	130205	73.68	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.413	0.000	-0.71	638892	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.413	0.000	----	638892	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.575	0.000	0.16	219884	105909	48.17	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.742	0.000	0.00	120748	109494	90.68	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.742	0.000	-0.38	814726	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.742	0.000	----	814726	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.918	0.000	0.18	114812	131399	114.45	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.096	0.000	0.35	154880	128932	83.25	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.410	0.000	0.00	791732	----	----	----		
PFBA-13C	216.90>172.15	----	3.409	0.000	-1.71	3890870	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.409	0.000	----	3890870	----	----	----		
PFPeA	263.05>219.10	----	3.981	0.000	0.04	1399363	----	----	----		
PFPeA-13C	267.90>223.00	----	3.938	-0.043	-1.18	3416946	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.938	-0.043	----	3416946	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.233	0.000	0.00	1522247	74294	4.88	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.232	0.000	-0.89	7945231	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.232	0.000	----	7945231	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.412	0.000	0.00	1401255	382633	27.31	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.412	0.000	-0.71	7695402	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.412	0.000	----	7695402	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.584	0.000	0.00	1797540	537947	29.93	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.584	0.000	-0.53	7144494	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.584	0.000	----	7144494	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.756	0.000	0.00	1111534	251071	22.59	21.68	10.84-32.52	

J:\LCMS06\Data\210413\_Curve\210413\_Curve.DAML

Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



## 210413\_036 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.756	0.000	-0.36	5573068	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.756	0.000	----	5573068	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.937	0.000	0.00	951344	208698	21.94	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.936	0.000	-0.18	3897053	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.936	0.000	----	3897053	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.119	0.000	0.00	1048471	139214	13.28	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.119	0.000	0.00	4746093	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.119	0.000	----	4746093	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.293	0.000	0.00	832989	163786	19.66	18.50	9.25-27.75	
PFDaA-13C	614.80>569.95	----	5.294	0.000	0.18	4980707	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.294	0.000	----	4980707	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	5.459	0.000	-0.16	865925	154161	17.80	17.61	8.8-26.41	
PFTeDA	713.00>669.00	713.00>169.10	5.616	0.000	0.00	683169	125537	18.38	18.66	9.33-27.99	
PFTeDA-13C	714.70>669.90	----	5.616	0.000	0.50	3251100	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.616	0.000	----	3251100	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.241	0.000	0.00	643208	30588	4.76	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.241	0.000	0.12	2509620	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.241	0.000	----	2509620	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.635	0.000	0.00	194175	122321	63.00	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.633	0.000	0.52	625210	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.633	0.000	----	625210	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.771	0.000	0.01	39689	26706	67.29	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.766	0.000	0.65	810106	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.766	0.000	----	810106	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.613	0.000	0.01	271068	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.604	0.000	0.49	580536	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.604	0.000	----	580536	----	----	----		
N-EtFOSE	630.00>58.90	----	5.743	0.000	0.01	285246	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.732	0.000	0.61	646738	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.732	0.000	----	646738	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.040	0.000	0.00	66204	34044	51.42	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.037	0.000	-0.08	390169	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.037	0.000	----	390169	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.138	0.000	0.00	65960	57751	87.56	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.135	0.000	0.02	392302	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.135	0.000	----	392302	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.206	0.000	0.00	243783	66802	27.40	26.07	13.03-39.1	
4_2-FTS-13C	328.80>309.05	----	4.207	0.000	-0.91	1193001	----	----	----	0-0	

J:\LCMS06\Data\210413\_Curve\210413\_Curve.DAML

Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_036 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.207	0.000	----	1193001	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.569	0.000	-0.01	172274	52314	30.37	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.574	0.000	-0.54	728476	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.574	0.000	----	728476	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.935	0.000	0.00	81805	6559	8.02	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.935	0.000	-0.18	350279	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.935	0.000	----	350279	----	----	----	0-0	
10_2-FTS_1	627.00>606.95	627.00>81.25	5.301	0.000	0.37	46515	20234	43.50	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.299	0.000	0.00	373269	363649	97.42	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.299	0.000	-0.82	2078173	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.299	0.000	----	2078173	----	----	----		



## 210413\_036

Sample ID: PFC ICAL 1.0 PPB  
 Date Acquired: 4/13/2021 6:00:40 PM  
 Acquired by: System Administrator  
 Data File: 210413\_036  
 Vial: 4 | Inj. Volume: 15.0000uL | Tray: 0

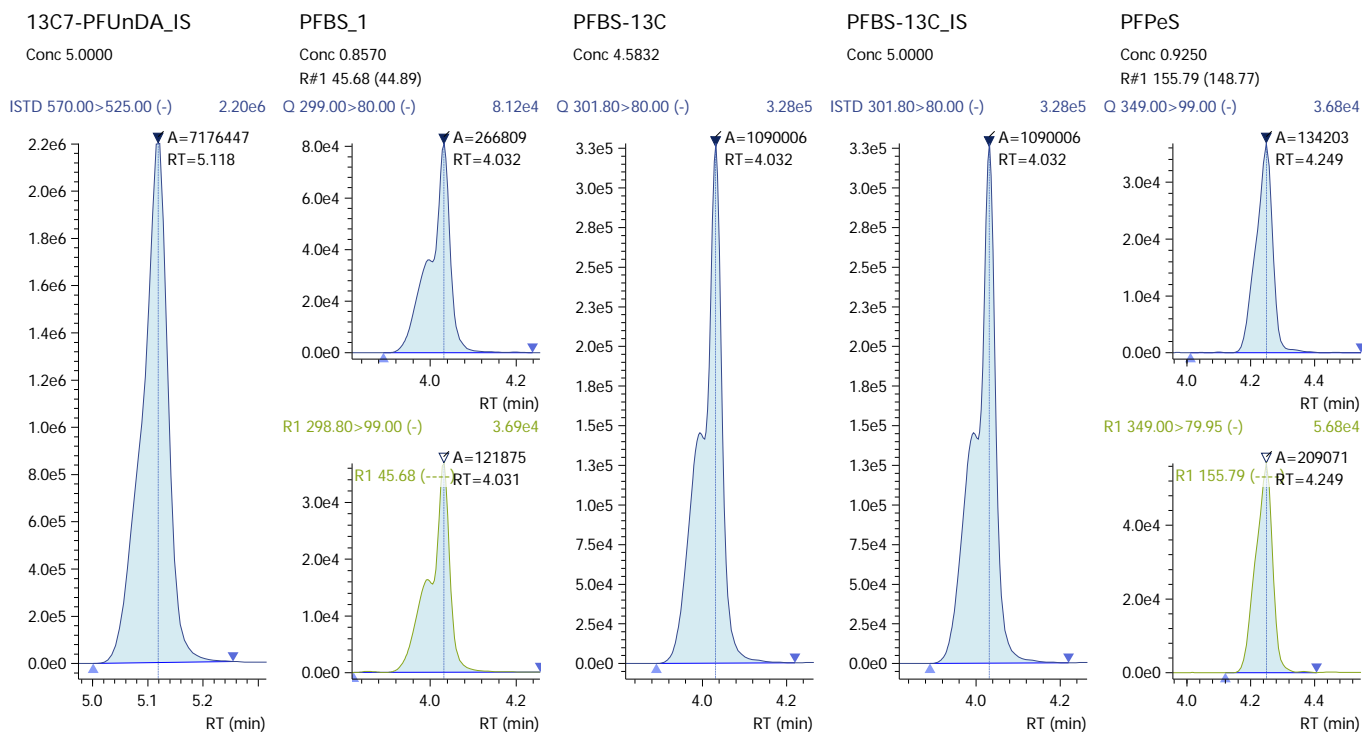
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.118	7176447	7176447	----	5.0000	5.0000	ng/mL
PFBS_1	Auto	4.032	266809	1090006	PFBS-13C_IS	0.8874	0.8570	ng/mL
PFBS-13C	Auto	4.032	1090006	7176447	13C7-PFUnDA_IS	5.0000	4.5832	ng/mL
PFBS-13C_IS	Auto	4.032	1090006	1090006	----	5.0000	5.0000	ng/mL
PFPeS	Auto	4.249	134203	1090006	PFBS-13C_IS	0.9409	0.9250	ng/mL
PFHxS_1	Auto	4.408	176721	638892	PFHxS-18O_IS	0.9131	0.8180	ng/mL
PFHxS-18O	Auto	4.413	638892	7176447	13C7-PFUnDA_IS	5.0000	5.4193	ng/mL
PFHxS-18O_IS	Auto	4.413	638892	638892	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.575	219884	638892	PFHxS-18O_IS	0.9534	0.8278	ng/mL
PFOS_1	Auto	4.742	120748	814726	PFOS-13C_IS	0.9292	0.8944	ng/mL
PFOS-13C	Auto	4.742	814726	7176447	13C7-PFUnDA_IS	5.0000	4.6367	ng/mL
PFOS-13C_IS	Auto	4.742	814726	814726	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.918	114812	814726	PFOS-13C_IS	0.9616	0.9737	ng/mL
PFDS_1	Auto	5.096	154880	814726	PFOS-13C_IS	0.9647	0.9391	ng/mL
PFBA	Auto	3.410	791732	3890870	PFBA-13C_IS	1.0000	0.9428	ng/mL
PFBA-13C	Auto	3.409	3890870	7176447	13C7-PFUnDA_IS	5.0000	4.6527	ng/mL
PFBA-13C_IS	Auto	3.409	3890870	3890870	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.981	1399363	3416946	PFPeA-13C_IS	1.0000	0.9812	ng/mL
PFPeA-13C	Auto	3.938	3416946	7176447	13C7-PFUnDA_IS	5.0000	4.6057	ng/mL
PFPeA-13C_IS	Auto	3.938	3416946	3416946	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.233	1522247	7945231	PFHxA-13C_IS	1.0000	0.9250	ng/mL
PFHxA-13C	Auto	4.232	7945231	7176447	13C7-PFUnDA_IS	5.0000	4.9509	ng/mL
PFHxA-13C_IS	Auto	4.232	7945231	7945231	----	5.0000	5.0000	ng/mL
PFHpA	Auto	4.412	1401255	7695402	PFHpA-13C_IS	1.0000	0.9116	ng/mL
PFHpA-13C	Auto	4.412	7695402	7176447	13C7-PFUnDA_IS	5.0000	4.9158	ng/mL
PFHpA-13C_IS	Auto	4.412	7695402	7695402	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.584	1797540	7144494	PFOA-13C_IS	1.0000	0.9420	ng/mL
PFOA-13C	Auto	4.584	7144494	7176447	13C7-PFUnDA_IS	5.0000	4.9538	ng/mL
PFOA-13C_IS	Auto	4.584	7144494	7144494	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.756	1111534	5573068	PFNA-13C_IS	1.0000	0.9880	ng/mL
PFNA-13C	Auto	4.756	5573068	7176447	13C7-PFUnDA_IS	5.0000	4.6016	ng/mL
PFNA-13C_IS	Auto	4.756	5573068	5573068	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.937	951344	3897053	PFDA-13C_IS	1.0000	0.9712	ng/mL
PFDA-13C	Auto	4.936	3897053	7176447	13C7-PFUnDA_IS	5.0000	4.8817	ng/mL
PFDA-13C_IS	Auto	4.936	3897053	3897053	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.119	1048471	4746093	PFUnA-13C_IS	1.0000	0.9642	ng/mL
PFUnA-13C	Auto	5.119	4746093	7176447	13C7-PFUnDA_IS	5.0000	4.8463	ng/mL
PFUnA-13C_IS	Auto	5.119	4746093	4746093	----	5.0000	5.0000	ng/mL
PFDaA	Auto	5.293	832989	4980707	PFDaA-13C_IS	1.0000	1.0313	ng/mL
PFDaA-13C	Auto	5.294	4980707	7176447	13C7-PFUnDA_IS	5.0000	4.7340	ng/mL
PFDaA-13C_IS	Auto	5.294	4980707	4980707	----	5.0000	5.0000	ng/mL
PFTeDA	Auto	5.459	865925	3251100	PFTeDA-13C_IS	1.0000	1.0279	ng/mL
PFTeDA	Auto	5.616	683169	3251100	PFTeDA-13C_IS	1.0000	0.9417	ng/mL
PFTeDA-13C	Auto	5.616	3251100	7176447	13C7-PFUnDA_IS	5.0000	4.7301	ng/mL
PFTeDA-13C_IS	Auto	5.616	3251100	3251100	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.241	643208	2509620	FOSA-13C_IS	1.0000	0.9965	ng/mL
FOSA-13C	Auto	5.241	2509620	7176447	13C7-PFUnDA_IS	5.0000	4.6298	ng/mL
FOSA-13C_IS	Auto	5.241	2509620	2509620	----	5.0000	5.0000	ng/mL
N-MeFOSA	Auto	5.635	194175	625210	N-MeFOSA-d3_IS	1.0000	1.0042	ng/mL
N-MeFOSA-d3	Auto	5.633	625210	7176447	13C7-PFUnDA_IS	5.0000	4.6408	ng/mL
N-MeFOSA-d3_IS	Auto	5.633	625210	625210	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.771	39689	810106	N-EtFOSA-d9_IS	1.0000	0.9778	ng/mL
N-EtFOSA-d9	Auto	5.766	810106	7176447	13C7-PFUnDA_IS	5.0000	4.5864	ng/mL
N-EtFOSA-d9_IS	Auto	5.766	810106	810106	----	5.0000	5.0000	ng/mL



210413\_036 (continued)

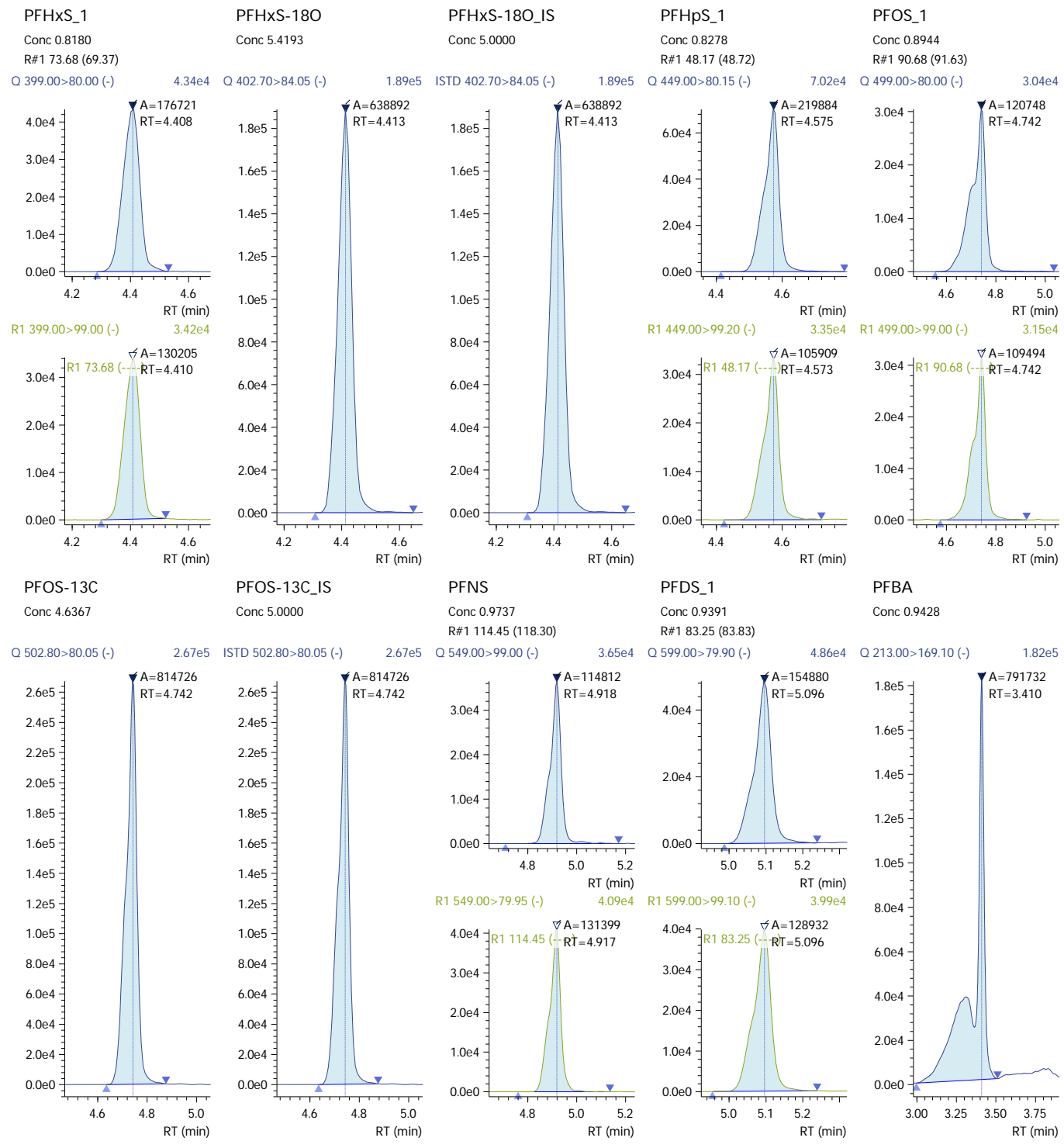
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.613	271068	580536	N-MeFOSE-d7_IS	1.0000	0.9977	ng/mL
N-MeFOSE-d7	Auto	5.604	580536	7176447	13C7-PFUnDA_IS	5.0000	4.6507	ng/mL
N-MeFOSE-d7_IS	Auto	5.604	580536	580536	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.743	285246	646738	N-EtFOSE-d9_IS	1.0000	0.9613	ng/mL
N-EtFOSE-d9	Auto	5.732	646738	7176447	13C7-PFUnDA_IS	5.0000	4.6637	ng/mL
N-EtFOSE-d9_IS	Auto	5.732	646738	646738	----	5.0000	5.0000	ng/mL
N-MeFOSAA	Auto	5.040	66204	390169	N-MeFOSAA-d3_IS	1.0000	0.9836	ng/mL
N-MeFOSAA-d3	Auto	5.037	390169	7176447	13C7-PFUnDA_IS	5.0000	4.4917	ng/mL
N-MeFOSAA-d3_IS	Auto	5.037	390169	390169	----	5.0000	5.0000	ng/mL
N-EtFOSAA	Auto	5.138	65960	392302	N-EtFOSAA-d5_IS	1.0000	0.9772	ng/mL
N-EtFOSAA-d5	Auto	5.135	392302	7176447	13C7-PFUnDA_IS	5.0000	4.5997	ng/mL
N-EtFOSAA-d5_IS	Auto	5.135	392302	392302	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.206	243783	1193001	4_2-FTS-13C_IS	0.9372	0.9374	ng/mL
4_2-FTS-13C	Auto	4.207	1193001	7176447	13C7-PFUnDA_IS	5.0000	4.3410	ng/mL
4_2-FTS-13C_IS	Auto	4.207	1193001	1193001	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.569	172274	728476	6_2-FTS-13C_IS	0.9512	0.9666	ng/mL
6_2-FTS-13C	Auto	4.574	728476	7176447	13C7-PFUnDA_IS	5.0000	4.9378	ng/mL
6_2-FTS-13C_IS	Auto	4.574	728476	728476	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.935	81805	350279	8_2-FTS-13C_IS	0.9600	0.9913	ng/mL
8_2-FTS-13C	Auto	4.935	350279	7176447	13C7-PFUnDA_IS	5.0000	4.8335	ng/mL
8_2-FTS-13C_IS	Auto	4.935	350279	350279	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.301	46515	350279	8_2-FTS-13C_IS	0.9662	0.9673	ng/mL
HPFO_DA	Auto	4.299	373269	2078173	HPFO_DA-13C_IS	1.0000	1.0371	ng/mL
HFPO_DA-13C	Auto	4.299	2078173	7176447	13C7-PFUnDA_IS	5.0000	4.3539	ng/mL
HFPO_DA-13C_IS	Auto	4.299	2078173	2078173	----	5.0000	5.0000	ng/mL



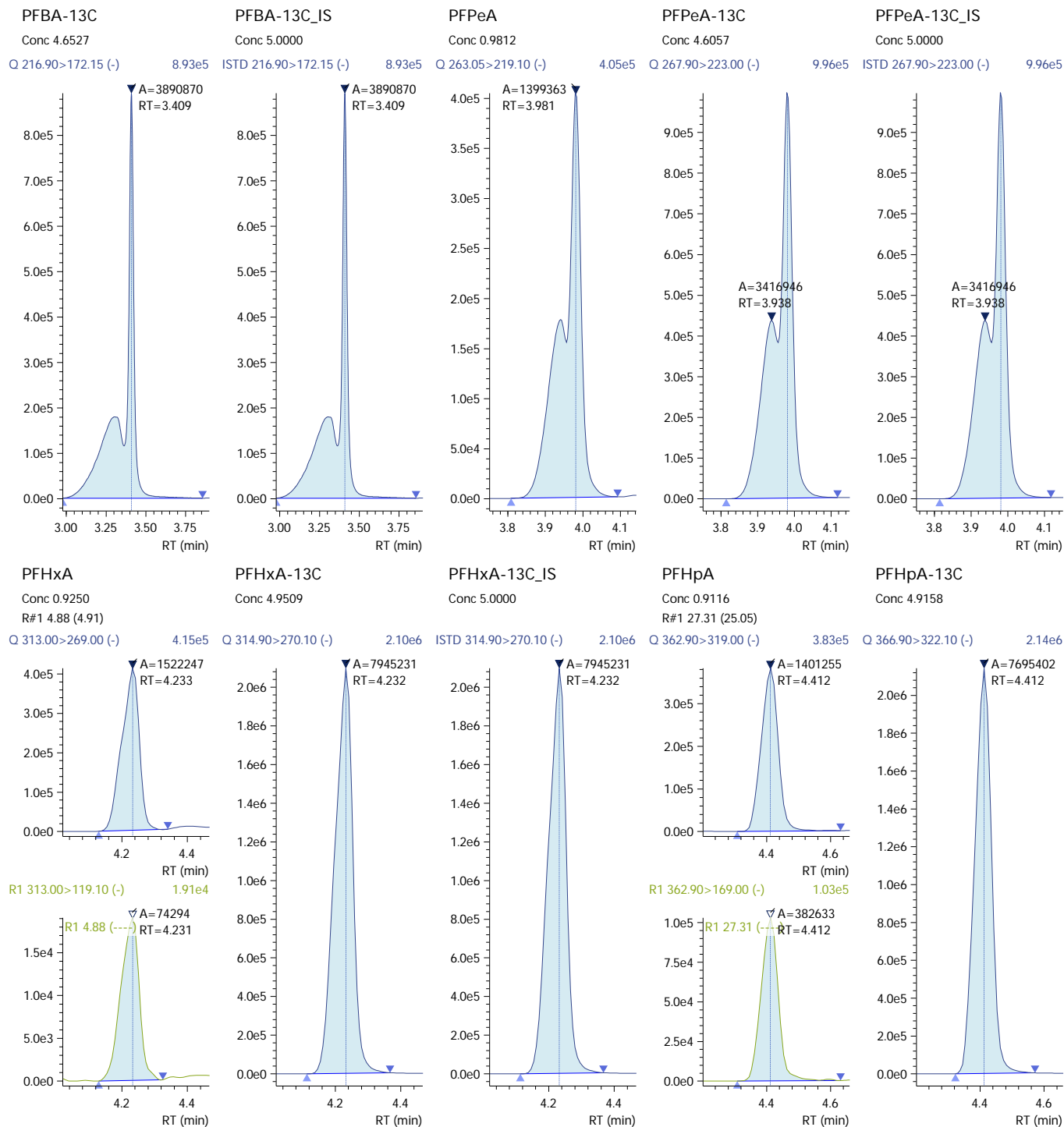


### 210413\_036 (continued)





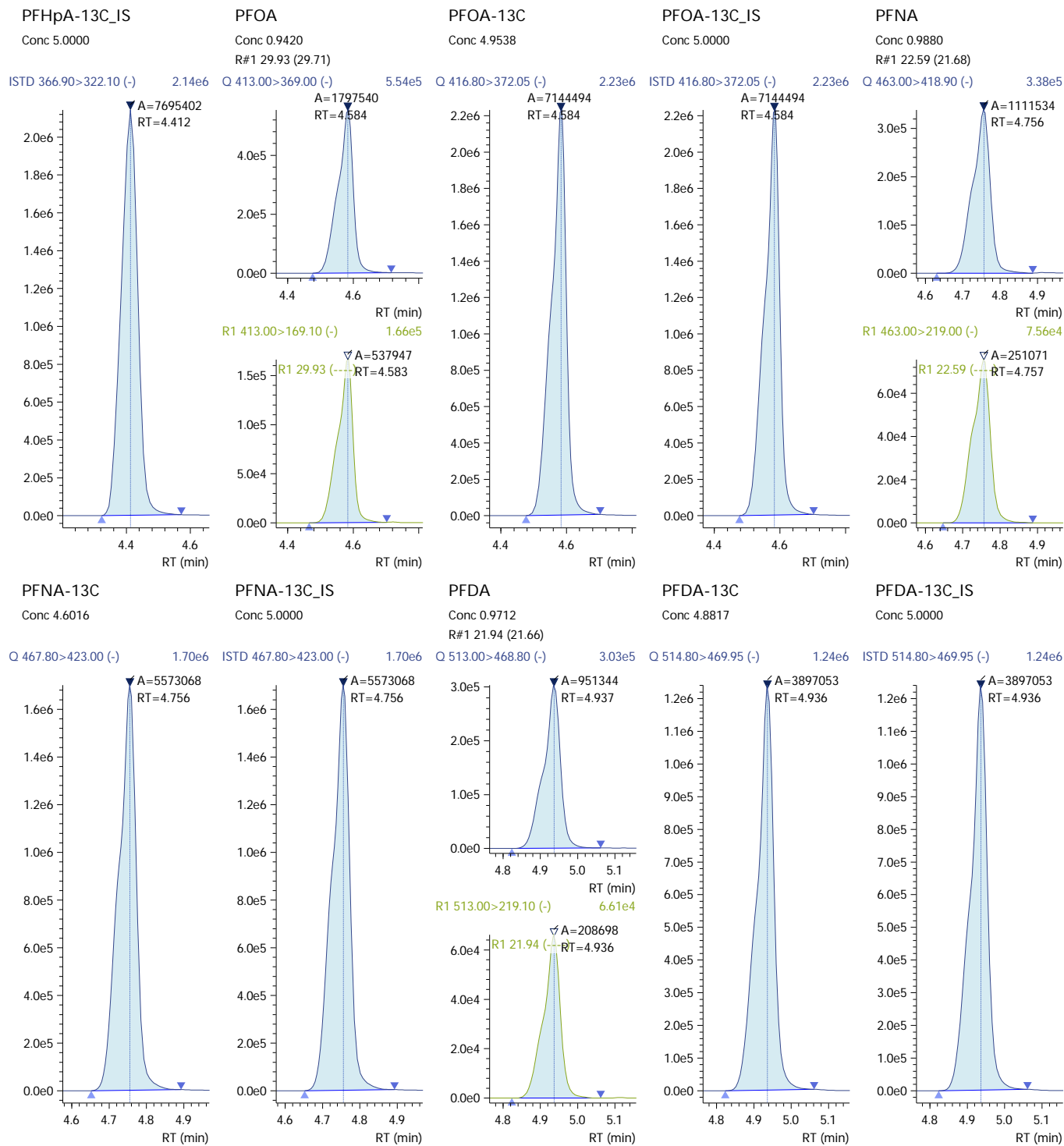
### 210413\_036 (continued)





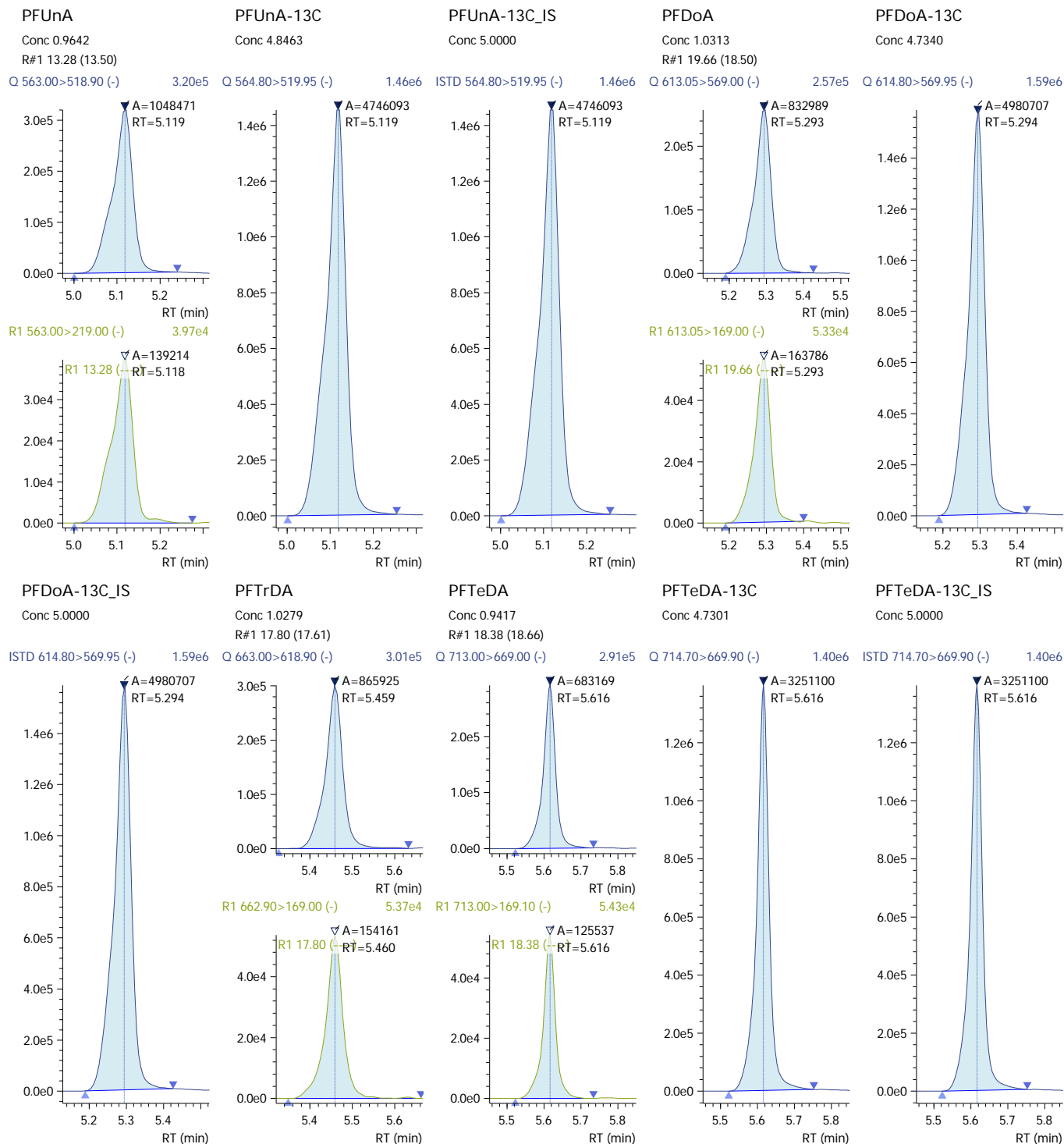


### 210413\_036 (continued)



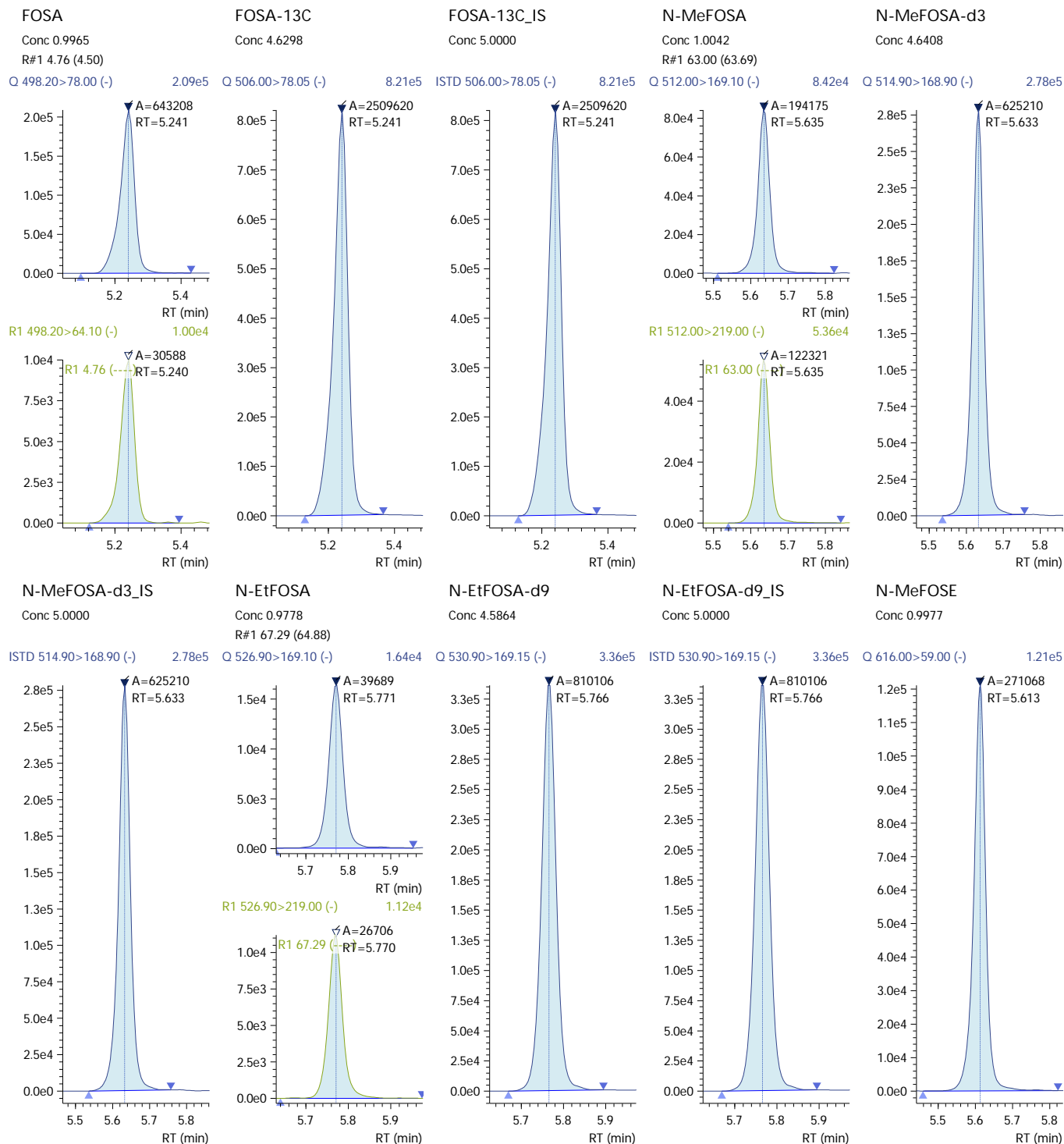


### 210413\_036 (continued)



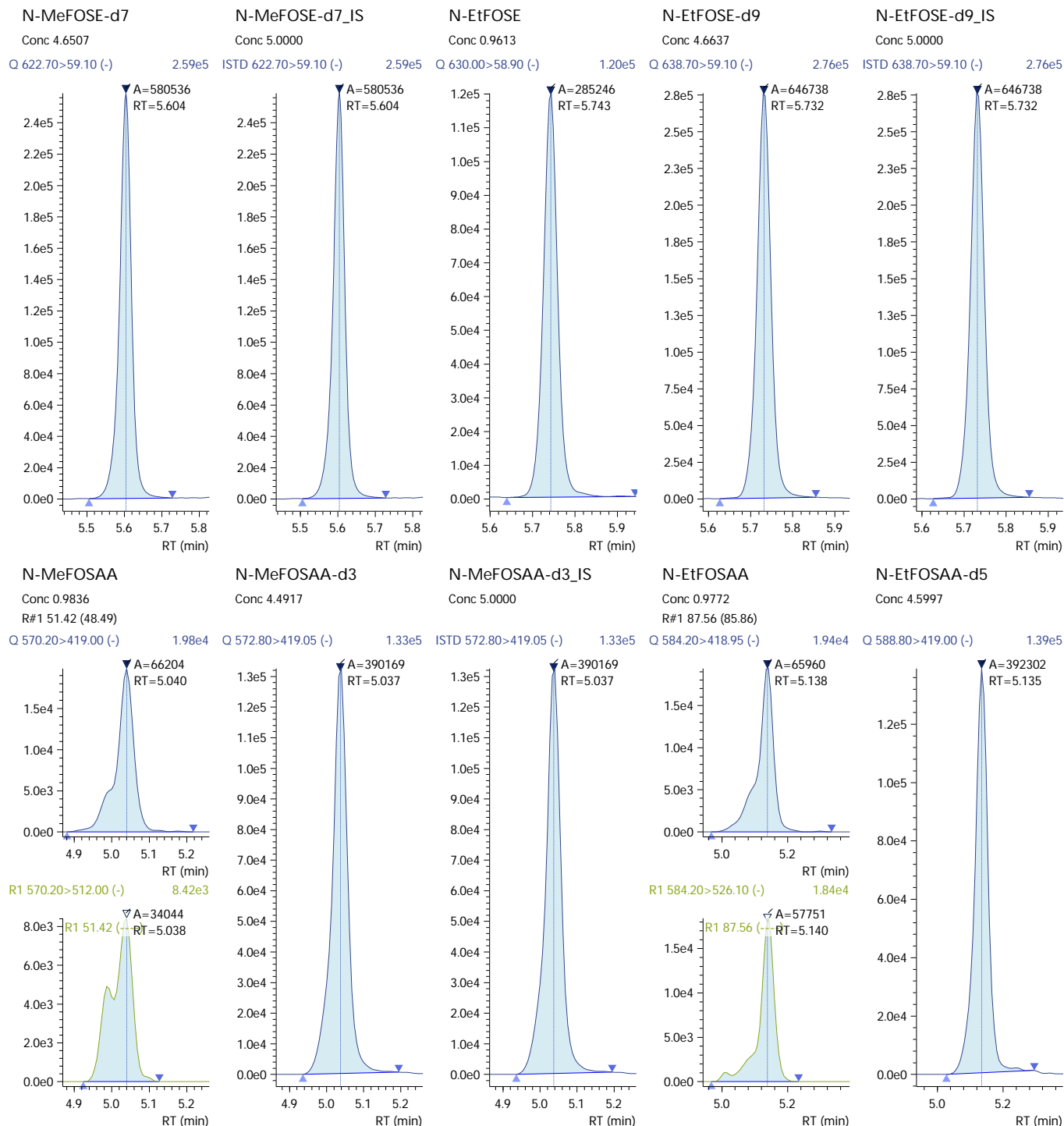


210413\_036 (continued)





### 210413\_036 (continued)





### 210413\_036 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.9374  
R#1 27.40 (26.07)

4\_2-FTS-13C  
Conc 4.3410

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.9666  
R#1 30.37 (30.56)

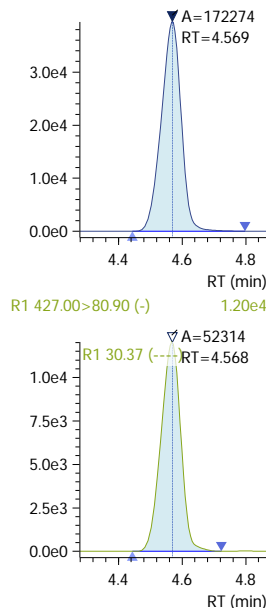
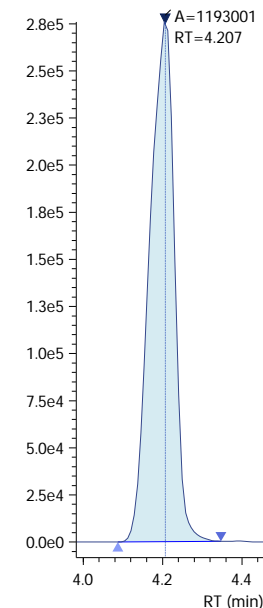
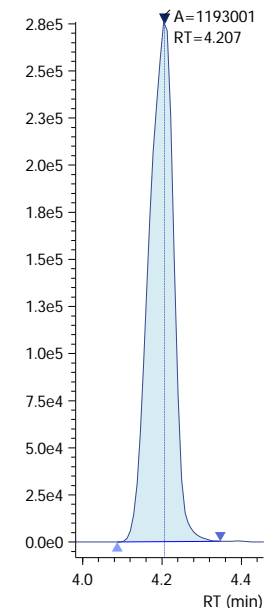
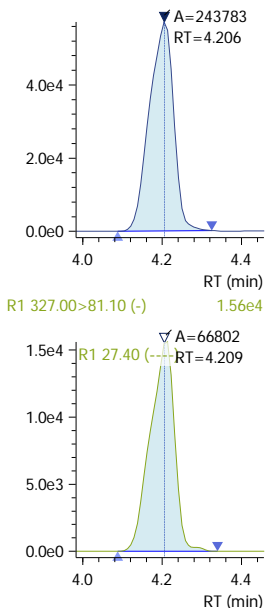
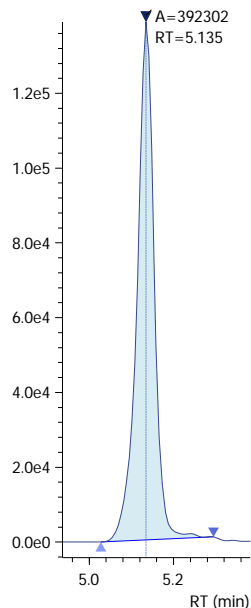
ISTD 588.80>419.00 (-) 1.39e5

Q 327.00>307.05 (-) 5.72e4

Q 328.80>309.05 (-) 2.76e5

ISTD 328.80>309.05 (-) 2.76e5

Q 427.00>407.00 (-) 3.94e4



6\_2-FTS-13C  
Conc 4.9378

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.9913  
R#1 8.02 (8.18)

8\_2-FTS-13C  
Conc 4.8335

8\_2-FTS-13C\_IS  
Conc 5.0000

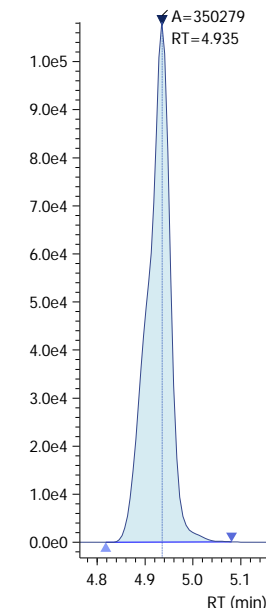
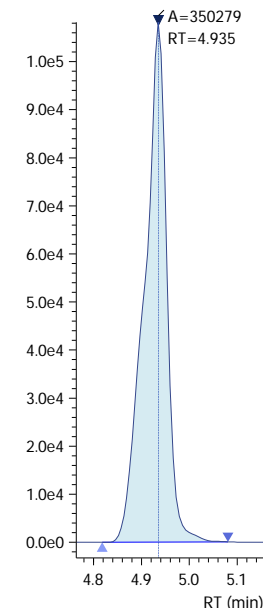
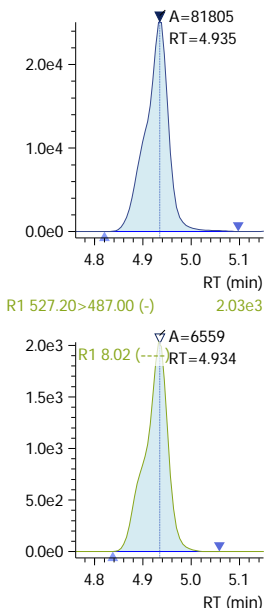
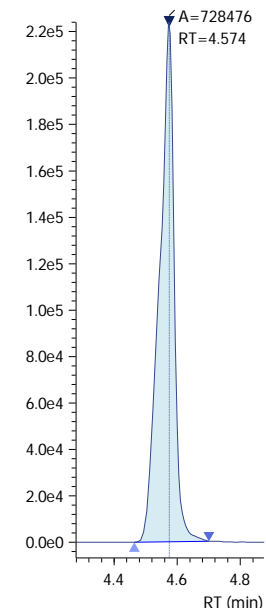
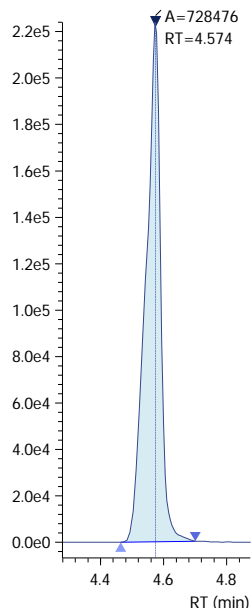
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ISTD 428.90>409.00 (-) 2.24e5

Q 527.10>506.90 (-) 2.51e4

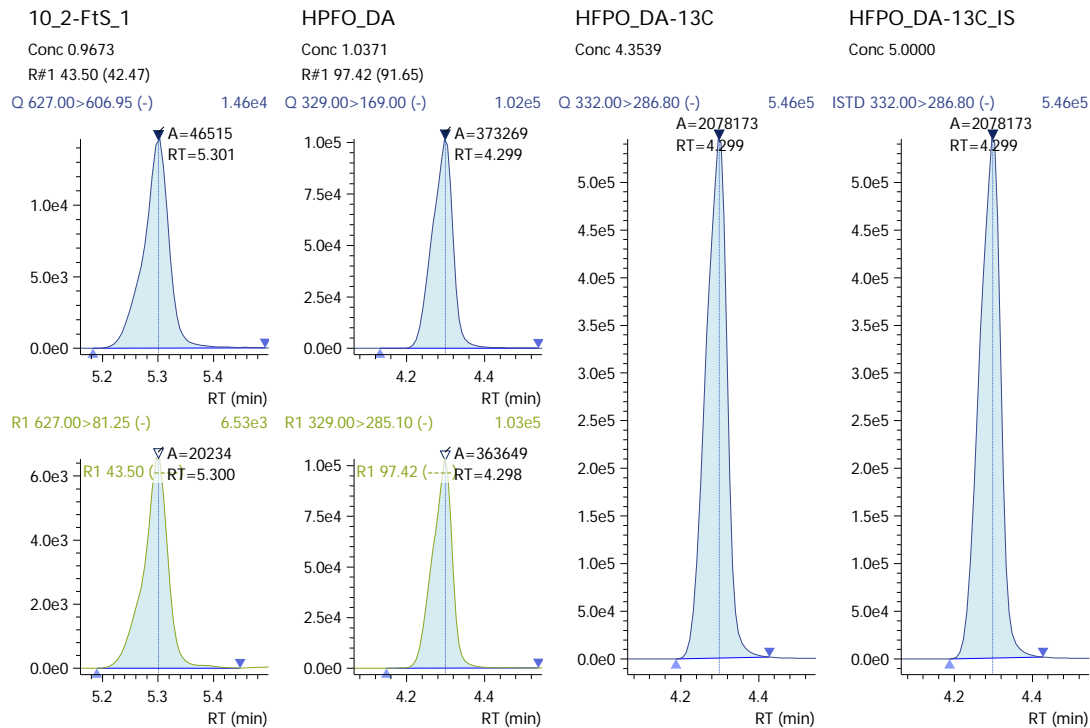
Q 528.80>509.00 (-) 1.08e5

ISTD 528.80>509.00 (-) 1.08e5





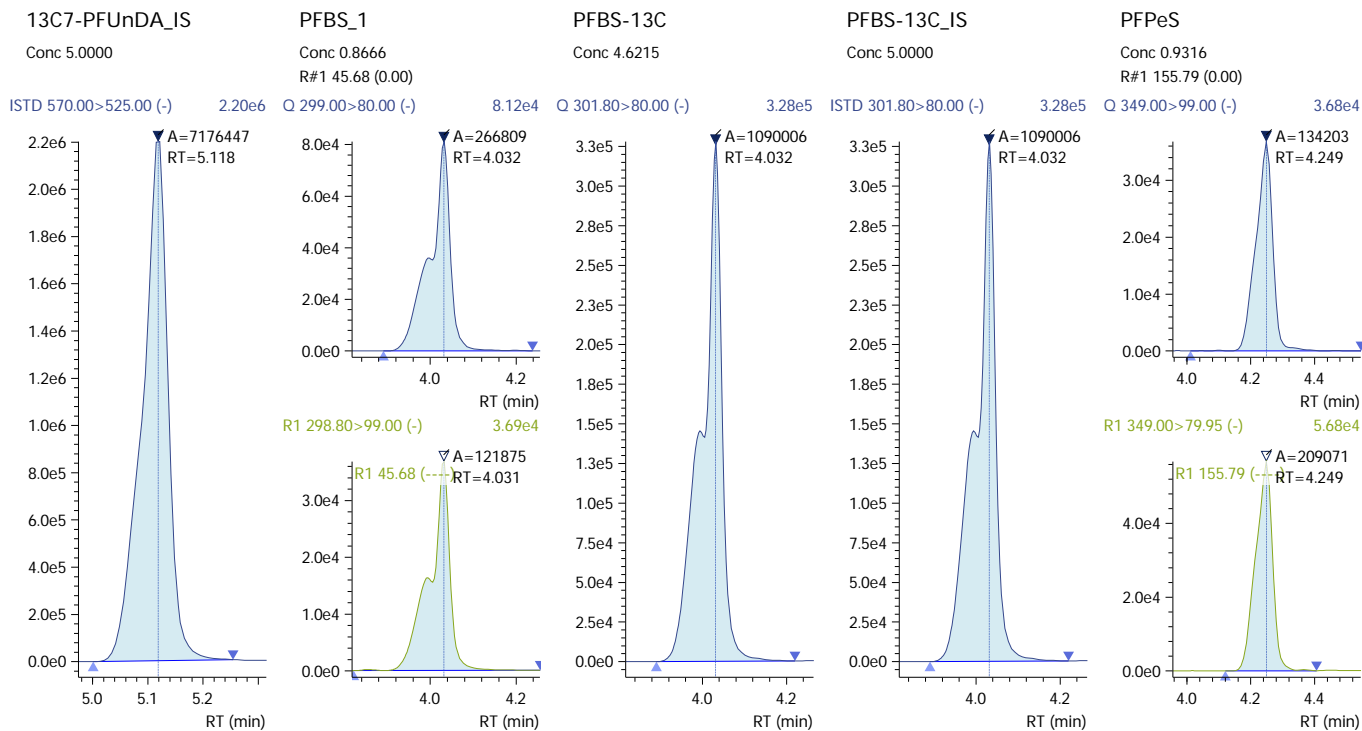
### 210413\_036 (continued)





### 210413\_036

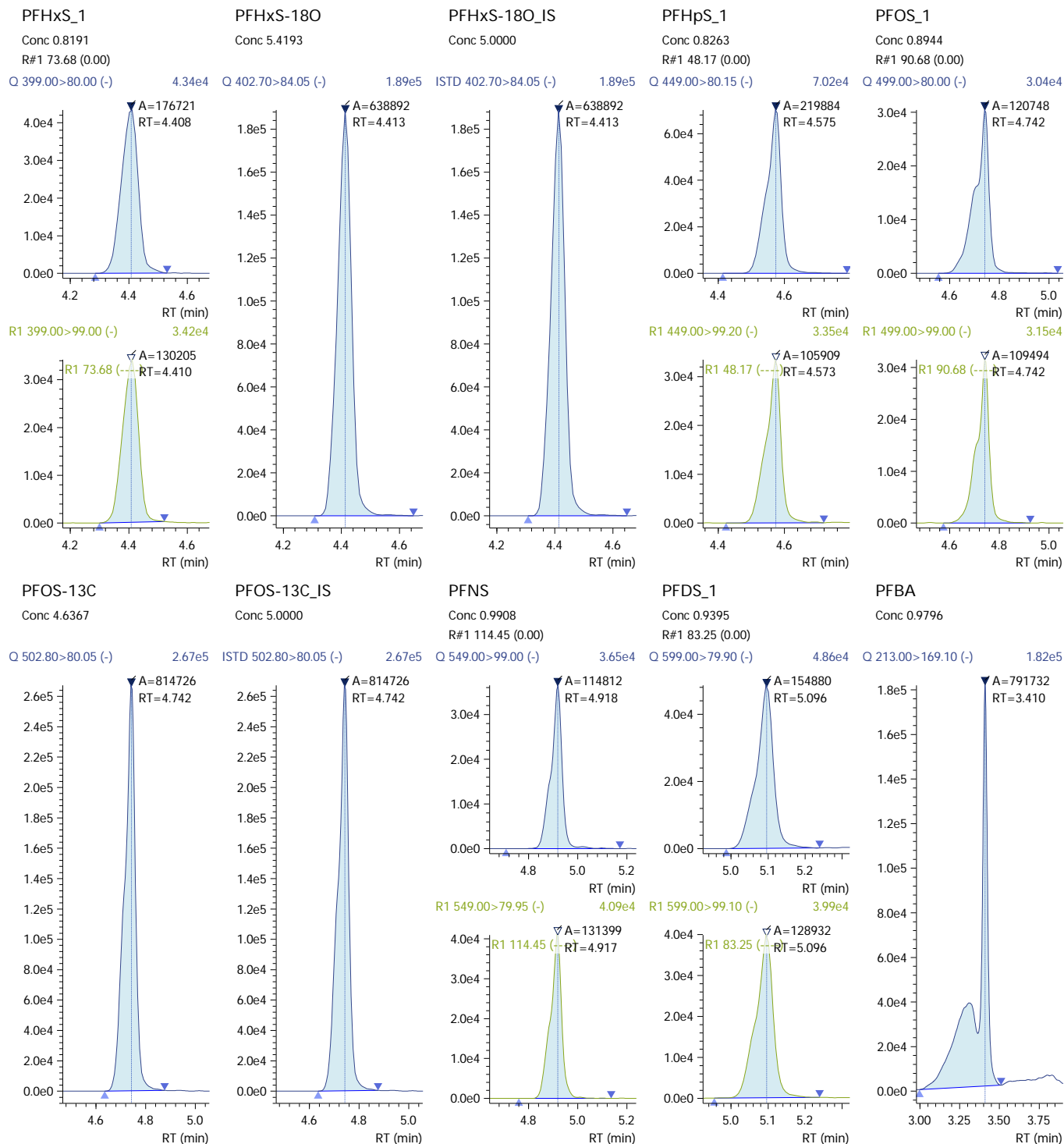
Sample ID: PFC ICAL 1.0 PPB  
Date Acquired: 4/13/2021 6:00:40 PM  
Acquired by: System Administrator  
Data File: 210413\_036  
Vial: 4 | Inj. Volume: 15.0000uL | Tray: 0





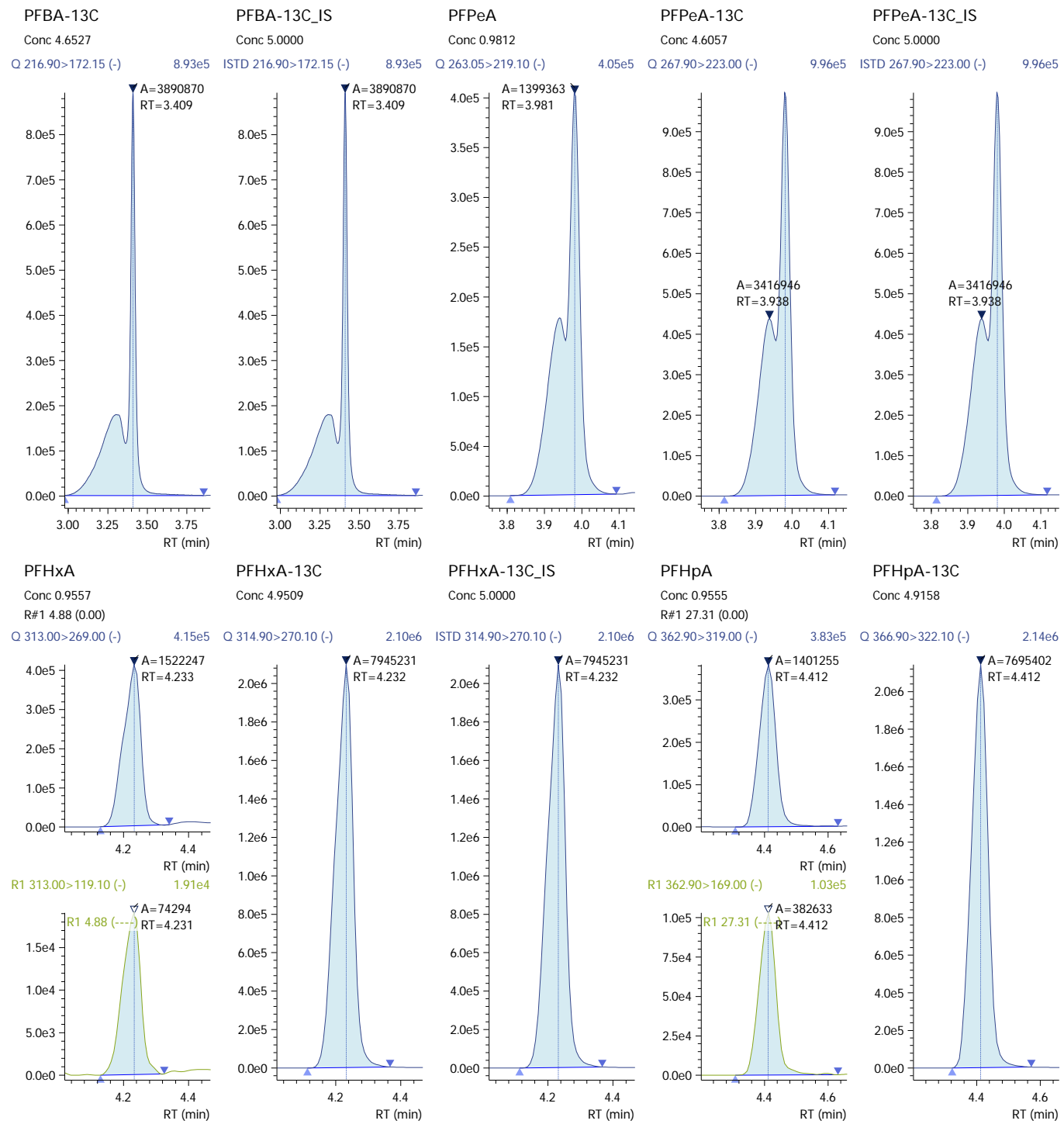


### 210413\_036 (continued)





### 210413\_036 (continued)

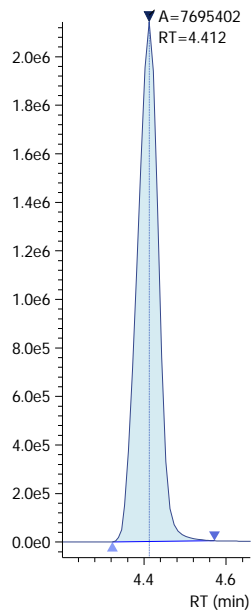




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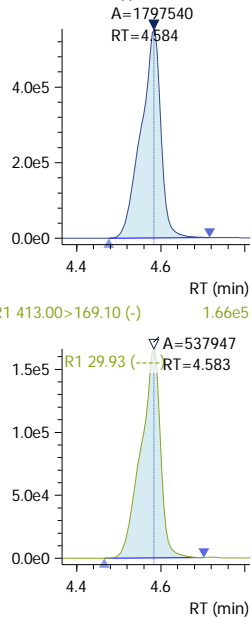
PFHpA-13C\_IS  
Conc 5.0000

ISTD 366.90>322.10 (-) 2.14e6



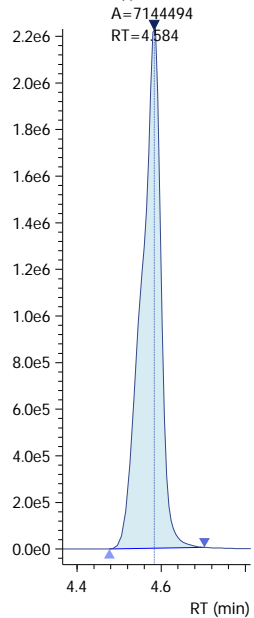
PFOA  
Conc 0.9536  
R#1 29.93 (0.00)

Q 413.00>369.00 (-) 5.54e5



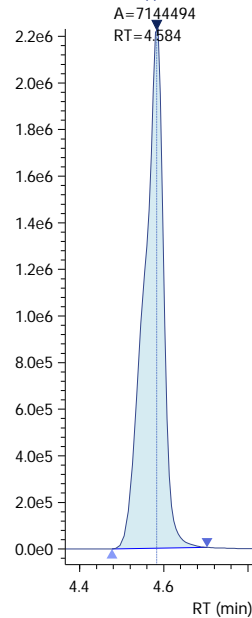
PFOA-13C  
Conc 4.9538

Q 416.80>372.05 (-) 2.23e6



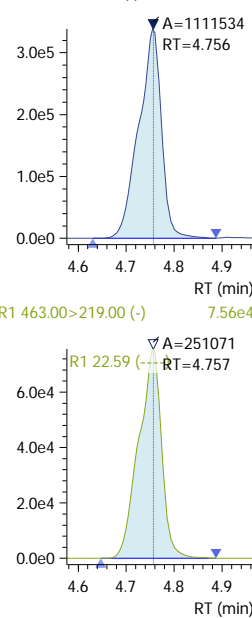
PFOA-13C\_IS  
Conc 5.0000

ISTD 416.80>372.05 (-) 2.23e6



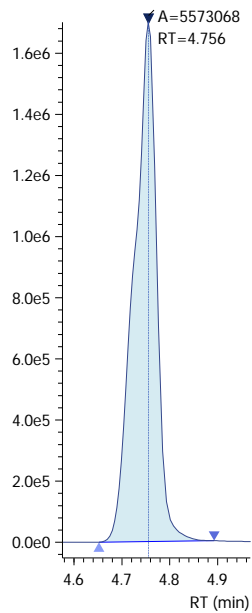
PFNA  
Conc 1.0153  
R#1 22.59 (0.00)

Q 463.00>418.90 (-) 3.38e5



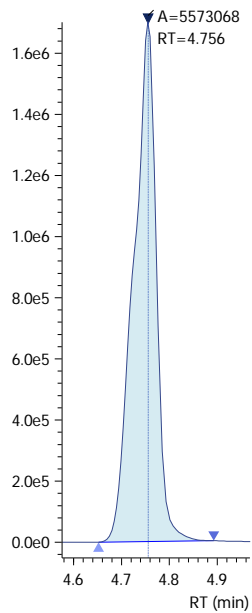
PFNA-13C  
Conc 4.6016

Q 467.80>423.00 (-) 1.70e6



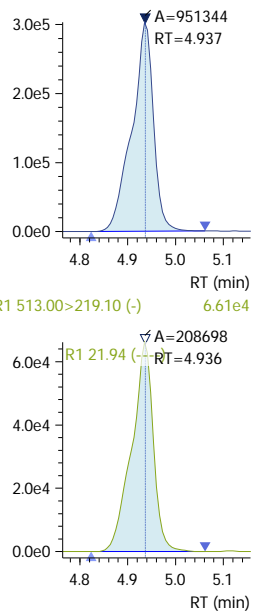
PFNA-13C\_IS  
Conc 5.0000

ISTD 467.80>423.00 (-) 1.70e6



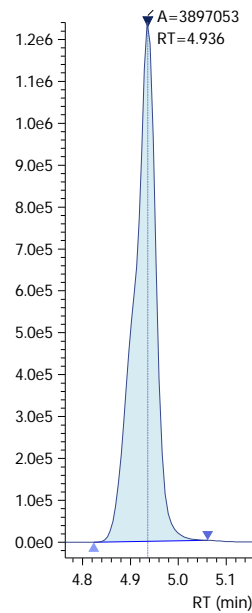
PFDA  
Conc 0.9712  
R#1 21.94 (0.00)

Q 513.00>468.80 (-) 3.03e5



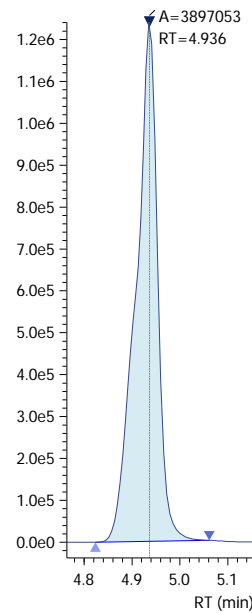
PFDA-13C  
Conc 4.8817

Q 514.80>469.95 (-) 1.24e6



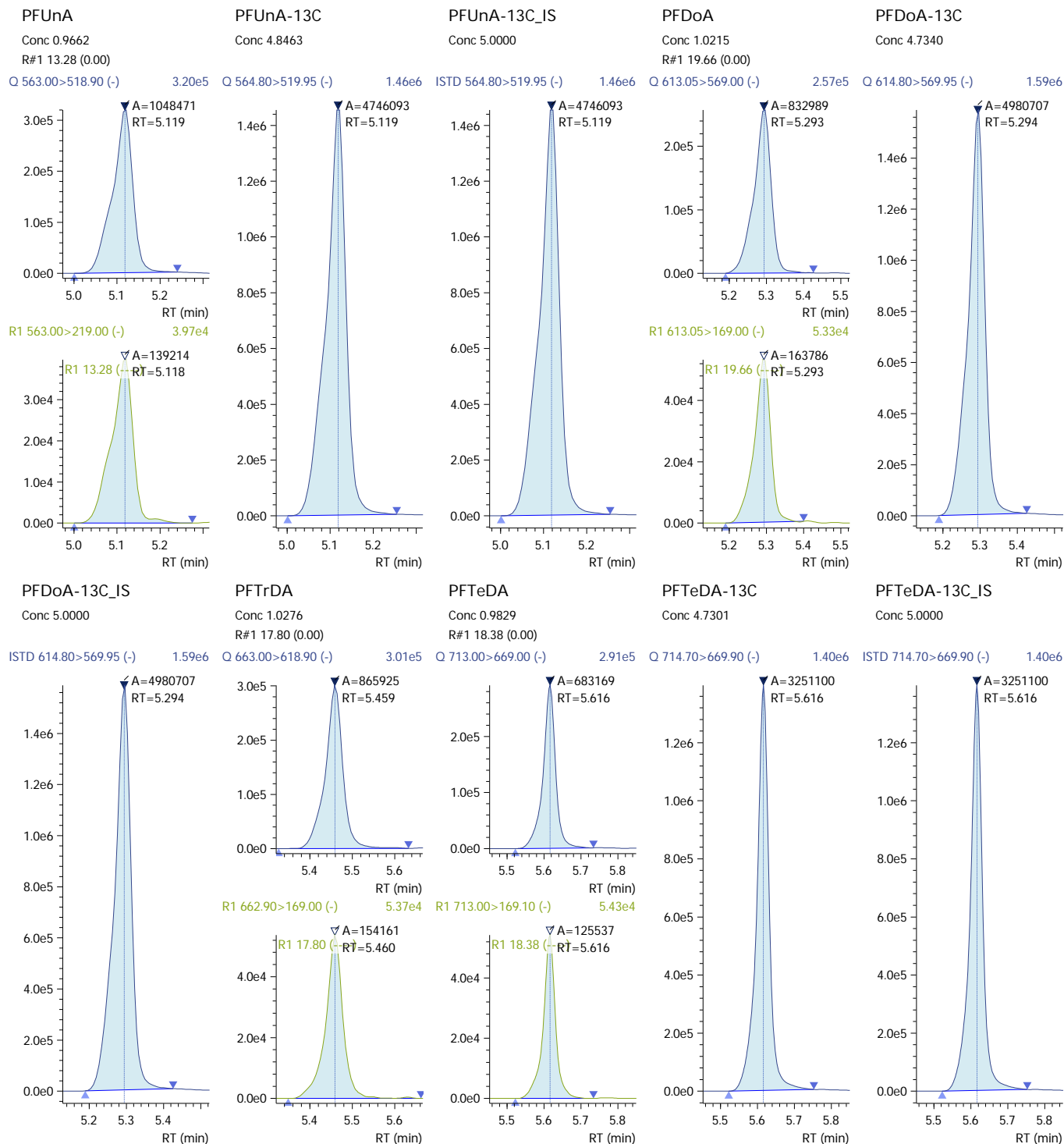
PFDA-13C\_IS  
Conc 5.0000

ISTD 514.80>469.95 (-) 1.24e6



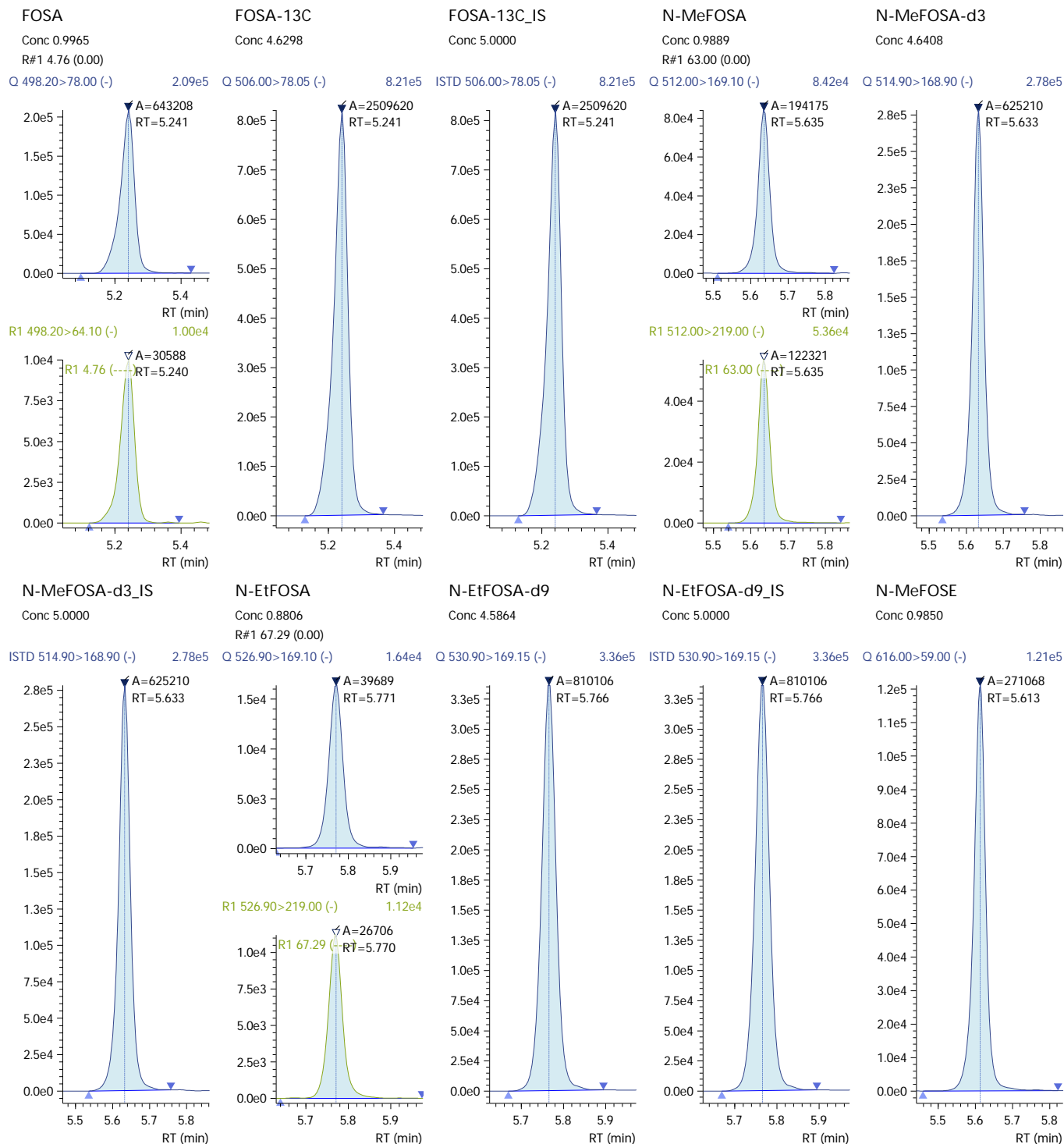


210413\_036 (continued)



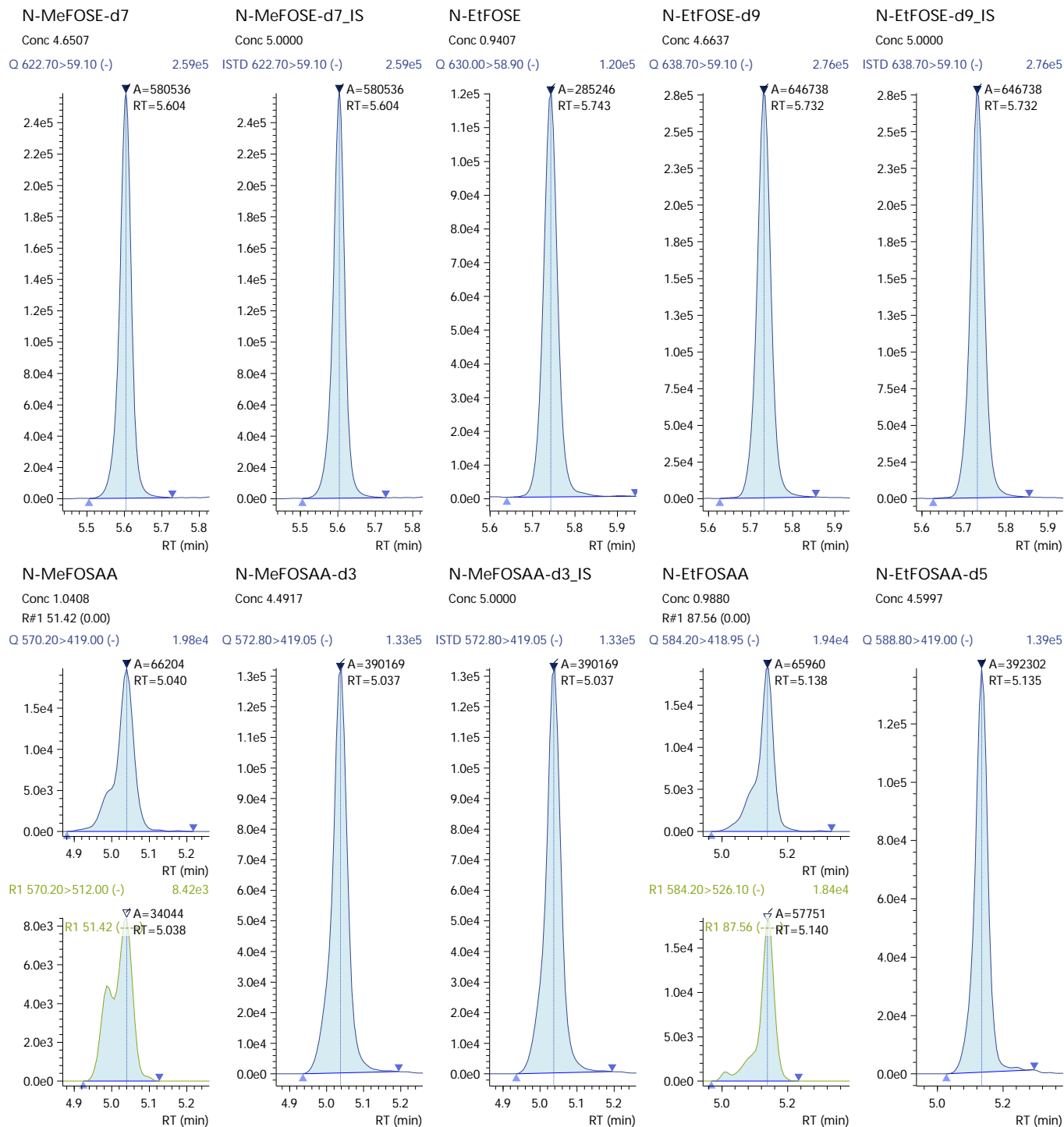


210413\_036 (continued)





### 210413\_036 (continued)





### 210413\_036 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.9210  
R#1 27.40 (0.00)

4\_2-FTS-13C  
Conc 4.3410

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.9666  
R#1 30.37 (0.00)

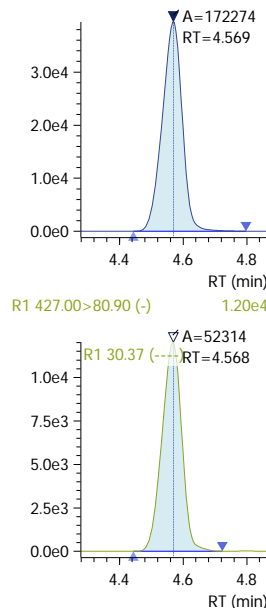
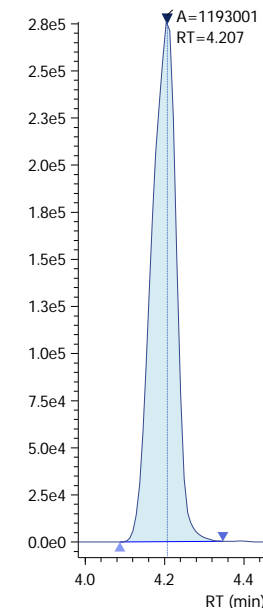
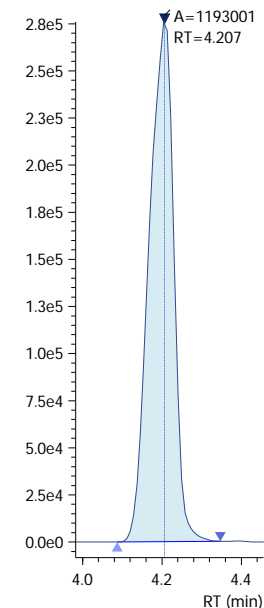
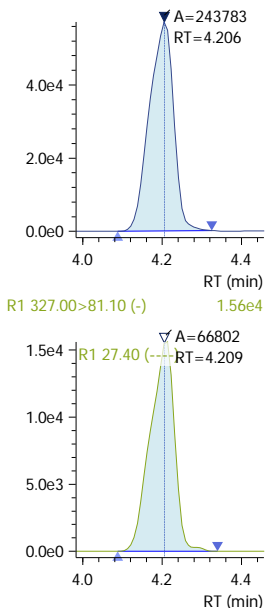
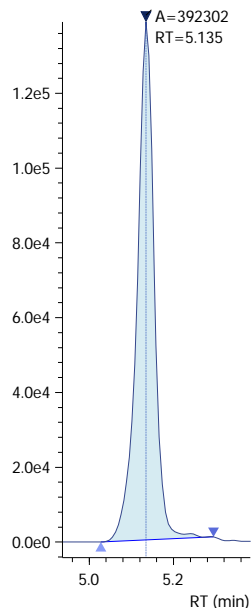
ISTD 588.80>419.00 (-) 1.39e5

Q 327.00>307.05 (-) 5.72e4

Q 328.80>309.05 (-) 2.76e5

ISTD 328.80>309.05 (-) 2.76e5

Q 427.00>407.00 (-) 3.94e4



6\_2-FTS-13C  
Conc 4.9378

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.9895  
R#1 8.02 (0.00)

8\_2-FTS-13C  
Conc 4.8335

8\_2-FTS-13C\_IS  
Conc 5.0000

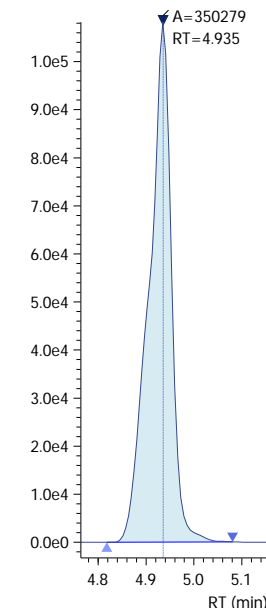
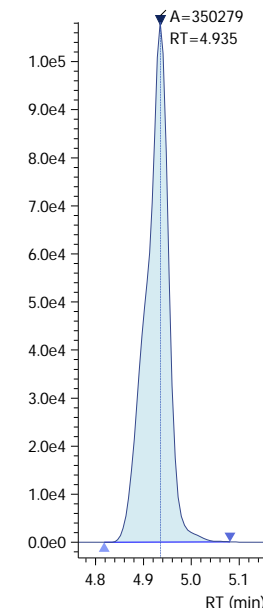
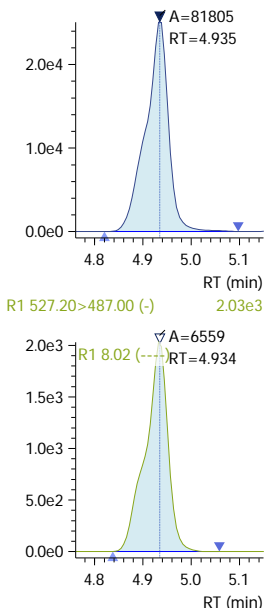
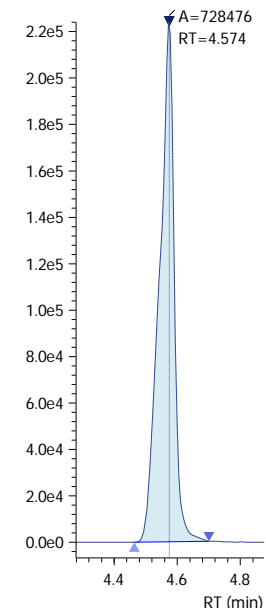
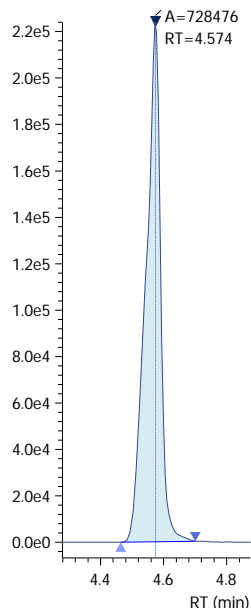
Q 428.90>409.00 (-) 2.24e5

ISTD 428.90>409.00 (-) 2.24e5

Q 527.10>506.90 (-) 2.51e4

Q 528.80>509.00 (-) 1.08e5

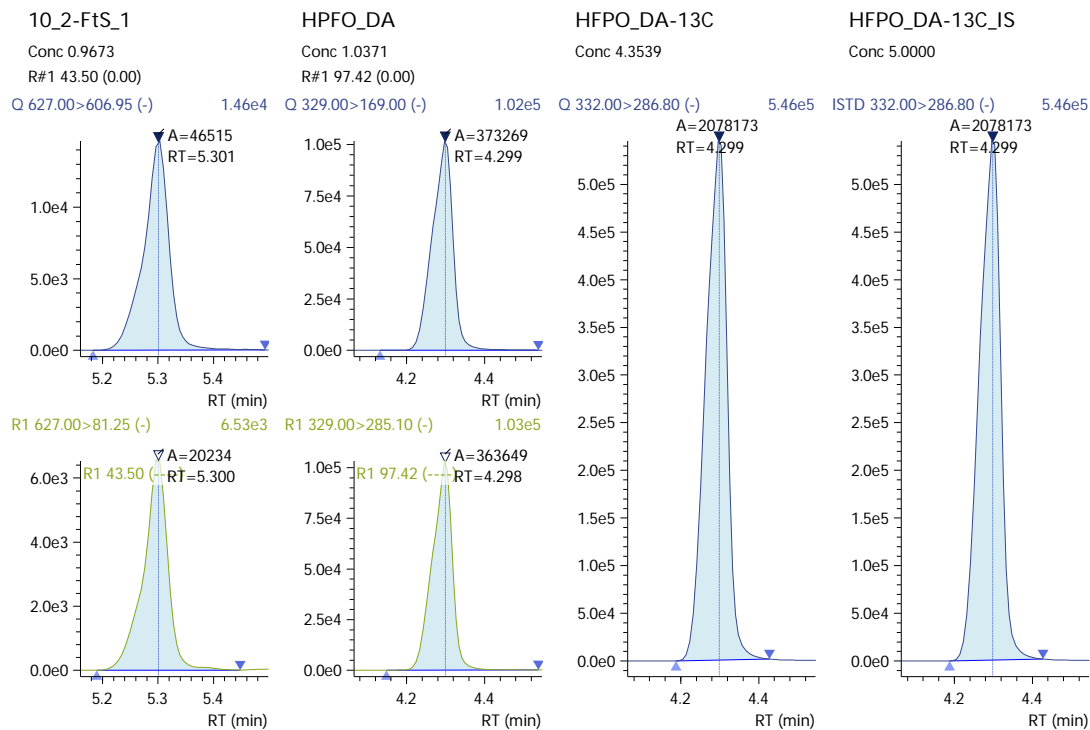
ISTD 528.80>509.00 (-) 1.08e5







### 210413\_036 (continued)





## 210413\_037

Sample ID: PFC ICAL 5.0 PPB

Date Acquired: 4/13/2021 6:11:09 PM

Acquired by: System Administrator

Data File: 210413\_037

Vial: 5 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.112	-0.006	----	7153438	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.027	-0.005	0.00	1345787	616335	45.80	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.027	-0.005	-1.09	1126570	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.027	-0.005	----	1126570	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.238	-0.011	0.21	684156	1050098	153.49	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.399	-0.009	0.00	830145	606230	73.03	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.402	-0.011	-0.71	555888	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.402	-0.011	----	555888	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.569	-0.006	0.17	1118240	528845	47.29	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.737	-0.005	0.00	609401	558975	91.73	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.737	-0.005	-0.38	822254	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.737	-0.005	----	822254	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.914	-0.004	0.18	583404	681406	116.80	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.089	-0.007	0.35	797947	685085	85.86	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.402	-0.008	0.00	3820300	----	----	----		
PFBA-13C	216.90>172.15	----	3.401	-0.008	-1.71	3626495	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.401	-0.008	----	3626495	----	----	----		
PFPeA	263.05>219.10	----	3.937	-0.044	0.00	7080527	----	----	----		
PFPeA-13C	267.90>223.00	----	3.936	-0.045	-1.18	3503251	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.936	-0.045	----	3503251	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.229	-0.004	0.00	7560007	333882	4.42	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.228	-0.004	-0.88	7720298	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.228	-0.004	----	7720298	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.407	-0.005	0.00	7014041	1831307	26.11	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.407	-0.005	-0.71	7641021	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.407	-0.005	----	7641021	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.579	-0.005	0.00	9237862	2732883	29.58	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.579	-0.005	-0.53	7026518	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.579	-0.005	----	7026518	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.751	-0.005	0.00	5705013	1324778	23.22	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



## 210413\_037 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.751	-0.005	-0.36	5968317	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.751	-0.005	----	5968317	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.932	-0.005	0.00	4757990	1012840	21.29	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.932	-0.004	-0.18	3907354	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.932	-0.004	----	3907354	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.112	-0.007	0.00	5414860	688816	12.72	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.112	-0.007	0.00	4861622	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.112	-0.007	----	4861622	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.289	-0.004	0.00	4032823	762773	18.91	18.50	9.25-27.75	
PFDaA-13C	614.80>569.95	----	5.289	-0.005	0.18	5073884	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.289	-0.005	----	5073884	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	5.455	-0.004	-0.16	4265954	726306	17.03	17.61	8.8-26.41	
PFTeDA	713.00>669.00	713.00>169.10	5.614	-0.002	0.00	3556475	659026	18.53	18.66	9.33-27.99	
PFTeDA-13C	714.70>669.90	----	5.614	-0.002	0.50	3357688	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.614	-0.002	----	3357688	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.236	-0.005	0.00	3368725	155391	4.61	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.236	-0.005	0.12	2610136	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.236	-0.005	----	2610136	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.633	-0.002	0.00	967994	620239	64.08	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.630	-0.003	0.52	620328	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.630	-0.003	----	620328	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.770	-0.001	0.01	204306	136387	66.76	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.764	-0.002	0.65	821036	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.764	-0.002	----	821036	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.610	-0.003	0.01	1369683	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.602	-0.002	0.49	574475	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.602	-0.002	----	574475	----	----	----		
N-EtFOSE	630.00>58.90	----	5.741	-0.001	0.01	1430529	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.731	-0.001	0.62	648409	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.731	-0.001	----	648409	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.033	-0.007	0.00	401338	162011	40.37	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.031	-0.006	-0.08	413681	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.031	-0.006	----	413681	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.132	-0.006	0.00	341099	282253	82.75	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.128	-0.007	0.02	427285	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.128	-0.007	----	427285	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.202	-0.004	0.00	1393812	329915	23.67	26.07	13.03-39.1	
4_2-FTS-13C	328.80>309.05	----	4.203	-0.004	-0.91	1381256	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_037 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.203	-0.004	----	1381256	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.562	-0.007	-0.01	801359	240061	29.96	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.570	-0.004	-0.54	686593	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.570	-0.004	----	686593	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.931	-0.005	0.00	399421	32229	8.07	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.931	-0.004	-0.18	361495	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.931	-0.004	----	361495	----	----	----	0-0	
10_2-FTS_1	627.00>606.95	627.00>81.25	5.296	-0.005	0.37	233701	96542	41.31	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.296	-0.003	0.00	1951752	1755254	89.93	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.296	-0.003	-0.82	2315221	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.296	-0.003	----	2315221	----	----	----		



210413\_037

Sample ID: PFC ICAL 5.0 PPB  
 Date Acquired: 4/13/2021 6:11:09 PM  
 Acquired by: System Administrator  
 Data File: 210413\_037  
 Vial: 5 | Inj. Volume: 15.000uL | Tray: 0

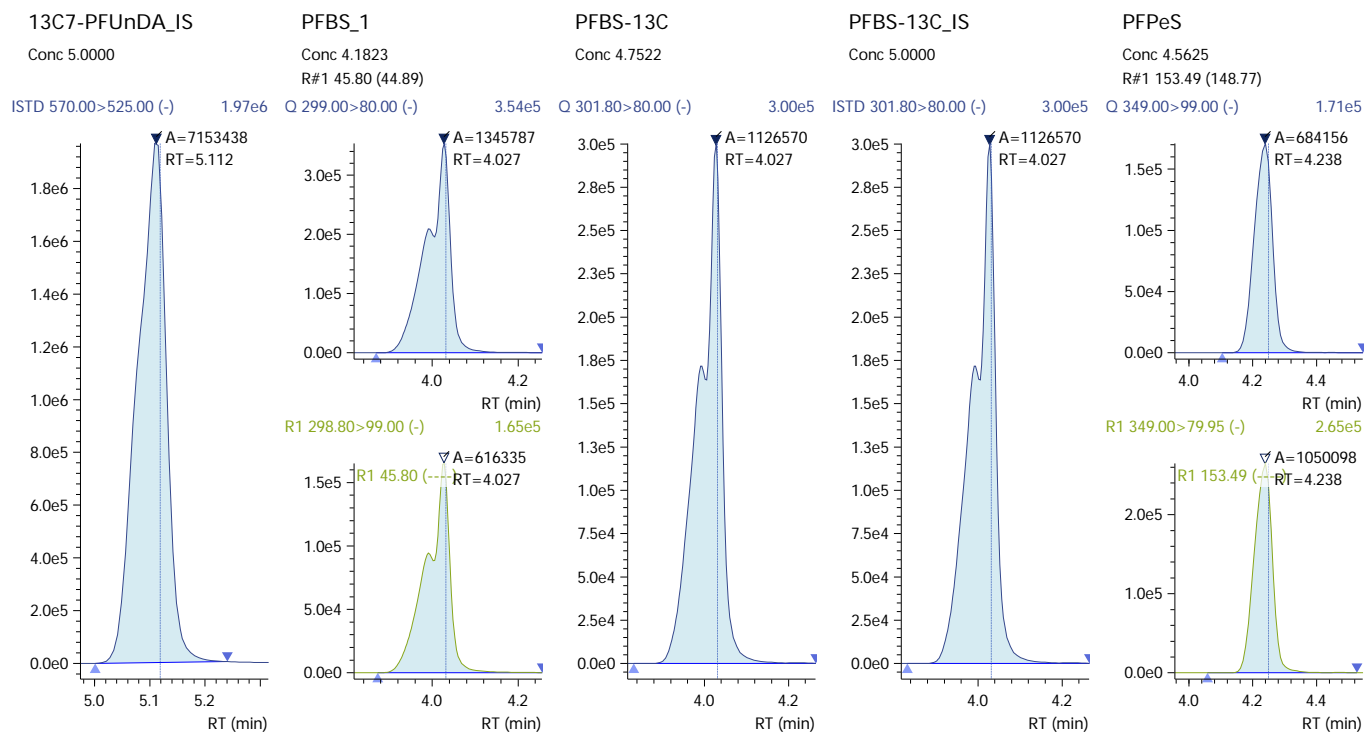
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.112	7153438	7153438	----	5.0000	5.0000	ng/mL
PFBS_1	Auto	4.027	1345787	1126570	PFBS-13C_IS	4.4369	4.1823	ng/mL
PFBS-13C	Auto	4.027	1126570	7153438	13C7-PFUnDA_IS	5.0000	4.7522	ng/mL
PFBS-13C_IS	Auto	4.027	1126570	1126570	----	5.0000	5.0000	ng/mL
PFPeS	Auto	4.238	684156	1126570	PFBS-13C_IS	4.7046	4.5625	ng/mL
PFHxS_1	Auto	4.399	830145	555888	PFHxS-18O_IS	4.5654	4.5162	ng/mL
PFHxS-18O	Auto	4.402	555888	7153438	13C7-PFUnDA_IS	5.0000	4.7304	ng/mL
PFHxS-18O_IS	Auto	4.402	555888	555888	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.569	1118240	555888	PFHxS-18O_IS	4.7672	4.8387	ng/mL
PFOS_1	Auto	4.737	609401	822254	PFOS-13C_IS	4.6461	4.4725	ng/mL
PFOS-13C	Auto	4.737	822254	7153438	13C7-PFUnDA_IS	5.0000	4.6946	ng/mL
PFOS-13C_IS	Auto	4.737	822254	822254	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.914	583404	822254	PFOS-13C_IS	4.8079	4.9023	ng/mL
PFDS_1	Auto	5.089	797947	822254	PFOS-13C_IS	4.8233	4.7938	ng/mL
PFBA	Auto	3.402	3820300	3626495	PFBA-13C_IS	5.0000	4.8807	ng/mL
PFBA-13C	Auto	3.401	3626495	7153438	13C7-PFUnDA_IS	5.0000	4.3505	ng/mL
PFBA-13C_IS	Auto	3.401	3626495	3626495	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.937	7080527	3503251	PFPeA-13C_IS	5.0000	4.9537	ng/mL
PFPeA-13C	Auto	3.936	3503251	7153438	13C7-PFUnDA_IS	5.0000	4.7372	ng/mL
PFPeA-13C_IS	Auto	3.936	3503251	3503251	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.229	7560007	7720298	PFHxA-13C_IS	5.0000	4.7277	ng/mL
PFHxA-13C	Auto	4.228	7720298	7153438	13C7-PFUnDA_IS	5.0000	4.8262	ng/mL
PFHxA-13C_IS	Auto	4.228	7720298	7720298	----	5.0000	5.0000	ng/mL
PFHpA	Auto	4.407	7014041	7641021	PFHpA-13C_IS	5.0000	4.5954	ng/mL
PFHpA-13C	Auto	4.407	7641021	7153438	13C7-PFUnDA_IS	5.0000	4.8967	ng/mL
PFHpA-13C_IS	Auto	4.407	7641021	7641021	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.579	9237862	7026518	PFOA-13C_IS	5.0000	4.9224	ng/mL
PFOA-13C	Auto	4.579	7026518	7153438	13C7-PFUnDA_IS	5.0000	4.8876	ng/mL
PFOA-13C_IS	Auto	4.579	7026518	7026518	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.751	5705013	5968317	PFNA-13C_IS	5.0000	4.7350	ng/mL
PFNA-13C	Auto	4.751	5968317	7153438	13C7-PFUnDA_IS	5.0000	4.9438	ng/mL
PFNA-13C_IS	Auto	4.751	5968317	5968317	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.932	4757990	3907354	PFDA-13C_IS	5.0000	4.8445	ng/mL
PFDA-13C	Auto	4.932	3907354	7153438	13C7-PFUnDA_IS	5.0000	4.9104	ng/mL
PFDA-13C_IS	Auto	4.932	3907354	3907354	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.112	5414860	4861622	PFUnA-13C_IS	5.0000	4.8613	ng/mL
PFUnA-13C	Auto	5.112	4861622	7153438	13C7-PFUnDA_IS	5.0000	4.9802	ng/mL
PFUnA-13C_IS	Auto	5.112	4861622	4861622	----	5.0000	5.0000	ng/mL
PFDaA	Auto	5.289	4032823	5073884	PFDaA-13C_IS	5.0000	4.9011	ng/mL
PFDaA-13C	Auto	5.289	5073884	7153438	13C7-PFUnDA_IS	5.0000	4.8380	ng/mL
PFDaA-13C_IS	Auto	5.289	5073884	5073884	----	5.0000	5.0000	ng/mL
PFTeDA	Auto	5.455	4265954	3357688	PFTeDA-13C_IS	5.0000	4.9030	ng/mL
PFTeDA	Auto	5.614	3556475	3357688	PFTeDA-13C_IS	5.0000	4.7466	ng/mL
PFTeDA-13C	Auto	5.614	3357688	7153438	13C7-PFUnDA_IS	5.0000	4.9009	ng/mL
PFTeDA-13C_IS	Auto	5.614	3357688	3357688	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.236	3368725	2610136	FOSA-13C_IS	5.0000	5.0181	ng/mL
FOSA-13C	Auto	5.236	2610136	7153438	13C7-PFUnDA_IS	5.0000	4.8307	ng/mL
FOSA-13C_IS	Auto	5.236	2610136	2610136	----	5.0000	5.0000	ng/mL
N-MeFOSA	Auto	5.633	967994	620328	N-MeFOSA-d3_IS	5.0000	5.0456	ng/mL
N-MeFOSA-d3	Auto	5.630	620328	7153438	13C7-PFUnDA_IS	5.0000	4.6194	ng/mL
N-MeFOSA-d3_IS	Auto	5.630	620328	620328	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.770	204306	821036	N-EtFOSA-d9_IS	5.0000	5.0904	ng/mL
N-EtFOSA-d9	Auto	5.764	821036	7153438	13C7-PFUnDA_IS	5.0000	4.6633	ng/mL
N-EtFOSA-d9_IS	Auto	5.764	821036	821036	----	5.0000	5.0000	ng/mL



### 210413\_037 (continued)

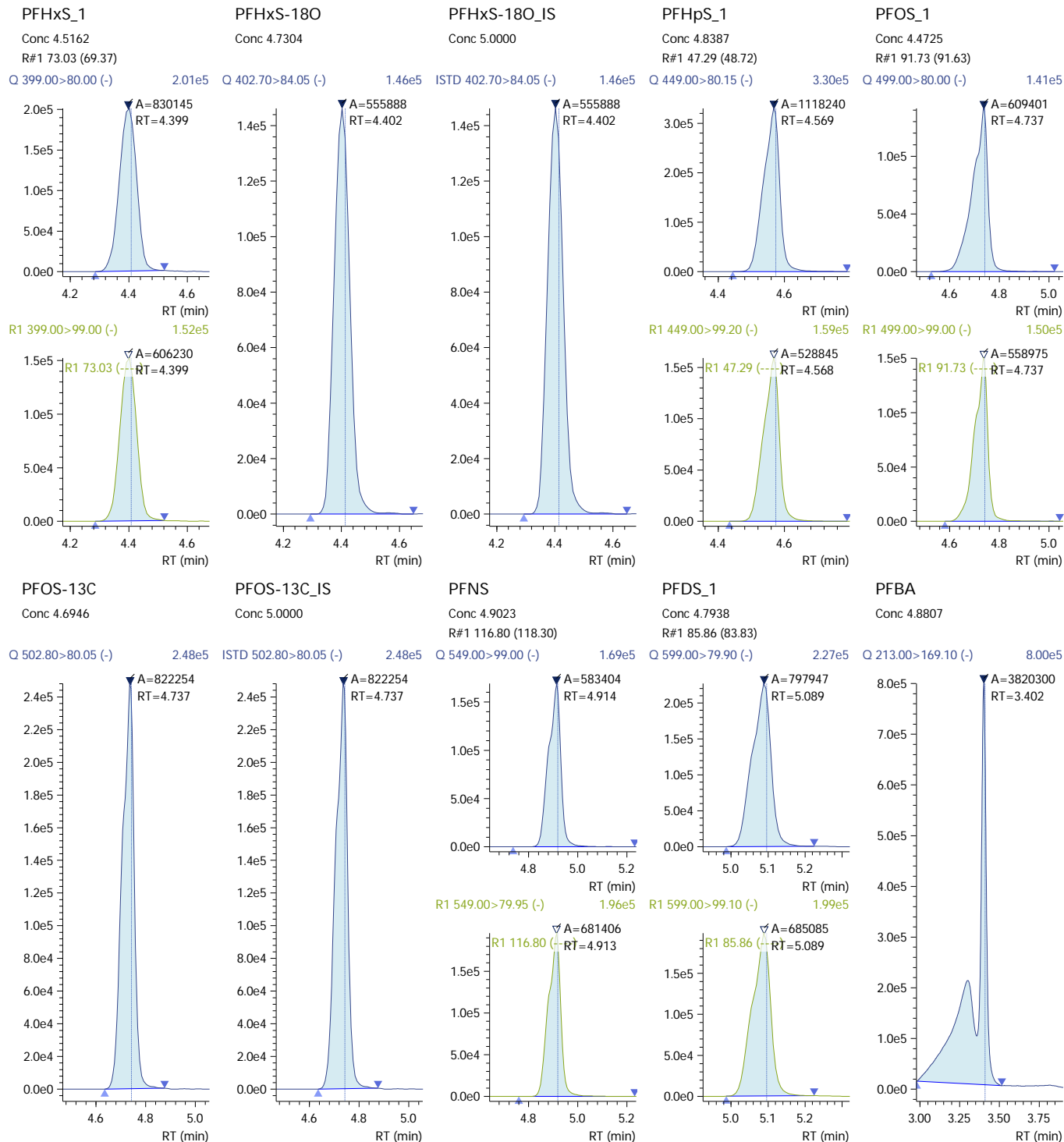
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.610	1369683	574475	N-MeFOSE-d7_IS	5.0000	5.0944	ng/mL
N-MeFOSE-d7	Auto	5.602	574475	7153438	13C7-PFUnDA_IS	5.0000	4.6170	ng/mL
N-MeFOSE-d7_IS	Auto	5.602	574475	574475	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.741	1430529	648409	N-EtFOSE-d9_IS	5.0000	4.8087	ng/mL
N-EtFOSE-d9	Auto	5.731	648409	7153438	13C7-PFUnDA_IS	5.0000	4.6907	ng/mL
N-EtFOSE-d9_IS	Auto	5.731	648409	648409	----	5.0000	5.0000	ng/mL
N-MeFOSAA	Auto	5.033	401338	413681	N-MeFOSAA-d3_IS	5.0000	5.4967	ng/mL
N-MeFOSAA-d3	Auto	5.031	413681	7153438	13C7-PFUnDA_IS	5.0000	4.7777	ng/mL
N-MeFOSAA-d3_IS	Auto	5.031	413681	413681	----	5.0000	5.0000	ng/mL
N-EtFOSAA	Auto	5.132	341099	427285	N-EtFOSAA-d5_IS	5.0000	4.6396	ng/mL
N-EtFOSAA-d5	Auto	5.128	427285	7153438	13C7-PFUnDA_IS	5.0000	5.0260	ng/mL
N-EtFOSAA-d5_IS	Auto	5.128	427285	427285	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.202	1393812	1381256	4_2-FTS-13C_IS	4.6861	4.6289	ng/mL
4_2-FTS-13C	Auto	4.203	1381256	7153438	13C7-PFUnDA_IS	5.0000	5.0421	ng/mL
4_2-FTS-13C_IS	Auto	4.203	1381256	1381256	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.562	801359	686593	6_2-FTS-13C_IS	4.7558	4.7708	ng/mL
6_2-FTS-13C	Auto	4.570	686593	7153438	13C7-PFUnDA_IS	5.0000	4.6689	ng/mL
6_2-FTS-13C_IS	Auto	4.570	686593	686593	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.931	399421	361495	8_2-FTS-13C_IS	4.8002	4.6898	ng/mL
8_2-FTS-13C	Auto	4.931	361495	7153438	13C7-PFUnDA_IS	5.0000	5.0043	ng/mL
8_2-FTS-13C_IS	Auto	4.931	361495	361495	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.296	233701	361495	8_2-FTS-13C_IS	4.8310	4.7093	ng/mL
HPFO_DA	Auto	4.296	1951752	2315221	HPFO_DA-13C_IS	5.0000	4.8674	ng/mL
HPFO_DA-13C	Auto	4.296	2315221	7153438	13C7-PFUnDA_IS	5.0000	4.8661	ng/mL
HPFO_DA-13C_IS	Auto	4.296	2315221	2315221	----	5.0000	5.0000	ng/mL





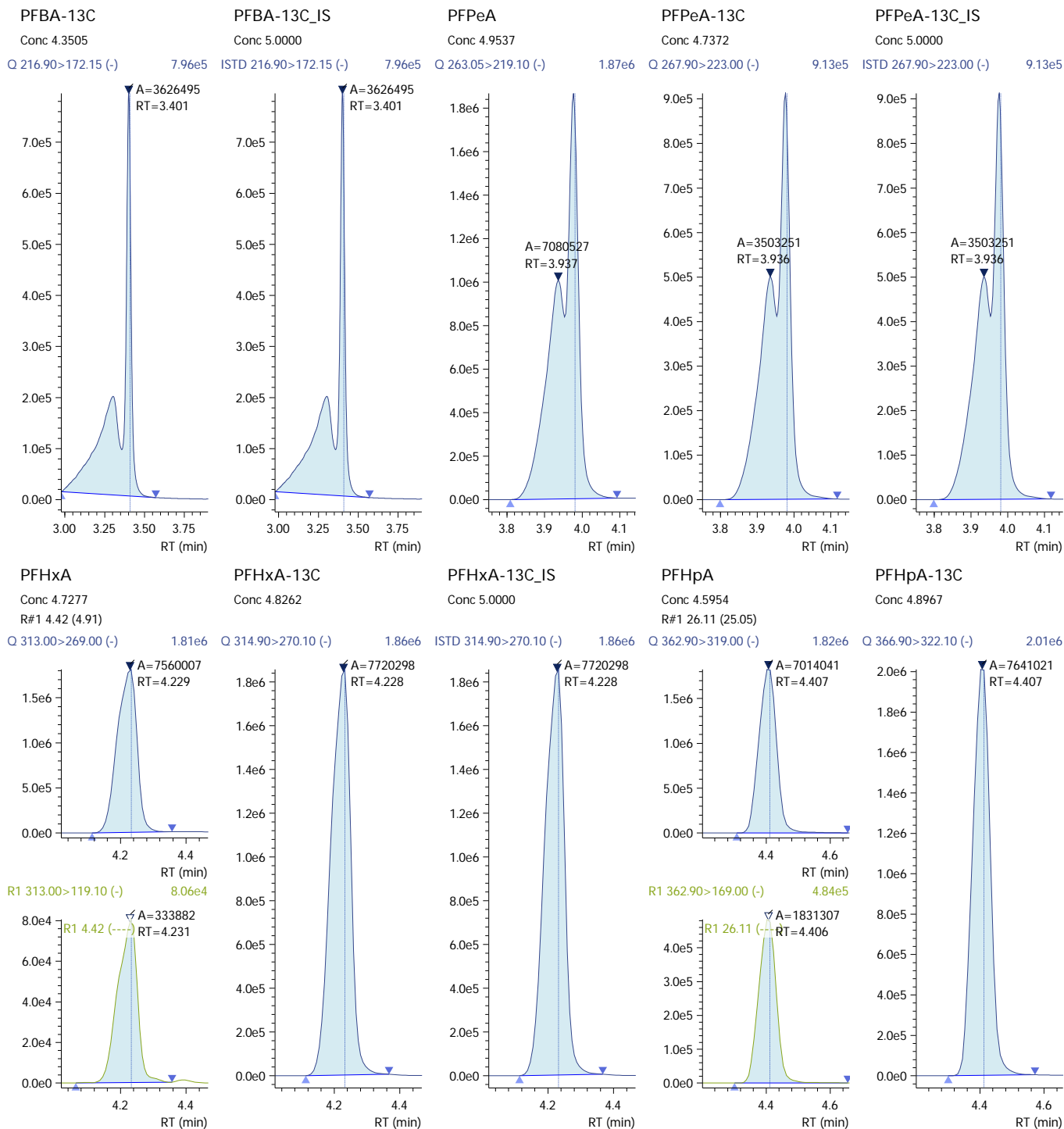
210413\_037 (continued)





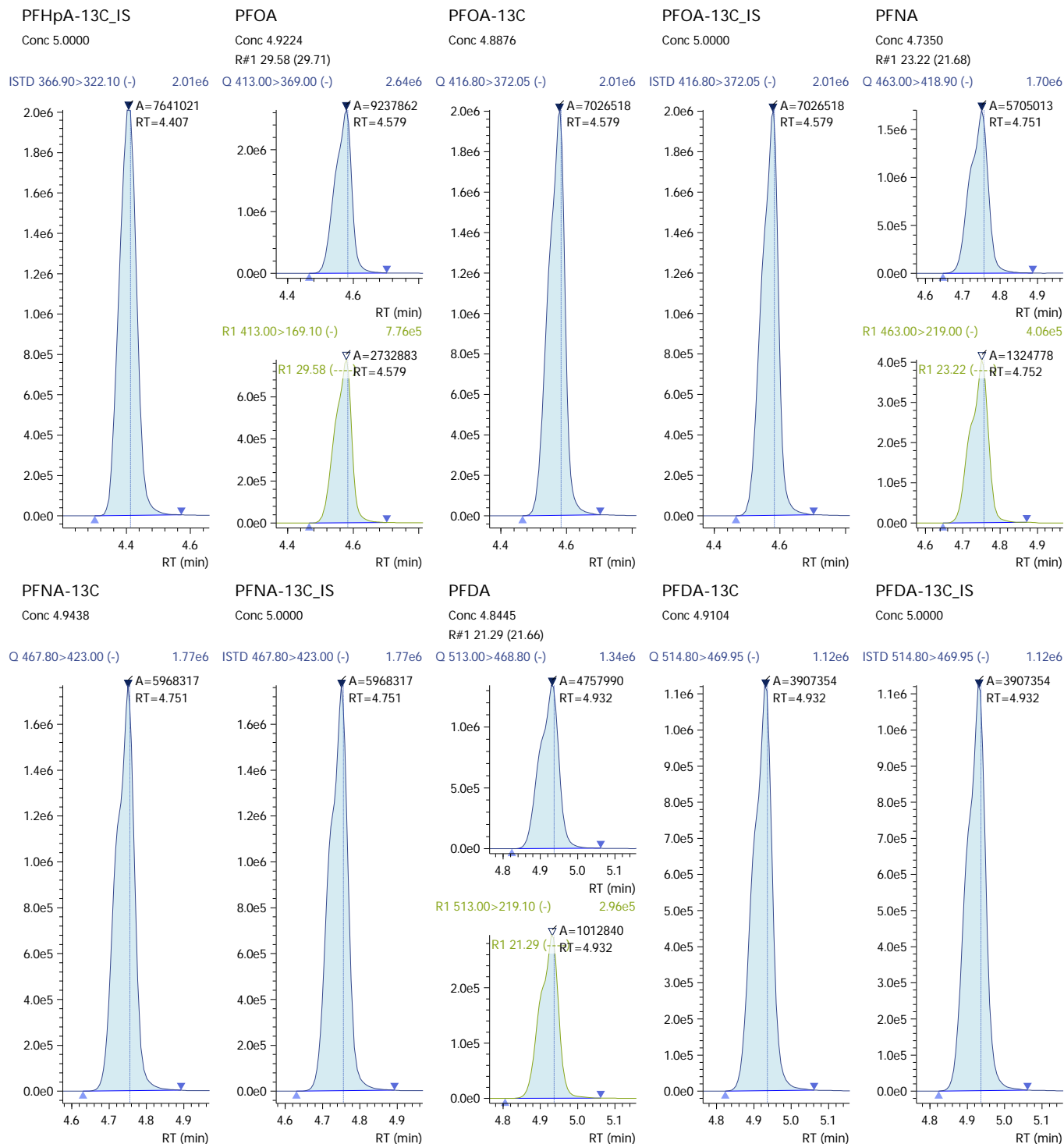


### 210413\_037 (continued)



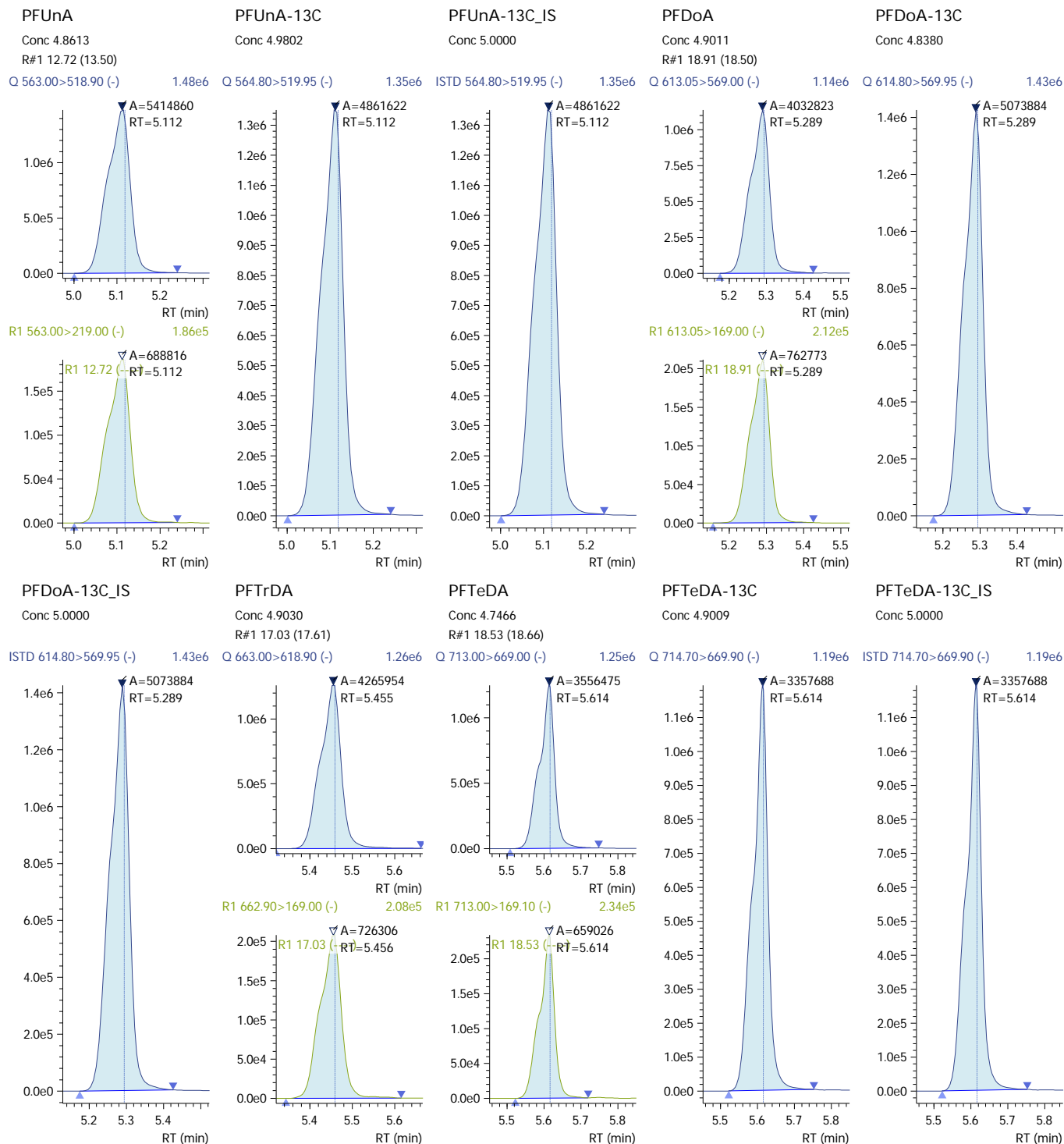


### 210413\_037 (continued)



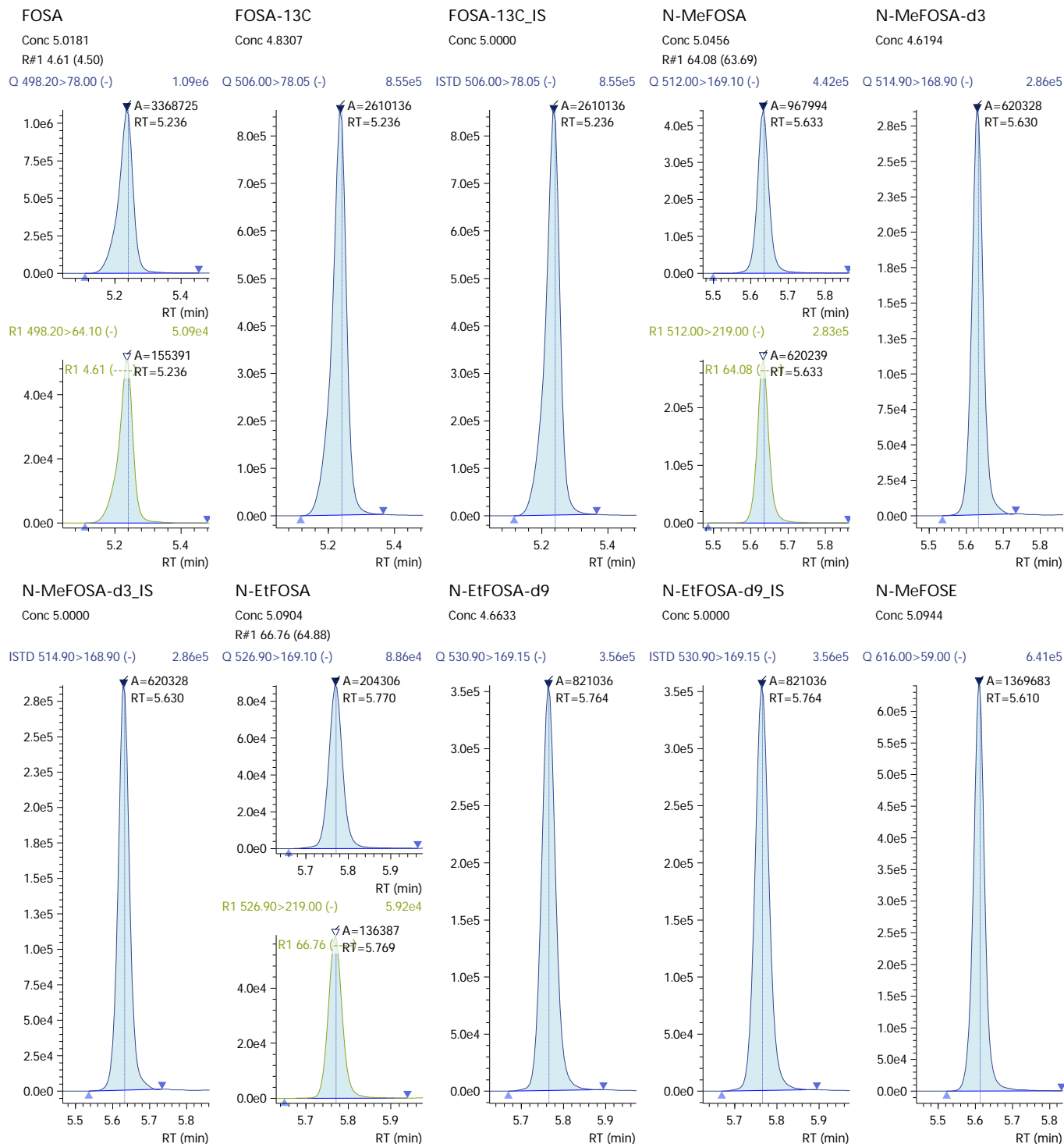


210413\_037 (continued)



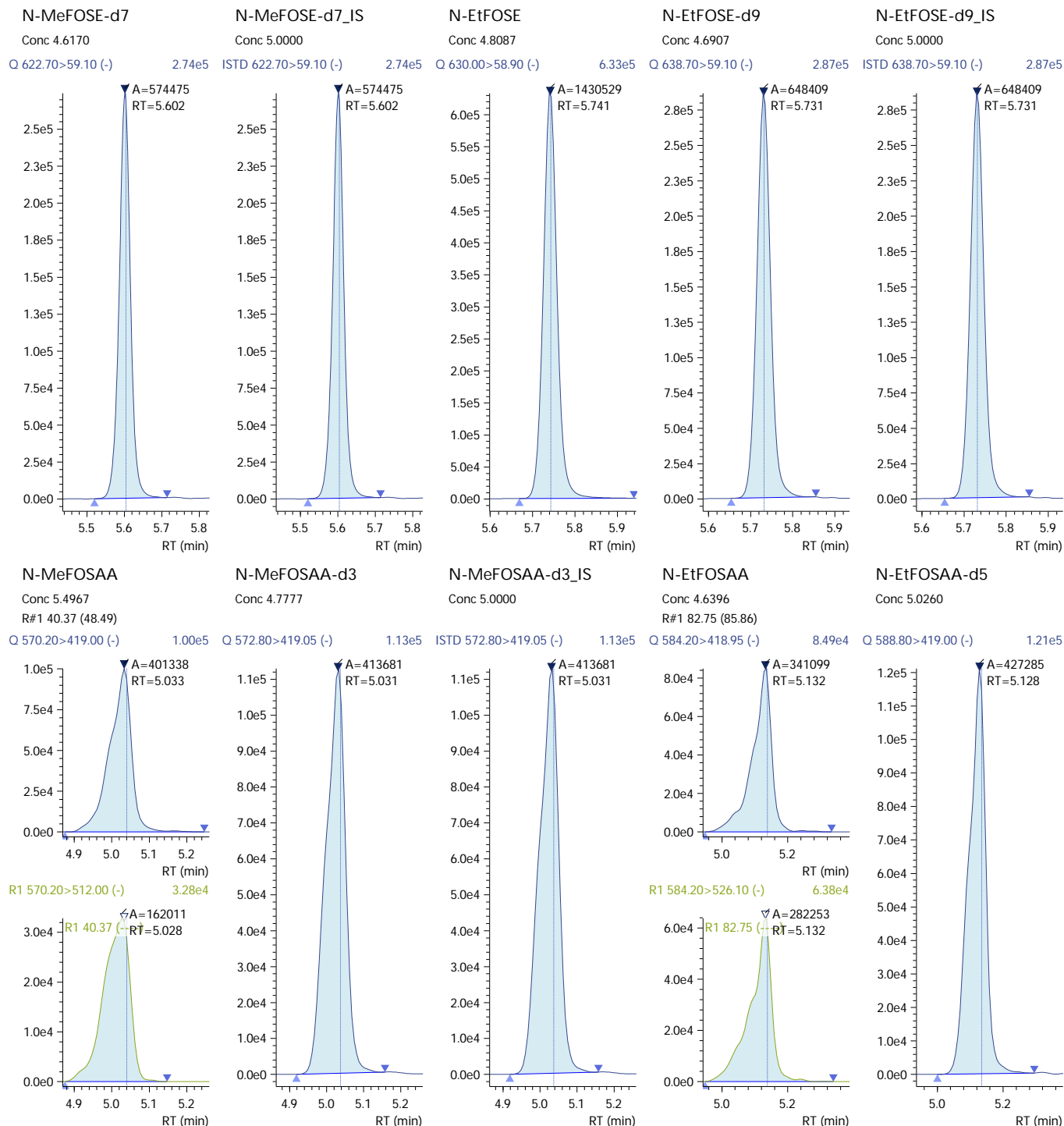


### 210413\_037 (continued)





210413\_037 (continued)





### 210413\_037 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 4.6289  
R#1 23.67 (26.07)

4\_2-FTS-13C  
Conc 5.0421

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 4.7708  
R#1 29.96 (30.56)

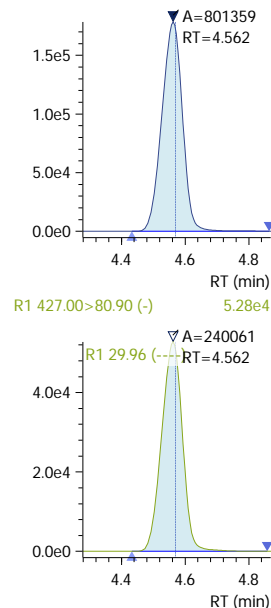
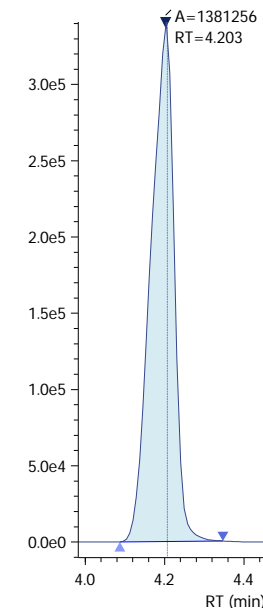
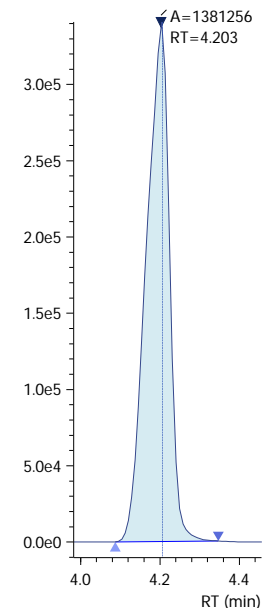
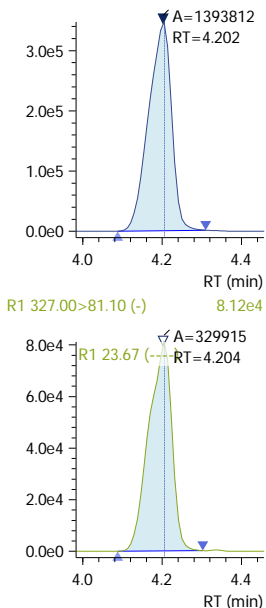
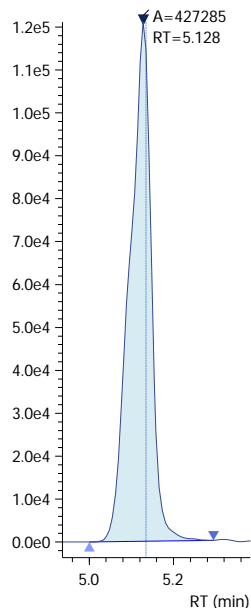
ISTD 588.80>419.00 (-) 1.21e5

Q 327.00>307.05 (-) 3.48e5

Q 328.80>309.05 (-) 3.41e5

ISTD 328.80>309.05 (-) 3.41e5

Q 427.00>407.00 (-) 1.78e5



6\_2-FTS-13C  
Conc 4.6689

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 4.6898  
R#1 8.07 (8.18)

8\_2-FTS-13C  
Conc 5.0043

8\_2-FTS-13C\_IS  
Conc 5.0000

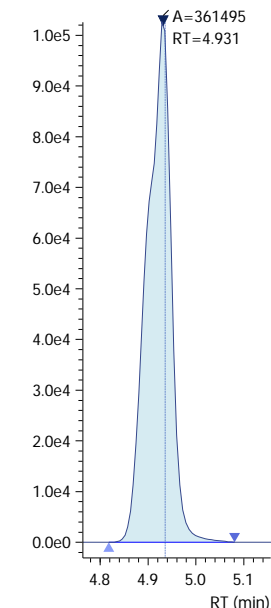
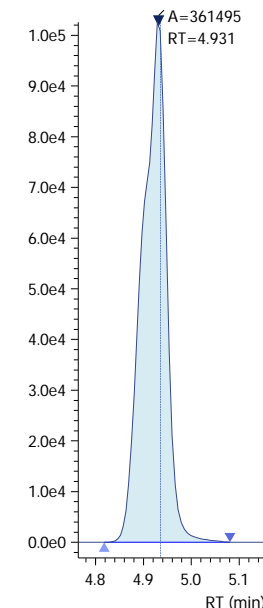
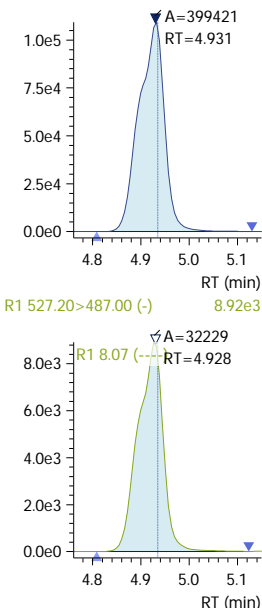
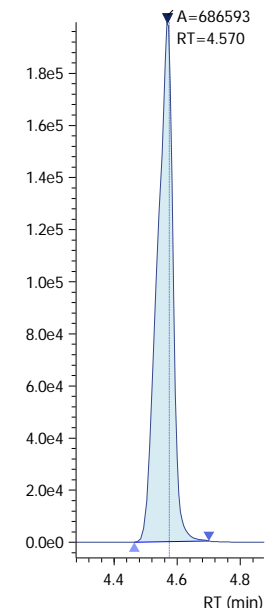
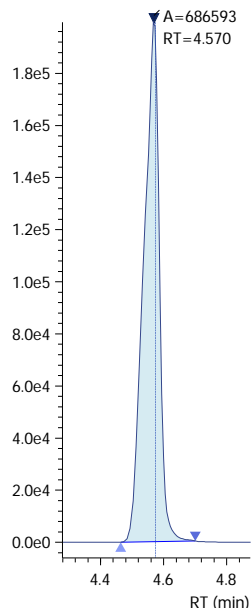
Q 428.90>409.00 (-) 2.00e5

ISTD 428.90>409.00 (-) 2.00e5

Q 527.10>506.90 (-) 1.09e5

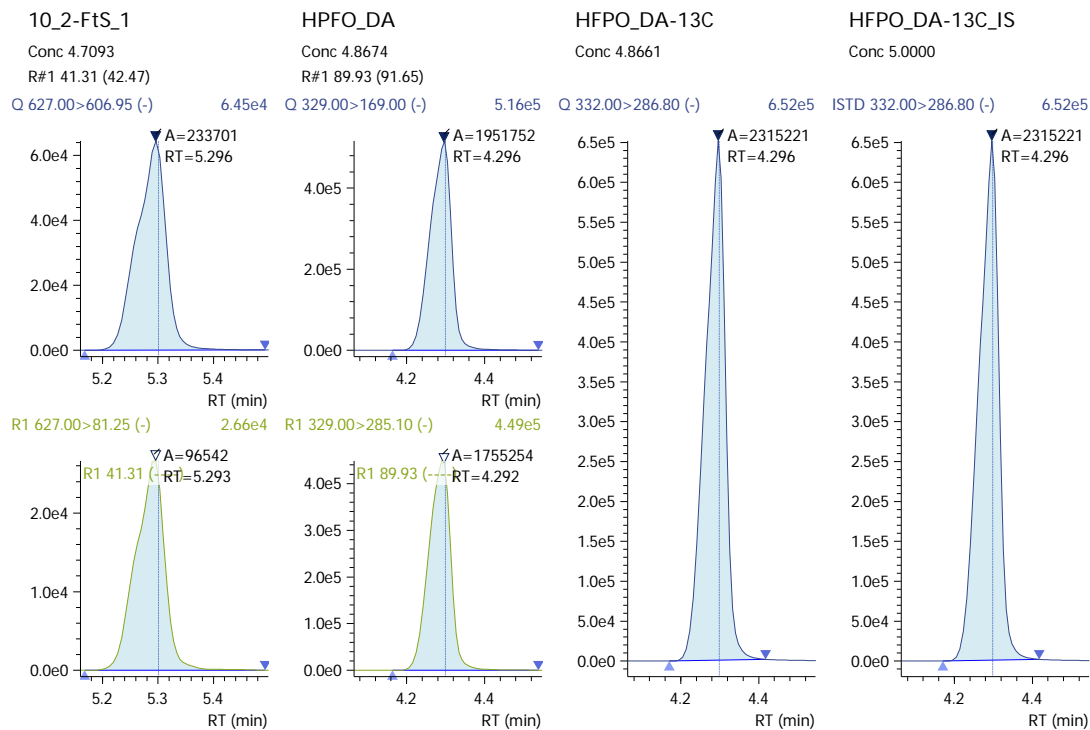
Q 528.80>509.00 (-) 1.03e5

ISTD 528.80>509.00 (-) 1.03e5





210413\_037 (continued)

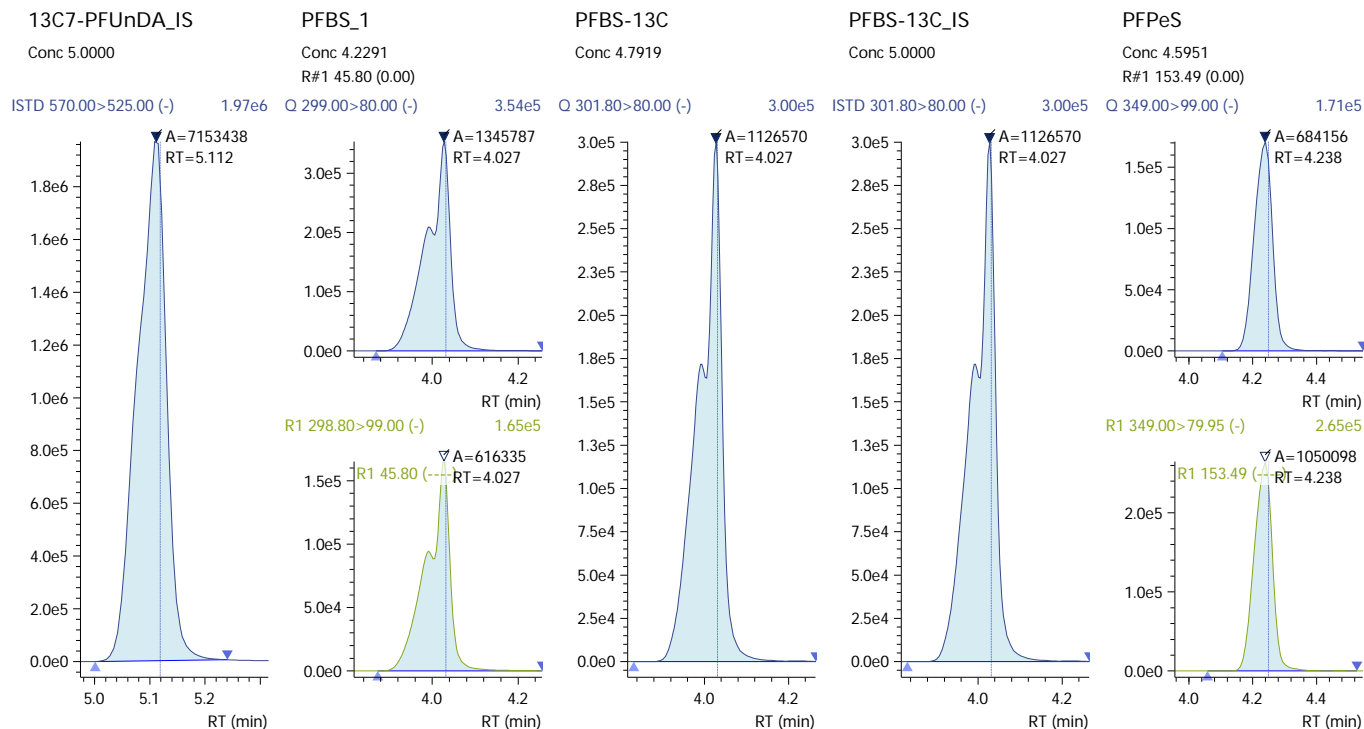






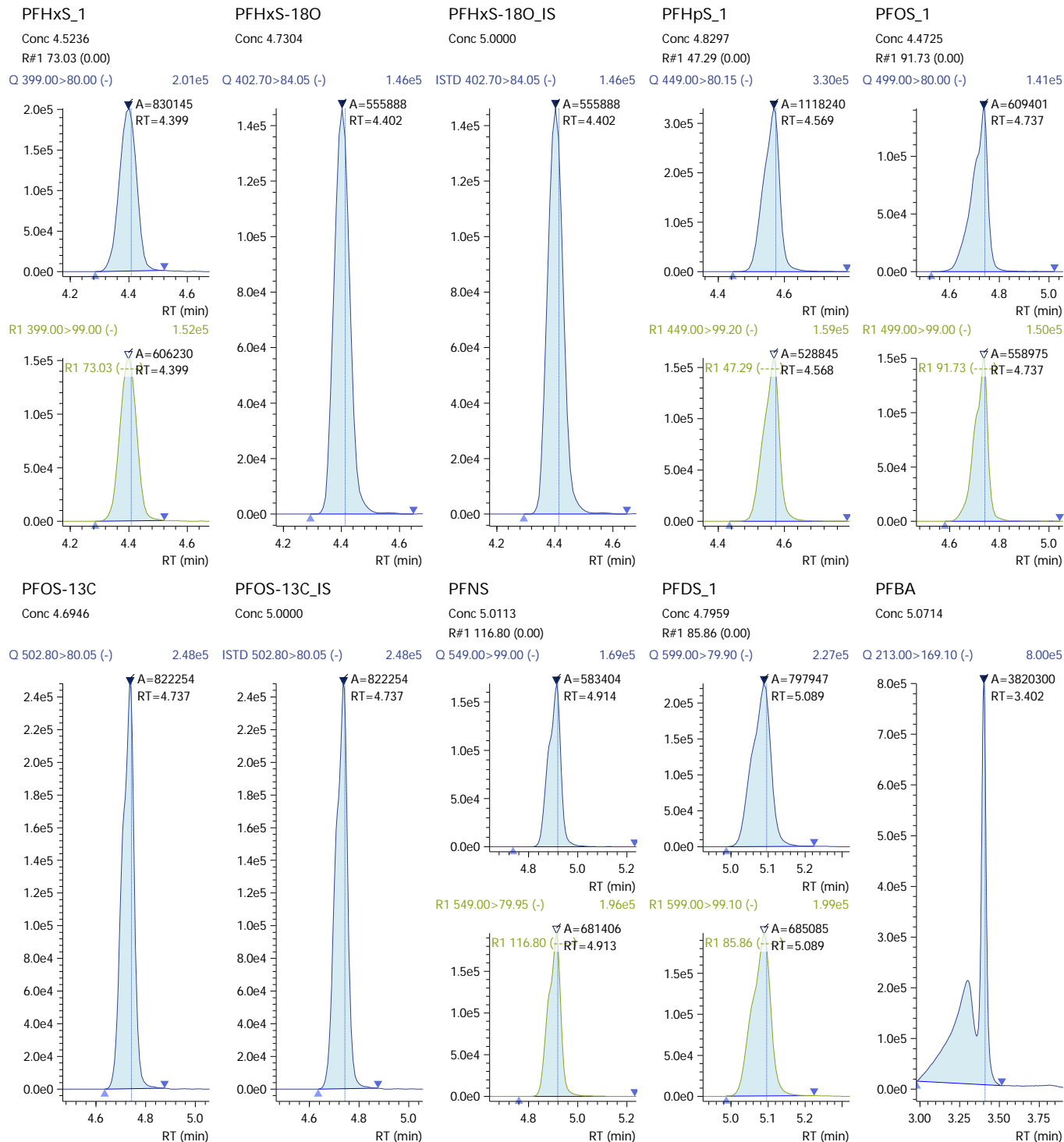
### 210413\_037

Sample ID: PFC ICAL 5.0 PPB  
Date Acquired: 4/13/2021 6:11:09 PM  
Acquired by: System Administrator  
Data File: 210413\_037  
Vial: 5 | Inj. Volume: 15.0000uL | Tray: 0



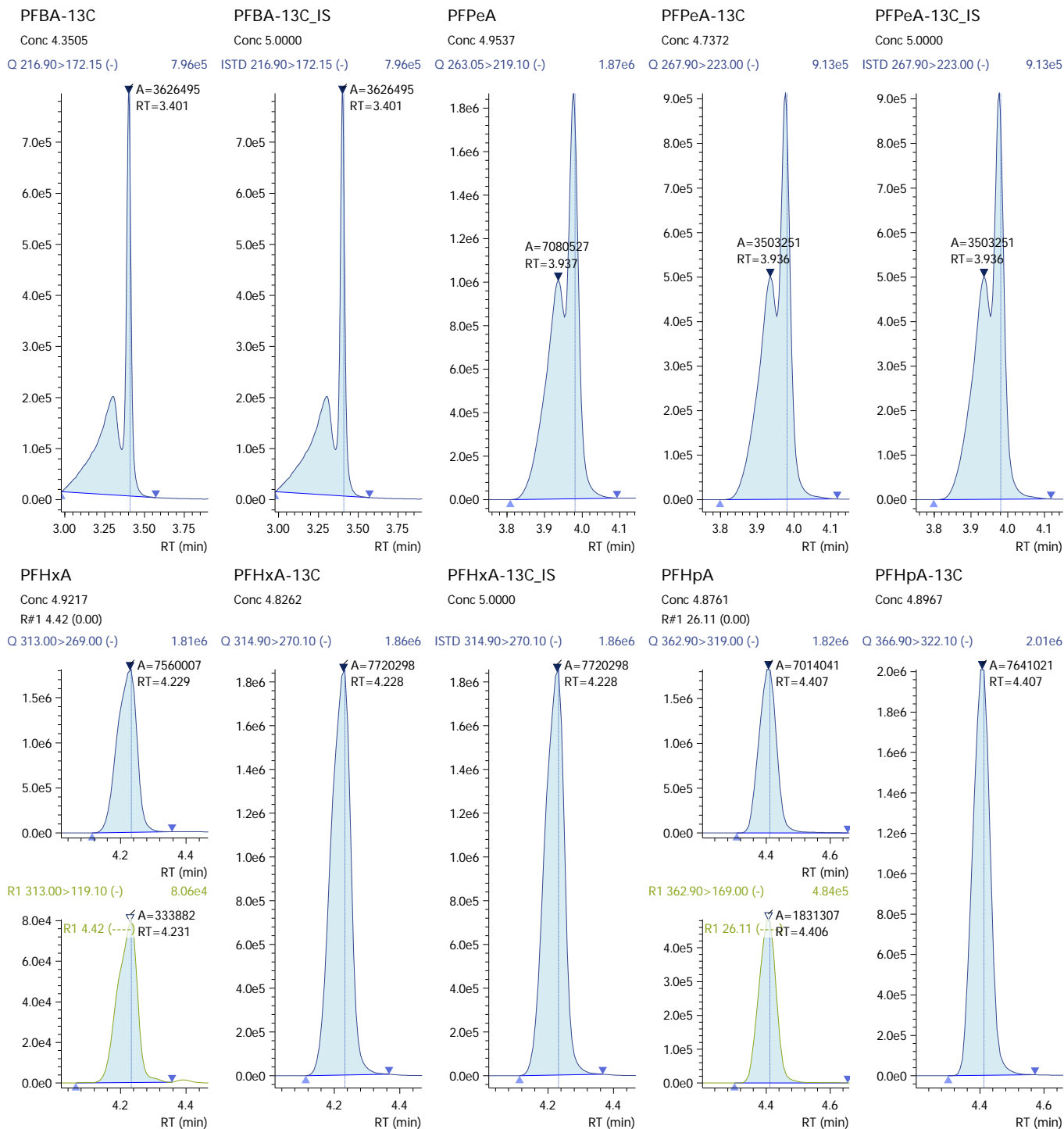


### 210413\_037 (continued)





210413\_037 (continued)

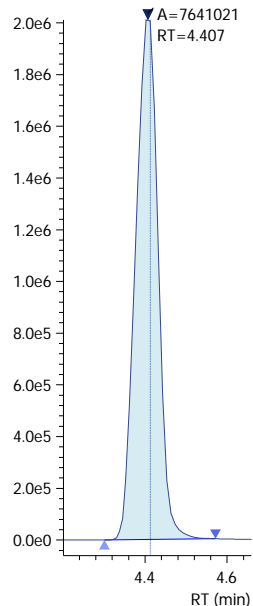




### 210413\_037 (continued)

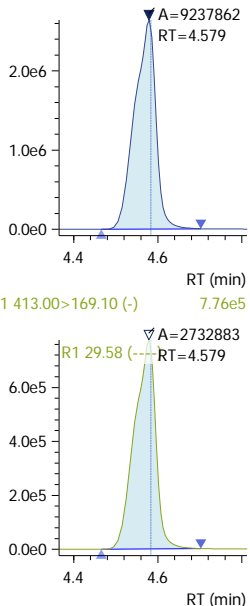
PFHpA-13C\_IS  
Conc 5.0000

ISTD 366.90>322.10 (-) 2.01e6



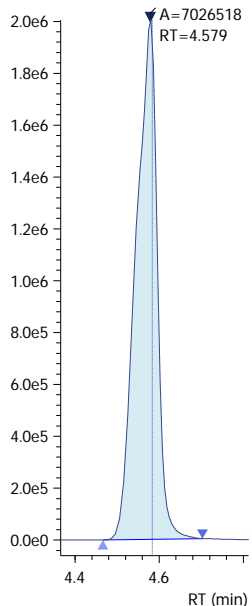
PFOA  
Conc 4.9973  
R#1 29.58 (0.00)

Q 413.00>369.00 (-) 2.64e6



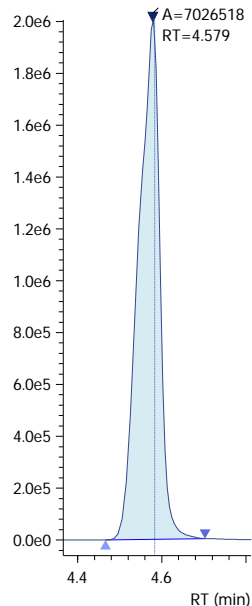
PFOA-13C  
Conc 4.8876

Q 416.80>372.05 (-) 2.01e6



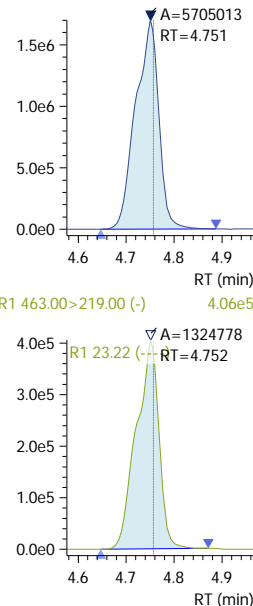
PFOA-13C\_IS  
Conc 5.0000

ISTD 416.80>372.05 (-) 2.01e6



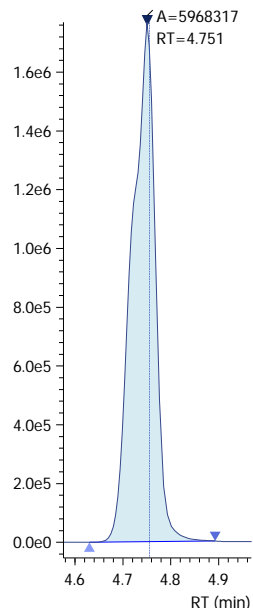
PFNA  
Conc 4.8938  
R#1 23.22 (0.00)

Q 463.00>418.90 (-) 1.70e6



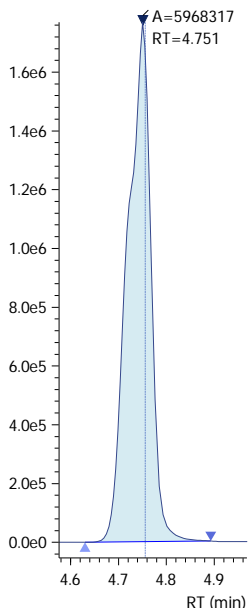
PFNA-13C  
Conc 4.9438

Q 467.80>423.00 (-) 1.77e6



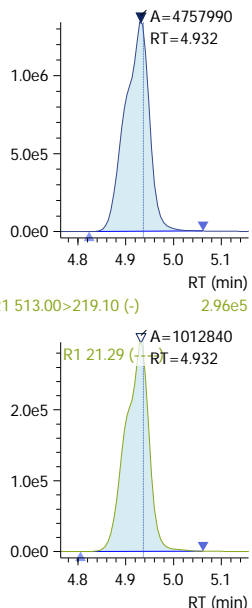
PFNA-13C\_IS  
Conc 5.0000

ISTD 467.80>423.00 (-) 1.77e6



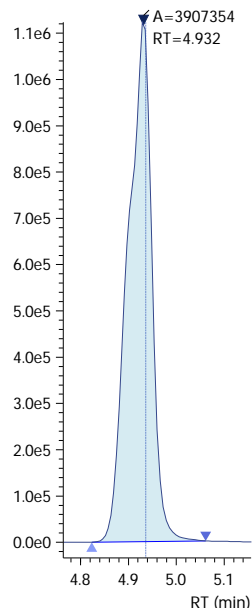
PFDA  
Conc 4.8445  
R#1 21.29 (0.00)

Q 513.00>468.80 (-) 1.34e6



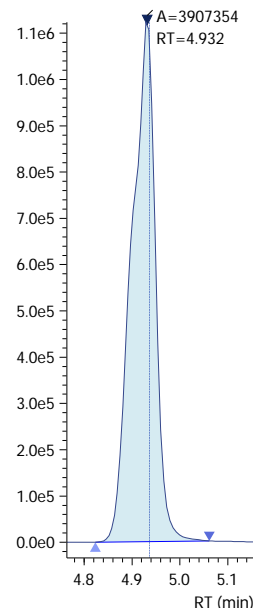
PFDA-13C  
Conc 4.9104

Q 514.80>469.95 (-) 1.12e6



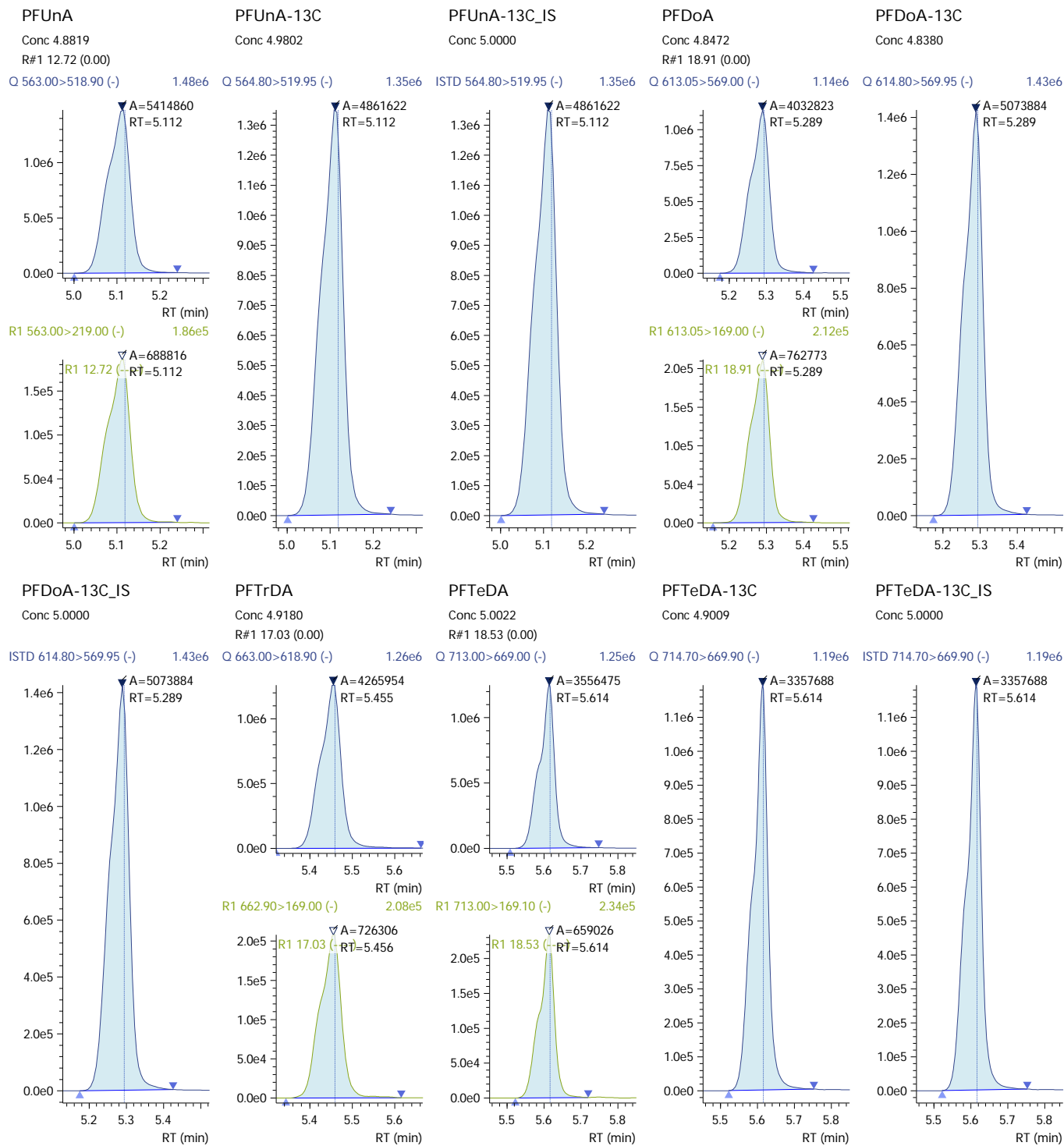
PFDA-13C\_IS  
Conc 5.0000

ISTD 514.80>469.95 (-) 1.12e6



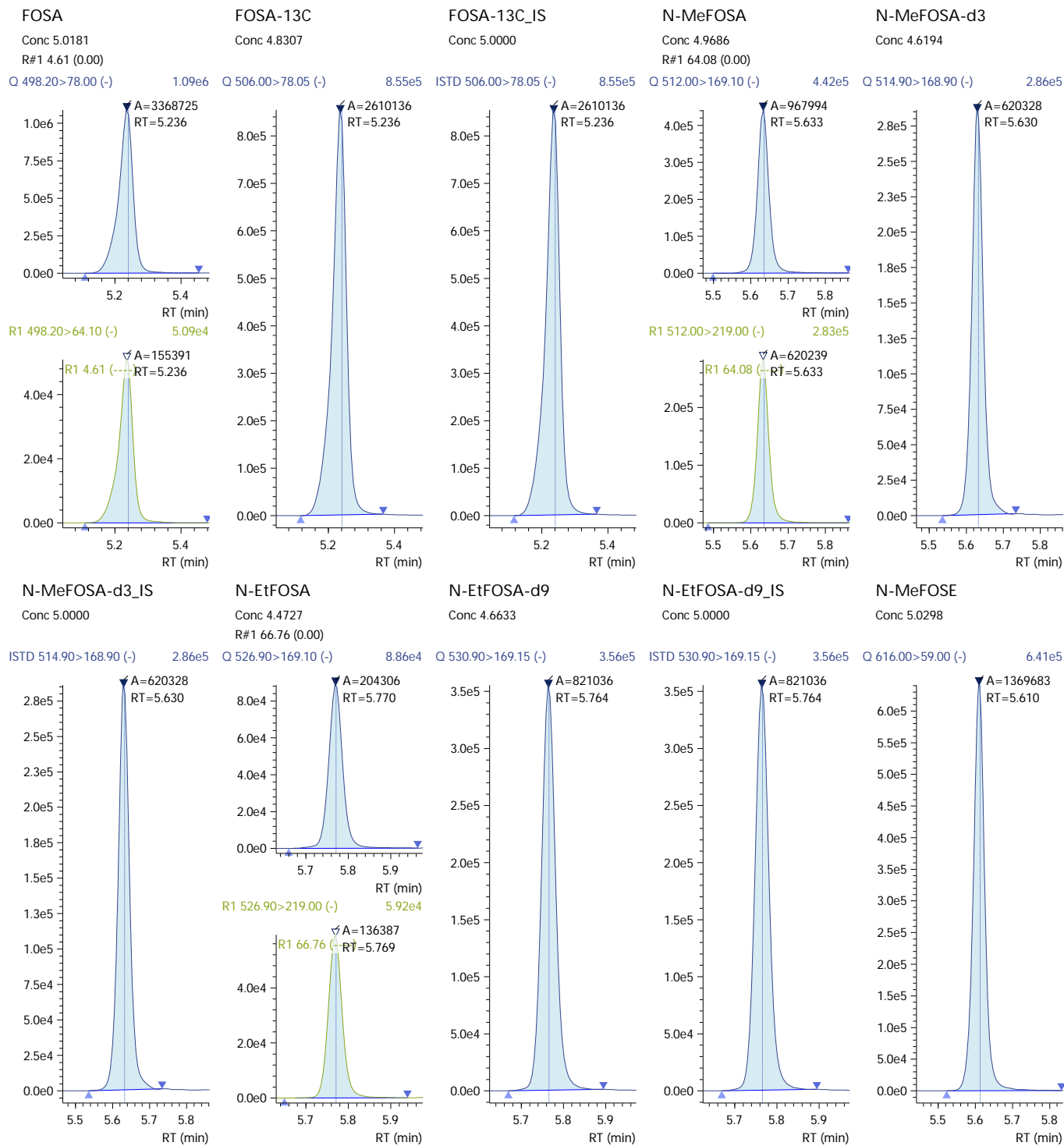


210413\_037 (continued)



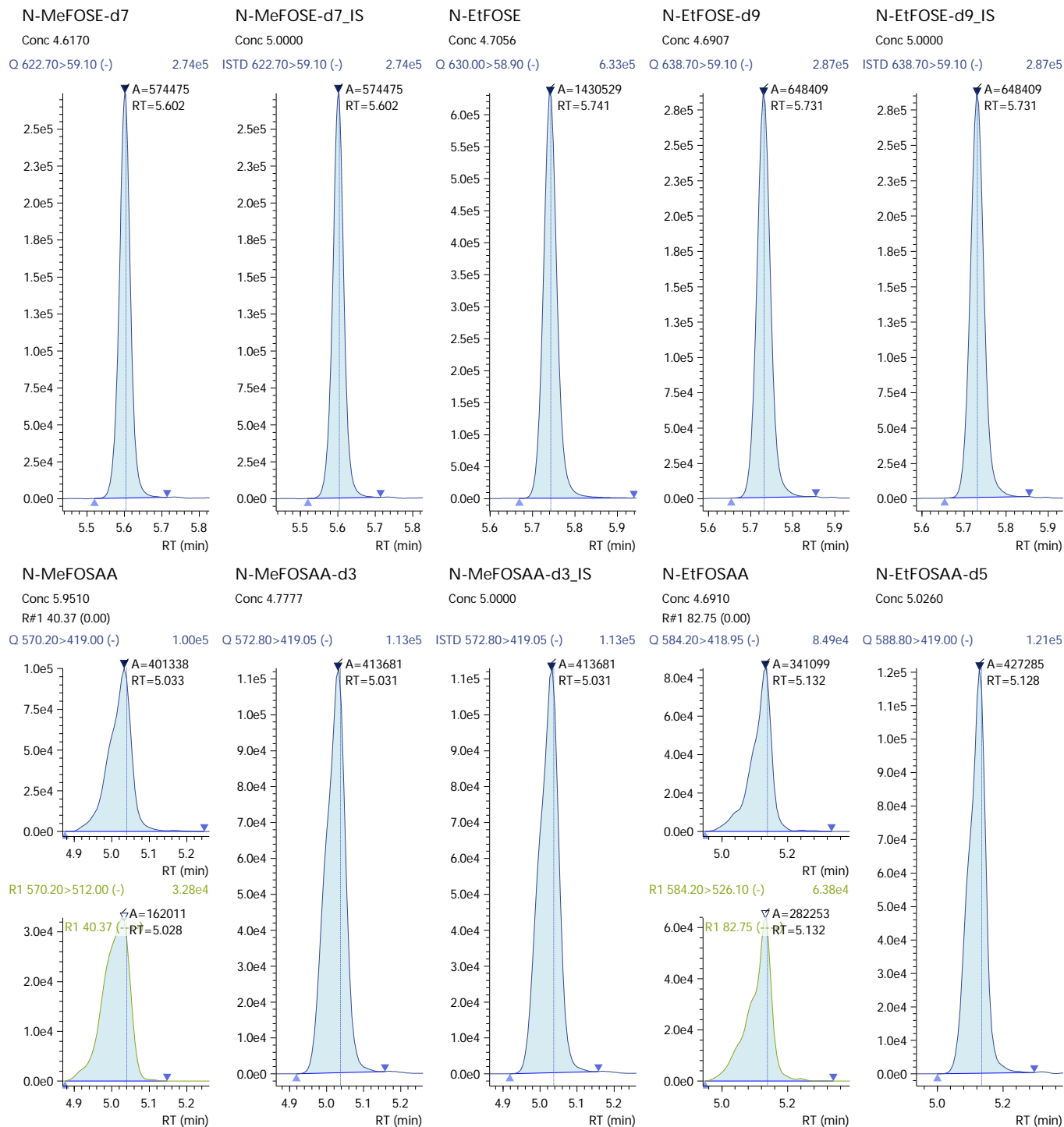


210413\_037 (continued)





210413\_037 (continued)







### 210413\_037 (continued)

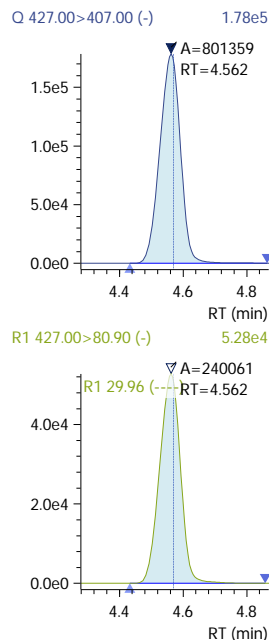
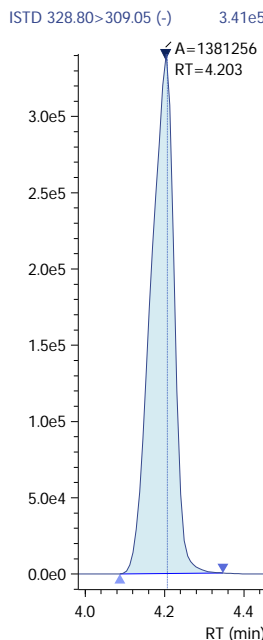
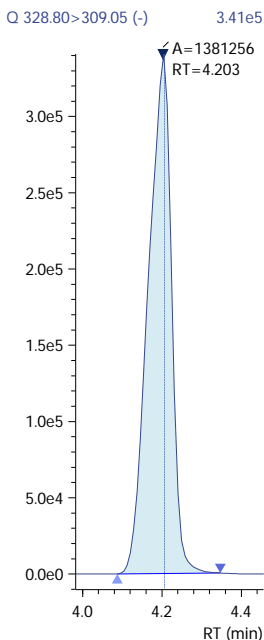
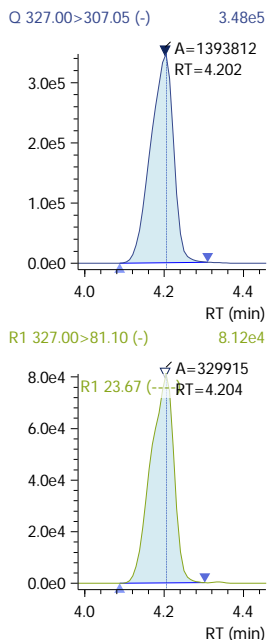
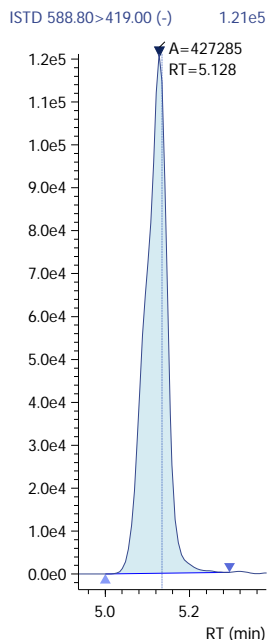
N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 4.5479  
R#1 23.67 (0.00)

4\_2-FTS-13C  
Conc 5.0421

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 4.7708  
R#1 29.96 (0.00)



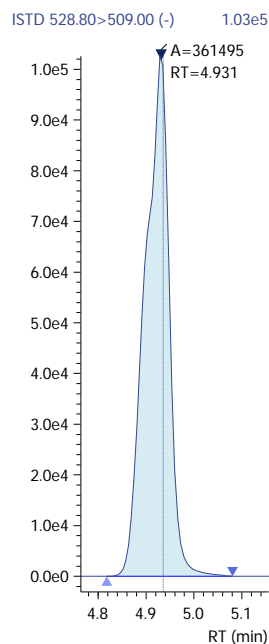
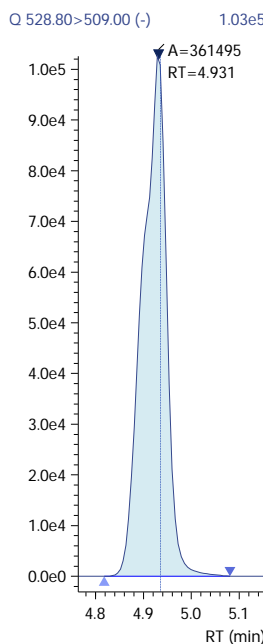
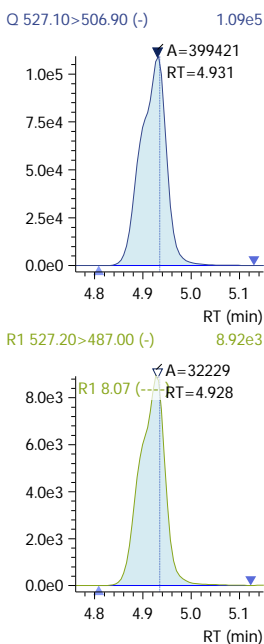
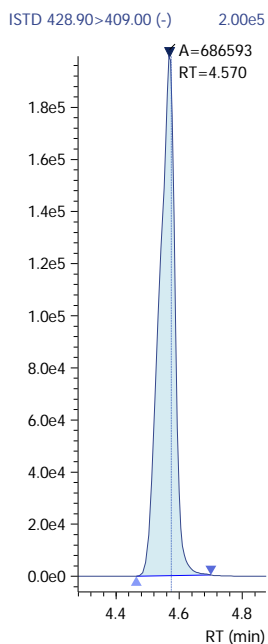
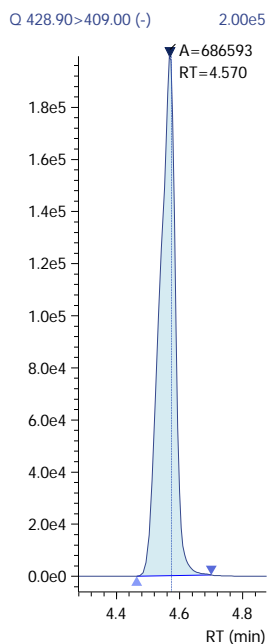
6\_2-FTS-13C  
Conc 4.6689

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 4.6815  
R#1 8.07 (0.00)

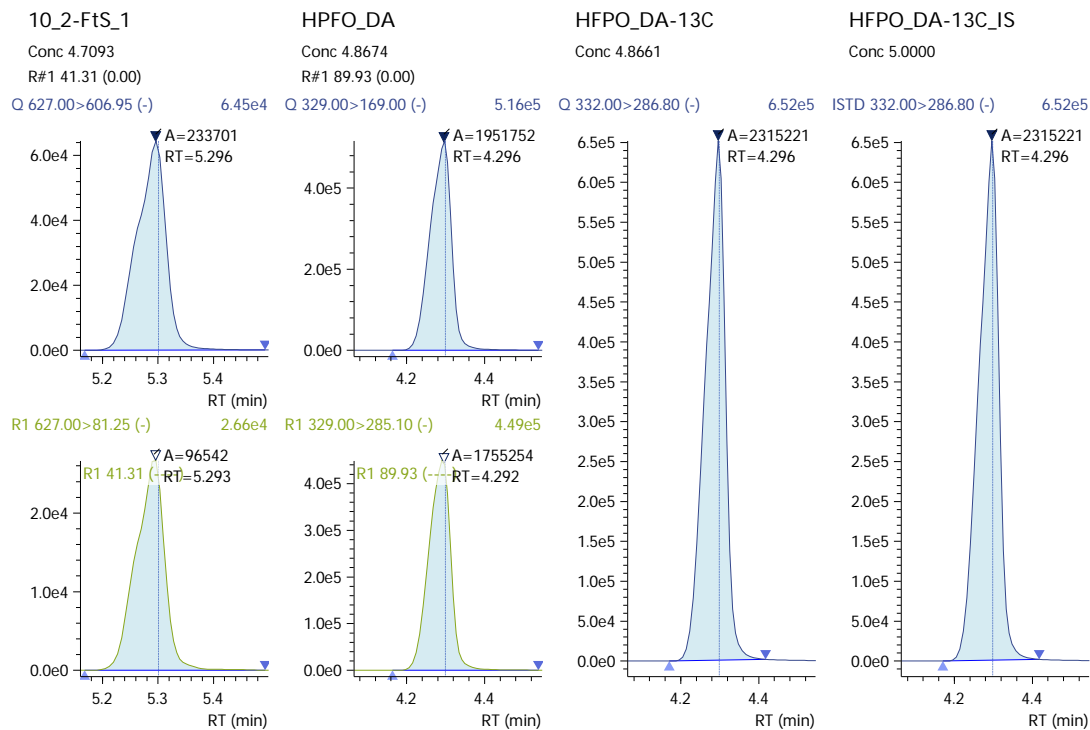
8\_2-FTS-13C  
Conc 5.0043

8\_2-FTS-13C\_IS  
Conc 5.0000





### 210413\_037 (continued)





Insight Report  
 Retention Time/Ion Ratio Confirmation  
 Printed 4/15/2021 14:00:22

210413\_038

Sample ID: PFC ICAL 10 PPB  
 Date Acquired: 4/13/2021 6:21:43 PM  
 Acquired by: System Administrator  
 Data File: 210413\_038  
 Vial: 6 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.115	-0.003	----	6878072	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.026	-0.006	0.00	2709968	1177866	43.46	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.026	-0.006	-1.09	1102015	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.026	-0.006	----	1102277	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.239	-0.010	0.21	1396807	2156317	154.38	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.399	-0.009	-0.01	1705458	1212735	71.11	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.404	-0.009	-0.71	555637	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.404	-0.009	----	555637	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.569	-0.006	0.17	2199520	1051809	47.82	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.738	-0.004	0.00	1213354	1105317	91.10	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.738	-0.004	-0.38	807634	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.738	-0.004	----	807634	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.915	-0.003	0.18	1153100	1375637	119.30	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.092	-0.004	0.35	1559651	1325689	85.00	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.400	-0.010	0.00	7656276	----	----	----		
PFBA-13C	216.90>172.15	----	3.399	-0.010	-1.72	3592135	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.399	-0.010	----	3592135	----	----	----		
PFPeA	263.05>219.10	----	3.937	-0.044	0.00	14226406	----	----	----		
PFPeA-13C	267.90>223.00	----	3.937	-0.044	-1.18	3495939	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.937	-0.044	----	3495939	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.227	-0.006	0.00	14820548	687998	4.64	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.227	-0.005	-0.89	7397388	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.227	-0.005	----	7397388	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.408	-0.004	0.00	14261771	3650544	25.60	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.408	-0.004	-0.71	7423214	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.408	-0.004	----	7423214	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.579	-0.005	0.00	18259371	5299541	29.02	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.579	-0.005	-0.54	6741767	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.579	-0.005	----	6741767	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.751	-0.005	0.00	11362217	2607412	22.95	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_038 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.751	-0.005	-0.36	5693058	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.751	-0.005	----	5693058	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.933	-0.004	0.00	9207604	1923786	20.89	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.933	-0.003	-0.18	3678090	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.933	-0.003	----	3678090	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.116	-0.003	0.00	10753086	1343603	12.50	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.116	-0.003	0.00	4602422	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.116	-0.003	----	4602422	----	----	----	0-0	
PFDoA	613.05>569.00	613.05>169.00	5.290	-0.003	0.00	8143777	1543074	18.95	18.50	9.25-27.75	
PFDoA-13C	614.80>569.95	----	5.290	-0.004	0.18	5129256	----	----	----	0-0	
PFDoA-13C_IS	614.80>569.95	----	5.290	-0.004	----	5129256	----	----	----	0-0	
PFTTrDA	663.00>618.90	662.90>169.00	5.457	-0.002	-0.16	8375853	1444414	17.25	17.61	8.8-26.41	
PFTTeDA	713.00>669.00	713.00>169.10	5.615	-0.001	0.00	7046083	1325072	18.81	18.66	9.33-27.99	
PFTTeDA-13C	714.70>669.90	----	5.615	-0.001	0.50	3298241	----	----	----	0-0	
PFTTeDA-13C_IS	714.70>669.90	----	5.615	-0.001	----	3298241	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.238	-0.003	0.00	6515475	303895	4.66	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.238	-0.003	0.12	2543420	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.238	-0.003	----	2543420	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.635	0.000	0.00	1920505	1241934	64.67	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.632	-0.001	0.52	625884	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.632	-0.001	----	625884	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.771	0.000	0.01	402347	268074	66.63	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.766	0.000	0.65	817191	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.766	0.000	----	817191	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.612	-0.001	0.01	2679852	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.603	-0.001	0.49	577007	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.603	-0.001	----	577007	----	----	----		
N-EtFOSE	630.00>58.90	----	5.742	0.000	0.01	2852989	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.732	0.000	0.62	659455	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.732	0.000	----	659455	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.035	-0.005	0.00	741147	336661	45.42	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.033	-0.004	-0.08	427665	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.033	-0.004	----	427665	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.135	-0.003	0.00	658654	548840	83.33	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.131	-0.004	0.02	406171	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.131	-0.004	----	406171	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.202	-0.004	0.00	2575381	633719	24.61	26.07	13.03-39.1	
4_2-FTS-13C	328.80>309.05	----	4.202	-0.005	-0.91	1386217	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_038 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.202	-0.005	----	1386217	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.561	-0.008	-0.01	1451391	437073	30.11	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.568	-0.006	-0.55	692728	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.568	-0.006	----	692728	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.932	-0.003	0.00	732828	59205	8.08	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.932	-0.003	-0.18	343672	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.932	-0.003	----	343672	----	----	----	0-0	
10_2-FTS_1	627.00>606.95	627.00>81.25	5.297	-0.004	0.37	458906	189476	41.29	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.295	-0.004	0.00	3830088	3492782	91.19	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.295	-0.004	-0.82	2271687	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.295	-0.004	----	2271687	----	----	----		



210413\_038

Sample ID: PFC ICAL 10 PPB  
 Date Acquired: 4/13/2021 6:21:43 PM  
 Acquired by: System Administrator  
 Data File: 210413\_038  
 Vial: 6 | Inj. Volume: 15.000uL | Tray: 0

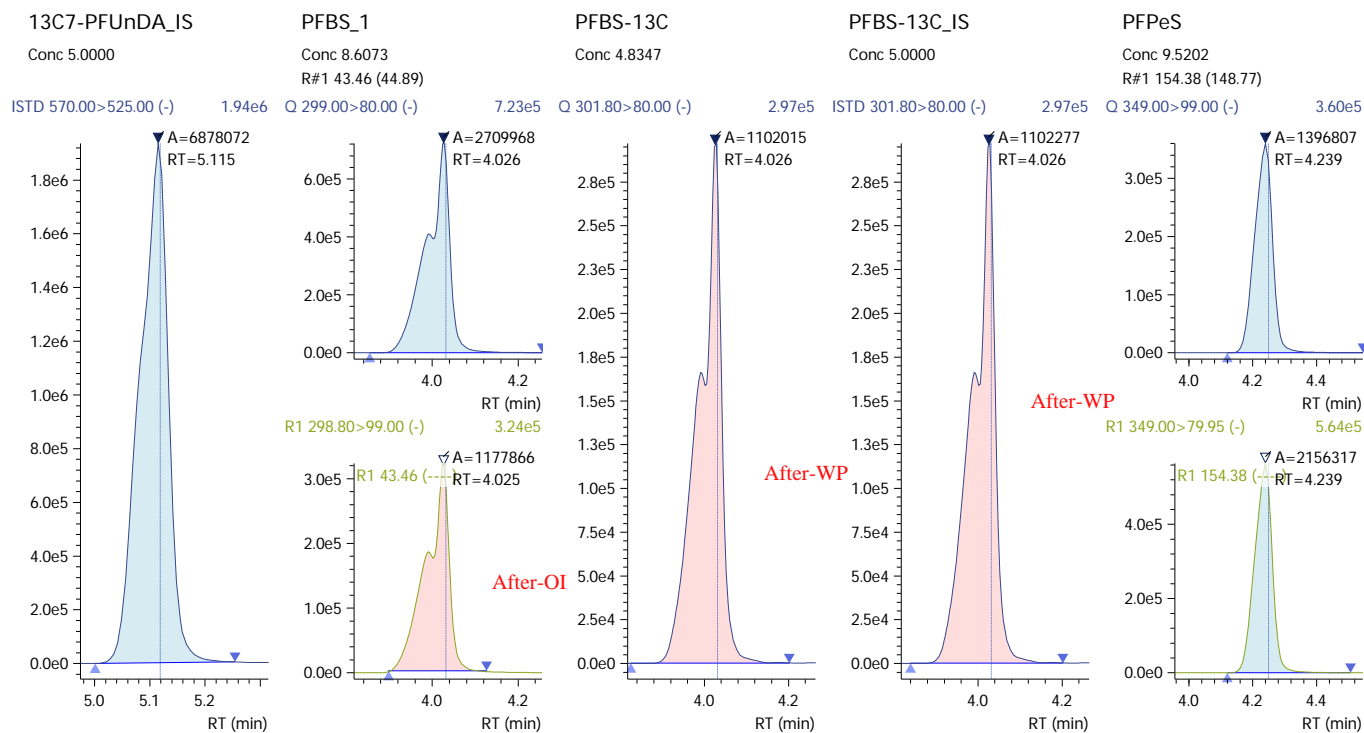
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.115	6878072	6878072	----	5.0000	5.0000	ng/mL
PFBS_1	MI R1	4.026	2709968	1102277	PFBS-13C_IS	8.8737	8.6073	ng/mL
PFBS-13C	M	4.026	1102015	6878072	13C7-PFUnDA_IS	5.0000	4.8347	ng/mL
PFBS-13C_IS	M	4.026	1102277	1102277	----	5.0000	5.0000	ng/mL
PFPeS	Auto	4.239	1396807	1102277	PFBS-13C_IS	9.4092	9.5202	ng/mL
PFHxS_1	Auto	4.399	1705458	555637	PFHxS-18O_IS	9.1308	9.3063	ng/mL
PFHxS-18O	Auto	4.404	555637	6878072	13C7-PFUnDA_IS	5.0000	4.9175	ng/mL
PFHxS-18O_IS	Auto	4.404	555637	555637	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.569	2199520	555637	PFHxS-18O_IS	9.5344	9.5218	ng/mL
PFOS_1	Auto	4.738	1213354	807634	PFOS-13C_IS	9.2923	9.0661	ng/mL
PFOS-13C	Auto	4.738	807634	6878072	13C7-PFUnDA_IS	5.0000	4.7957	ng/mL
PFOS-13C_IS	Auto	4.738	807634	807634	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.915	1153100	807634	PFOS-13C_IS	9.6158	9.8648	ng/mL
PFDS_1	M	5.092	1559651	807634	PFOS-13C_IS	9.6467	9.5395	ng/mL
PFBA	Auto	3.400	7656276	3592135	PFBA-13C_IS	10.0000	9.8750	ng/mL
PFBA-13C	Auto	3.399	3592135	6878072	13C7-PFUnDA_IS	5.0000	4.4818	ng/mL
PFBA-13C_IS	Auto	3.399	3592135	3592135	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.937	14226406	3495939	PFPeA-13C_IS	10.0000	10.0026	ng/mL
PFPeA-13C	Auto	3.937	3495939	6878072	13C7-PFUnDA_IS	5.0000	4.9166	ng/mL
PFPeA-13C_IS	Auto	3.937	3495939	3495939	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.227	14820548	7397388	PFHxA-13C_IS	10.0000	9.6727	ng/mL
PFHxA-13C	Auto	4.227	7397388	6878072	13C7-PFUnDA_IS	5.0000	4.8095	ng/mL
PFHxA-13C_IS	Auto	4.227	7397388	7397388	----	5.0000	5.0000	ng/mL
PFHpA	Auto	4.408	14261771	7423214	PFHpA-13C_IS	10.0000	9.6181	ng/mL
PFHpA-13C	Auto	4.408	7423214	6878072	13C7-PFUnDA_IS	5.0000	4.9476	ng/mL
PFHpA-13C_IS	Auto	4.408	7423214	7423214	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.579	18259371	6741767	PFOA-13C_IS	10.0000	10.1405	ng/mL
PFOA-13C	Auto	4.579	6741767	6878072	13C7-PFUnDA_IS	5.0000	4.8773	ng/mL
PFOA-13C_IS	Auto	4.579	6741767	6741767	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.751	11362217	5693058	PFNA-13C_IS	10.0000	9.8862	ng/mL
PFNA-13C	Auto	4.751	5693058	6878072	13C7-PFUnDA_IS	5.0000	4.9046	ng/mL
PFNA-13C_IS	Auto	4.751	5693058	5693058	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.933	9207604	3678090	PFDA-13C_IS	10.0000	9.9594	ng/mL
PFDA-13C	Auto	4.933	3678090	6878072	13C7-PFUnDA_IS	5.0000	4.8073	ng/mL
PFDA-13C_IS	Auto	4.933	3678090	3678090	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.116	10753086	4602422	PFUnA-13C_IS	10.0000	10.1976	ng/mL
PFUnA-13C	Auto	5.116	4602422	6878072	13C7-PFUnDA_IS	5.0000	4.9034	ng/mL
PFUnA-13C_IS	Auto	5.116	4602422	4602422	----	5.0000	5.0000	ng/mL
PFDaA	Auto	5.290	8143777	5129256	PFDaA-13C_IS	10.0000	9.7904	ng/mL
PFDaA-13C	Auto	5.290	5129256	6878072	13C7-PFUnDA_IS	5.0000	5.0866	ng/mL
PFDaA-13C_IS	Auto	5.290	5129256	5129256	----	5.0000	5.0000	ng/mL
PFTeDA	Auto	5.457	8375853	3298241	PFTeDA-13C_IS	10.0000	9.8002	ng/mL
PFTeDA	Auto	5.615	7046083	3298241	PFTeDA-13C_IS	10.0000	9.5734	ng/mL
PFTeDA-13C	Auto	5.615	3298241	6878072	13C7-PFUnDA_IS	5.0000	5.0068	ng/mL
PFTeDA-13C_IS	Auto	5.615	3298241	3298241	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.238	6515475	2543420	FOSA-13C_IS	10.0000	9.9602	ng/mL
FOSA-13C	Auto	5.238	2543420	6878072	13C7-PFUnDA_IS	5.0000	4.8957	ng/mL
FOSA-13C_IS	Auto	5.238	2543420	2543420	----	5.0000	5.0000	ng/mL
N-MeFOSA	Auto	5.635	1920505	625884	N-MeFOSA-d3_IS	10.0000	9.9216	ng/mL
N-MeFOSA-d3	Auto	5.632	625884	6878072	13C7-PFUnDA_IS	5.0000	4.8473	ng/mL
N-MeFOSA-d3_IS	Auto	5.632	625884	625884	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.771	402347	817191	N-EtFOSA-d9_IS	10.0000	10.1017	ng/mL
N-EtFOSA-d9	Auto	5.766	817191	6878072	13C7-PFUnDA_IS	5.0000	4.8272	ng/mL
N-EtFOSA-d9_IS	Auto	5.766	817191	817191	----	5.0000	5.0000	ng/mL



### 210413\_038 (continued)

(Table continued from previous page)

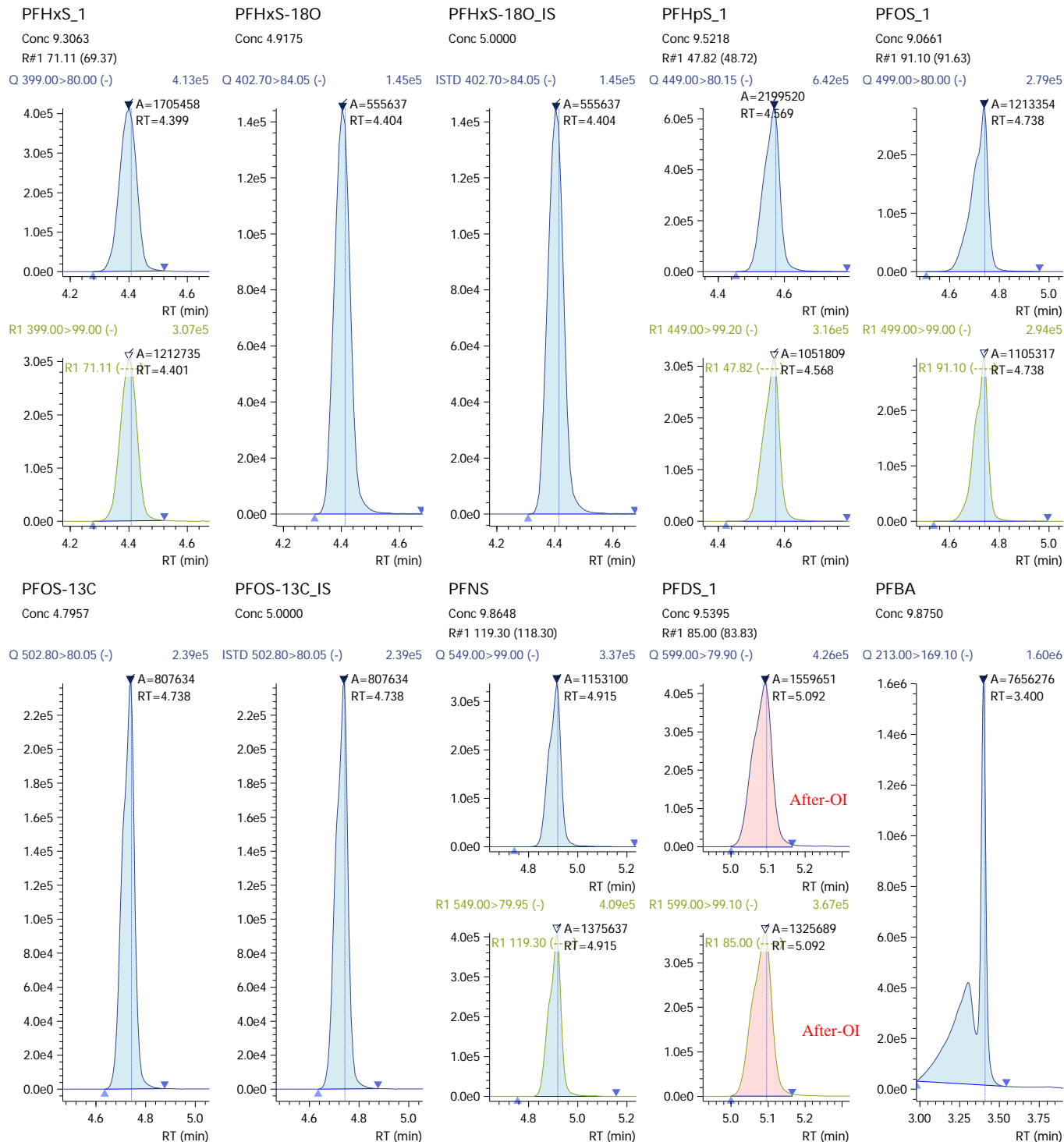
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.612	2679852	577007	N-MeFOSE-d7_IS	10.0000	9.9236	ng/mL
N-MeFOSE-d7	Auto	5.603	577007	6878072	13C7-PFUnDA_IS	5.0000	4.8230	ng/mL
N-MeFOSE-d7_IS	Auto	5.603	577007	577007	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.742	2852989	659455	N-EtFOSE-d9_IS	10.0000	9.4296	ng/mL
N-EtFOSE-d9	Auto	5.732	659455	6878072	13C7-PFUnDA_IS	5.0000	4.9617	ng/mL
N-EtFOSE-d9_IS	Auto	5.732	659455	659455	----	5.0000	5.0000	ng/mL
N-MeFOSAA	Auto	5.035	741147	427665	N-MeFOSAA-d3_IS	10.0000	9.7977	ng/mL
N-MeFOSAA-d3	Auto	5.033	427665	6878072	13C7-PFUnDA_IS	5.0000	5.1369	ng/mL
N-MeFOSAA-d3_IS	Auto	5.033	427665	427665	----	5.0000	5.0000	ng/mL
N-EtFOSAA	Auto	5.135	658654	406171	N-EtFOSAA-d5_IS	10.0000	9.4247	ng/mL
N-EtFOSAA-d5	Auto	5.131	406171	6878072	13C7-PFUnDA_IS	5.0000	4.9689	ng/mL
N-EtFOSAA-d5_IS	Auto	5.131	406171	406171	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.202	2575381	1386217	4_2-FTS-13C_IS	9.3722	8.5223	ng/mL
4_2-FTS-13C	Auto	4.202	1386217	6878072	13C7-PFUnDA_IS	5.0000	5.2628	ng/mL
4_2-FTS-13C_IS	Auto	4.202	1386217	1386217	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.561	1451391	692728	6_2-FTS-13C_IS	9.5117	8.5642	ng/mL
6_2-FTS-13C	Auto	4.568	692728	6878072	13C7-PFUnDA_IS	5.0000	4.8992	ng/mL
6_2-FTS-13C_IS	Auto	4.568	692728	692728	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.932	732828	343672	8_2-FTS-13C_IS	9.6005	9.0507	ng/mL
8_2-FTS-13C	Auto	4.932	343672	6878072	13C7-PFUnDA_IS	5.0000	4.9480	ng/mL
8_2-FTS-13C_IS	Auto	4.932	343672	343672	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.297	458906	343672	8_2-FTS-13C_IS	9.6619	9.7270	ng/mL
HPFO_DA	Auto	4.295	3830088	2271687	HPFO_DA-13C_IS	10.0000	9.7348	ng/mL
HPFO_DA-13C	Auto	4.295	2271687	6878072	13C7-PFUnDA_IS	5.0000	4.9658	ng/mL
HPFO_DA-13C_IS	Auto	4.295	2271687	2271687	----	5.0000	5.0000	ng/mL





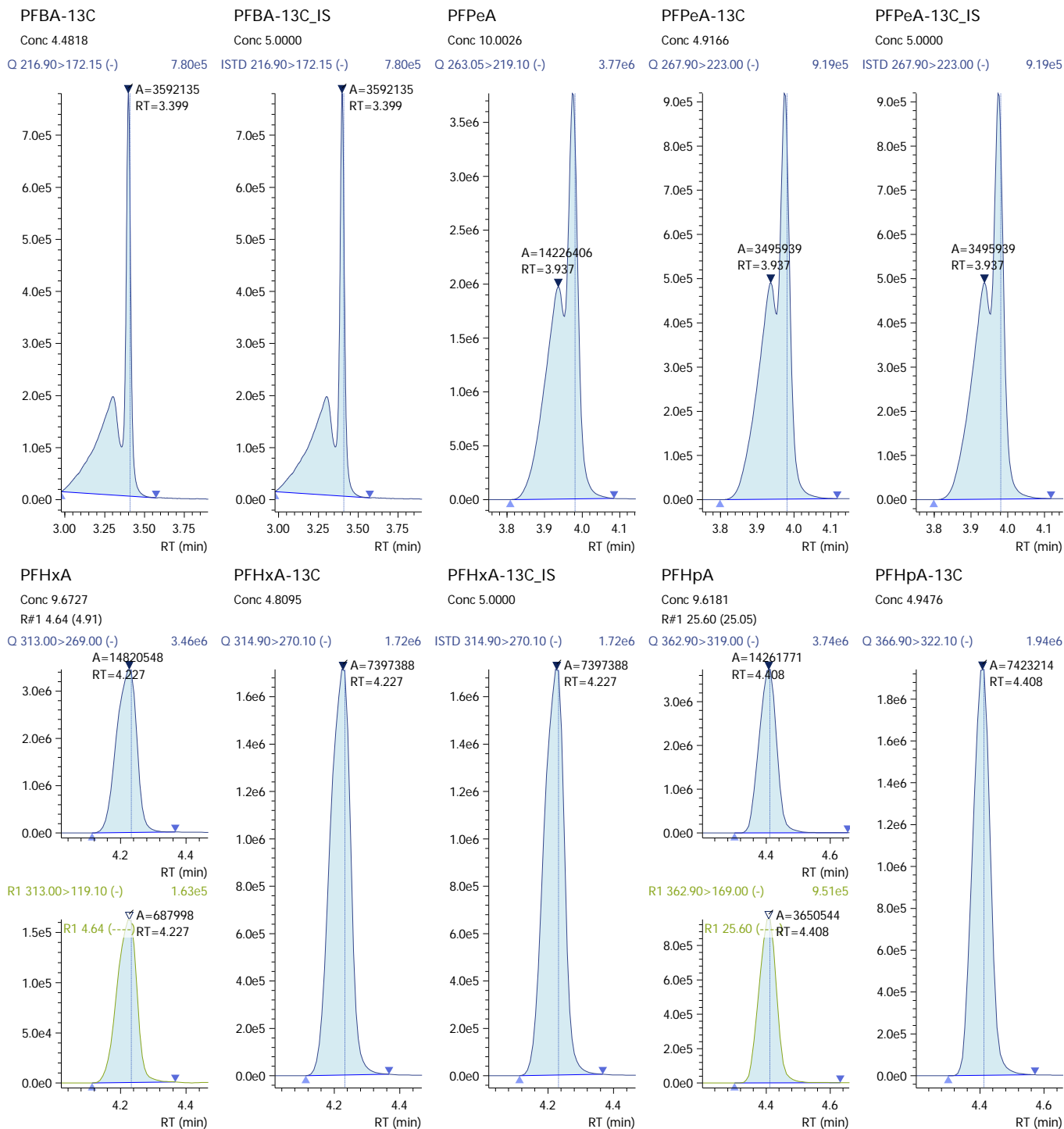


### 210413\_038 (continued)



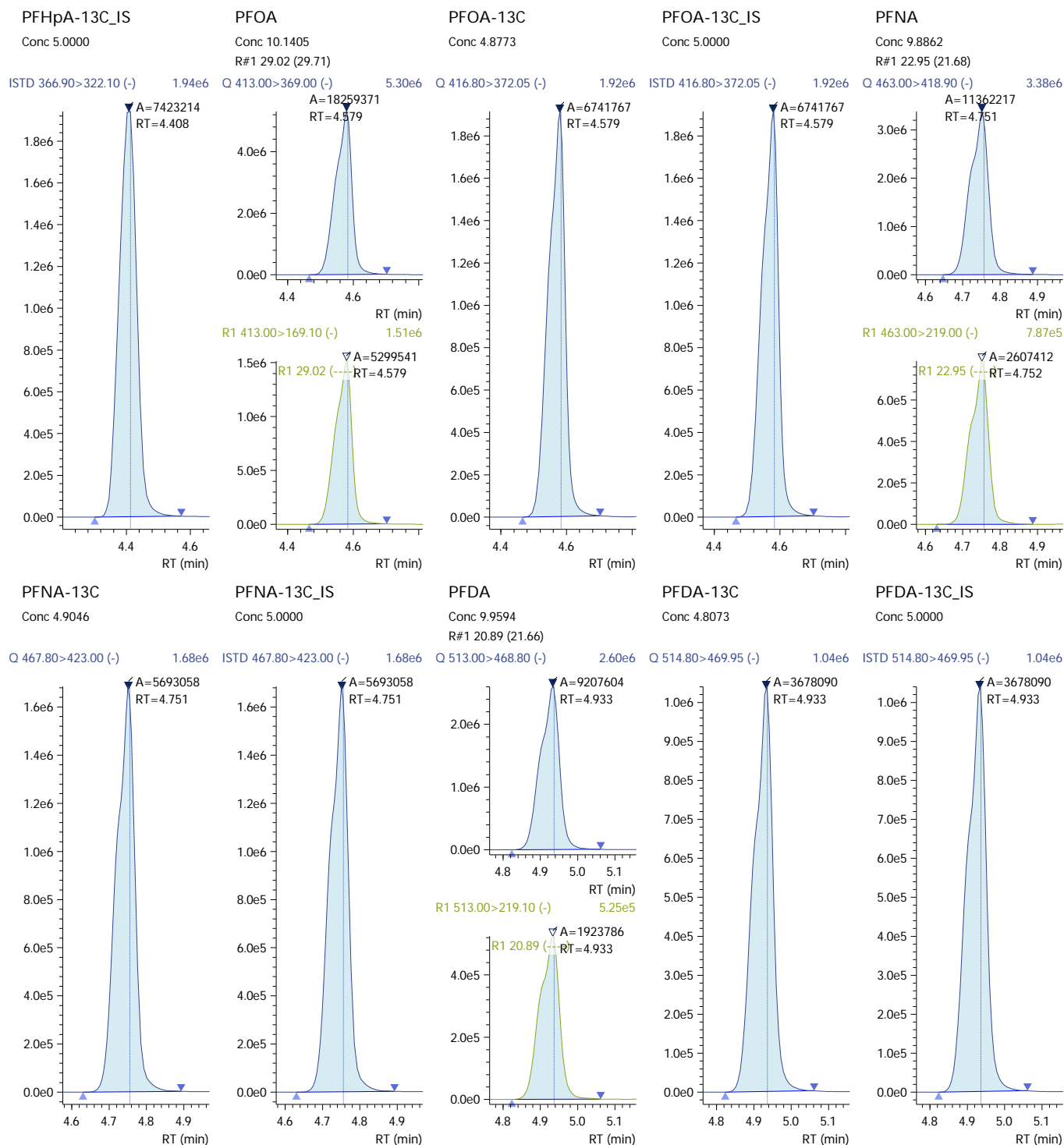


210413\_038 (continued)



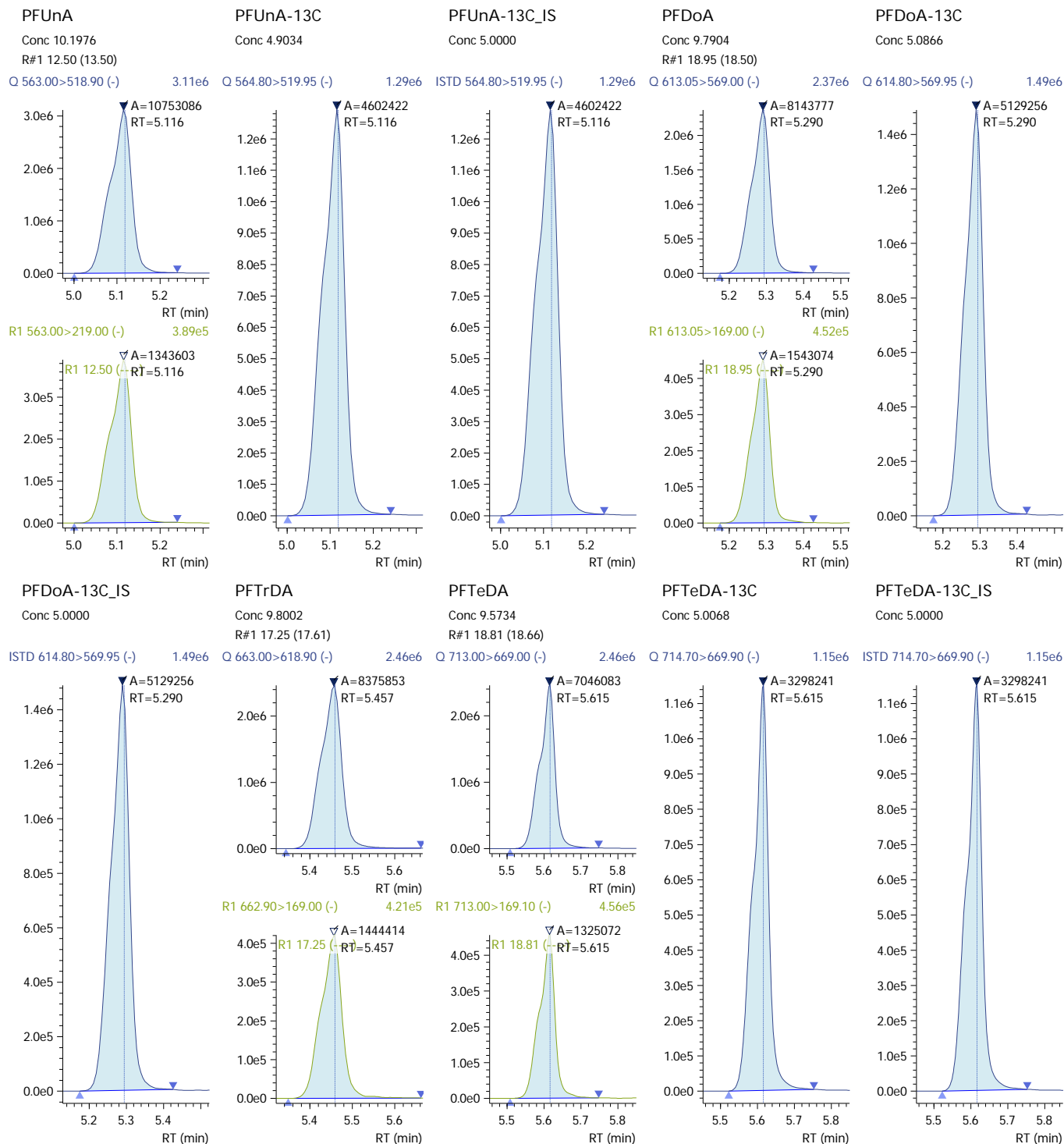


### 210413\_038 (continued)



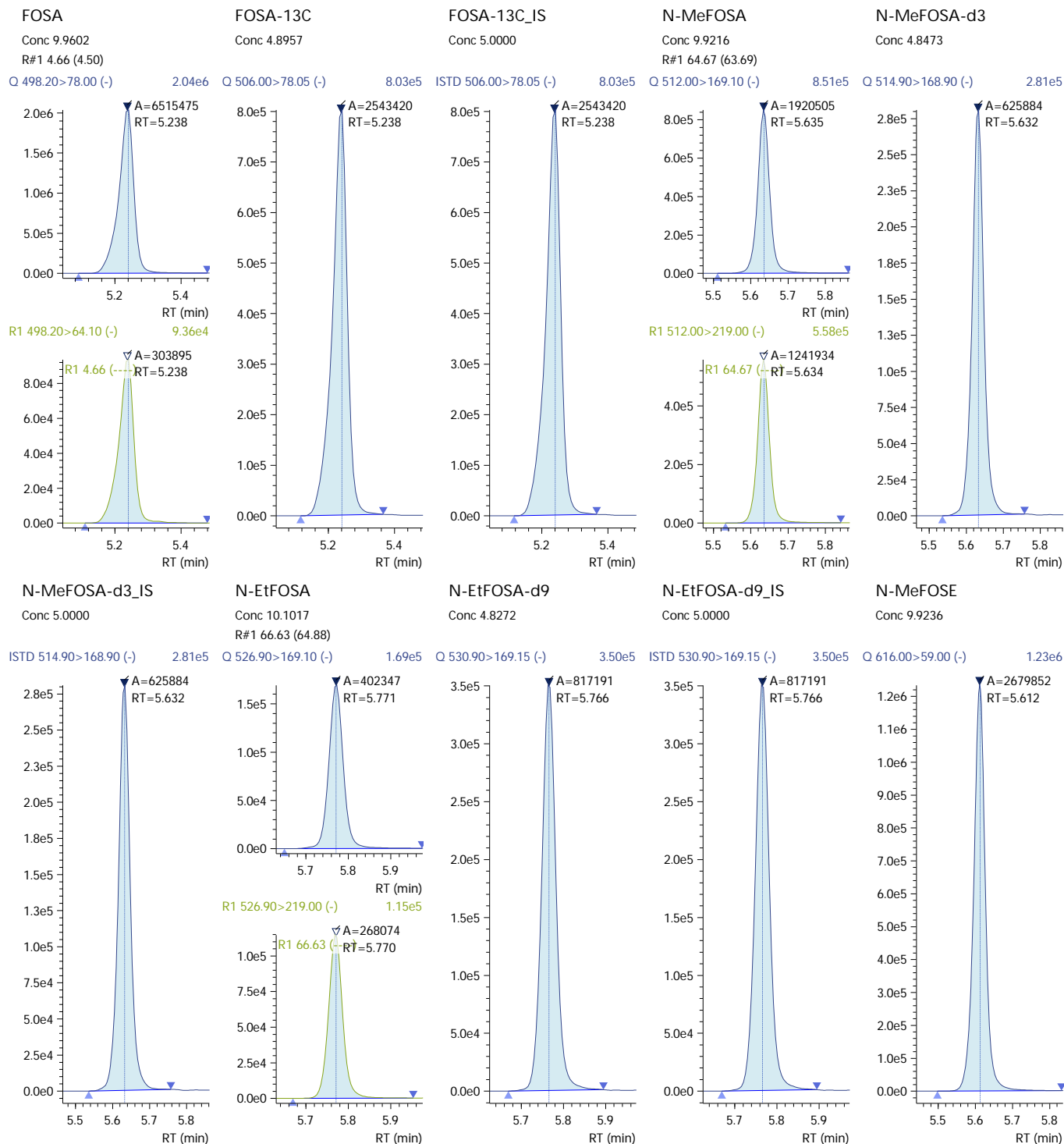


### 210413\_038 (continued)



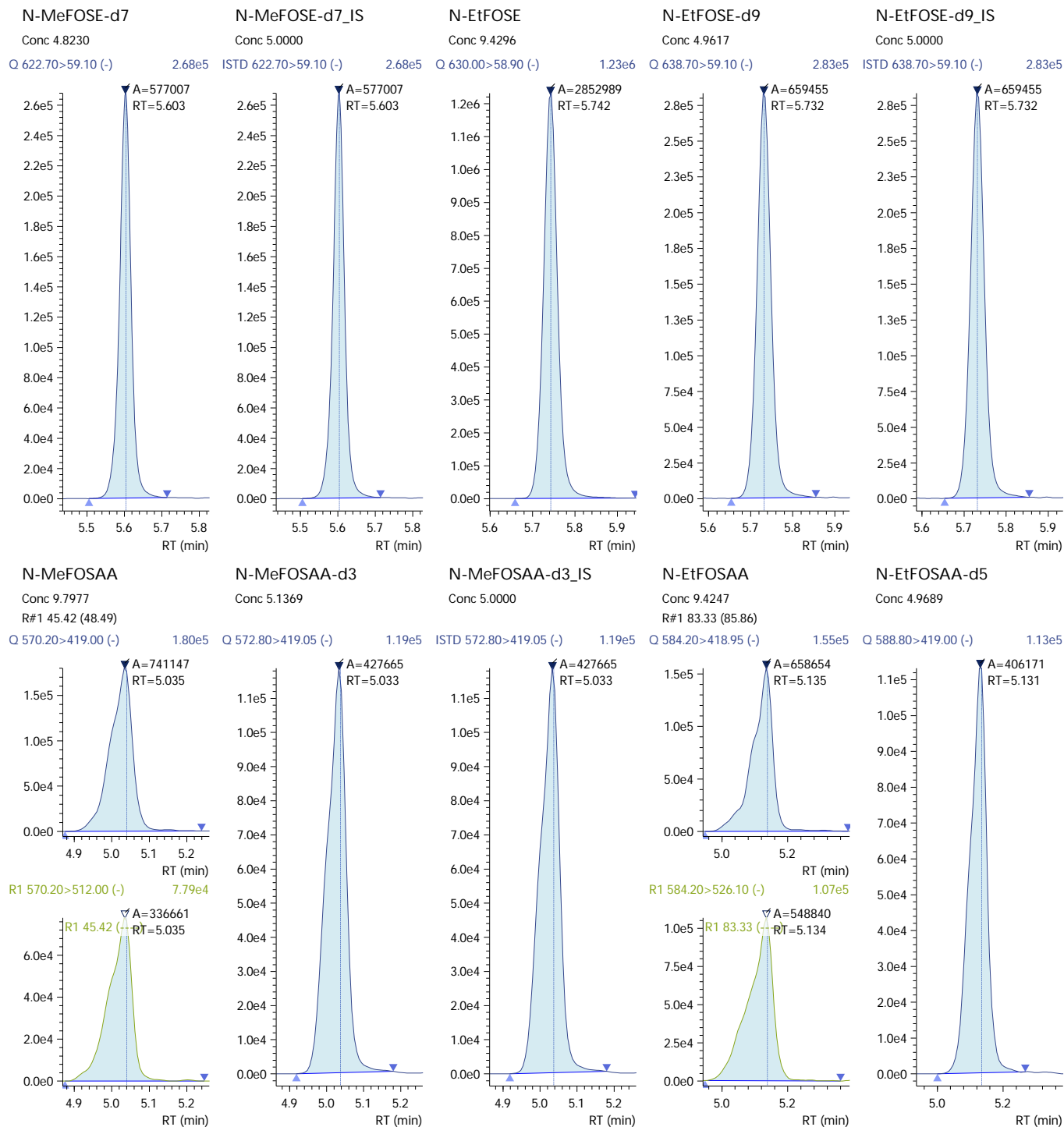


### 210413\_038 (continued)



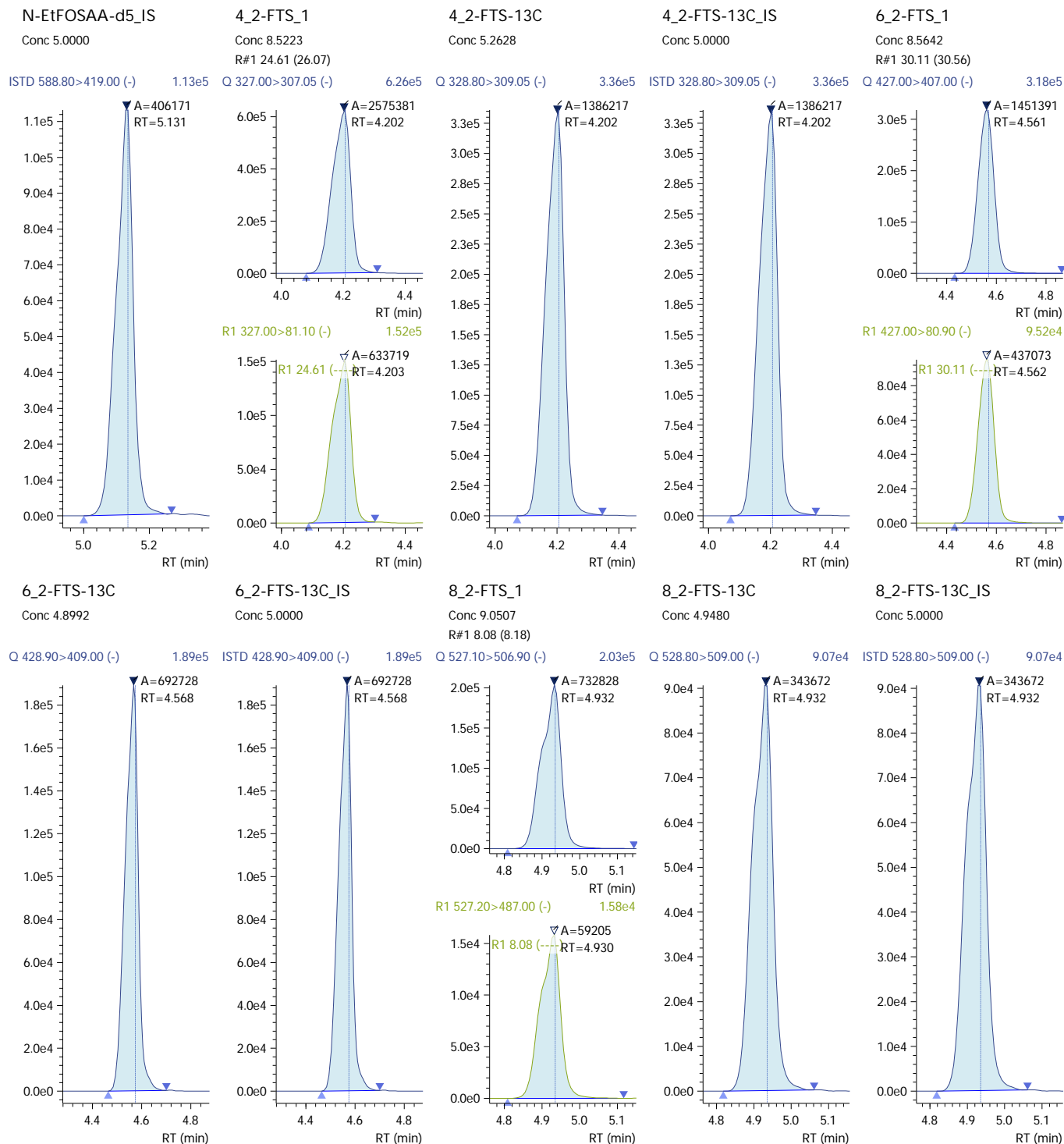


210413\_038 (continued)



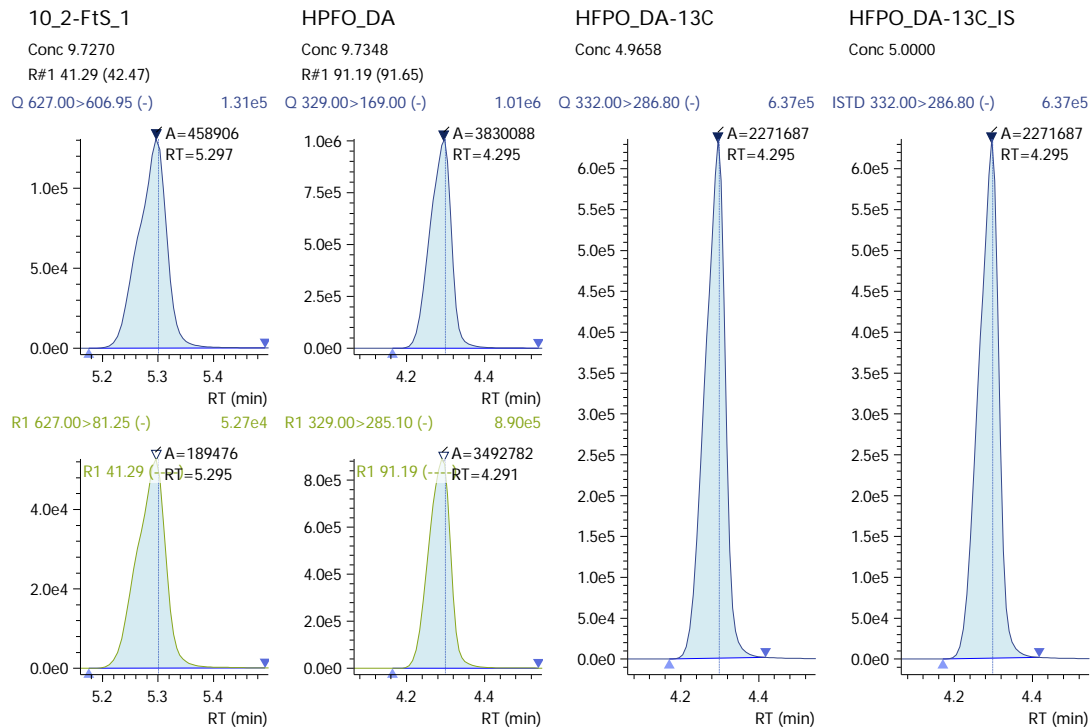


### 210413\_038 (continued)





### 210413\_038 (continued)

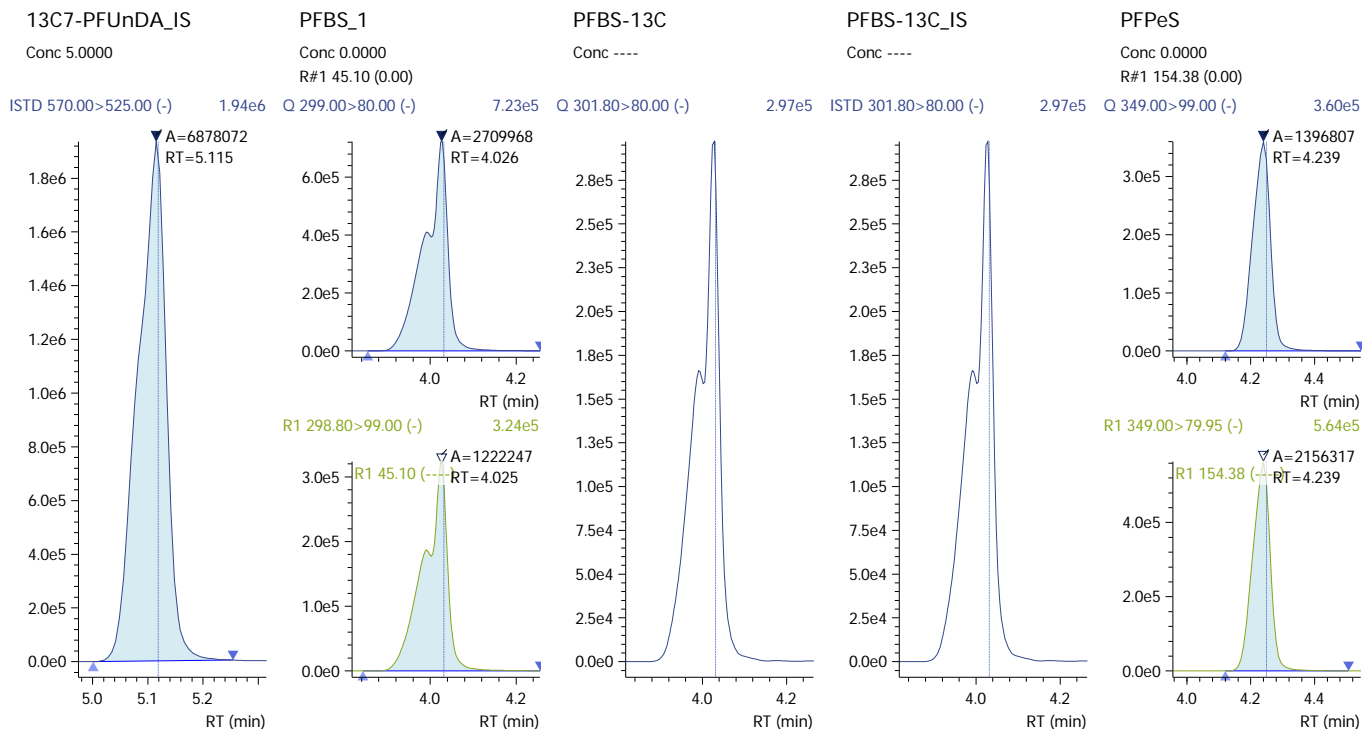






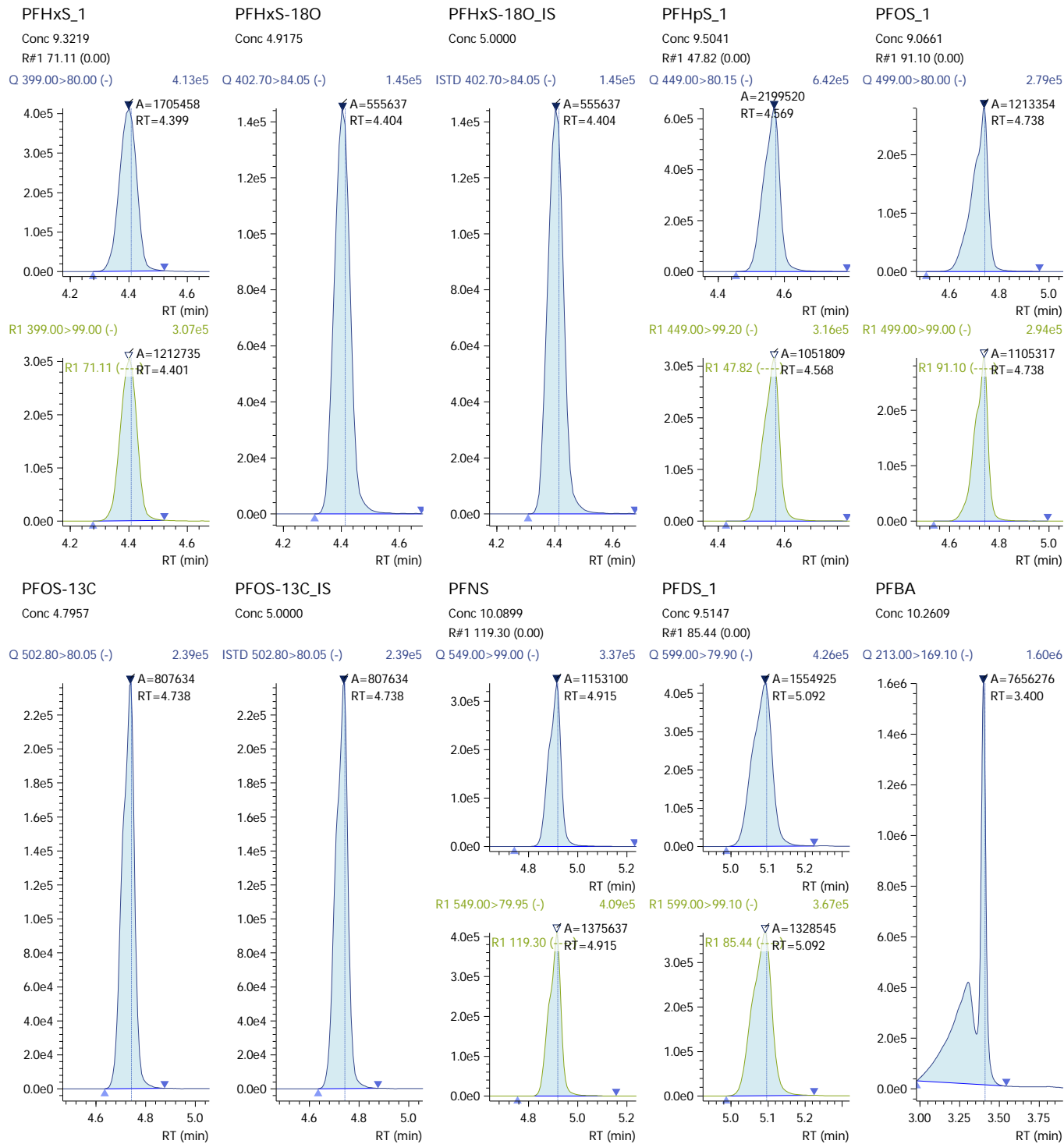
### 210413\_038

Sample ID: PFC ICAL 10 PPB  
Date Acquired: 4/13/2021 6:21:43 PM  
Acquired by: System Administrator  
Data File: 210413\_038  
Vial: 6 | Inj. Volume: 15.0000uL | Tray: 0



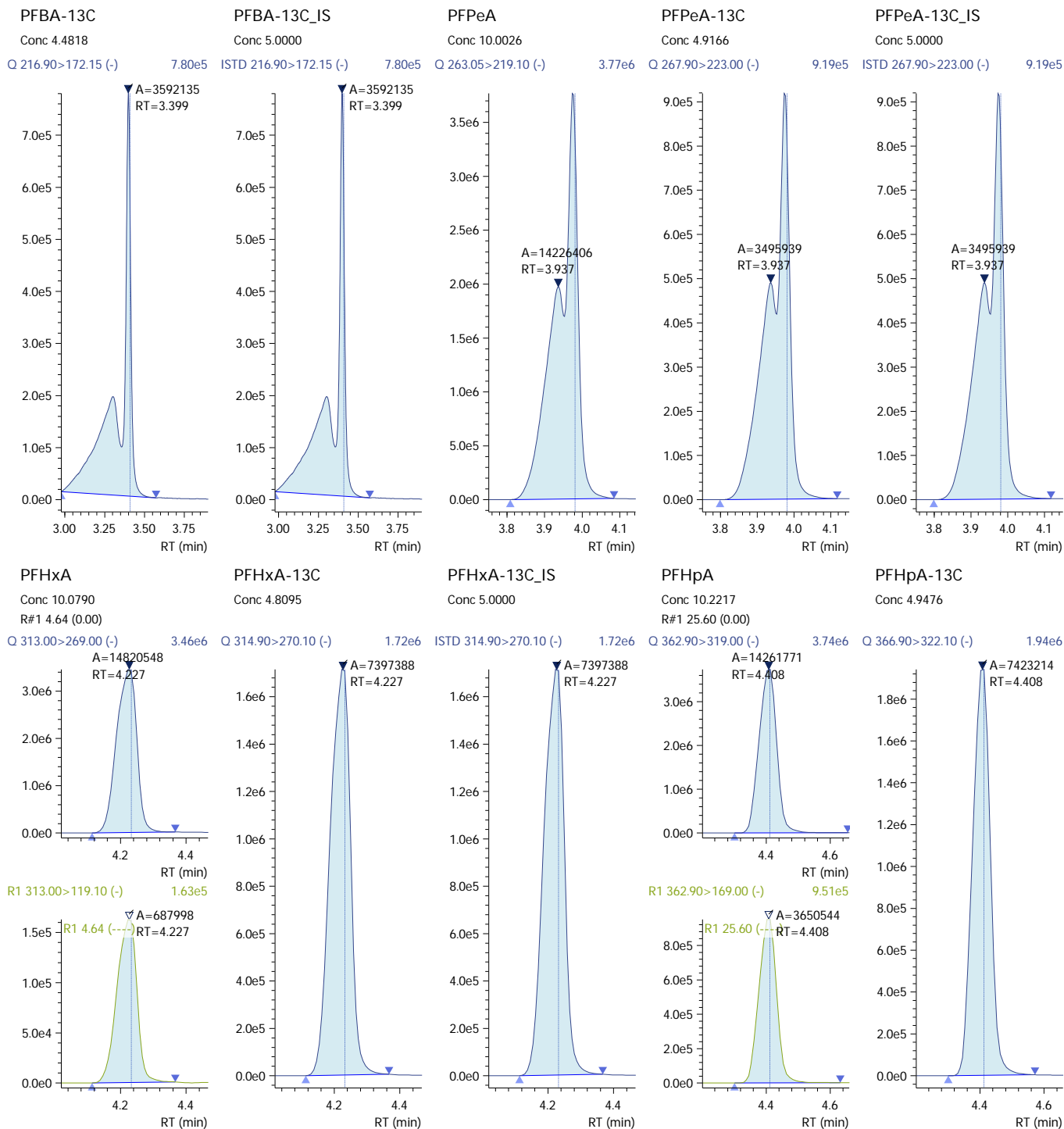


### 210413\_038 (continued)





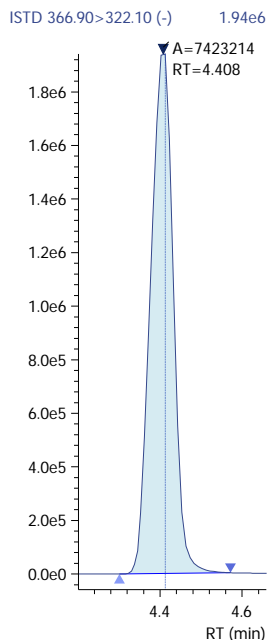
210413\_038 (continued)



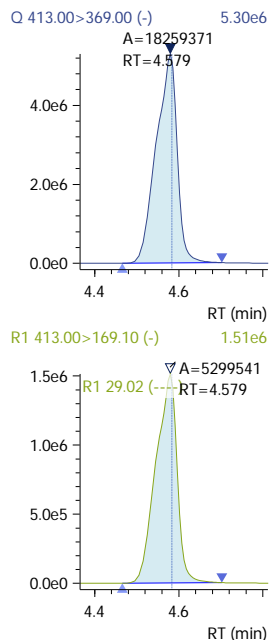


### 210413\_038 (continued)

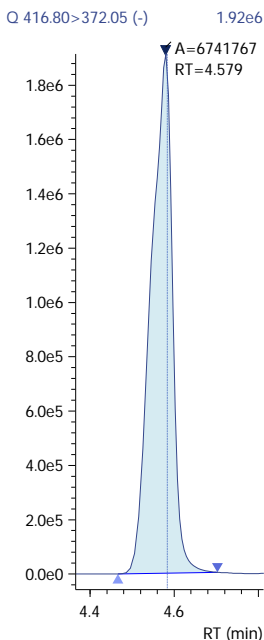
PFHpA-13C\_IS  
Conc 5.0000



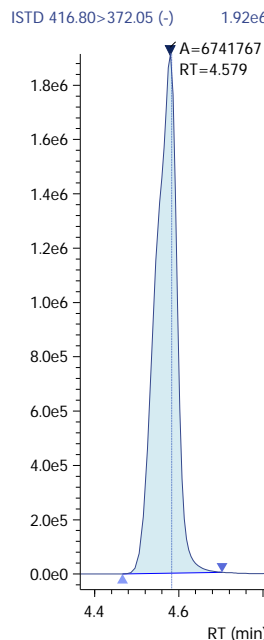
PFOA  
Conc 10.2982  
R#1 29.02 (0.00)



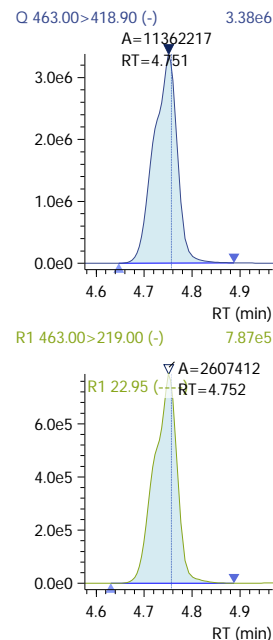
PFOA-13C  
Conc 4.8773



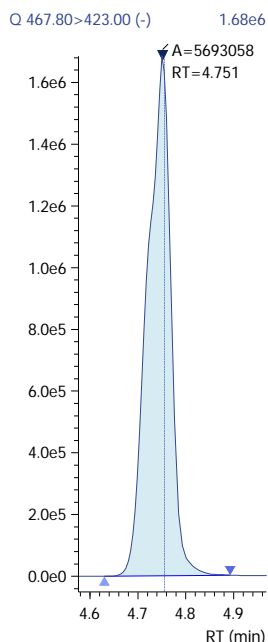
PFOA-13C\_IS  
Conc 5.0000



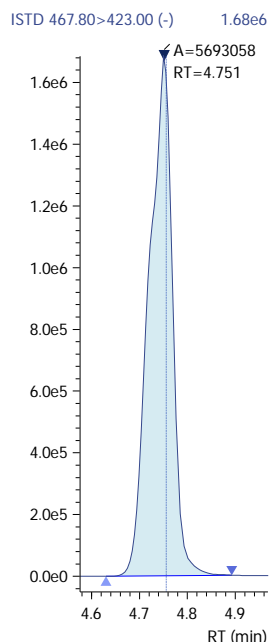
PFNA  
Conc 10.2258  
R#1 22.95 (0.00)



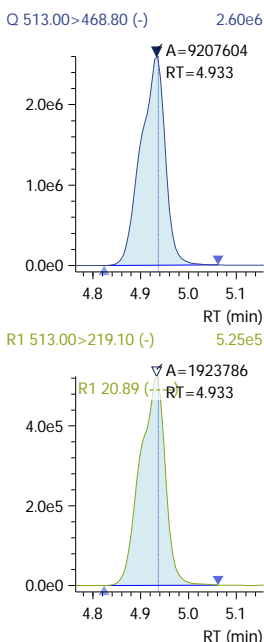
PFNA-13C  
Conc 4.9046



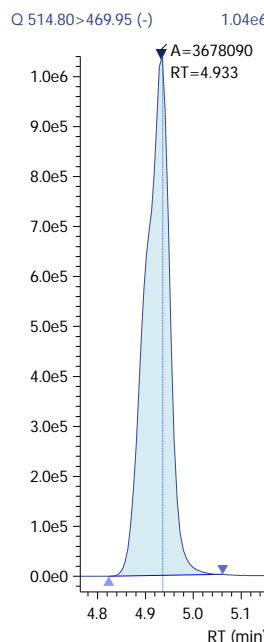
PFNA-13C\_IS  
Conc 5.0000



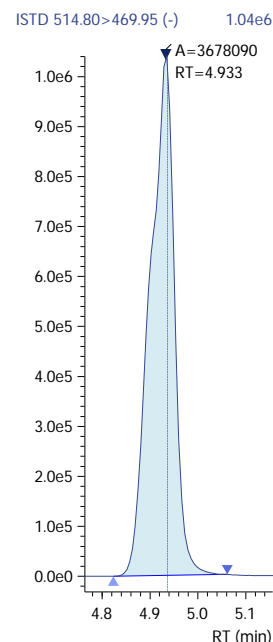
PFDA  
Conc 9.9594  
R#1 20.89 (0.00)



PFDA-13C  
Conc 4.8073

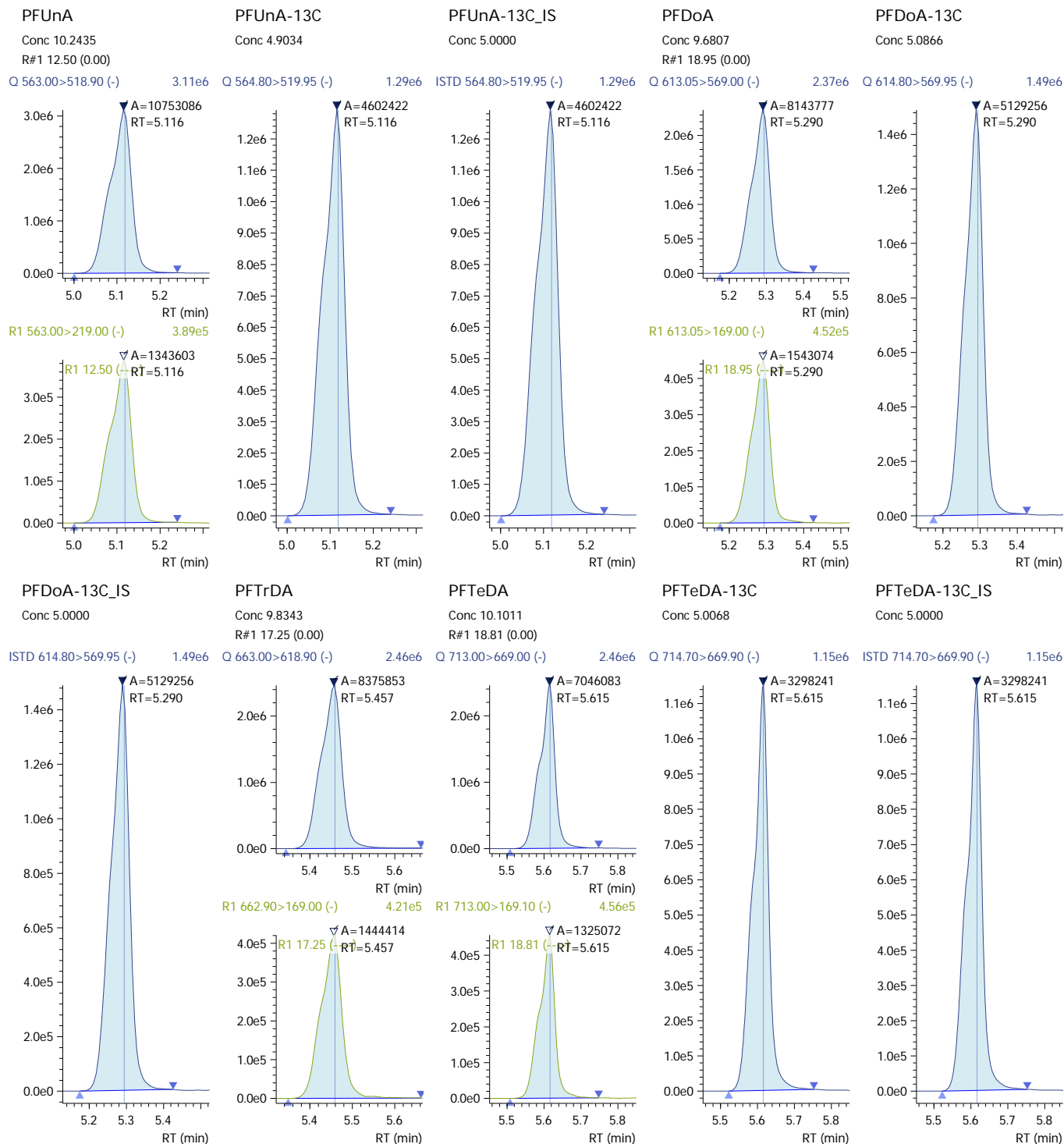


PFDA-13C\_IS  
Conc 5.0000



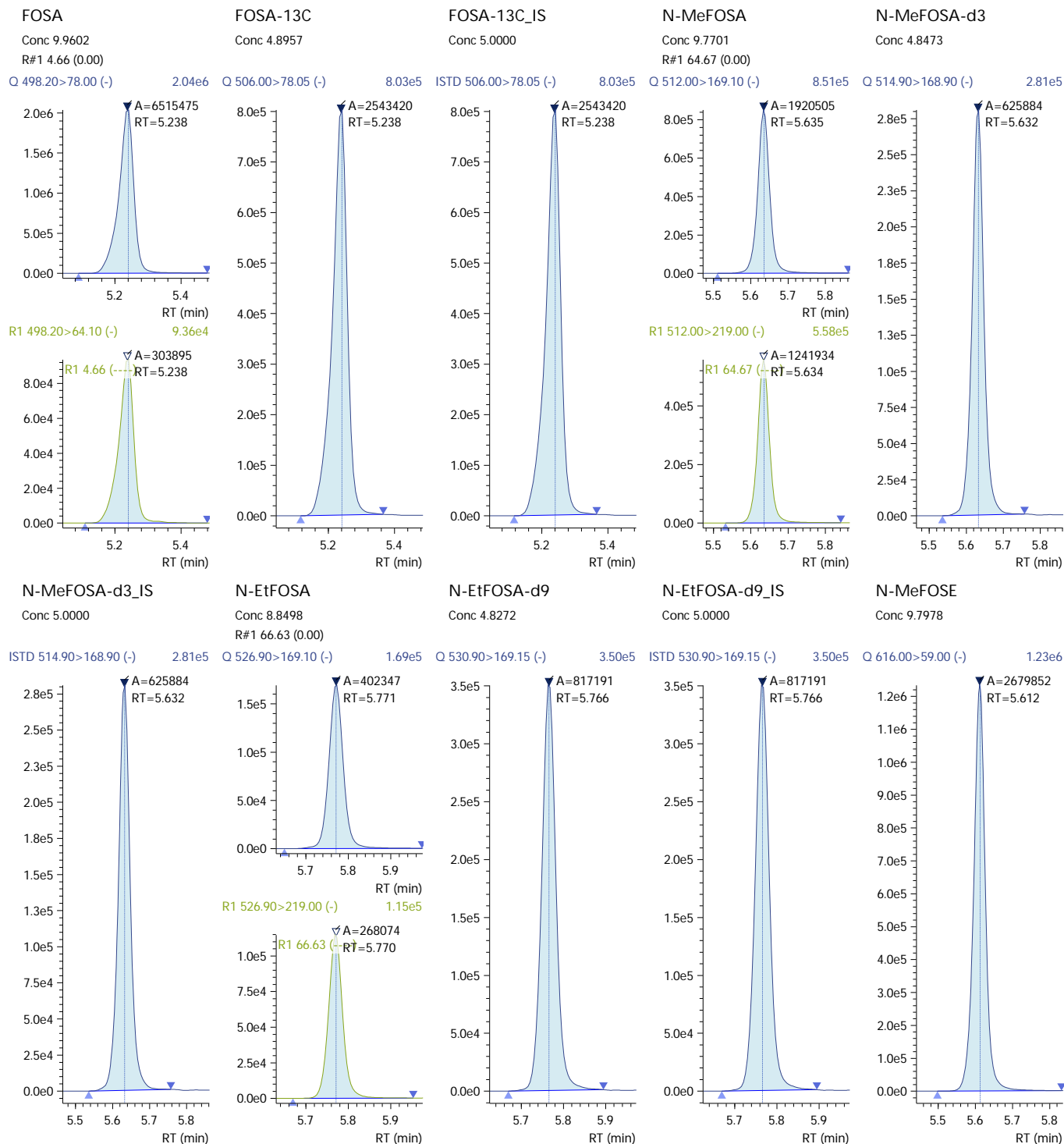


### 210413\_038 (continued)



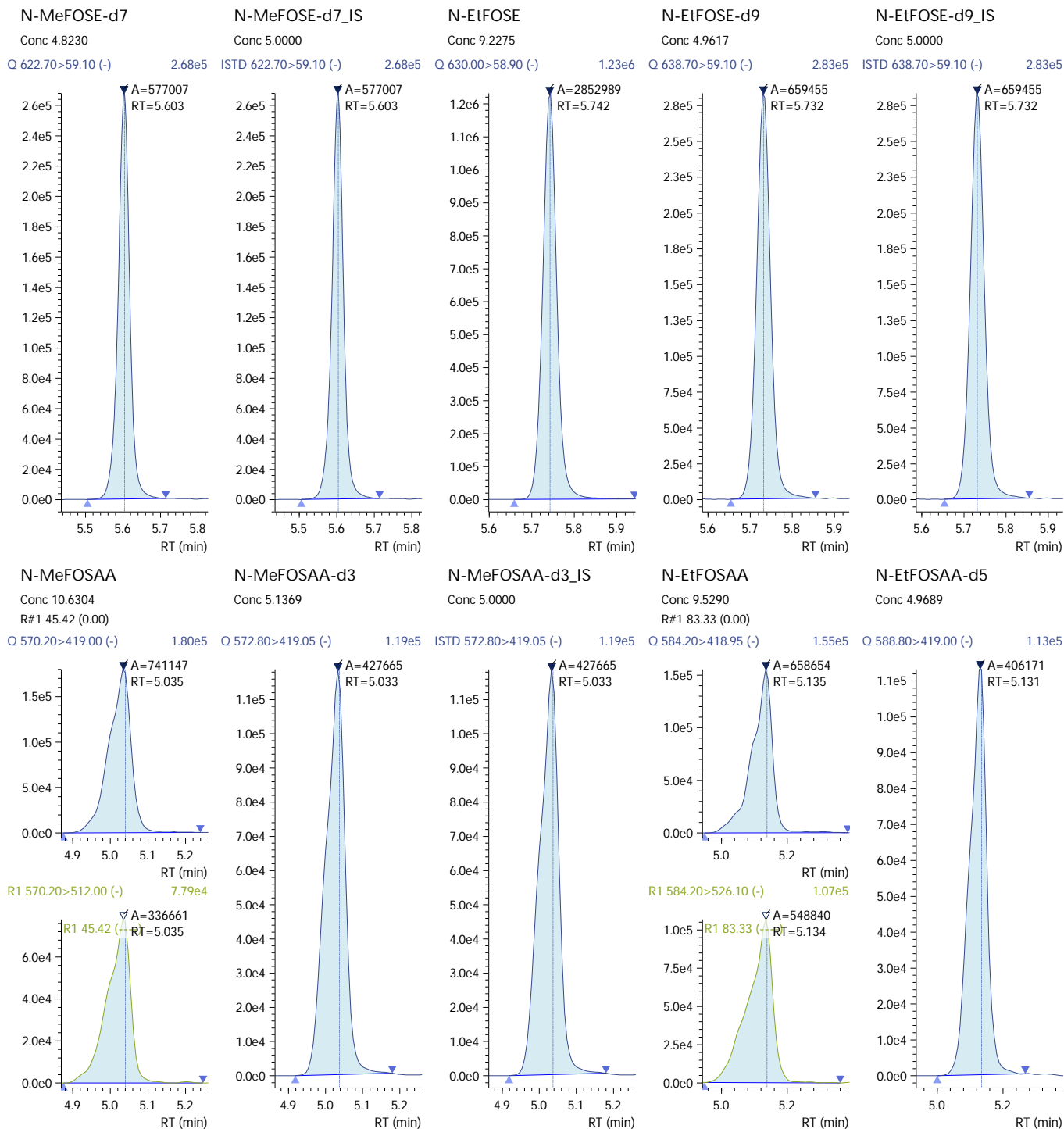


### 210413\_038 (continued)



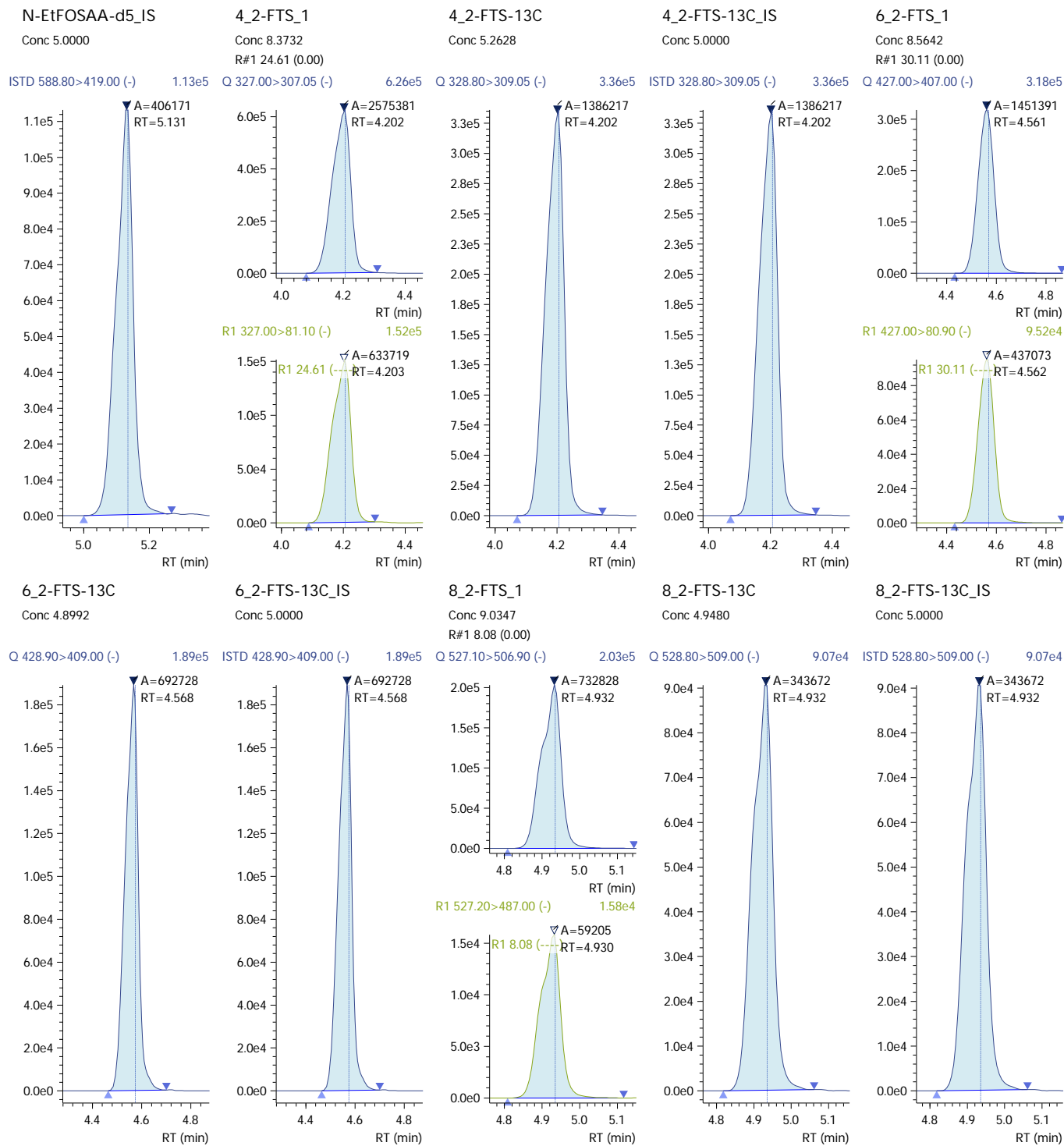


210413\_038 (continued)





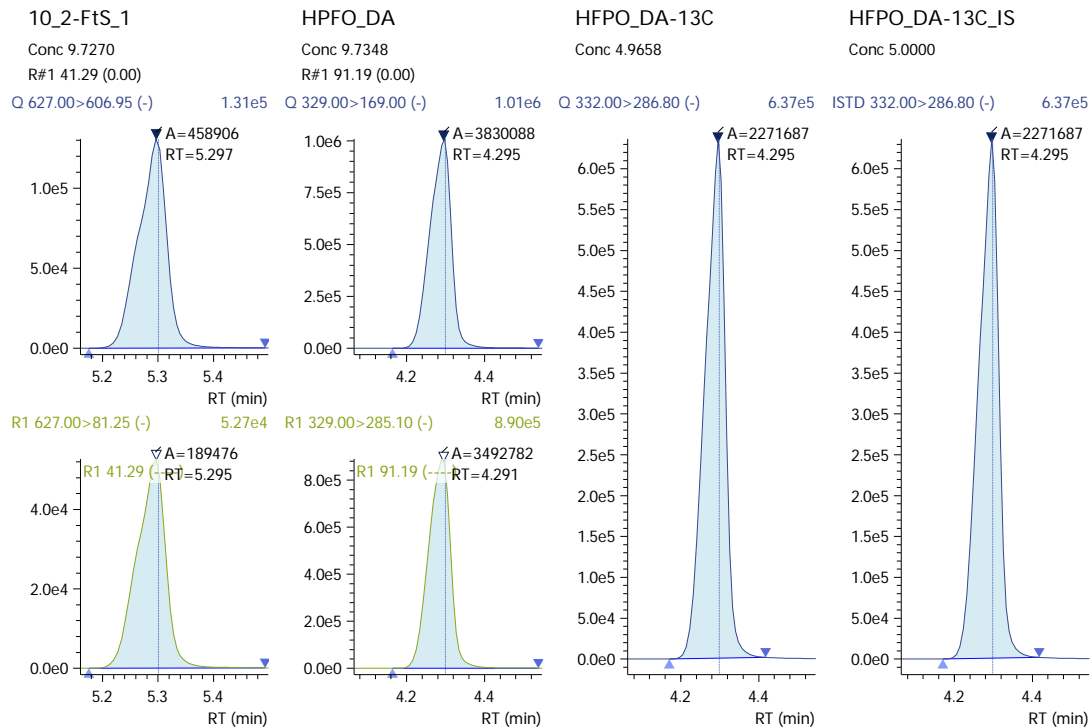
### 210413\_038 (continued)







### 210413\_038 (continued)





210413\_039

Sample ID: CCB  
 Date Acquired: 4/13/2021 6:32:11 PM  
 Acquired by: System Administrator  
 Data File: 210413\_039  
 Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.126	0.008	----	5623782	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.037	0.005	0.00	1400	564	40.29	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.038	0.006	-1.09	1043127	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.038	0.006	----	1043127	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.261	0.012	0.22	188	87	46.28	148.77	74.38 -223.15	IRr
PFHxS_1	399.00>80.00	399.00>99.00	4.420	0.012	0.00	3484	1614	46.33	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.421	0.008	-0.71	471519	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.421	0.008	----	471519	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.581	0.006	0.16	339	394	116.22	48.72	24.36-73.08	IRr
PFOS_1	499.00>80.00	499.00>99.00	4.754	0.012	0.00	612	564	92.16	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.750	0.008	-0.38	725702	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.750	0.008	----	725702	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	----	----	----	----	0	0.00	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.101	0.005	0.35	232	1052	453.95	83.83	41.92 -125.75	IRr
PFBA	213.00>169.10	----	----	----	----	----	----	----	----		
PFBA-13C	216.90>172.15	----	3.421	0.012	-1.71	3720540	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.421	0.012	----	3720540	----	----	----		
PFPeA	263.05>219.10	----	3.987	0.006	0.00	37083	----	----	----		
PFPeA-13C	267.90>223.00	----	3.987	0.006	-1.14	3189665	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.987	0.006	----	3189665	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.242	0.009	0.00	11658	1051	9.02	4.91	2.46-7.37	IRr
PFHxA-13C	314.90>270.10	----	4.243	0.011	-0.88	7361277	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.243	0.011	----	7361277	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.413	0.001	-0.01	7906	1411	17.85	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.423	0.011	-0.70	6826944	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.423	0.011	----	6826944	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.592	0.008	0.00	8404	3271	38.92	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.591	0.007	-0.54	6433667	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.591	0.007	----	6433667	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	----	----	----	----	0	0.00	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



## 210413\_039 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.763	0.007	-0.36	4691408	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.763	0.007	----	4691408	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.943	0.006	0.00	5041	701	13.90	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.945	0.009	-0.18	3551900	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.945	0.009	----	3551900	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.128	0.009	0.00	4449	864	19.41	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.126	0.007	0.00	4368202	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.126	0.007	----	4368202	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.301	0.008	0.00	4800	391	8.14	18.50	9.25-27.75	IRr
PFDaA-13C	614.80>569.95	----	5.302	0.008	0.18	4530475	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.302	0.008	----	4530475	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	5.472	0.013	-0.15	6428	561	8.73	17.61	8.8-26.41	IRr
PFTeDA	713.00>669.00	713.00>169.10	5.626	0.010	0.00	11013	1291	11.72	18.66	9.33-27.99	
PFTeDA-13C	714.70>669.90	----	5.624	0.008	0.50	2870916	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.624	0.008	----	2870916	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.243	0.002	-0.01	4509	124	2.75	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.248	0.007	0.12	2077691	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.248	0.007	----	2077691	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.644	0.009	0.01	1548	467	30.17	63.69	31.85-95.54	IRr
N-MeFOSA-d3	514.90>168.90	----	5.639	0.006	0.51	531725	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.639	0.006	----	531725	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.796	0.025	0.02	664	213	32.08	64.88	32.44-97.33	IRr
N-EtFOSA-d9	530.90>169.15	----	5.774	0.008	0.65	658805	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.774	0.008	----	658805	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.622	0.009	0.01	1122	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.612	0.008	0.49	430515	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.612	0.008	----	430515	----	----	----		
N-EtFOSE	630.00>58.90	----	5.750	0.008	0.01	1999	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.740	0.008	0.61	450530	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.740	0.008	----	450530	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	----	----	----	----	0	0.00	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.044	0.007	-0.08	369686	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.044	0.007	----	369686	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	----	----	----	----	0	0.00	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.142	0.007	0.02	359301	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.142	0.007	----	359301	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.199	-0.007	-0.02	526	514	97.90	26.07	13.03-39.1	IRr
4_2-FTS-13C	328.80>309.05	----	4.217	0.010	-0.91	1187970	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_039 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.217	0.010	----	1187970	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.578	0.009	0.00	341	353	103.52	30.56	15.28-45.84	IRr
6_2-FTS-13C	428.90>409.00	----	4.582	0.008	-0.54	656601	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.582	0.008	----	656601	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.946	0.011	0.00	254	0	0.00	8.18	4.09-12.27	IRr
8_2-FTS-13C	528.80>509.00	----	4.945	0.010	-0.18	295098	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.945	0.010	----	295098	----	----	----	0-0	
10_2-Fts_1	627.00>606.95	627.00>81.25	5.312	0.011	0.37	100	32	32.00	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.305	0.006	0.00	1027	704	68.55	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.307	0.008	-0.82	1979913	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.307	0.008	----	1979913	----	----	----		

Flag ID key: IRr: Ion Ratio (Relative)



210413\_039

Sample ID: CCB  
 Date Acquired: 4/13/2021 6:32:11 PM  
 Acquired by: System Administrator  
 Data File: 210413\_039  
 Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1

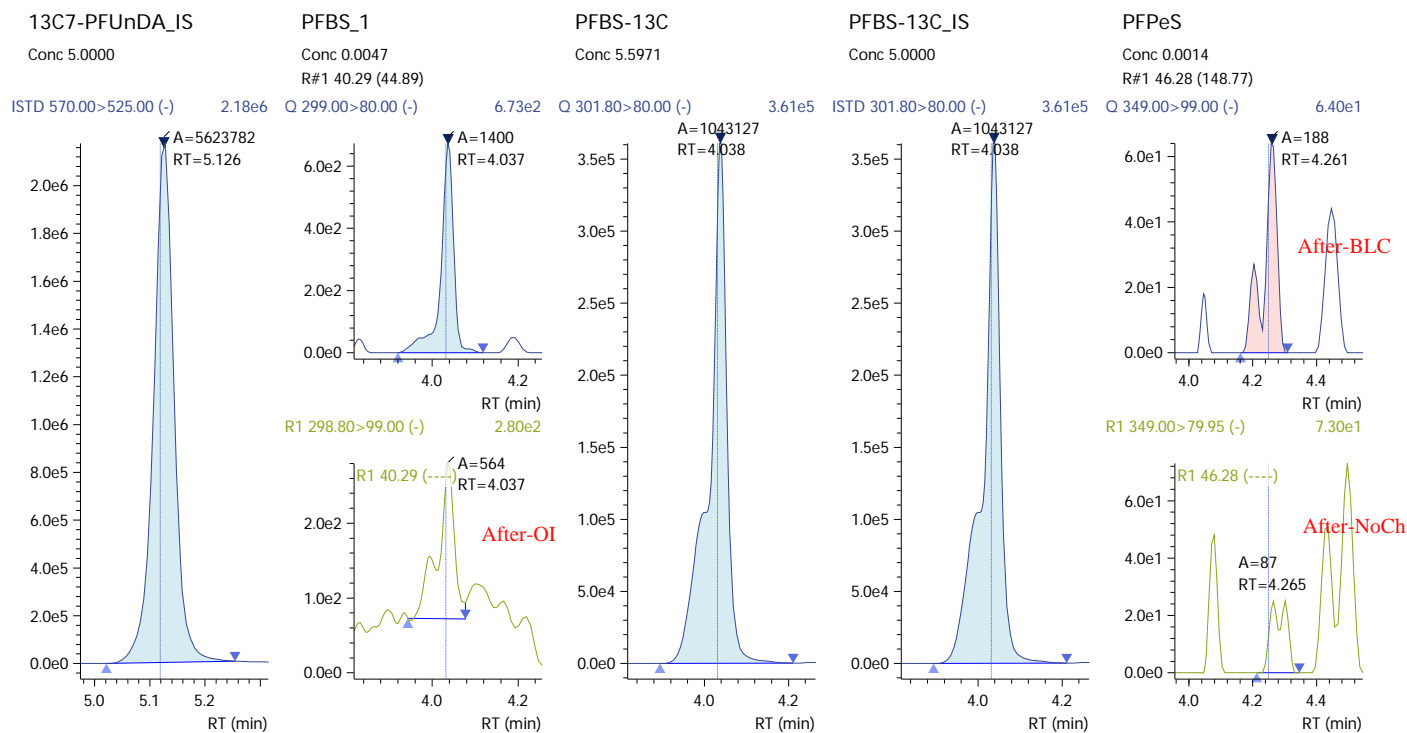
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.126	5623782	5623782	----	----	5.0000	ng/mL
PFBS_1	Auto	4.037	1400	1043127	PFBS-13C_IS	----	0.0047	ng/mL
PFBS-13C	Auto	4.038	1043127	5623782	13C7-PFUnDA_IS	----	5.5971	ng/mL
PFBS-13C_IS	Auto	4.038	1043127	1043127	----	----	5.0000	ng/mL
PFPeS	M	4.261	188	1043127	PFBS-13C_IS	----	0.0014	ng/mL
PFHxS_1	Auto	4.420	3484	471519	PFHxS-18O_IS	----	-0.0002	ng/mL
PFHxS-18O	Auto	4.421	471519	5623782	13C7-PFUnDA_IS	----	5.1038	ng/mL
PFHxS-18O_IS	Auto	4.421	471519	471519	----	----	5.0000	ng/mL
PFHpS_1	M	4.581	339	471519	PFHxS-18O_IS	----	0.0017	ng/mL
PFOS_1	Auto	4.754	612	725702	PFOS-13C_IS	----	0.0051	ng/mL
PFOS-13C	Auto	4.750	725702	5623782	13C7-PFUnDA_IS	----	5.2703	ng/mL
PFOS-13C_IS	Auto	4.750	725702	725702	----	----	5.0000	ng/mL
PFNS	ND(W/B)	----	----	725702	PFOS-13C_IS	----	----	ng/mL
PFDS_1	M	5.101	232	725702	PFOS-13C_IS	----	0.0016	ng/mL
PFBA	ND(W/B)	----	----	3720540	PFBA-13C_IS	----	----	ng/mL
PFBA-13C	Auto	3.421	3720540	5623782	13C7-PFUnDA_IS	----	5.6774	ng/mL
PFBA-13C_IS	Auto	3.421	3720540	3720540	----	----	5.0000	ng/mL
PFPeA	Auto	3.987	37083	3189665	PFPeA-13C_IS	----	0.0003	ng/mL
PFPeA-13C	Auto	3.987	3189665	5623782	13C7-PFUnDA_IS	----	5.4863	ng/mL
PFPeA-13C_IS	Auto	3.987	3189665	3189665	----	----	5.0000	ng/mL
PFHxA	Auto	4.242	11658	7361277	PFHxA-13C_IS	----	0.0076	ng/mL
PFHxA-13C	Auto	4.243	7361277	5623782	13C7-PFUnDA_IS	----	5.8534	ng/mL
PFHxA-13C_IS	Auto	4.243	7361277	7361277	----	----	5.0000	ng/mL
PFHpA	M	4.413	7906	6826944	PFHpA-13C_IS	----	0.0058	ng/mL
PFHpA-13C	Auto	4.423	6826944	5623782	13C7-PFUnDA_IS	----	5.5650	ng/mL
PFHpA-13C_IS	Auto	4.423	6826944	6826944	----	----	5.0000	ng/mL
PFOA	M	4.592	8404	6433667	PFOA-13C_IS	----	0.0049	ng/mL
PFOA-13C	Auto	4.591	6433667	5623782	13C7-PFUnDA_IS	----	5.6925	ng/mL
PFOA-13C_IS	Auto	4.591	6433667	6433667	----	----	5.0000	ng/mL
PFNA	ND(W/B)	----	----	4691408	PFNA-13C_IS	----	----	ng/mL
PFNA-13C	Auto	4.763	4691408	5623782	13C7-PFUnDA_IS	----	4.9431	ng/mL
PFNA-13C_IS	Auto	4.763	4691408	4691408	----	----	5.0000	ng/mL
PFDA	M	4.943	5041	3551900	PFDA-13C_IS	----	0.0056	ng/mL
PFDA-13C	Auto	4.945	3551900	5623782	13C7-PFUnDA_IS	----	5.6778	ng/mL
PFDA-13C_IS	Auto	4.945	3551900	3551900	----	----	5.0000	ng/mL
PFUnA	M	5.128	4449	4368202	PFUnA-13C_IS	----	0.0044	ng/mL
PFUnA-13C	Auto	5.126	4368202	5623782	13C7-PFUnDA_IS	----	5.6919	ng/mL
PFUnA-13C_IS	Auto	5.126	4368202	4368202	----	----	5.0000	ng/mL
PFDaA	Auto	5.301	4800	4530475	PFDaA-13C_IS	----	0.0065	ng/mL
PFDaA-13C	Auto	5.302	4530475	5623782	13C7-PFUnDA_IS	----	5.4949	ng/mL
PFDaA-13C_IS	Auto	5.302	4530475	4530475	----	----	5.0000	ng/mL
PFTeDA	M	5.472	6428	2870916	PFTeDA-13C_IS	----	0.0086	ng/mL
PFTeDA	M	5.626	11013	2870916	PFTeDA-13C_IS	----	0.0172	ng/mL
PFTeDA-13C	Auto	5.624	2870916	5623782	13C7-PFUnDA_IS	----	5.3302	ng/mL
PFTeDA-13C_IS	Auto	5.624	2870916	2870916	----	----	5.0000	ng/mL
FOSA	Auto	5.243	4509	2077691	FOSA-13C_IS	----	0.0084	ng/mL
FOSA-13C	Auto	5.248	2077691	5623782	13C7-PFUnDA_IS	----	4.8912	ng/mL
FOSA-13C_IS	Auto	5.248	2077691	2077691	----	----	5.0000	ng/mL
N-MeFOSA	M	5.644	1548	531725	N-MeFOSA-d3_IS	----	0.0094	ng/mL
N-MeFOSA-d3	Auto	5.639	531725	5623782	13C7-PFUnDA_IS	----	5.0366	ng/mL
N-MeFOSA-d3_IS	Auto	5.639	531725	531725	----	----	5.0000	ng/mL
N-EtFOSA	M	5.796	664	658805	N-EtFOSA-d9_IS	----	-0.0097	ng/mL
N-EtFOSA-d9	Auto	5.774	658805	5623782	13C7-PFUnDA_IS	----	4.7596	ng/mL
N-EtFOSA-d9_IS	Auto	5.774	658805	658805	----	----	5.0000	ng/mL



### 210413\_039 (continued)

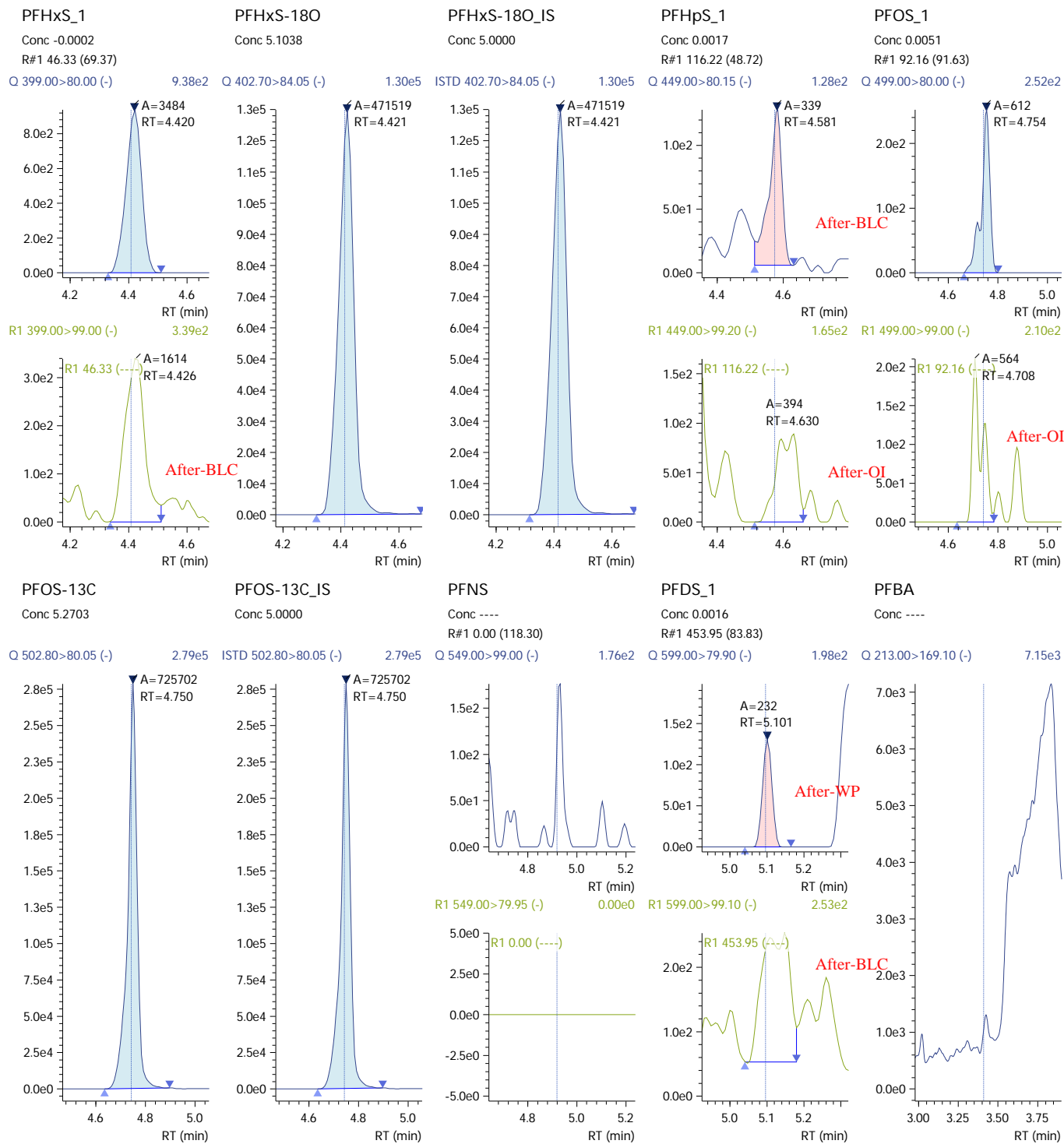
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.622	1122	430515	N-MeFOSE-d7_IS	----	0.0056	ng/mL
N-MeFOSE-d7	Auto	5.612	430515	5623782	13C7-PFUnDA_IS	----	4.4011	ng/mL
N-MeFOSE-d7_IS	Auto	5.612	430515	430515	----	----	5.0000	ng/mL
N-EtFOSE	M	5.750	1999	450530	N-EtFOSE-d9_IS	----	0.0097	ng/mL
N-EtFOSE-d9	Auto	5.740	450530	5623782	13C7-PFUnDA_IS	----	4.1457	ng/mL
N-EtFOSE-d9_IS	Auto	5.740	450530	450530	----	----	5.0000	ng/mL
N-MeFOSAA	ND(W/B)	----	----	369686	N-MeFOSAA-d3_IS	----	----	ng/mL
N-MeFOSAA-d3	Auto	5.044	369686	5623782	13C7-PFUnDA_IS	----	5.4309	ng/mL
N-MeFOSAA-d3_IS	Auto	5.044	369686	369686	----	----	5.0000	ng/mL
N-EtFOSAA	ND(W/B)	----	----	359301	N-EtFOSAA-d5_IS	----	----	ng/mL
N-EtFOSAA-d5	Auto	5.142	359301	5623782	13C7-PFUnDA_IS	----	5.3759	ng/mL
N-EtFOSAA-d5_IS	Auto	5.142	359301	359301	----	----	5.0000	ng/mL
4_2-FTS_1	MI R1	4.199	526	1187970	4_2-FTS-13C_IS	----	0.0020	ng/mL
4_2-FTS-13C	Auto	4.217	1187970	5623782	13C7-PFUnDA_IS	----	5.5161	ng/mL
4_2-FTS-13C_IS	Auto	4.217	1187970	1187970	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.578	341	656601	6_2-FTS-13C_IS	----	0.0021	ng/mL
6_2-FTS-13C	Auto	4.582	656601	5623782	13C7-PFUnDA_IS	----	5.6794	ng/mL
6_2-FTS-13C_IS	Auto	4.582	656601	656601	----	----	5.0000	ng/mL
8_2-FTS_1	Auto	4.946	254	295098	8_2-FTS-13C_IS	----	0.0037	ng/mL
8_2-FTS-13C	Auto	4.945	295098	5623782	13C7-PFUnDA_IS	----	5.1963	ng/mL
8_2-FTS-13C_IS	Auto	4.945	295098	295098	----	----	5.0000	ng/mL
10_2-FTS_1	M	5.312	100	295098	8_2-FTS-13C_IS	----	0.0025	ng/mL
HPFO_DA	M	4.305	1027	1979913	HPFO_DA-13C_IS	----	0.0030	ng/mL
HPFO_DA-13C	Auto	4.307	1979913	5623782	13C7-PFUnDA_IS	----	5.2932	ng/mL
HPFO_DA-13C_IS	Auto	4.307	1979913	1979913	----	----	5.0000	ng/mL



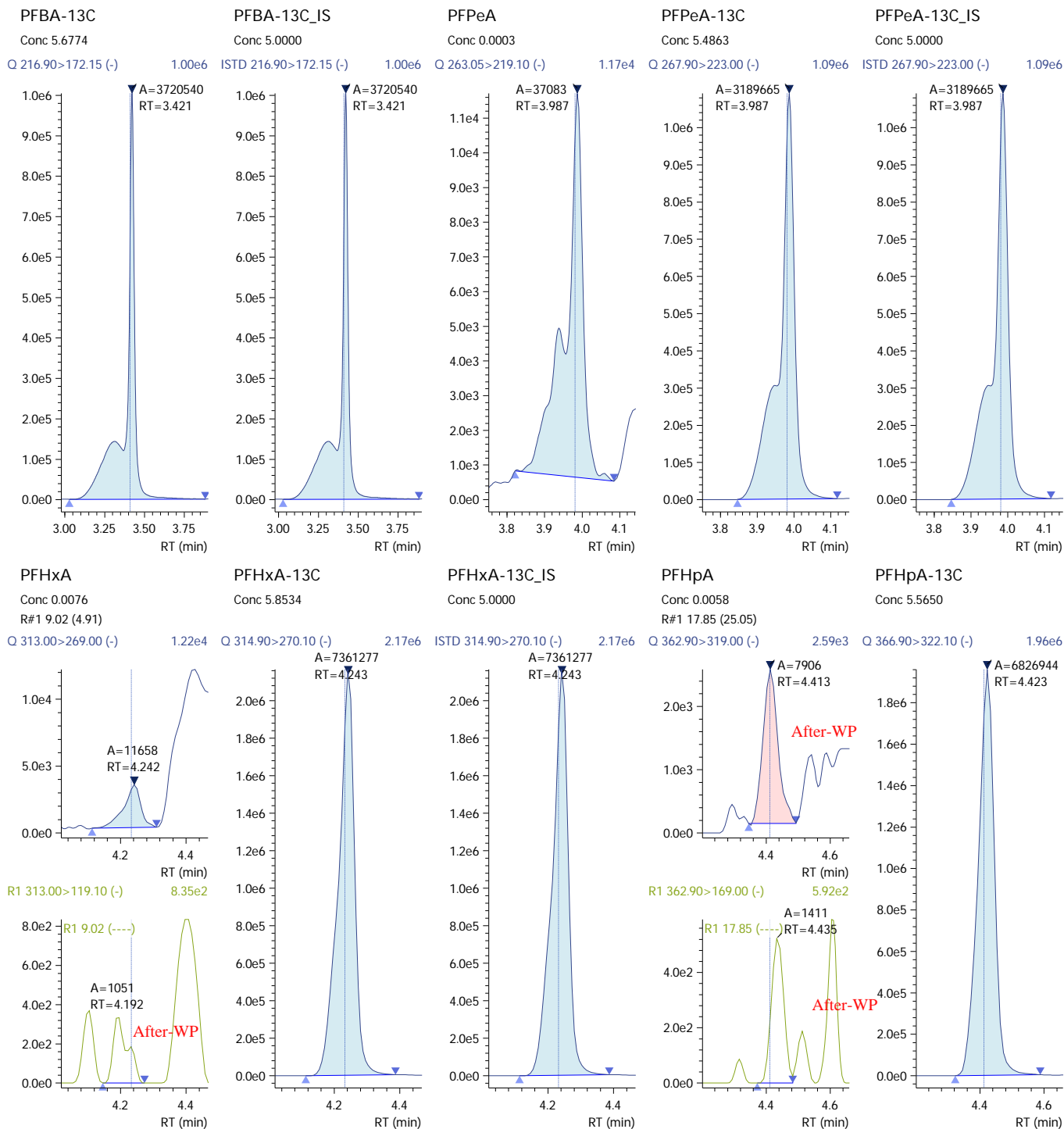


### 210413\_039 (continued)





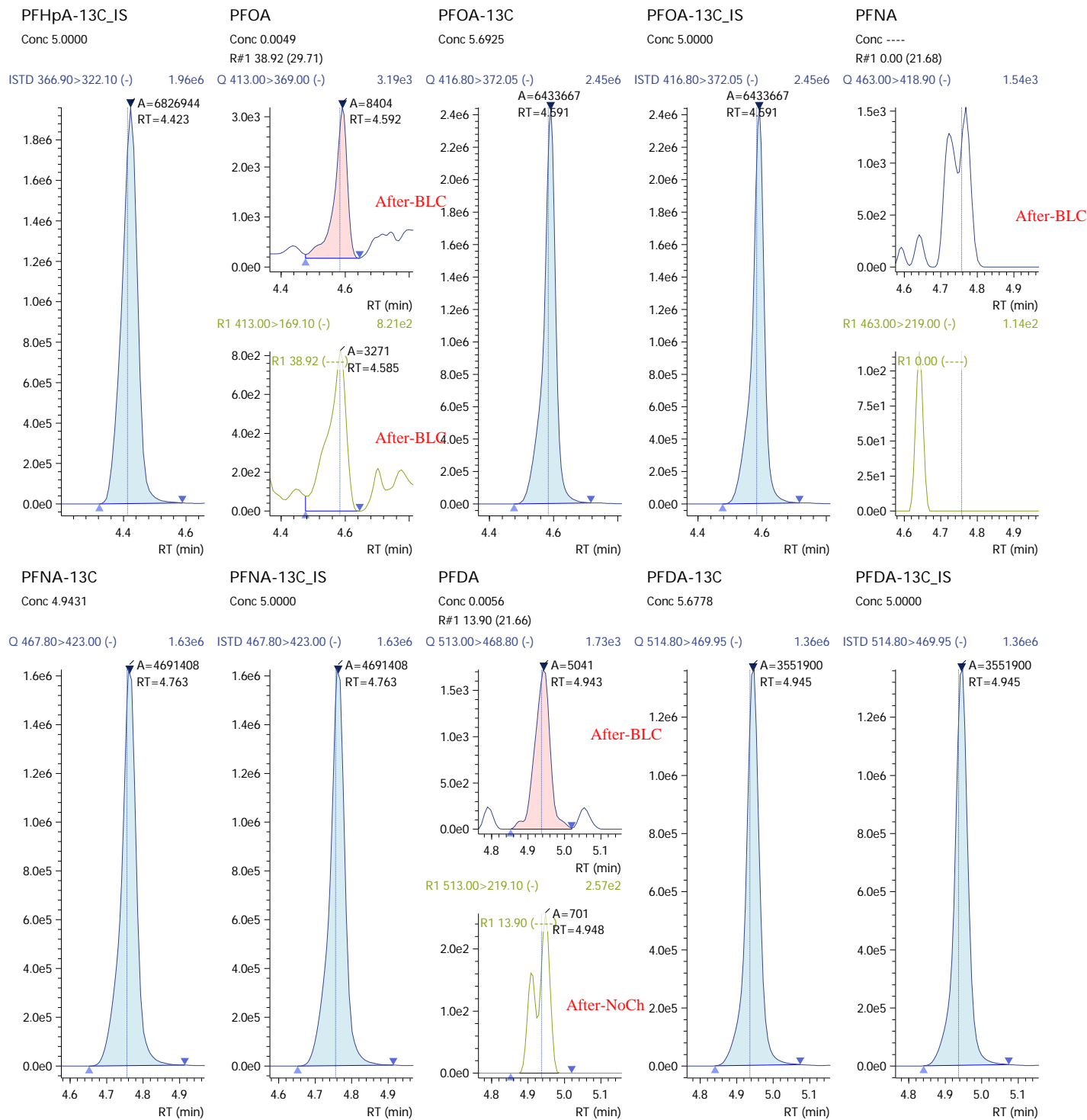
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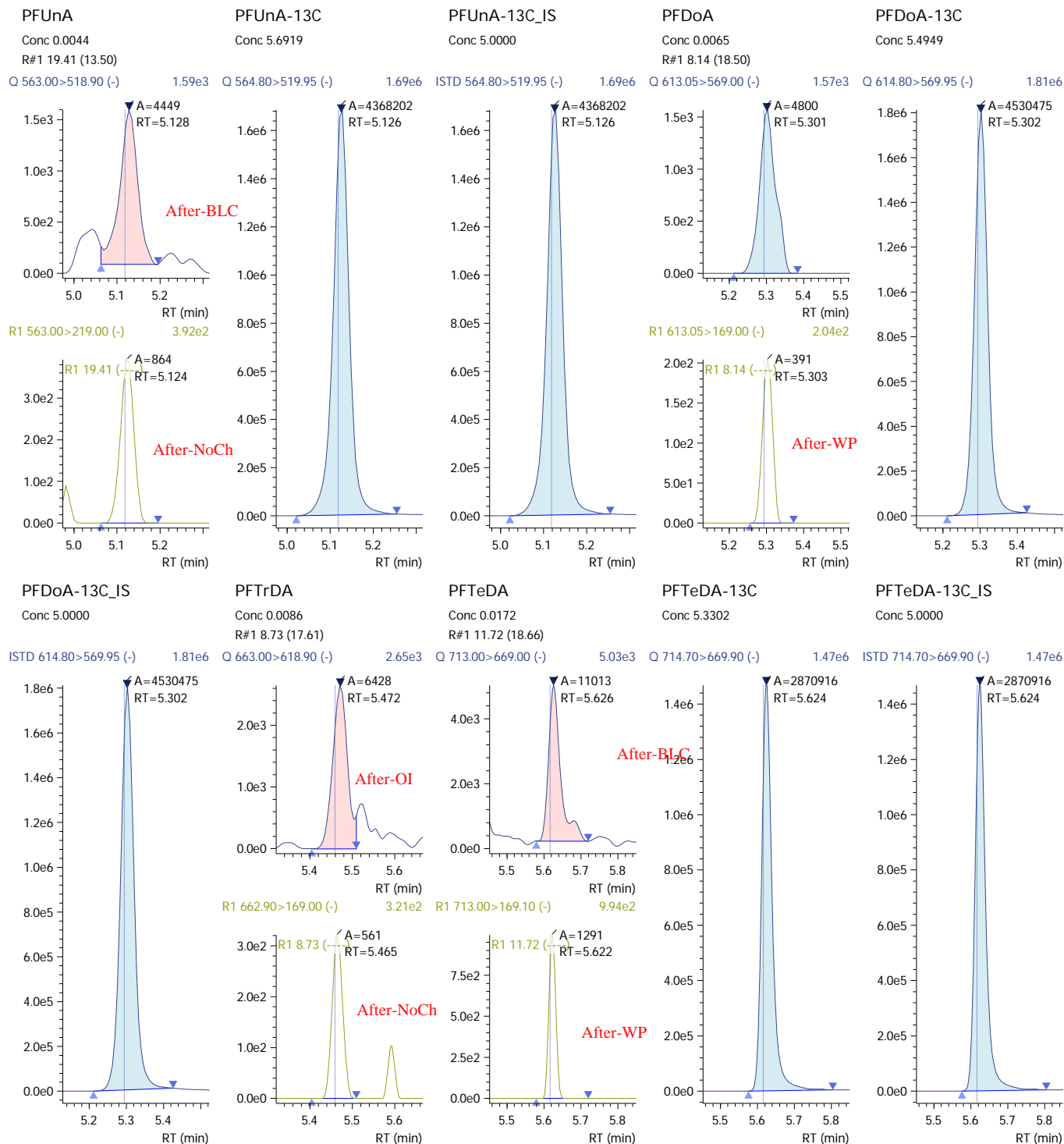


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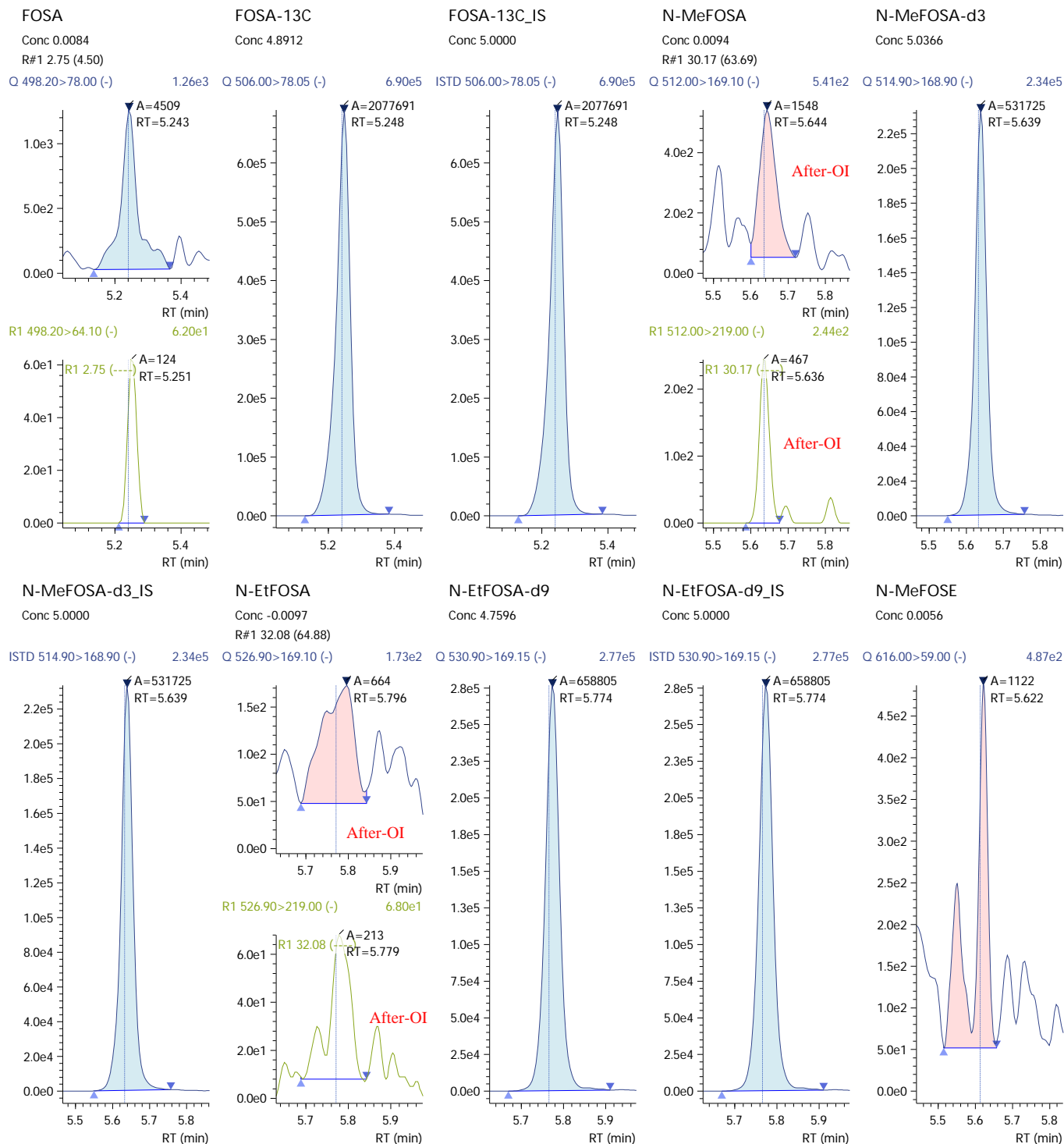


210413\_039 (continued)



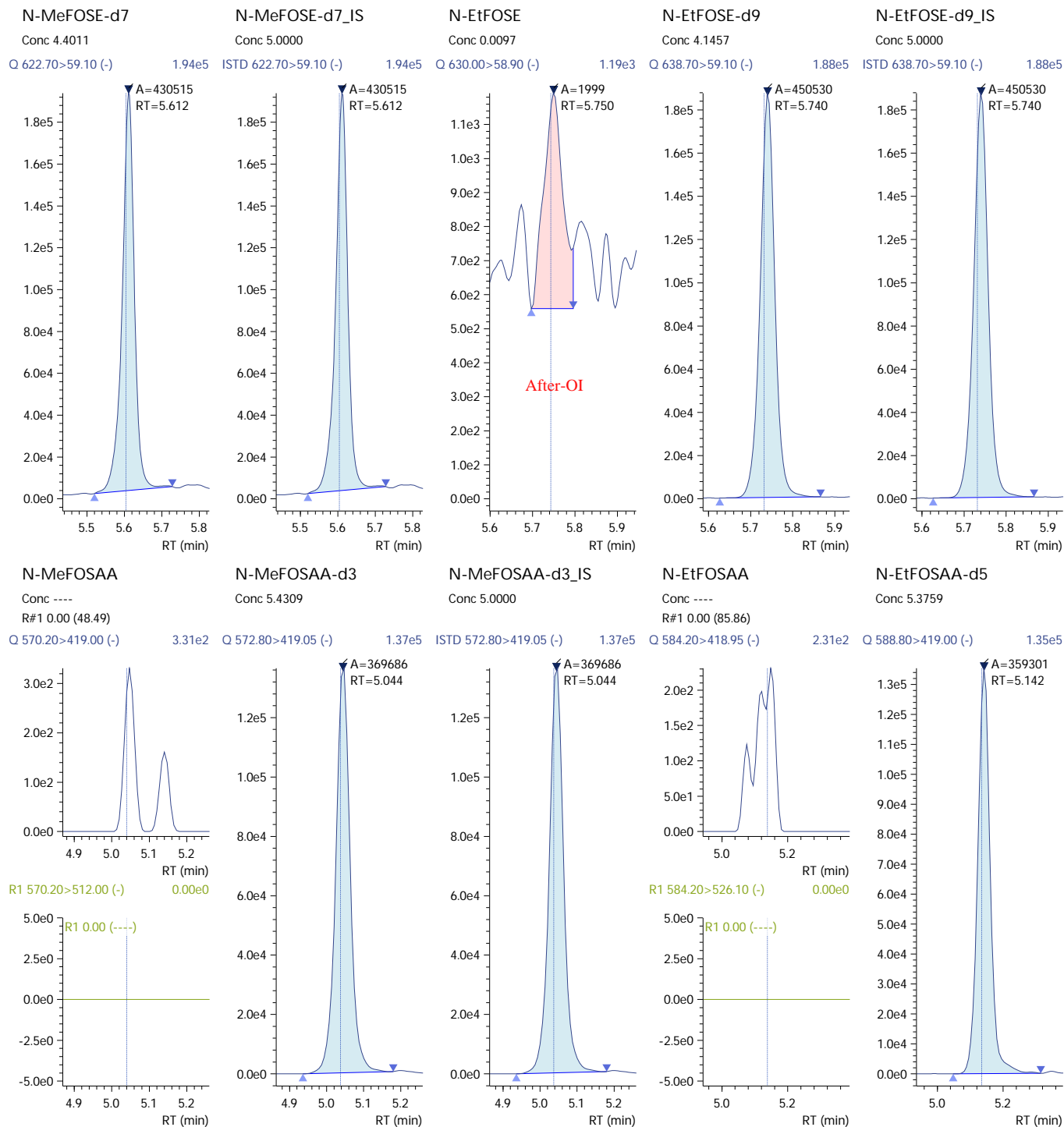


210413\_039 (continued)



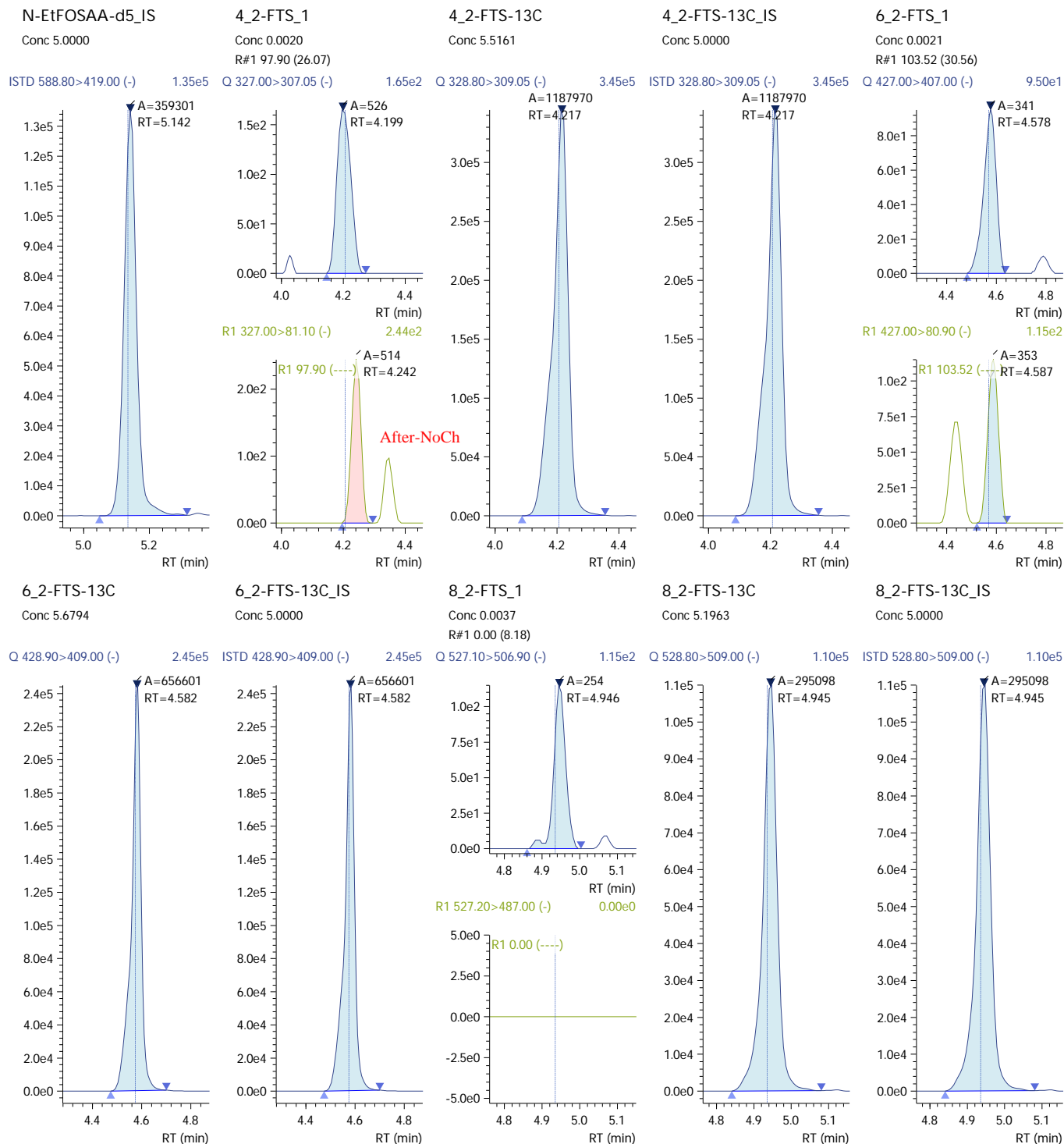


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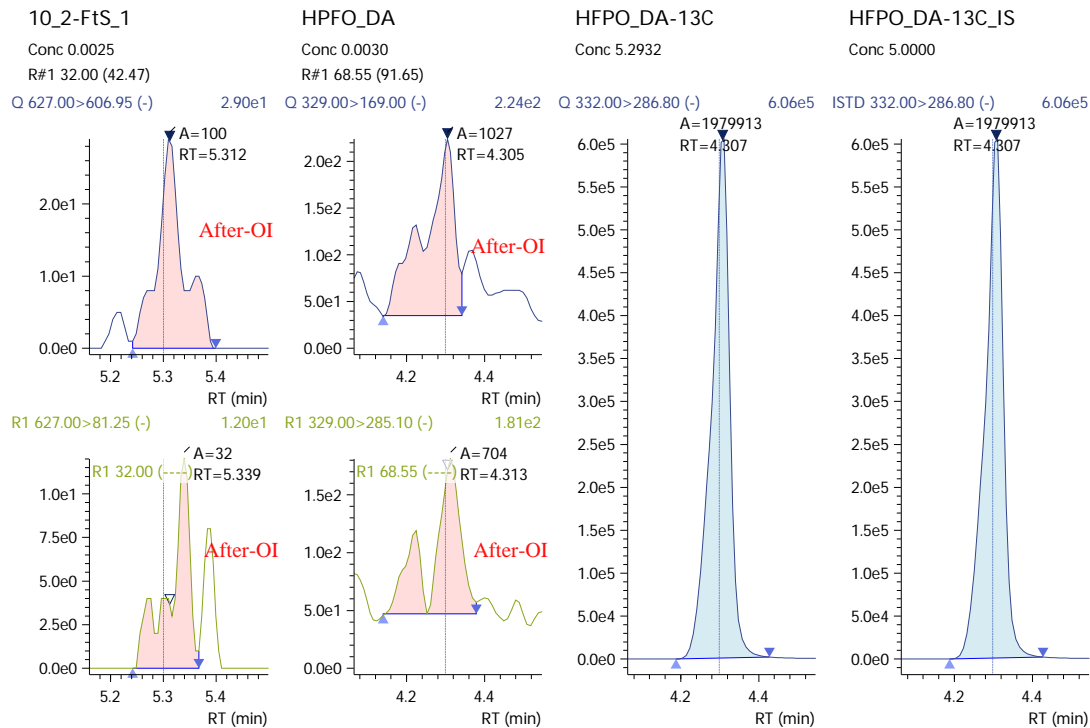


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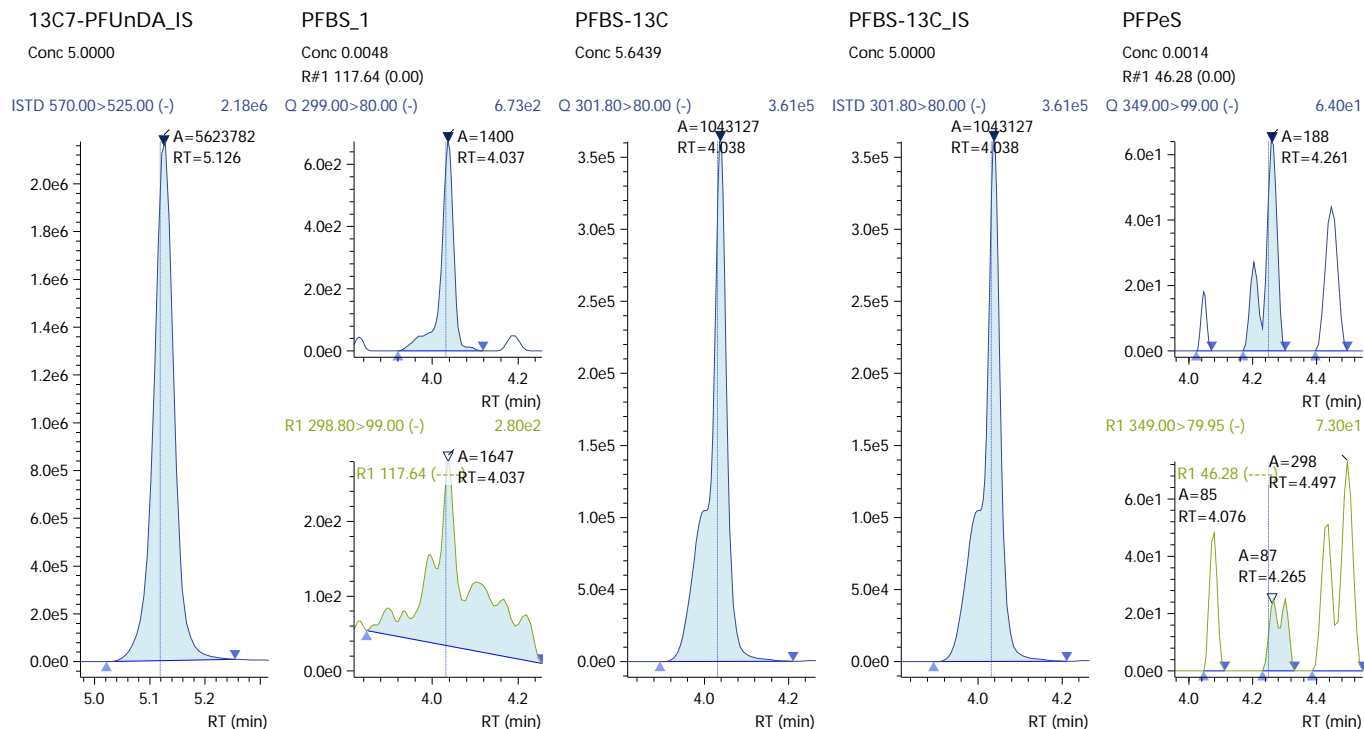
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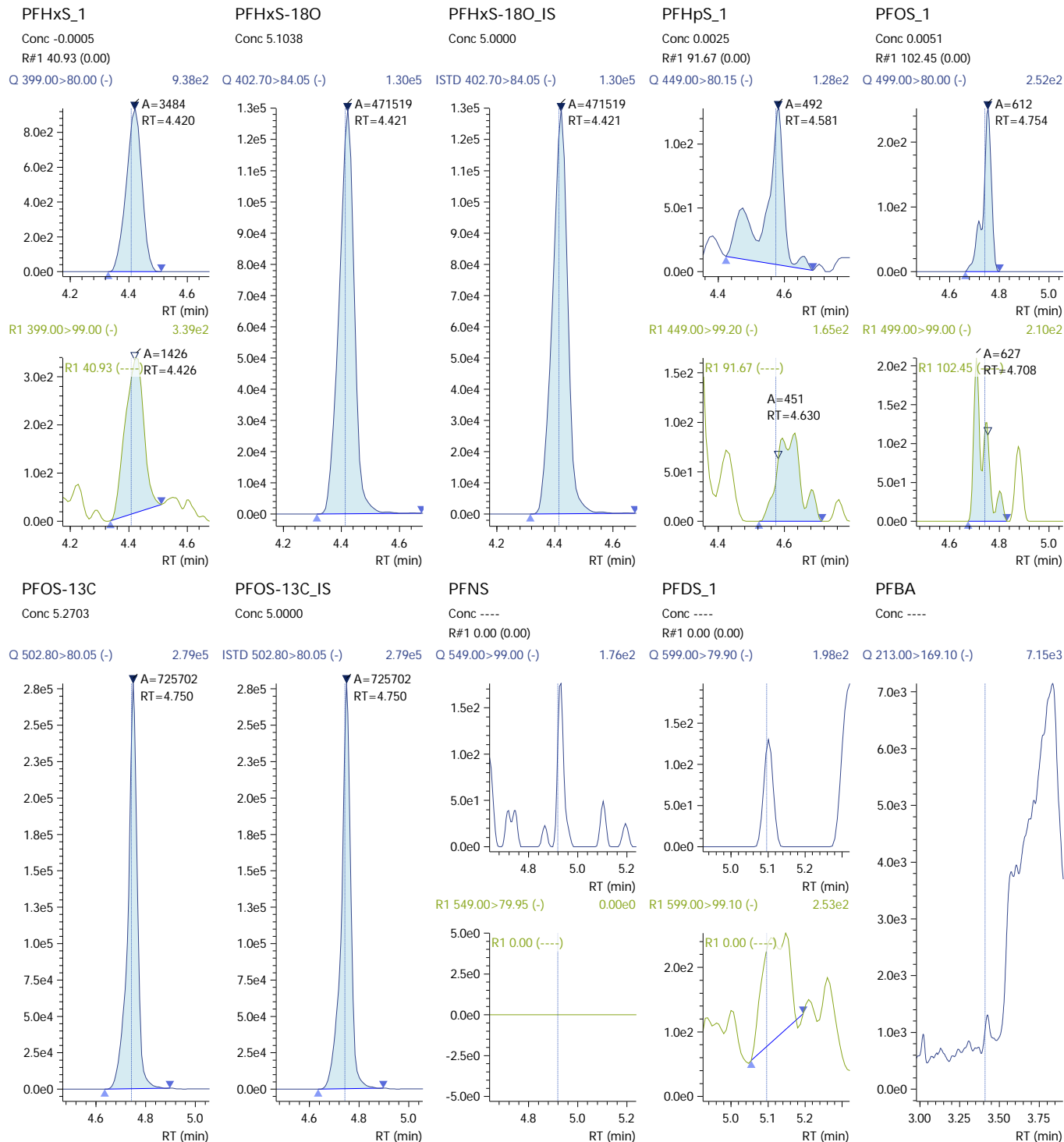
# 210413\_039

Sample ID: CCB  
Date Acquired: 4/13/2021 6:32:11 PM  
Acquired by: System Administrator  
Data File: 210413\_039  
Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1





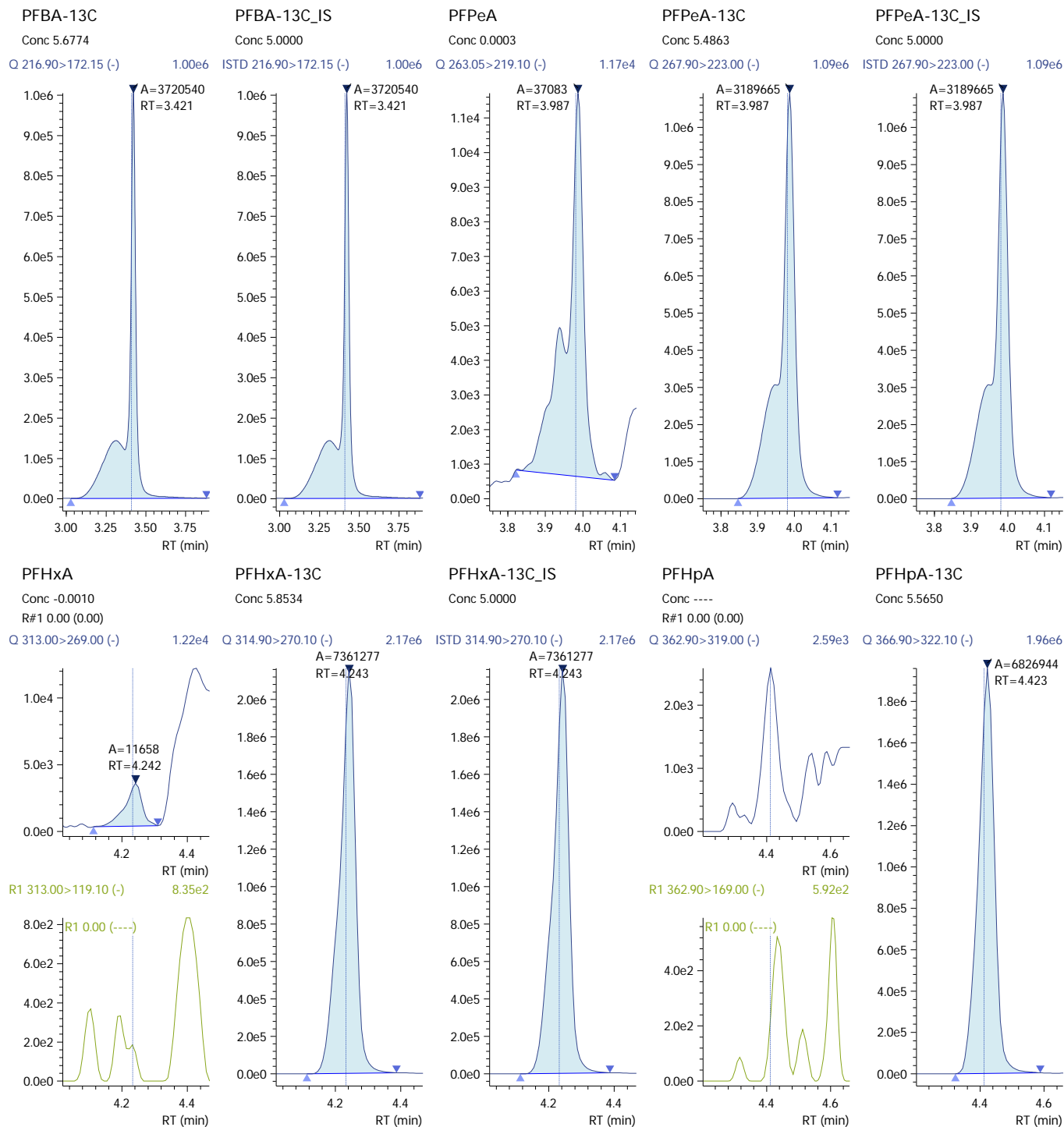
### 210413\_039 (continued)





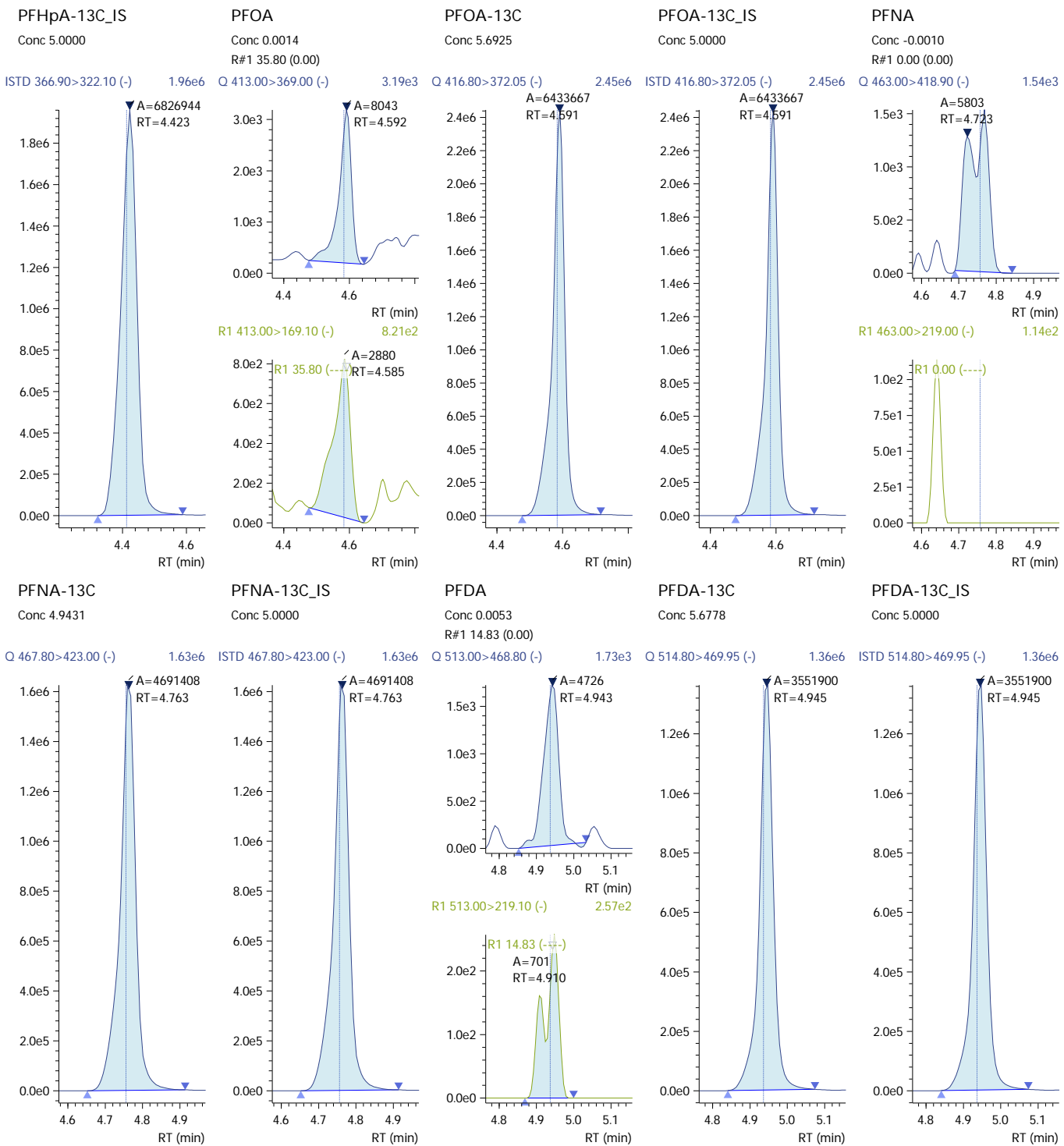


### 210413\_039 (continued)



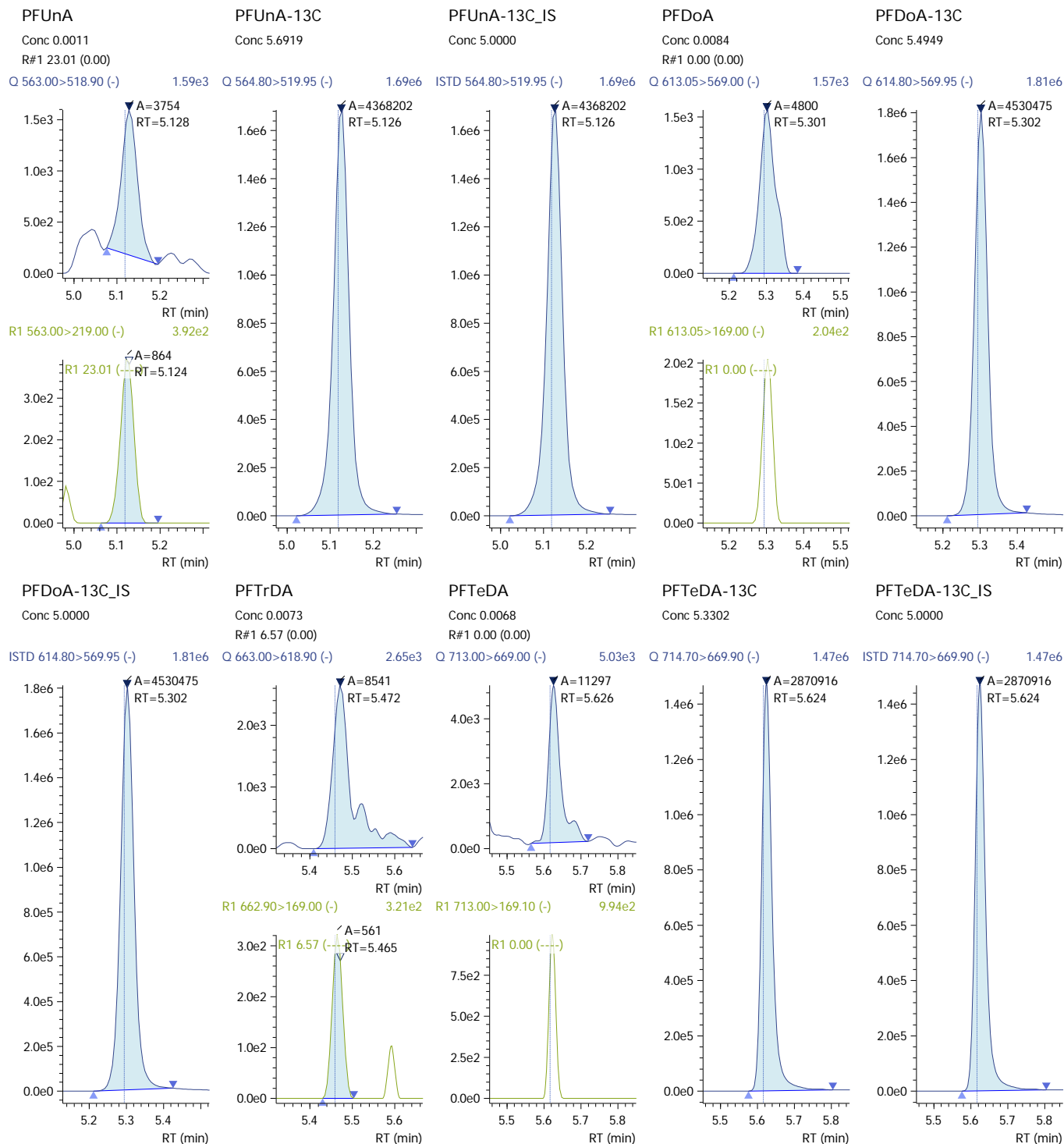


### 210413\_039 (continued)



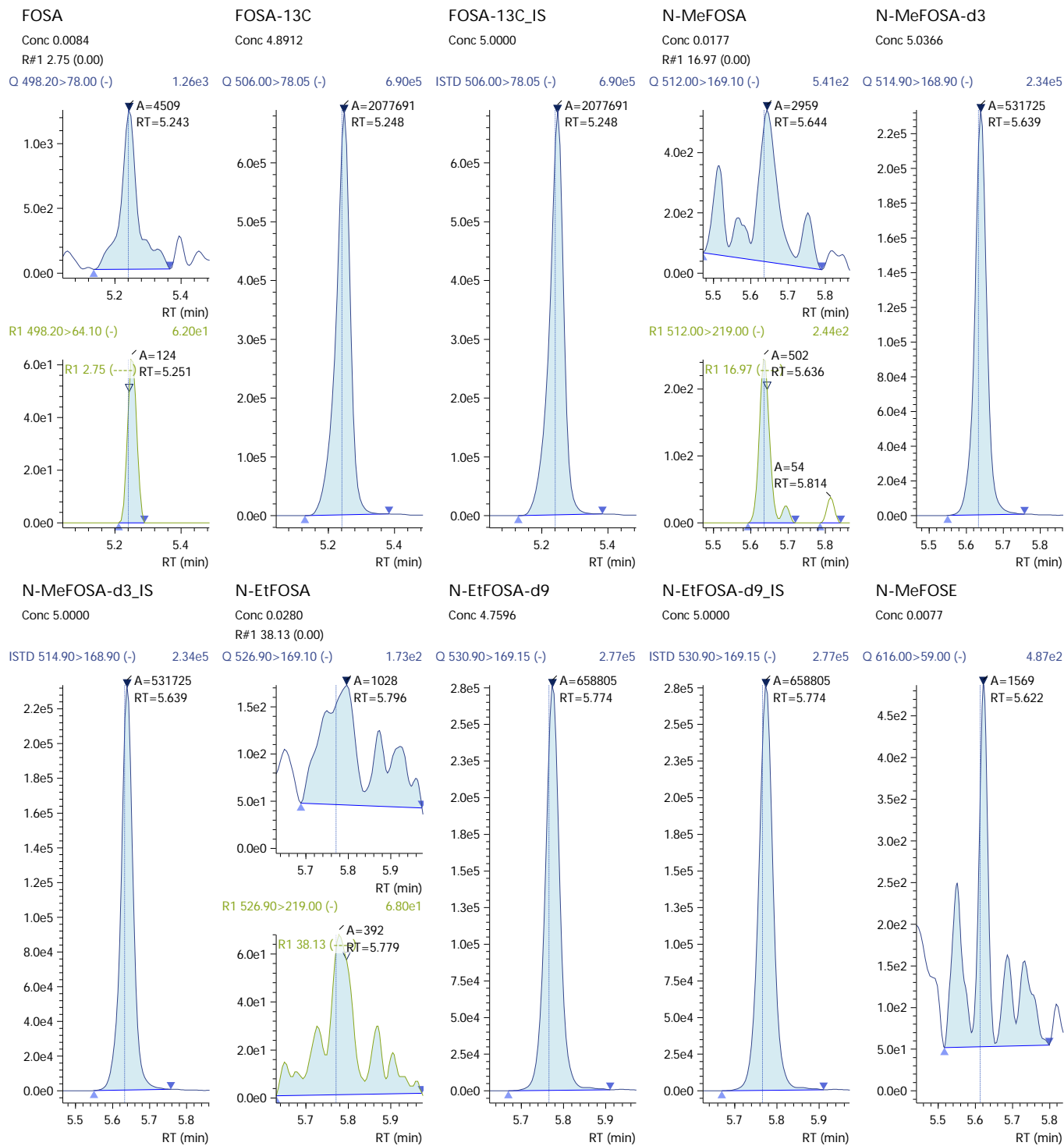


### 210413\_039 (continued)



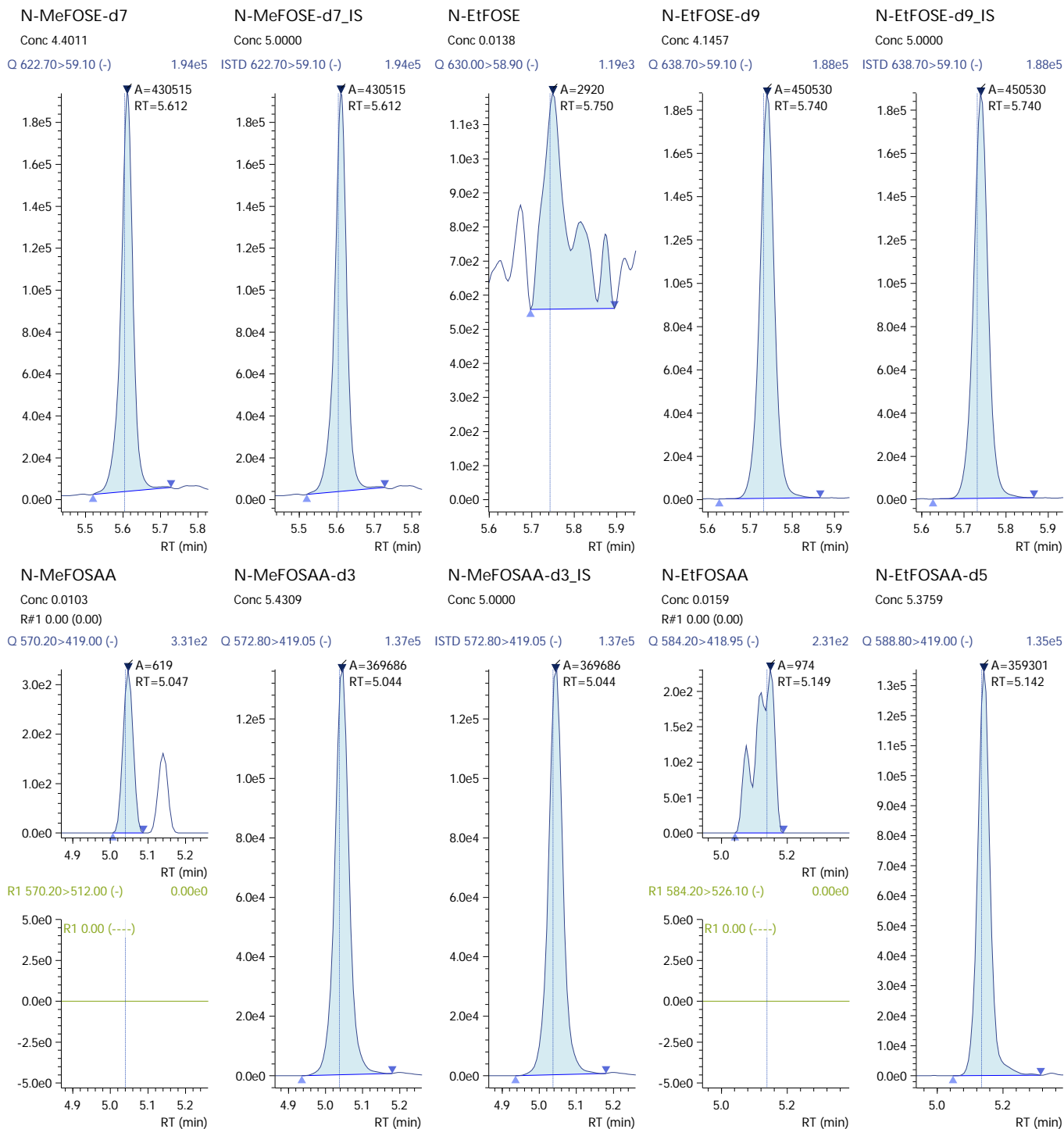


### 210413\_039 (continued)





210413\_039 (continued)





### 210413\_039 (continued)

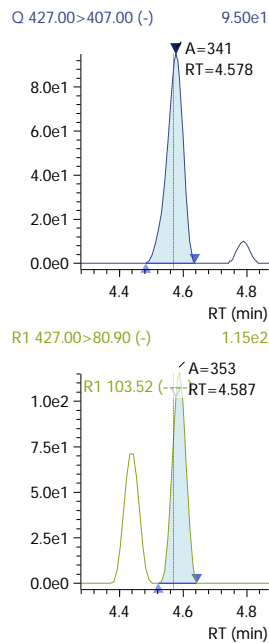
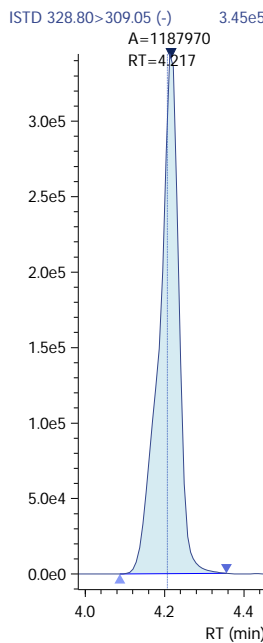
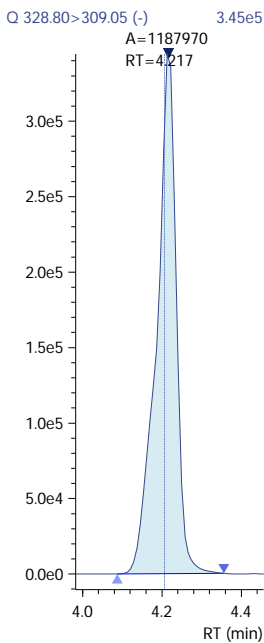
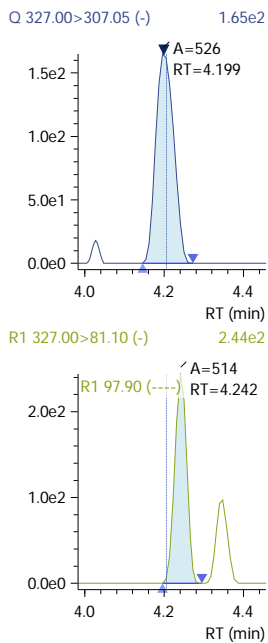
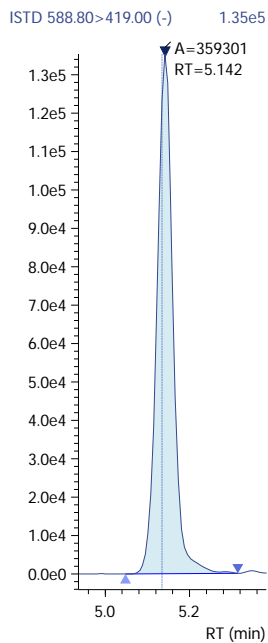
N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.0020  
R#1 97.90 (0.00)

4\_2-FTS-13C  
Conc 5.5161

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.0021  
R#1 103.52 (0.00)



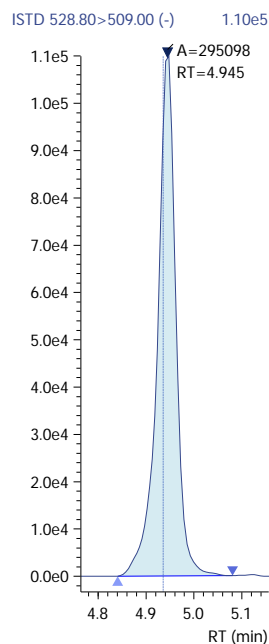
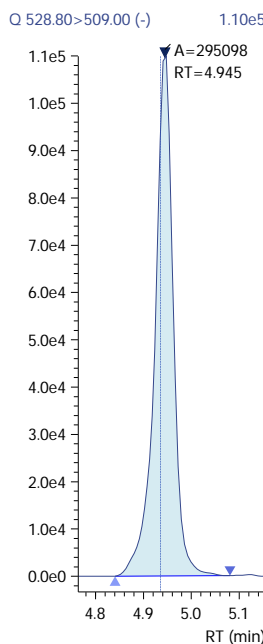
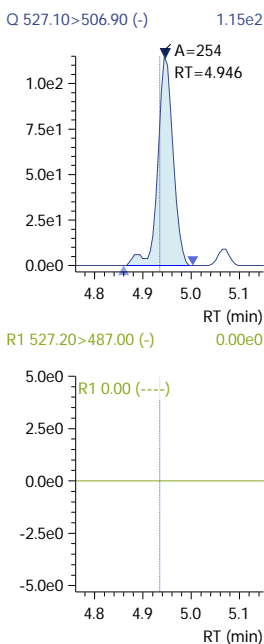
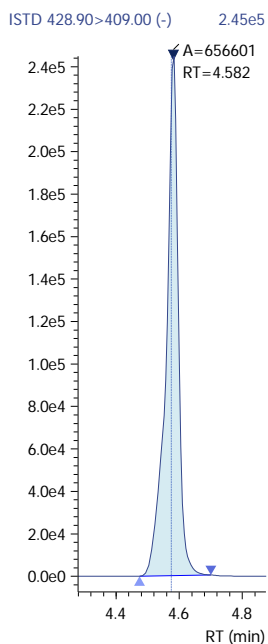
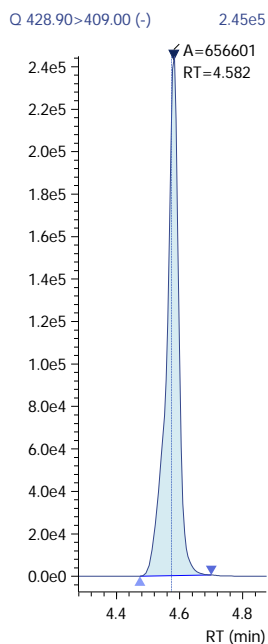
6\_2-FTS-13C  
Conc 5.6794

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.0036  
R#1 0.00 (0.00)

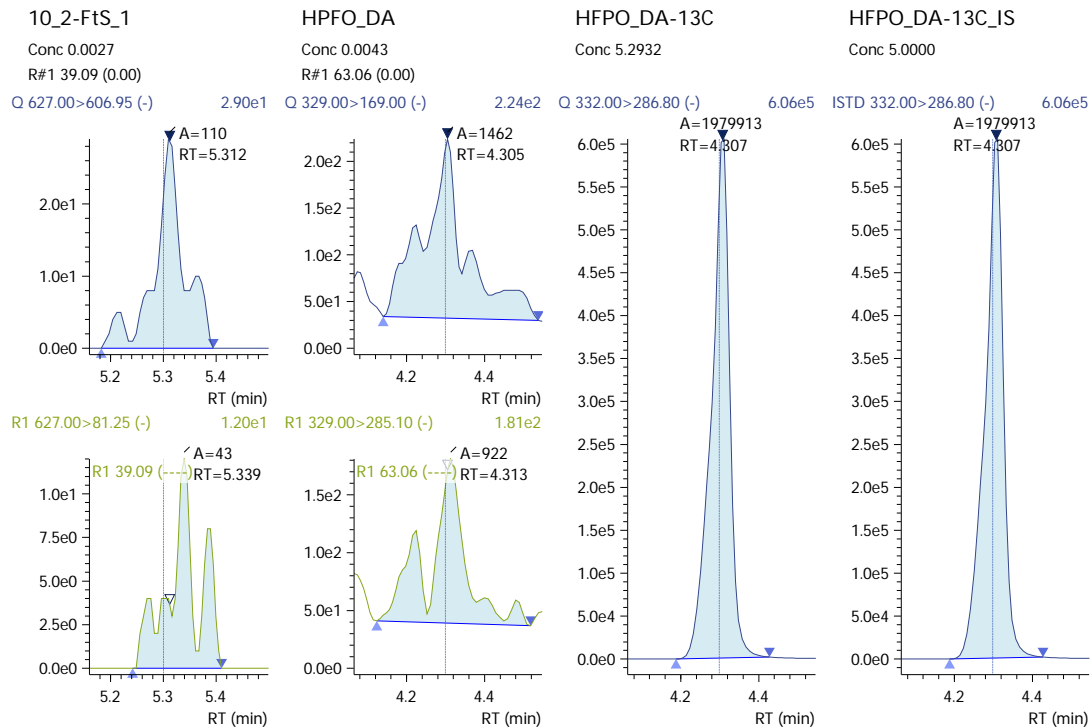
8\_2-FTS-13C  
Conc 5.1963

8\_2-FTS-13C\_IS  
Conc 5.0000





### 210413\_039 (continued)





## 210413\_040

Sample ID: PFC ICAL 15 PPB

Date Acquired: 4/13/2021 6:42:36 PM

Acquired by: System Administrator

Data File: 210413\_040

Vial: 7 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.115	-0.003	----	5919301	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.028	-0.004	0.00	3886710	1756996	45.21	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.028	-0.004	-1.09	1082855	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.028	-0.004	----	1082855	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.245	-0.004	0.22	1973464	2938932	148.92	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.407	-0.001	0.00	2217560	1577977	71.16	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.410	-0.003	-0.71	493780	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.410	-0.003	----	493780	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.570	-0.005	0.16	3131590	1512111	48.29	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.739	-0.003	0.00	1746116	1593368	91.25	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.739	-0.003	-0.38	817498	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.739	-0.003	----	817498	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.915	-0.003	0.18	1583053	1891179	119.46	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.092	-0.004	0.35	2197180	1909988	86.93	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.415	0.005	0.00	12440522	----	----	----		
PFBA-13C	216.90>172.15	----	3.414	0.005	-1.70	3933244	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.414	0.005	----	3933244	----	----	----		
PFPeA	263.05>219.10	----	3.978	-0.003	0.00	20293645	----	----	----		
PFPeA-13C	267.90>223.00	----	3.977	-0.004	-1.14	3317343	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.977	-0.004	----	3317343	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.232	-0.001	0.00	20157468	926653	4.60	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.232	0.000	-0.88	6746281	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.232	0.000	----	6746281	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.412	0.000	0.00	17837195	4514757	25.31	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.412	0.000	-0.70	6365624	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.412	0.000	----	6365624	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.581	-0.003	0.00	23499935	6730144	28.64	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.581	-0.003	-0.53	5800778	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.581	-0.003	----	5800778	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.753	-0.003	0.00	15044432	3523548	23.42	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.





210413\_040 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.753	-0.003	-0.36	5193623	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.753	-0.003	----	5193623	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.934	-0.003	0.00	12255202	2560267	20.89	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.934	-0.002	-0.18	3210048	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.934	-0.002	----	3210048	----	----	----	0-0	
PfUnA	563.00>518.90	563.00>219.00	5.115	-0.004	0.00	14034143	1719858	12.26	13.50	6.75-20.25	
PfUnA-13C	564.80>519.95	----	5.115	-0.004	0.00	4000524	----	----	----	0-0	
PfUnA-13C_IS	564.80>519.95	----	5.115	-0.004	----	4000524	----	----	----	0-0	
PfDoA	613.05>569.00	613.05>169.00	5.290	-0.003	0.00	10756851	1940964	18.04	18.50	9.25-27.75	
PfDoA-13C	614.80>569.95	----	5.290	-0.004	0.18	4390003	----	----	----	0-0	
PfDoA-13C_IS	614.80>569.95	----	5.290	-0.004	----	4390003	----	----	----	0-0	
PfTrDA	663.00>618.90	662.90>169.00	5.456	-0.003	-0.16	11392699	2007457	17.62	17.61	8.8-26.41	
PfTeDA	713.00>669.00	713.00>169.10	5.613	-0.003	0.00	9149505	1719992	18.80	18.66	9.33-27.99	
PfTeDA-13C	714.70>669.90	----	5.613	-0.003	0.50	2903006	----	----	----	0-0	
PfTeDA-13C_IS	714.70>669.90	----	5.613	-0.003	----	2903006	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.235	-0.006	0.00	9479854	431909	4.56	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.235	-0.006	0.12	2501764	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.235	-0.006	----	2501764	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.631	-0.004	0.00	2794523	1783604	63.83	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.628	-0.005	0.51	620115	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.628	-0.005	----	620115	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.768	-0.003	0.01	578501	398398	68.87	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.762	-0.004	0.65	801264	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.762	-0.004	----	801264	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.608	-0.005	0.01	3816507	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.599	-0.005	0.48	569813	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.599	-0.005	----	569813	----	----	----		
N-EtFOSE	630.00>58.90	----	5.739	-0.003	0.01	4066958	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.728	-0.004	0.61	634177	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.728	-0.004	----	634177	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.036	-0.004	0.00	1011902	487476	48.17	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.034	-0.003	-0.08	388571	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.034	-0.003	----	388571	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.134	-0.004	0.00	897924	789003	87.87	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.130	-0.005	0.02	359594	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.130	-0.005	----	359594	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.207	0.001	0.00	3467779	834506	24.07	26.07	13.03-39.1	
4_2-FTS-13C	328.80>309.05	----	4.206	-0.001	-0.91	1247858	----	----	----	0-0	

J:\LCMS06\Data\210413\_Curve\210413\_Curve.DAML

Comment 1 field specifies acceptance range for Ref 1 ratio.  
IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_040 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.206	-0.001	----	1247858	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.567	-0.002	0.00	1840688	565146	30.70	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.569	-0.005	-0.55	603529	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.569	-0.005	----	603529	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.933	-0.002	0.00	892250	72510	8.13	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.934	-0.001	-0.18	316757	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.934	-0.001	----	316757	----	----	----	0-0	
10_2-FTS_1	627.00>606.95	627.00>81.25	5.297	-0.004	0.36	567334	239708	42.25	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.298	-0.001	0.00	5408213	4800095	88.76	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.298	-0.001	-0.82	2196512	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.298	-0.001	----	2196512	----	----	----		



## 210413\_040

Sample ID: PFC ICAL 15 PPB  
 Date Acquired: 4/13/2021 6:42:36 PM  
 Acquired by: System Administrator  
 Data File: 210413\_040  
 Vial: 7 | Inj. Volume: 15.0000uL | Tray: 0

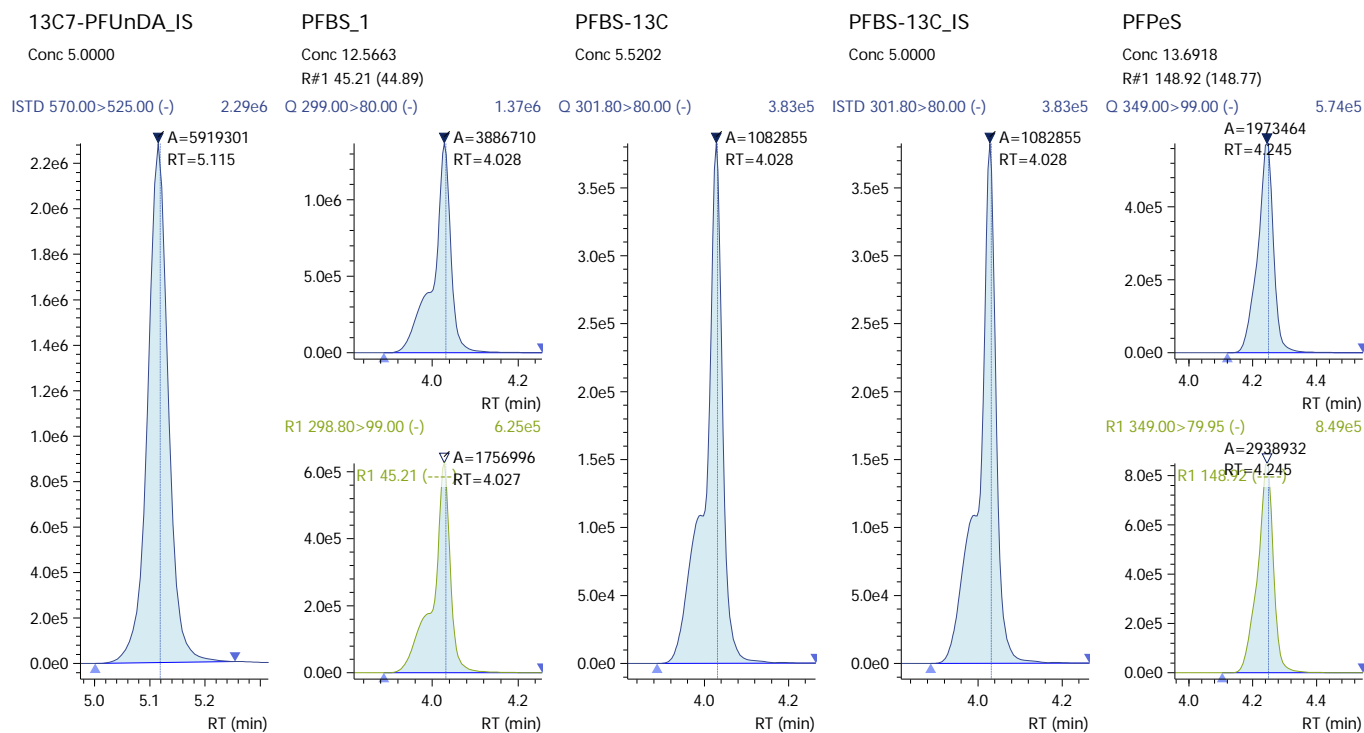
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.115	5919301	5919301	----	5.0000	5.0000	ng/mL
PFBS_1	Auto	4.028	3886710	1082855	PFBS-13C_IS	13.3106	12.5663	ng/mL
PFBS-13C	Auto	4.028	1082855	5919301	13C7-PFUnDA_IS	5.0000	5.5202	ng/mL
PFBS-13C_IS	Auto	4.028	1082855	1082855	----	5.0000	5.0000	ng/mL
PFPeS	Auto	4.245	1973464	1082855	PFBS-13C_IS	14.1138	13.6918	ng/mL
PFHxS_1	Auto	4.407	2217560	493780	PFHxS-18O_IS	13.6961	13.6272	ng/mL
PFHxS-18O	Auto	4.410	493780	5919301	13C7-PFUnDA_IS	5.0000	5.0779	ng/mL
PFHxS-18O_IS	Auto	4.410	493780	493780	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.570	3131590	493780	PFHxS-18O_IS	14.3016	15.2551	ng/mL
PFOS_1	Auto	4.739	1746116	817498	PFOS-13C_IS	13.9385	12.8895	ng/mL
PFOS-13C	Auto	4.739	817498	5919301	13C7-PFUnDA_IS	5.0000	5.6405	ng/mL
PFOS-13C_IS	Auto	4.739	817498	817498	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.915	1583053	817498	PFOS-13C_IS	14.4237	13.3796	ng/mL
PFDS_1	Auto	5.092	2197180	817498	PFOS-13C_IS	14.4700	13.2767	ng/mL
PFBA	Auto	3.415	12440522	3933244	PFBA-13C_IS	15.0000	14.6541	ng/mL
PFBA-13C	Auto	3.414	3933244	5919301	13C7-PFUnDA_IS	5.0000	5.7023	ng/mL
PFBA-13C_IS	Auto	3.414	3933244	3933244	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.978	20293645	3317343	PFPeA-13C_IS	15.0000	15.0509	ng/mL
PFPeA-13C	Auto	3.977	3317343	5919301	13C7-PFUnDA_IS	5.0000	5.4211	ng/mL
PFPeA-13C_IS	Auto	3.977	3317343	3317343	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.232	20157468	6746281	PFHxA-13C_IS	15.0000	14.4256	ng/mL
PFHxA-13C	Auto	4.232	6746281	5919301	13C7-PFUnDA_IS	5.0000	5.0966	ng/mL
PFHxA-13C_IS	Auto	4.232	6746281	6746281	----	5.0000	5.0000	ng/mL
PFHpA	Auto	4.412	17837195	6365624	PFHpA-13C_IS	15.0000	14.0279	ng/mL
PFHpA-13C	Auto	4.412	6365624	5919301	13C7-PFUnDA_IS	5.0000	4.9299	ng/mL
PFHpA-13C_IS	Auto	4.412	6365624	6365624	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.581	23499935	5800778	PFOA-13C_IS	15.0000	15.1679	ng/mL
PFOA-13C	Auto	4.581	5800778	5919301	13C7-PFUnDA_IS	5.0000	4.8763	ng/mL
PFOA-13C_IS	Auto	4.581	5800778	5800778	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.753	15044432	5193623	PFNA-13C_IS	15.0000	14.3488	ng/mL
PFNA-13C	Auto	4.753	5193623	5919301	13C7-PFUnDA_IS	5.0000	5.1990	ng/mL
PFNA-13C_IS	Auto	4.753	5193623	5193623	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.934	12255202	3210048	PFDA-13C_IS	15.0000	15.1886	ng/mL
PFDA-13C	Auto	4.934	3210048	5919301	13C7-PFUnDA_IS	5.0000	4.8751	ng/mL
PFDA-13C_IS	Auto	4.934	3210048	3210048	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.115	14034143	4000524	PFUnA-13C_IS	15.0000	15.3115	ng/mL
PFUnA-13C	Auto	5.115	4000524	5919301	13C7-PFUnDA_IS	5.0000	4.9525	ng/mL
PFUnA-13C_IS	Auto	5.115	4000524	4000524	----	5.0000	5.0000	ng/mL
PFDaA	Auto	5.290	10756851	4390003	PFDaA-13C_IS	15.0000	15.1094	ng/mL
PFDaA-13C	Auto	5.290	4390003	5919301	13C7-PFUnDA_IS	5.0000	5.0587	ng/mL
PFDaA-13C_IS	Auto	5.290	4390003	4390003	----	5.0000	5.0000	ng/mL
PFTeDA	Auto	5.456	11392699	2903006	PFTeDA-13C_IS	15.0000	15.1449	ng/mL
PFTeDA	Auto	5.613	9149505	2903006	PFTeDA-13C_IS	15.0000	14.1237	ng/mL
PFTeDA-13C	Auto	5.613	2903006	5919301	13C7-PFUnDA_IS	5.0000	5.1207	ng/mL
PFTeDA-13C_IS	Auto	5.613	2903006	2903006	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.235	9479854	2501764	FOSA-13C_IS	15.0000	14.7332	ng/mL
FOSA-13C	Auto	5.235	2501764	5919301	13C7-PFUnDA_IS	5.0000	5.5955	ng/mL
FOSA-13C_IS	Auto	5.235	2501764	2501764	----	5.0000	5.0000	ng/mL
N-MeFOSA	Auto	5.631	2794523	620115	N-MeFOSA-d3_IS	15.0000	14.5713	ng/mL
N-MeFOSA-d3	Auto	5.628	620115	5919301	13C7-PFUnDA_IS	5.0000	5.5805	ng/mL
N-MeFOSA-d3_IS	Auto	5.628	620115	620115	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.768	578501	801264	N-EtFOSA-d9_IS	15.0000	14.8272	ng/mL
N-EtFOSA-d9	Auto	5.762	801264	5919301	13C7-PFUnDA_IS	5.0000	5.4998	ng/mL
N-EtFOSA-d9_IS	Auto	5.762	801264	801264	----	5.0000	5.0000	ng/mL



210413\_040 (continued)

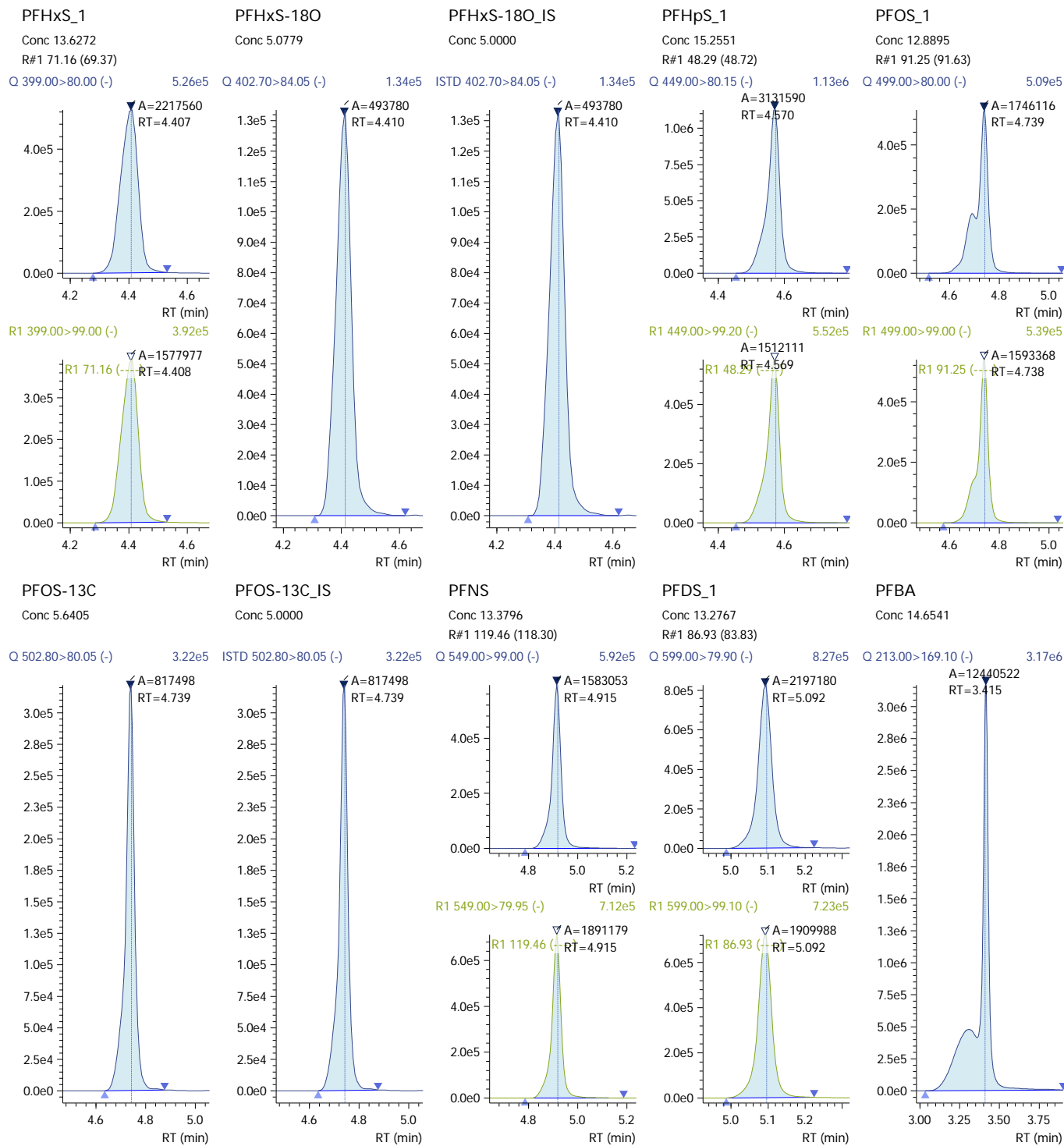
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.608	3816507	569813	N-MeFOSE-d7_IS	15.0000	14.3112	ng/mL
N-MeFOSE-d7	Auto	5.599	569813	5919301	13C7-PFUnDA_IS	5.0000	5.5343	ng/mL
N-MeFOSE-d7_IS	Auto	5.599	569813	569813	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.739	4066958	634177	N-EtFOSE-d9_IS	15.0000	13.9778	ng/mL
N-EtFOSE-d9	Auto	5.728	634177	5919301	13C7-PFUnDA_IS	5.0000	5.5443	ng/mL
N-EtFOSE-d9_IS	Auto	5.728	634177	634177	----	5.0000	5.0000	ng/mL
N-MeFOSAA	Auto	5.036	1011902	388571	N-MeFOSAA-d3_IS	15.0000	14.7092	ng/mL
N-MeFOSAA-d3	Auto	5.034	388571	5919301	13C7-PFUnDA_IS	5.0000	5.4233	ng/mL
N-MeFOSAA-d3_IS	Auto	5.034	388571	388571	----	5.0000	5.0000	ng/mL
N-EtFOSAA	Auto	5.134	897924	359594	N-EtFOSAA-d5_IS	15.0000	14.5126	ng/mL
N-EtFOSAA-d5	Auto	5.130	359594	5919301	13C7-PFUnDA_IS	5.0000	5.1116	ng/mL
N-EtFOSAA-d5_IS	Auto	5.130	359594	359594	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.207	3467779	1247858	4_2-FTS-13C_IS	14.0583	12.7477	ng/mL
4_2-FTS-13C	Auto	4.206	1247858	5919301	13C7-PFUnDA_IS	5.0000	5.5049	ng/mL
4_2-FTS-13C_IS	Auto	4.206	1247858	1247858	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.567	1840688	603529	6_2-FTS-13C_IS	14.2676	12.4665	ng/mL
6_2-FTS-13C	Auto	4.569	603529	5919301	13C7-PFUnDA_IS	5.0000	4.9597	ng/mL
6_2-FTS-13C_IS	Auto	4.569	603529	603529	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.933	892250	316757	8_2-FTS-13C_IS	14.4007	11.9560	ng/mL
8_2-FTS-13C	Auto	4.934	316757	5919301	13C7-PFUnDA_IS	5.0000	5.2992	ng/mL
8_2-FTS-13C_IS	Auto	4.934	316757	316757	----	5.0000	5.0000	ng/mL
10_2-FTS_1	Auto	5.297	567334	316757	8_2-FTS-13C_IS	14.4929	13.0470	ng/mL
HPFO_DA	Auto	4.298	5408213	2196512	HPFO_DA-13C_IS	15.0000	14.2163	ng/mL
HPFO_DA-13C	Auto	4.298	2196512	5919301	13C7-PFUnDA_IS	5.0000	5.5791	ng/mL
HPFO_DA-13C_IS	Auto	4.298	2196512	2196512	----	5.0000	5.0000	ng/mL



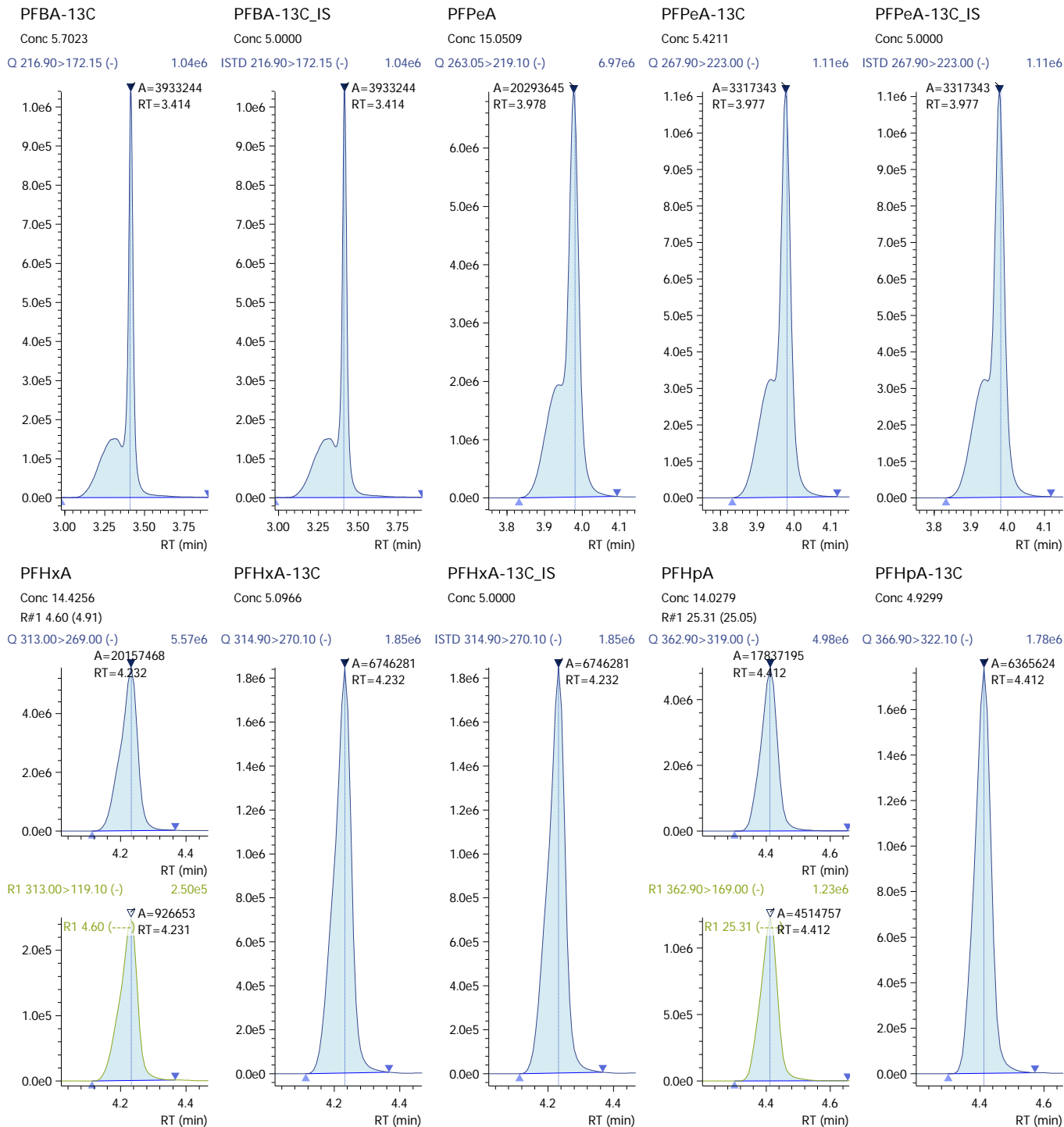


### 210413\_040 (continued)



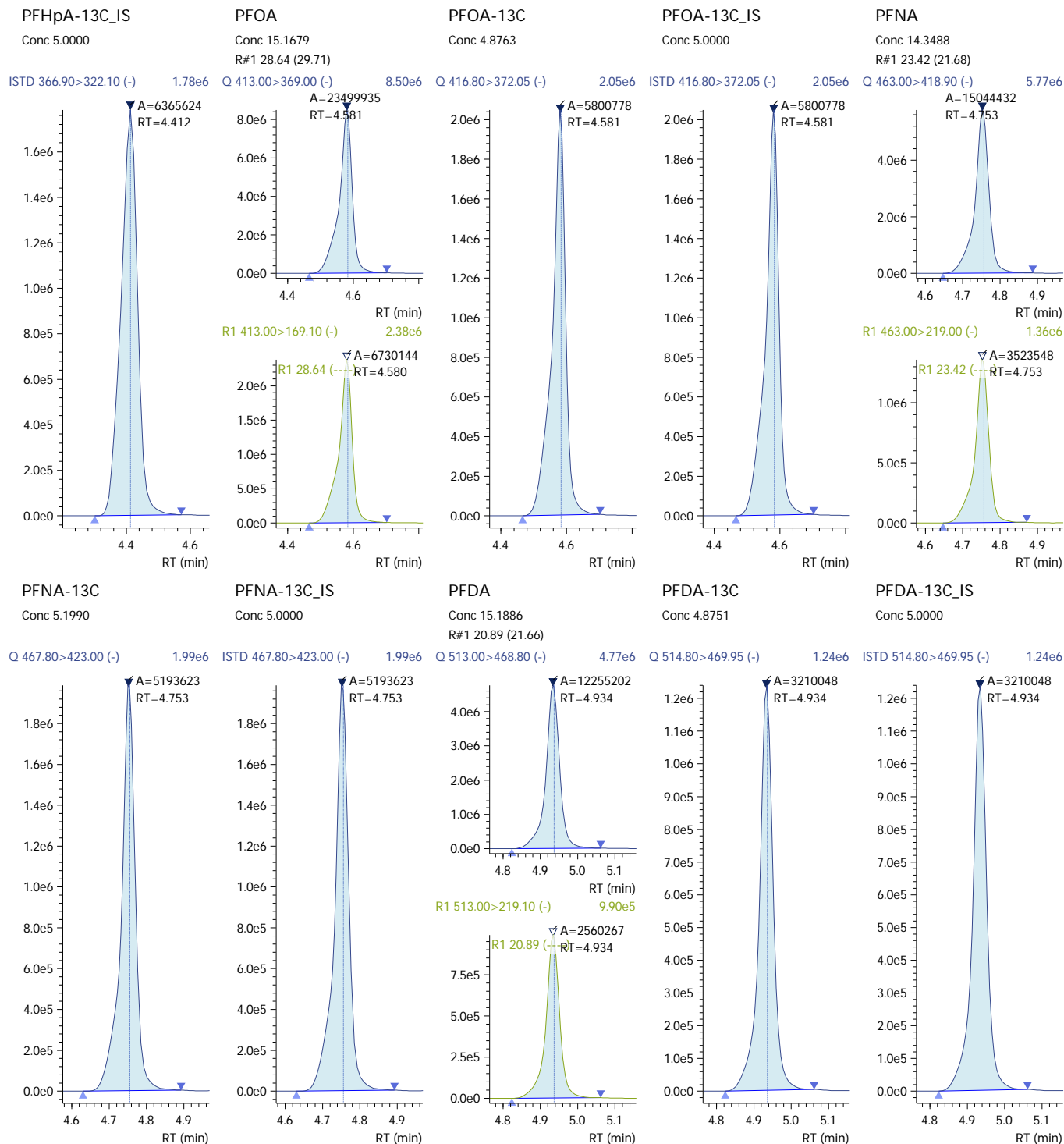


### 210413\_040 (continued)



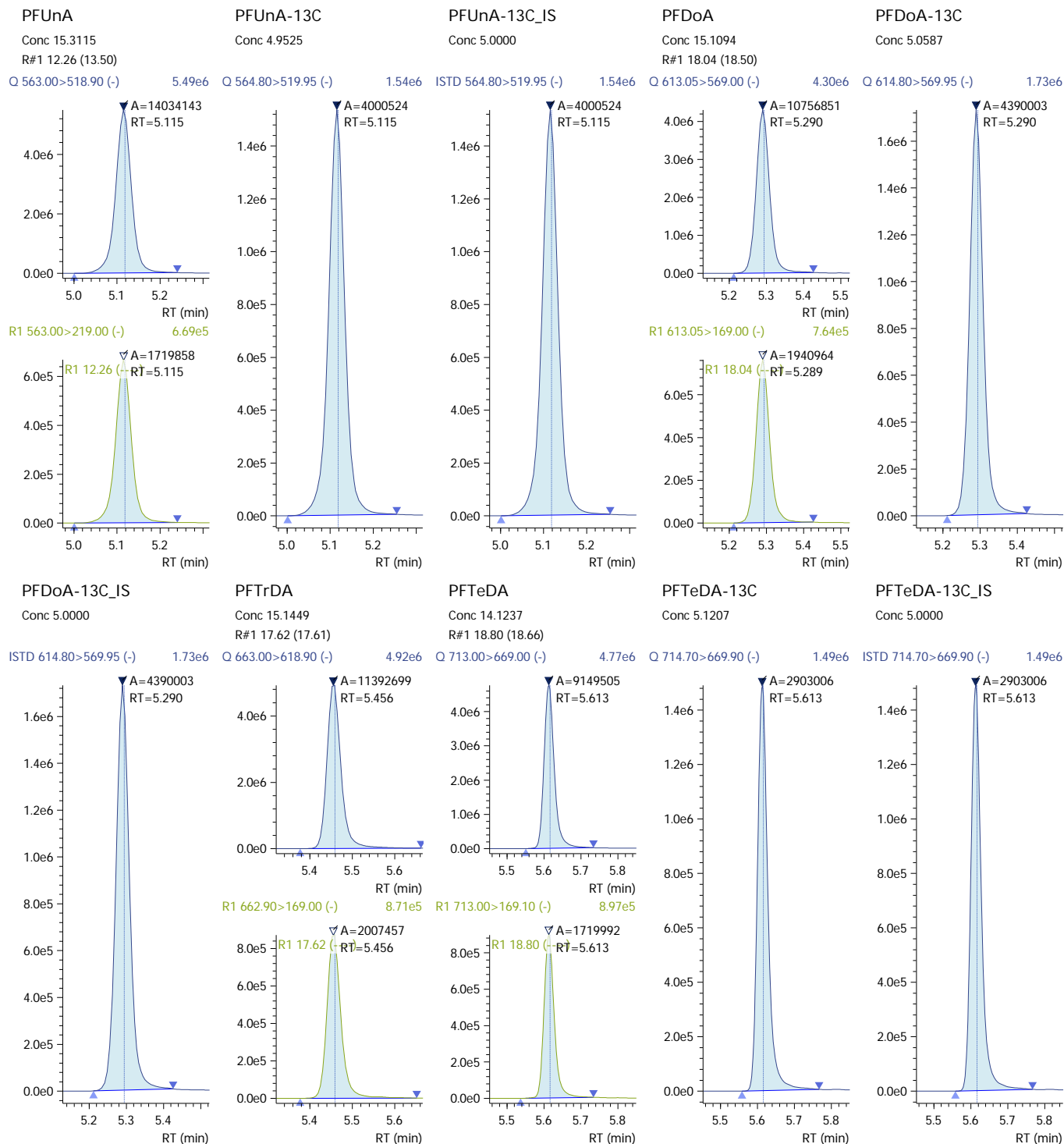


### 210413\_040 (continued)





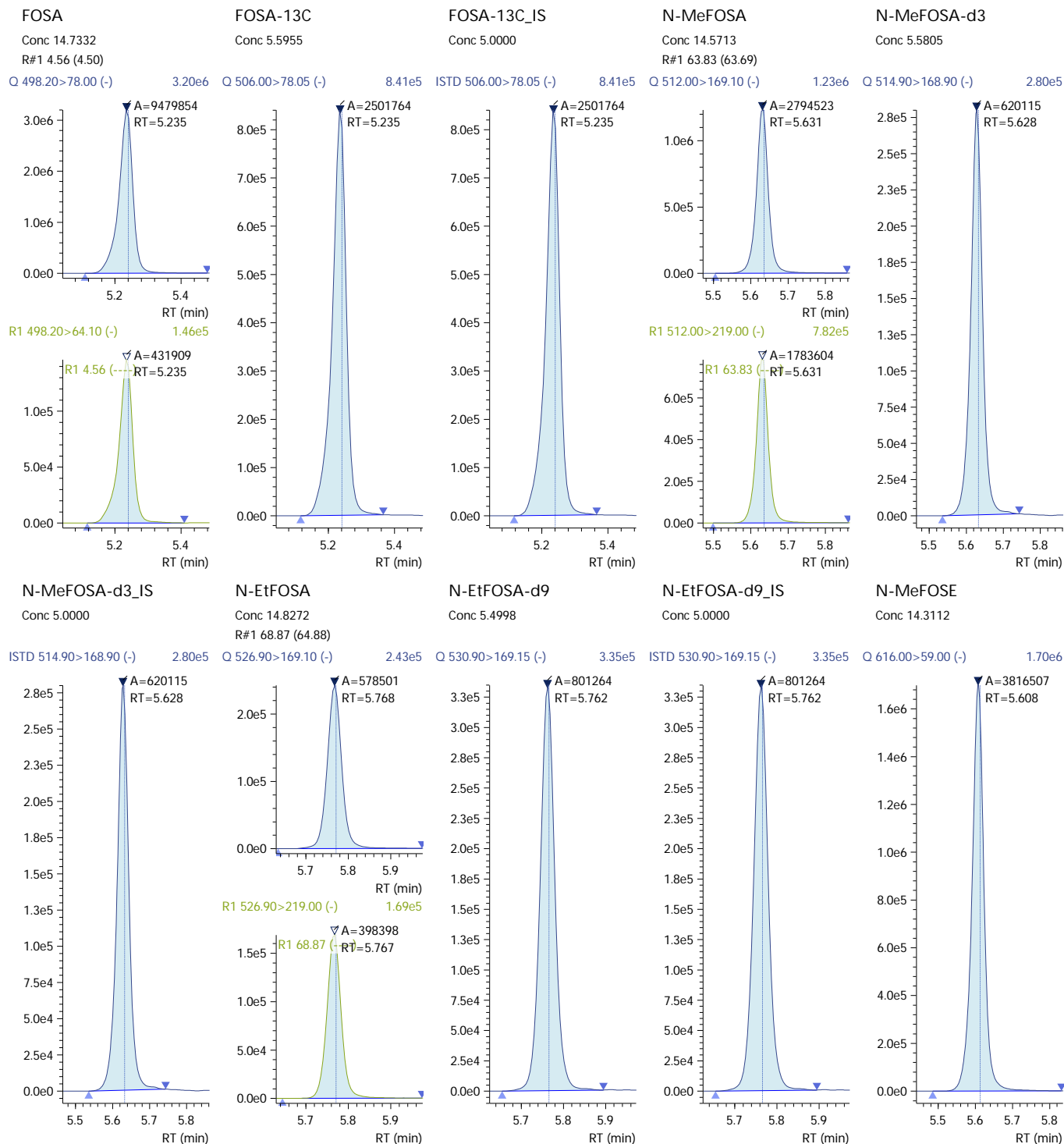
### 210413\_040 (continued)





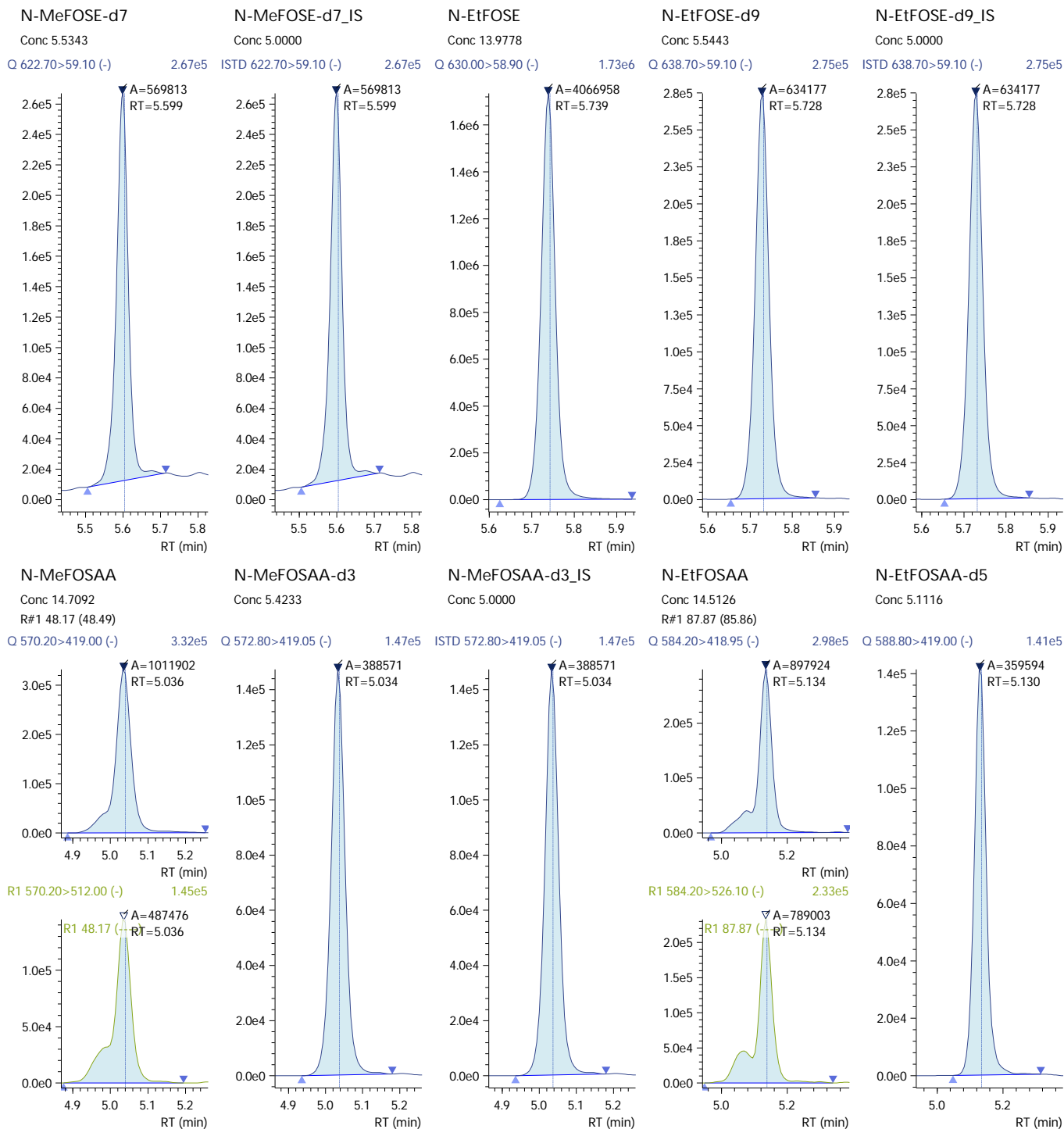


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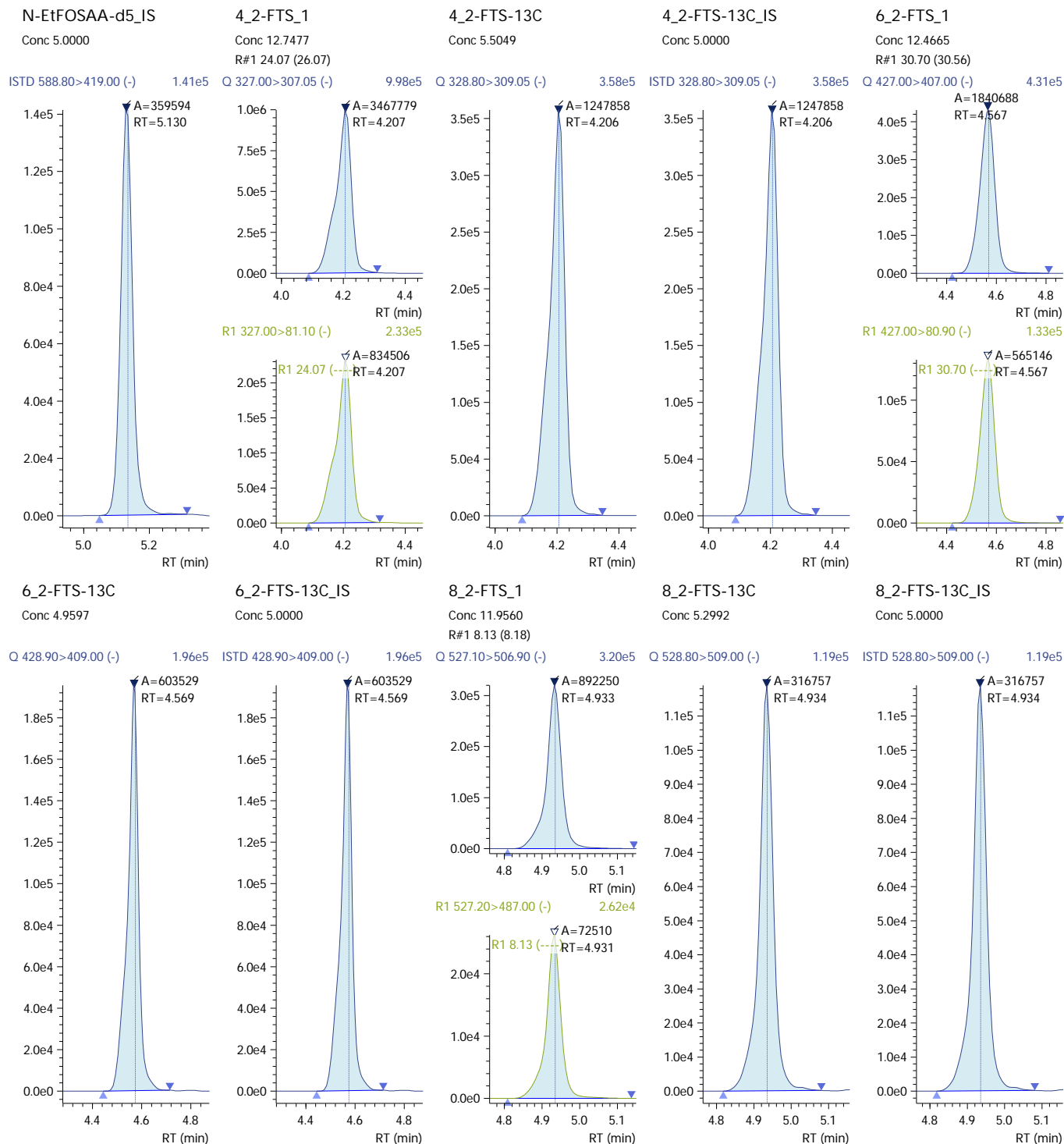


210413\_040 (continued)



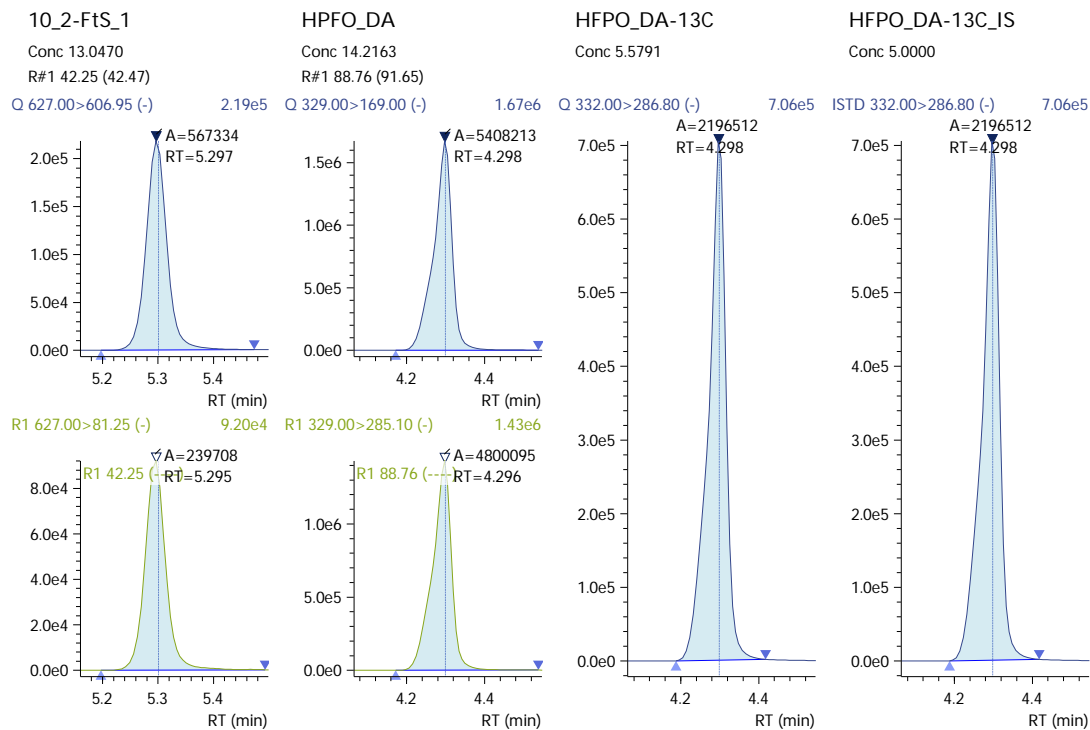


210413\_040 (continued)





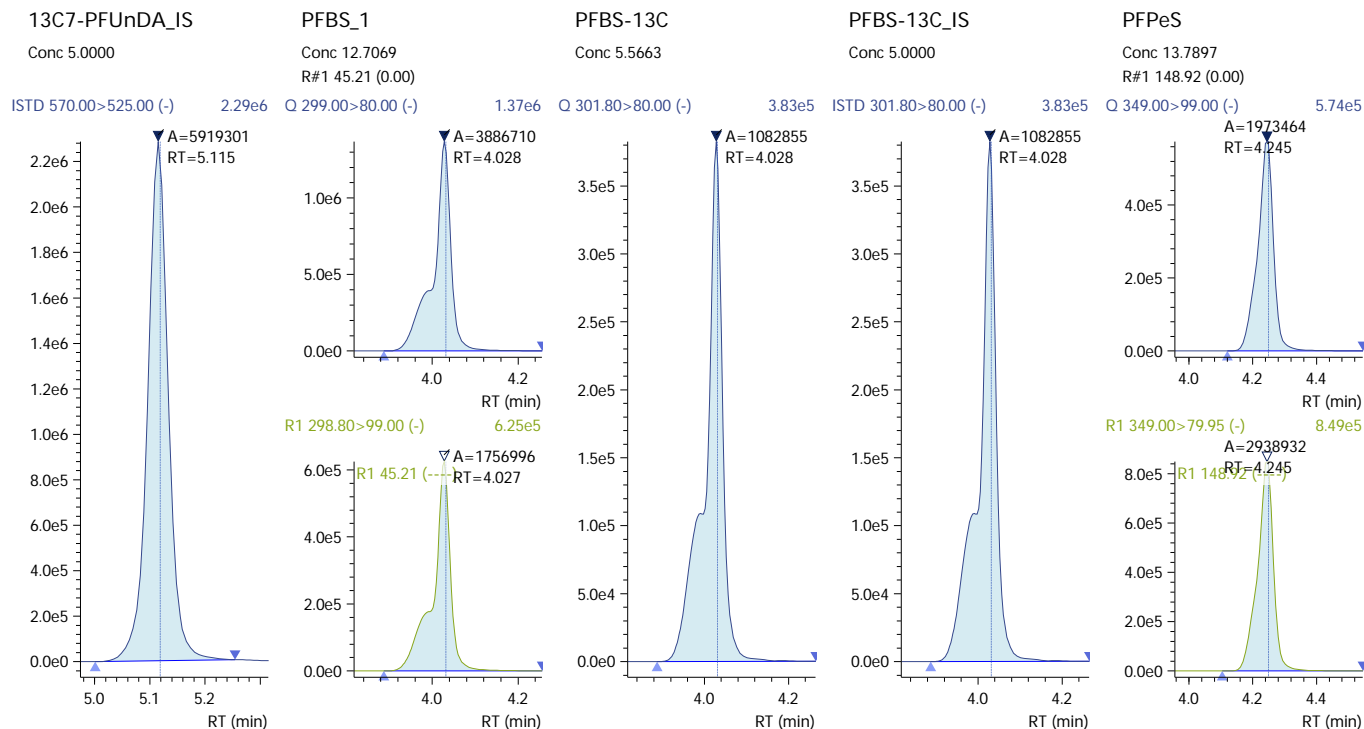
210413\_040 (continued)





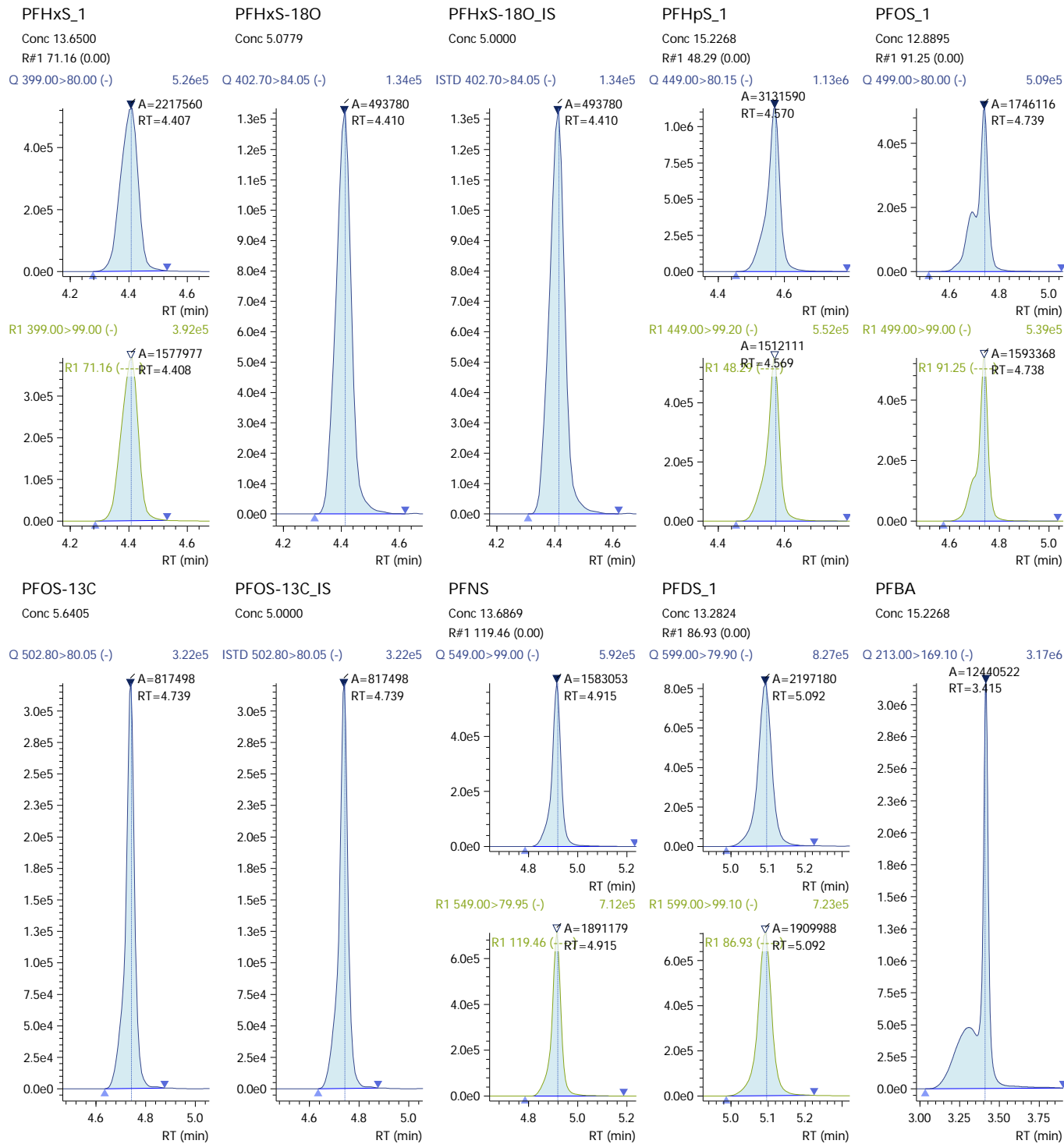
### 210413\_040

Sample ID: PFC ICAL 15 PPB  
Date Acquired: 4/13/2021 6:42:36 PM  
Acquired by: System Administrator  
Data File: 210413\_040  
Vial: 7 | Inj. Volume: 15.0000uL | Tray: 0



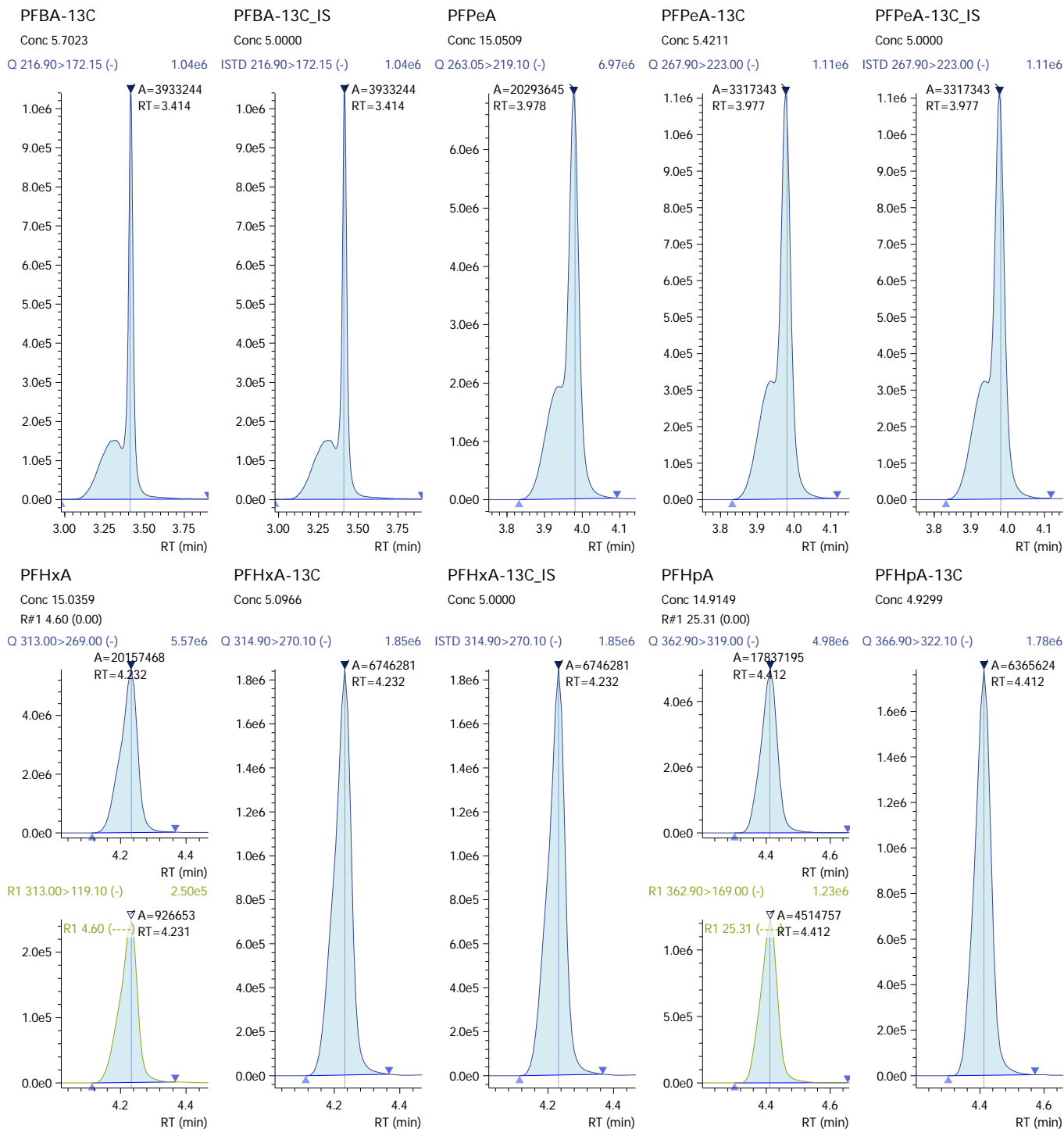


### 210413\_040 (continued)



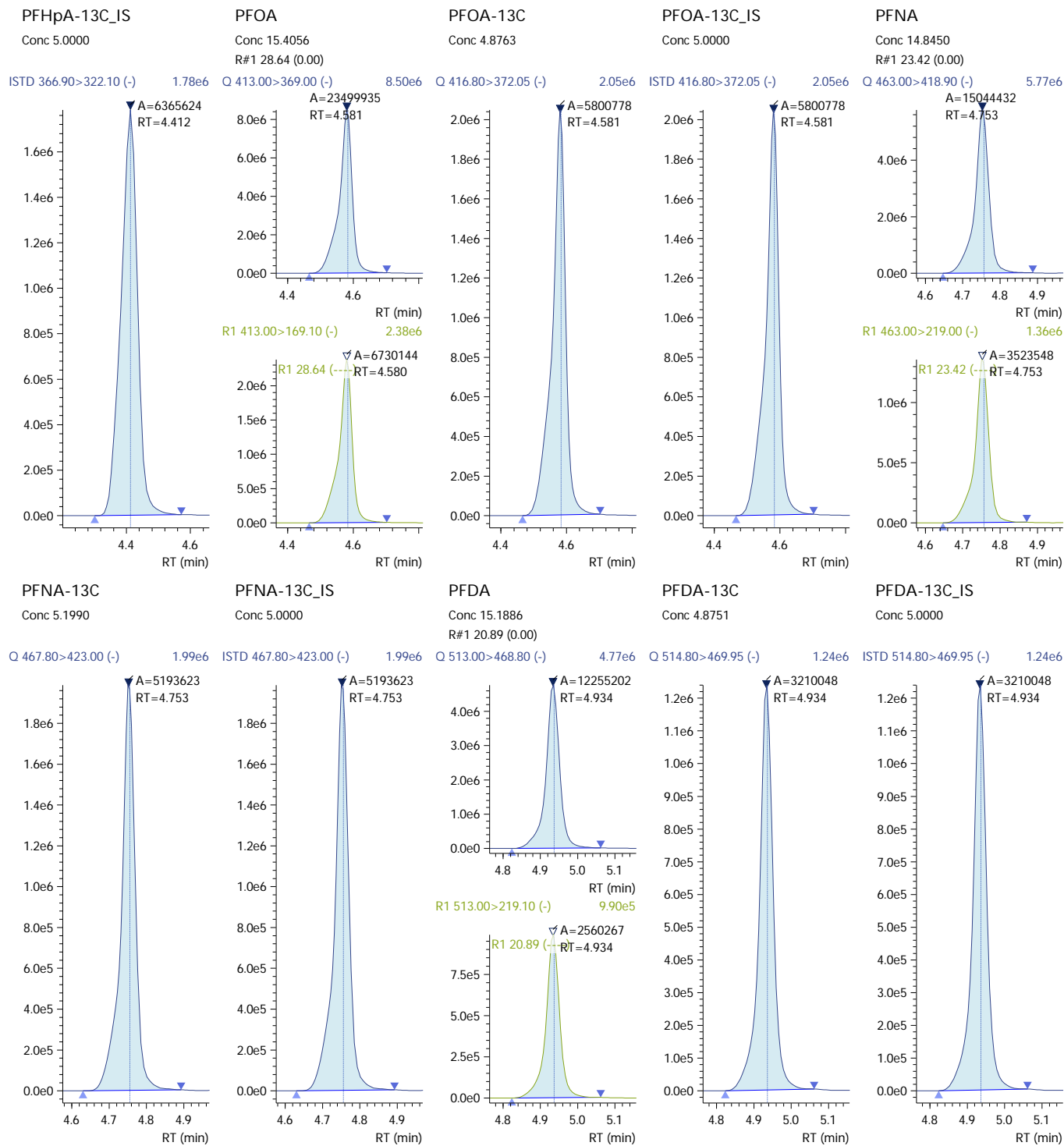


### 210413\_040 (continued)





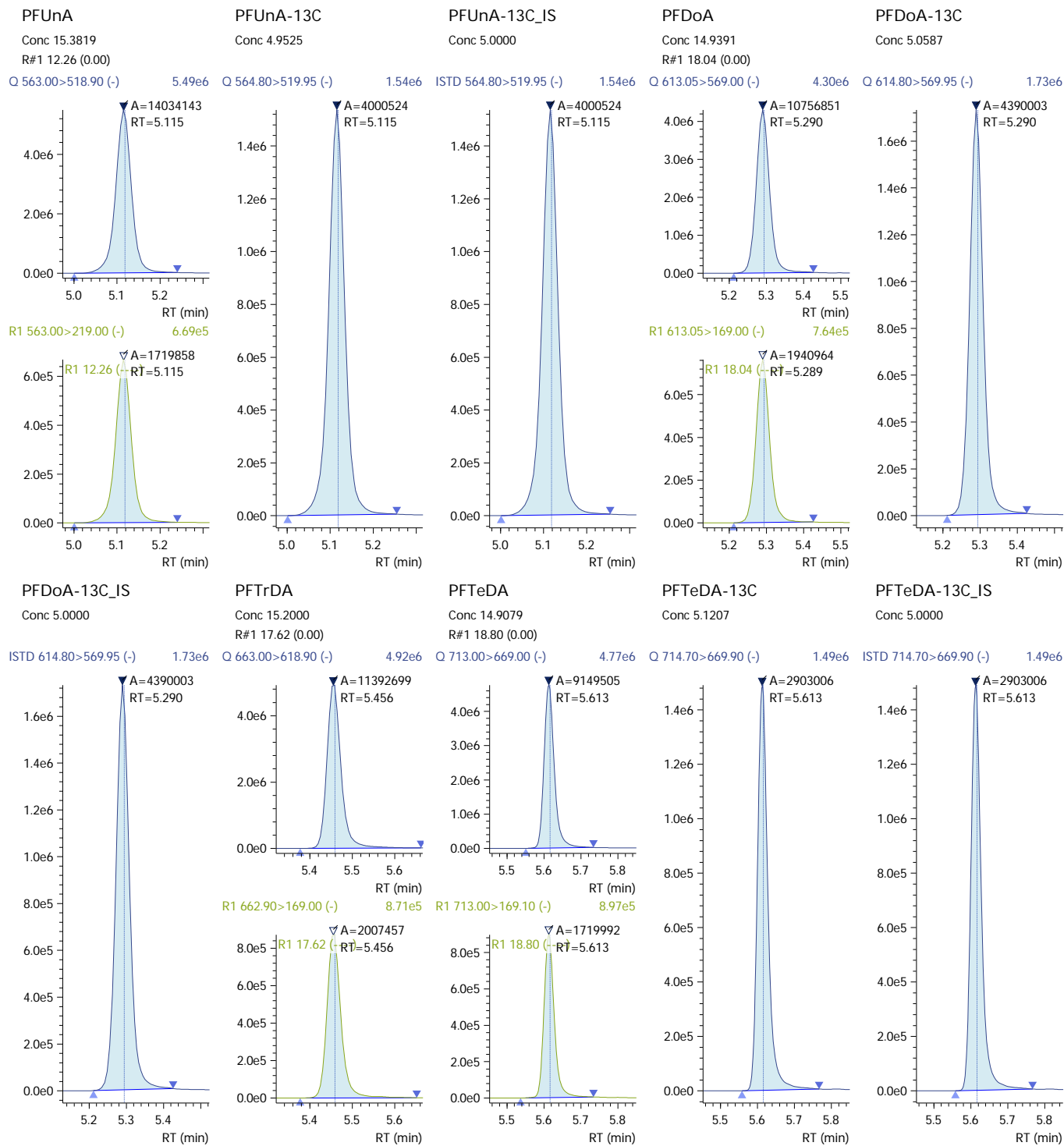
### 210413\_040 (continued)





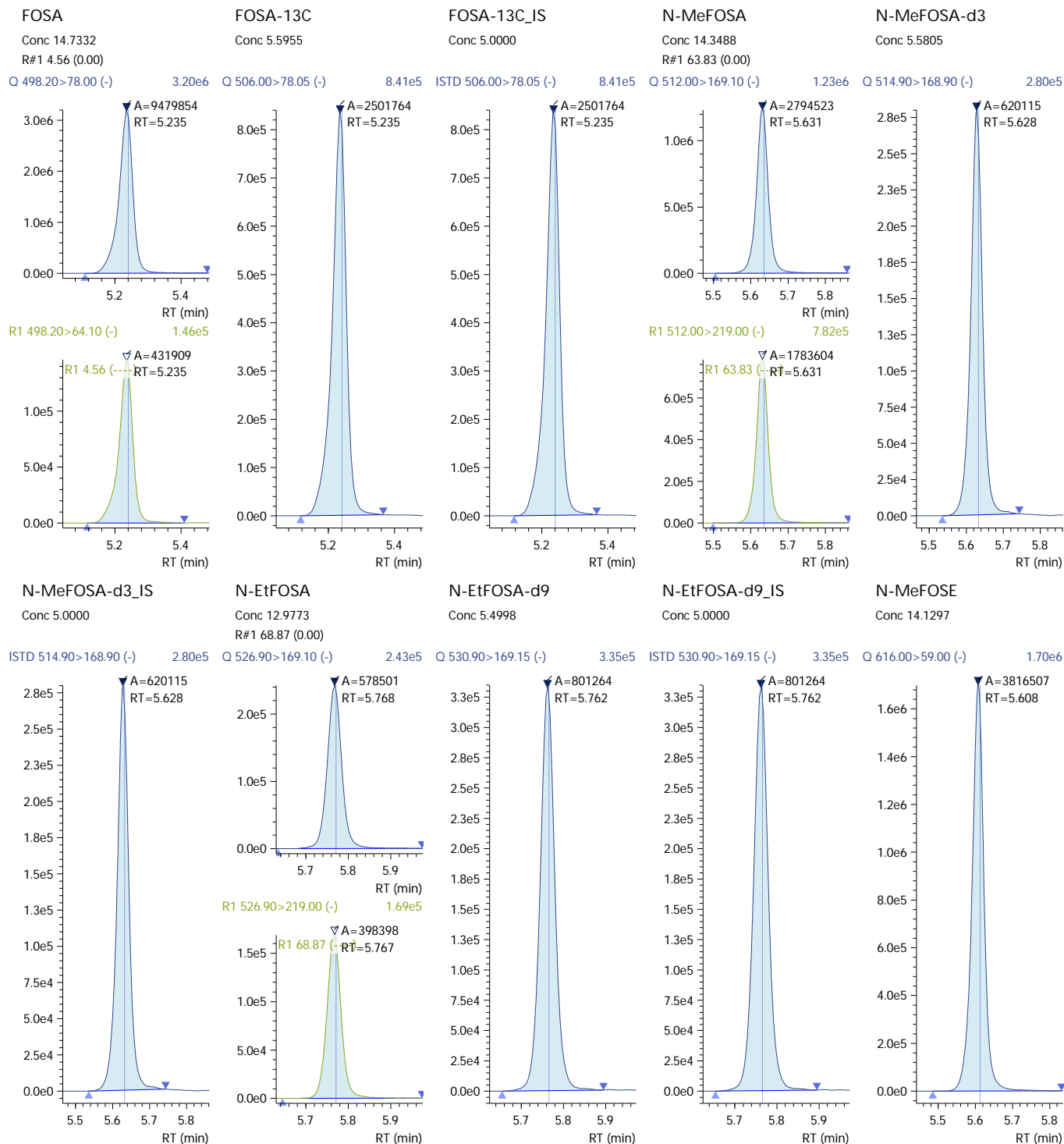


### 210413\_040 (continued)



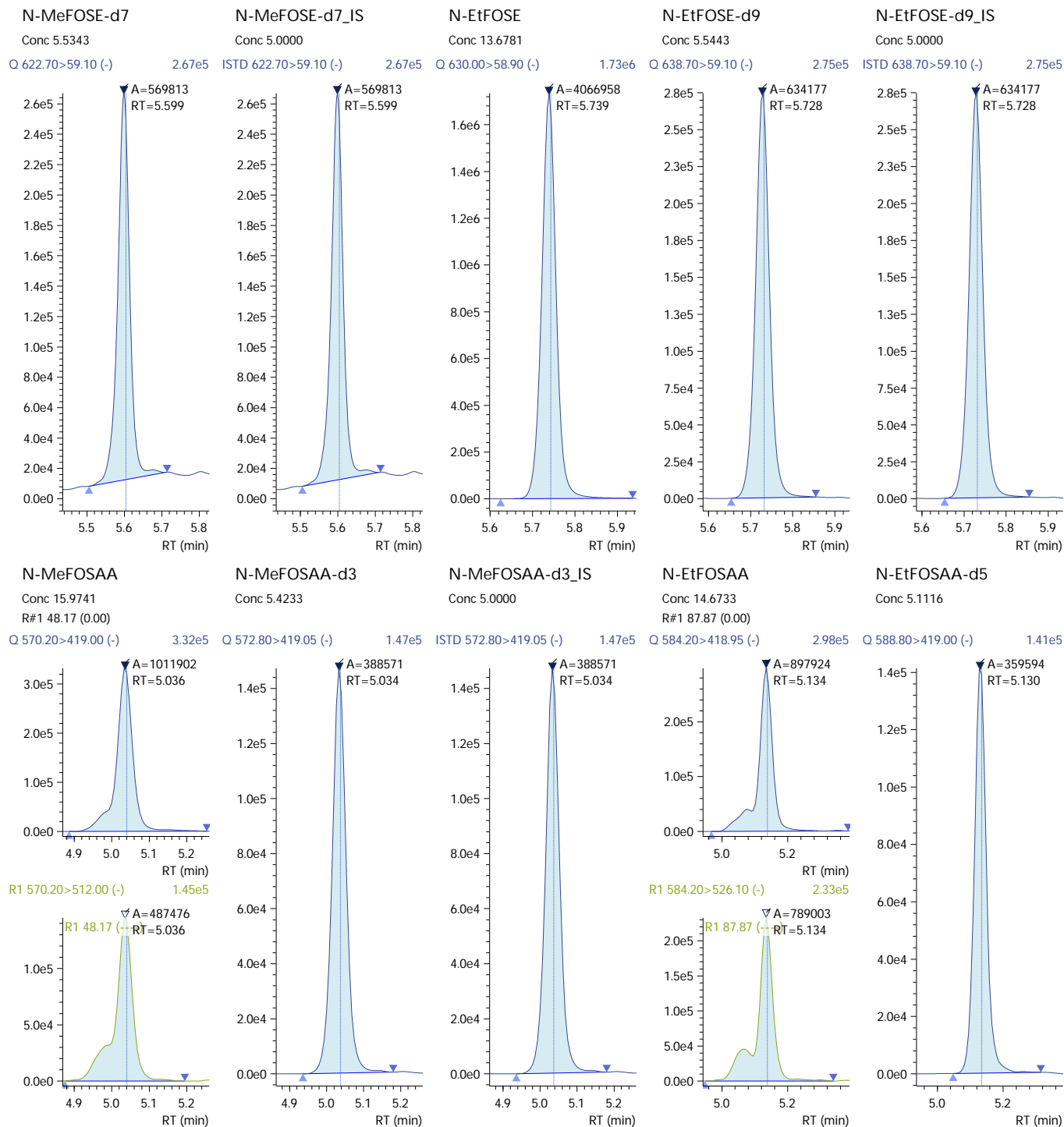


### 210413\_040 (continued)





### 210413\_040 (continued)





### 210413\_040 (continued)

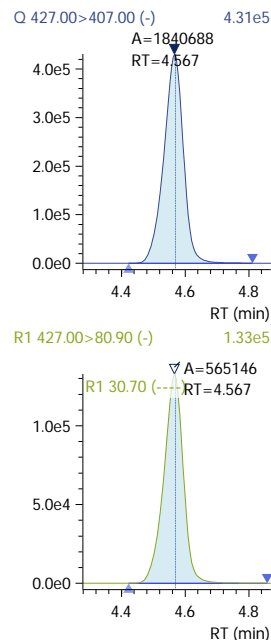
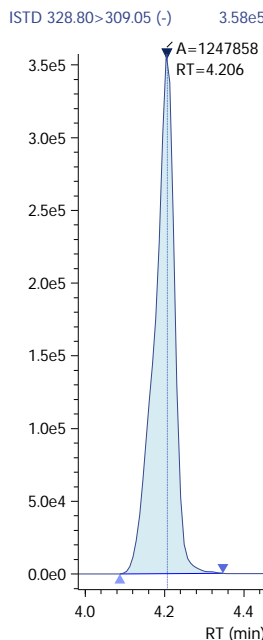
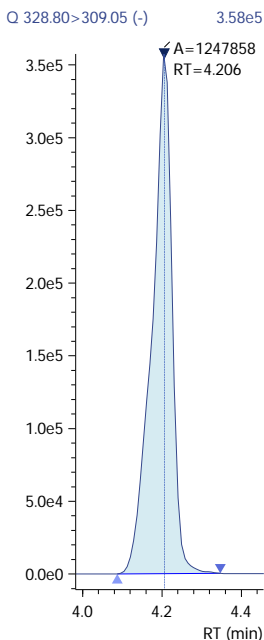
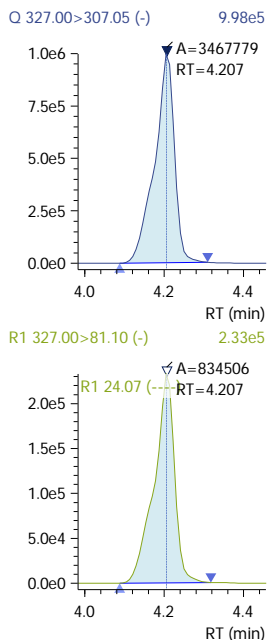
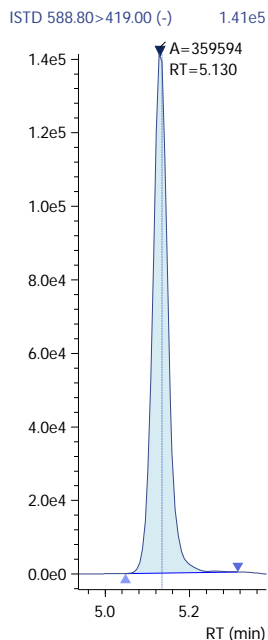
N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 12.5246  
R#1 24.07 (0.00)

4\_2-FTS-13C  
Conc 5.5049

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 12.4665  
R#1 30.70 (0.00)



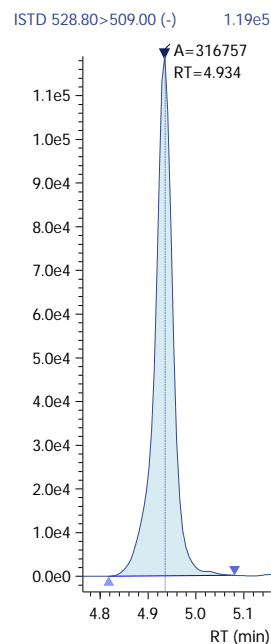
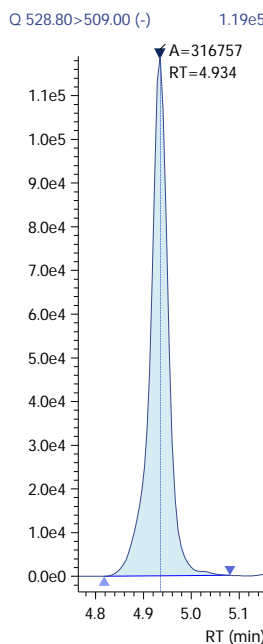
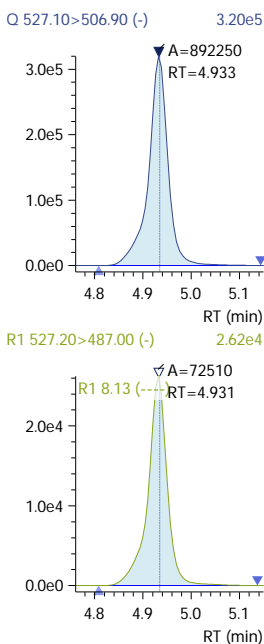
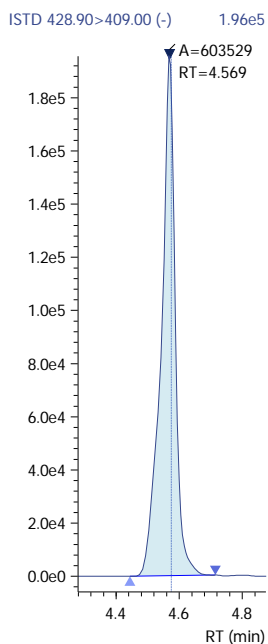
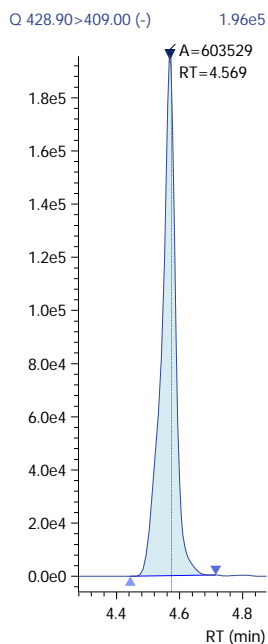
6\_2-FTS-13C  
Conc 4.9597

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 11.9348  
R#1 8.13 (0.00)

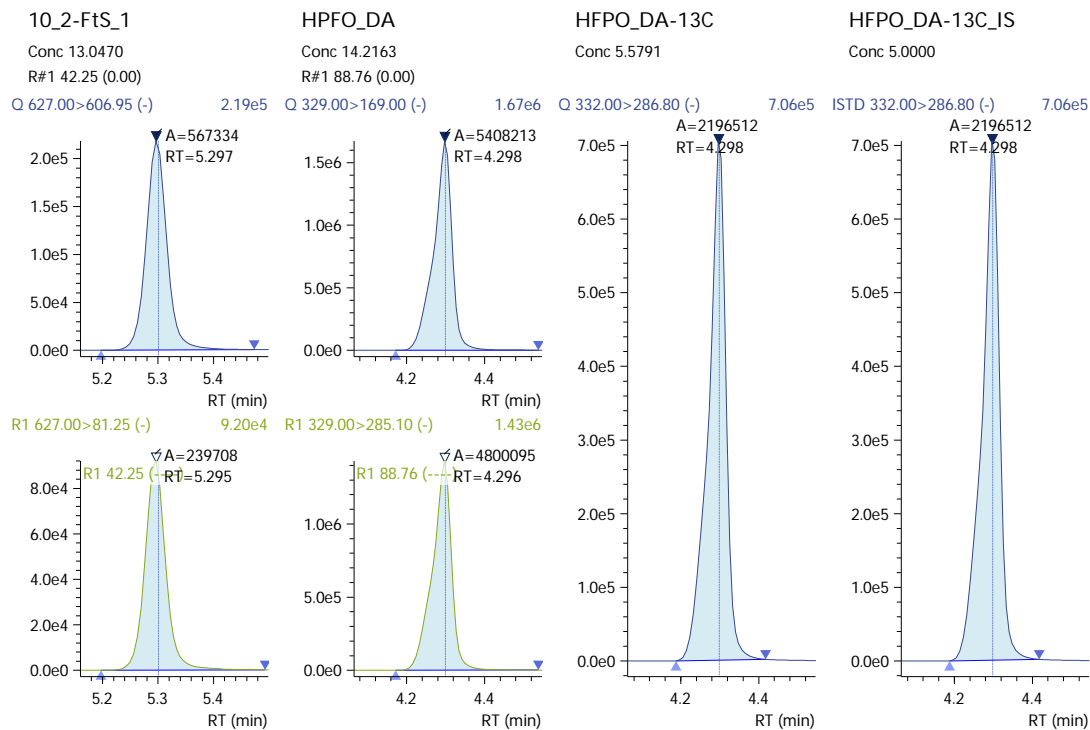
8\_2-FTS-13C  
Conc 5.2992

8\_2-FTS-13C\_IS  
Conc 5.0000





### 210413\_040 (continued)





210413\_041

Sample ID: CCB  
 Date Acquired: 4/13/2021 6:53:06 PM  
 Acquired by: System Administrator  
 Data File: 210413\_041  
 Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.116	-0.002	----	5415746	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.027	-0.005	0.00	1663	847	50.93	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.028	-0.004	-1.09	1021491	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.028	-0.004	----	1021491	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.239	-0.010	0.21	411	433	105.35	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.415	0.007	0.00	2763	2705	97.92	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.412	-0.001	-0.70	493112	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.412	-0.001	----	493112	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.573	-0.002	0.16	465	321	69.03	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.739	-0.003	0.00	383	561	146.48	91.63	45.82 -137.45	IRr
PFOS-13C	502.80>80.05	----	4.739	-0.003	-0.38	751446	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.739	-0.003	----	751446	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	----	----	----	----	0	0.00	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	----	----	----	----	0	0.00	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	----	----	----	----	----	----	----		
PFBA-13C	216.90>172.15	----	3.414	0.005	-1.70	3710288	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.414	0.005	----	3710288	----	----	----		
PFPeA	263.05>219.10	----	3.978	-0.003	0.00	39776	----	----	----		
PFPeA-13C	267.90>223.00	----	3.977	-0.004	-1.14	3183767	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.977	-0.004	----	3183767	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.228	-0.005	-0.01	14630	354	2.42	4.91	2.46-7.37	IRr
PFHxA-13C	314.90>270.10	----	4.233	0.001	-0.88	6977970	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.233	0.001	----	6977970	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.401	-0.011	-0.01	8613	3223	37.42	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.414	0.002	-0.70	7219587	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.414	0.002	----	7219587	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.581	-0.003	0.00	12140	2855	23.52	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.581	-0.003	-0.54	6336624	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.581	-0.003	----	6336624	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.743	-0.013	-0.01	6624	487	7.36	21.68	10.84-32.52	IRr

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_041 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.752	-0.004	-0.36	5508569	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.752	-0.004	----	5508569	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.933	-0.004	0.00	8054	1385	17.20	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.933	-0.003	-0.18	3472946	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.933	-0.003	----	3472946	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.110	-0.009	-0.01	9625	1485	15.43	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.116	-0.003	0.00	4159955	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.116	-0.003	----	4159955	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.292	-0.001	0.00	11923	1606	13.47	18.50	9.25-27.75	
PFDaA-13C	614.80>569.95	----	5.291	-0.003	0.18	4687081	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.291	-0.003	----	4687081	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	5.461	0.002	-0.16	14069	2560	18.20	17.61	8.8-26.41	
PFTeDA	713.00>669.00	713.00>169.10	5.617	0.001	0.00	20757	2632	12.68	18.66	9.33-27.99	
PFTeDA-13C	714.70>669.90	----	5.616	0.000	0.50	2998684	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.616	0.000	----	2998684	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.236	-0.005	0.00	5873	338	5.76	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.236	-0.005	0.12	2120604	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.236	-0.005	----	2120604	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.638	0.003	0.01	1849	408	22.07	63.69	31.85-95.54	IRr
N-MeFOSA-d3	514.90>168.90	----	5.630	-0.003	0.51	527800	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.630	-0.003	----	527800	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.768	-0.003	0.00	420	274	65.24	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.765	-0.001	0.65	643004	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.765	-0.001	----	643004	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.610	-0.003	0.01	1623	----	----	----	0-0	
N-MeFOSE-d7	622.70>59.10	----	5.602	-0.002	0.49	424228	----	----	----	0-0	
N-MeFOSE-d7_IS	622.70>59.10	----	5.602	-0.002	----	424228	----	----	----	0-0	
N-EtFOSE	630.00>58.90	----	5.743	0.001	0.01	1853	----	----	----	0-0	
N-EtFOSE-d9	638.70>59.10	----	5.731	-0.001	0.62	466369	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.731	-0.001	----	466369	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.046	0.006	0.01	4342	821	18.91	48.49	24.24-72.73	IRr
N-MeFOSAA-d3	572.80>419.05	----	5.034	-0.003	-0.08	350979	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.034	-0.003	----	350979	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.139	0.001	0.01	5241	1980	37.78	85.86	42.93 -128.79	IRr
N-EtFOSAA-d5	588.80>419.00	----	5.131	-0.004	0.02	362516	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.131	-0.004	----	362516	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.202	-0.004	-0.01	384	2338	608.82	26.07	13.03-39.1	IRr
4_2-FTS-13C	328.80>309.05	----	4.207	0.000	-0.91	1205496	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_041 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.207	0.000	----	1205496	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.572	0.003	0.00	505	456	90.30	30.56	15.28-45.84	IRr
6_2-FTS-13C	428.90>409.00	----	4.571	-0.003	-0.55	656320	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.571	-0.003	----	656320	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.931	-0.004	0.00	306	29	9.48	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.933	-0.002	-0.18	311507	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.933	-0.002	----	311507	----	----	----	0-0	
10_2-Fts_1	627.00>606.95	627.00>81.25	5.302	0.001	0.37	237	102	43.04	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.301	0.002	0.00	696	845	121.41	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.298	-0.001	-0.82	2086224	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.298	-0.001	----	2086224	----	----	----		

Flag ID key: IRr: Ion Ratio (Relative)





210413\_041

Sample ID: CCB  
 Date Acquired: 4/13/2021 6:53:06 PM  
 Acquired by: System Administrator  
 Data File: 210413\_041  
 Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1

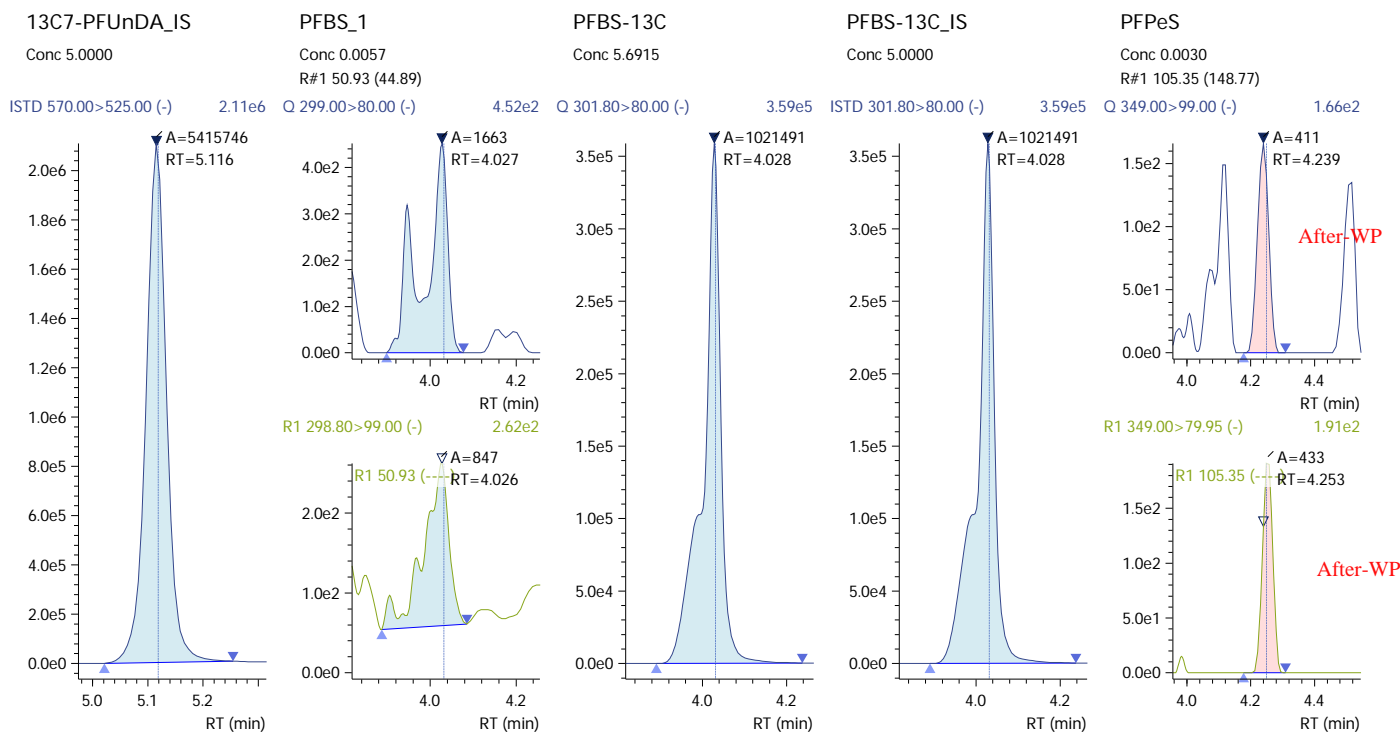
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.116	5415746	5415746	----	----	5.0000	ng/mL
PFBS_1	Auto	4.027	1663	1021491	PFBS-13C_IS	----	0.0057	ng/mL
PFBS-13C	Auto	4.028	1021491	5415746	13C7-PFUnDA_IS	----	5.6915	ng/mL
PFBS-13C_IS	Auto	4.028	1021491	1021491	----	----	5.0000	ng/mL
PFPeS	M	4.239	411	1021491	PFBS-13C_IS	----	0.0030	ng/mL
PFHxS_1	MI R1	4.415	2763	493112	PFHxS-18O_IS	----	-0.0056	ng/mL
PFHxS-18O	Auto	4.412	493112	5415746	13C7-PFUnDA_IS	----	5.5425	ng/mL
PFHxS-18O_IS	Auto	4.412	493112	493112	----	----	5.0000	ng/mL
PFHpS_1	M	4.573	465	493112	PFHxS-18O_IS	----	0.0023	ng/mL
PFOS_1	MI R1	4.739	383	751446	PFOS-13C_IS	----	0.0031	ng/mL
PFOS-13C	Auto	4.739	751446	5415746	13C7-PFUnDA_IS	----	5.6669	ng/mL
PFOS-13C_IS	Auto	4.739	751446	751446	----	----	5.0000	ng/mL
PFNS	ND(W/B)	----	----	751446	PFOS-13C_IS	----	----	ng/mL
PFDS_1	ND(W/B)	----	----	751446	PFOS-13C_IS	----	----	ng/mL
PFBA	ND(W/B)	----	----	3710288	PFBA-13C_IS	----	----	ng/mL
PFBA-13C	Auto	3.414	3710288	5415746	13C7-PFUnDA_IS	----	5.8792	ng/mL
PFBA-13C_IS	Auto	3.414	3710288	3710288	----	----	5.0000	ng/mL
PFPeA	M	3.978	39776	3183767	PFPeA-13C_IS	----	0.0025	ng/mL
PFPeA-13C	Auto	3.977	3183767	5415746	13C7-PFUnDA_IS	----	5.6865	ng/mL
PFPeA-13C_IS	Auto	3.977	3183767	3183767	----	----	5.0000	ng/mL
PFHxA	M	4.228	14630	6977970	PFHxA-13C_IS	----	0.0101	ng/mL
PFHxA-13C	Auto	4.233	6977970	5415746	13C7-PFUnDA_IS	----	5.7618	ng/mL
PFHxA-13C_IS	Auto	4.233	6977970	6977970	----	----	5.0000	ng/mL
PFHpA	M	4.401	8613	7219587	PFHpA-13C_IS	----	0.0060	ng/mL
PFHpA-13C	Auto	4.414	7219587	5415746	13C7-PFUnDA_IS	----	6.1111	ng/mL
PFHpA-13C_IS	Auto	4.414	7219587	7219587	----	----	5.0000	ng/mL
PFOA	Auto	4.581	12140	6336624	PFOA-13C_IS	----	0.0072	ng/mL
PFOA-13C	Auto	4.581	6336624	5415746	13C7-PFUnDA_IS	----	5.8220	ng/mL
PFOA-13C_IS	Auto	4.581	6336624	6336624	----	----	5.0000	ng/mL
PFNA	MI R1	4.743	6624	5508569	PFNA-13C_IS	----	0.0060	ng/mL
PFNA-13C	Auto	4.752	5508569	5415746	13C7-PFUnDA_IS	----	6.0270	ng/mL
PFNA-13C_IS	Auto	4.752	5508569	5508569	----	----	5.0000	ng/mL
PFDA	M	4.933	8054	3472946	PFDA-13C_IS	----	0.0092	ng/mL
PFDA-13C	Auto	4.933	3472946	5415746	13C7-PFUnDA_IS	----	5.7648	ng/mL
PFDA-13C_IS	Auto	4.933	3472946	3472946	----	----	5.0000	ng/mL
PFUnA	M	5.110	9625	4159955	PFUnA-13C_IS	----	0.0101	ng/mL
PFUnA-13C	Auto	5.116	4159955	5415746	13C7-PFUnDA_IS	----	5.6287	ng/mL
PFUnA-13C_IS	Auto	5.116	4159955	4159955	----	----	5.0000	ng/mL
PFDaA	M	5.292	11923	4687081	PFDaA-13C_IS	----	0.0157	ng/mL
PFDaA-13C	Auto	5.291	4687081	5415746	13C7-PFUnDA_IS	----	5.9032	ng/mL
PFDaA-13C_IS	Auto	5.291	4687081	4687081	----	----	5.0000	ng/mL
PFTeDA	M	5.461	14069	2998684	PFTeDA-13C_IS	----	0.0181	ng/mL
PFTeDA	M	5.617	20757	2998684	PFTeDA-13C_IS	----	0.0310	ng/mL
PFTeDA-13C	Auto	5.616	2998684	5415746	13C7-PFUnDA_IS	----	5.7812	ng/mL
PFTeDA-13C_IS	Auto	5.616	2998684	2998684	----	----	5.0000	ng/mL
FOSA	M	5.236	5873	2120604	FOSA-13C_IS	----	0.0108	ng/mL
FOSA-13C	Auto	5.236	2120604	5415746	13C7-PFUnDA_IS	----	5.1840	ng/mL
FOSA-13C_IS	Auto	5.236	2120604	2120604	----	----	5.0000	ng/mL
N-MeFOSA	M	5.638	1849	527800	N-MeFOSA-d3_IS	----	0.0113	ng/mL
N-MeFOSA-d3	Auto	5.630	527800	5415746	13C7-PFUnDA_IS	----	5.1914	ng/mL
N-MeFOSA-d3_IS	Auto	5.630	527800	527800	----	----	5.0000	ng/mL
N-EtFOSA	M	5.768	420	643004	N-EtFOSA-d9_IS	----	-0.0170	ng/mL
N-EtFOSA-d9	Auto	5.765	643004	5415746	13C7-PFUnDA_IS	----	4.8239	ng/mL
N-EtFOSA-d9_IS	Auto	5.765	643004	643004	----	----	5.0000	ng/mL



210413\_041 (continued)

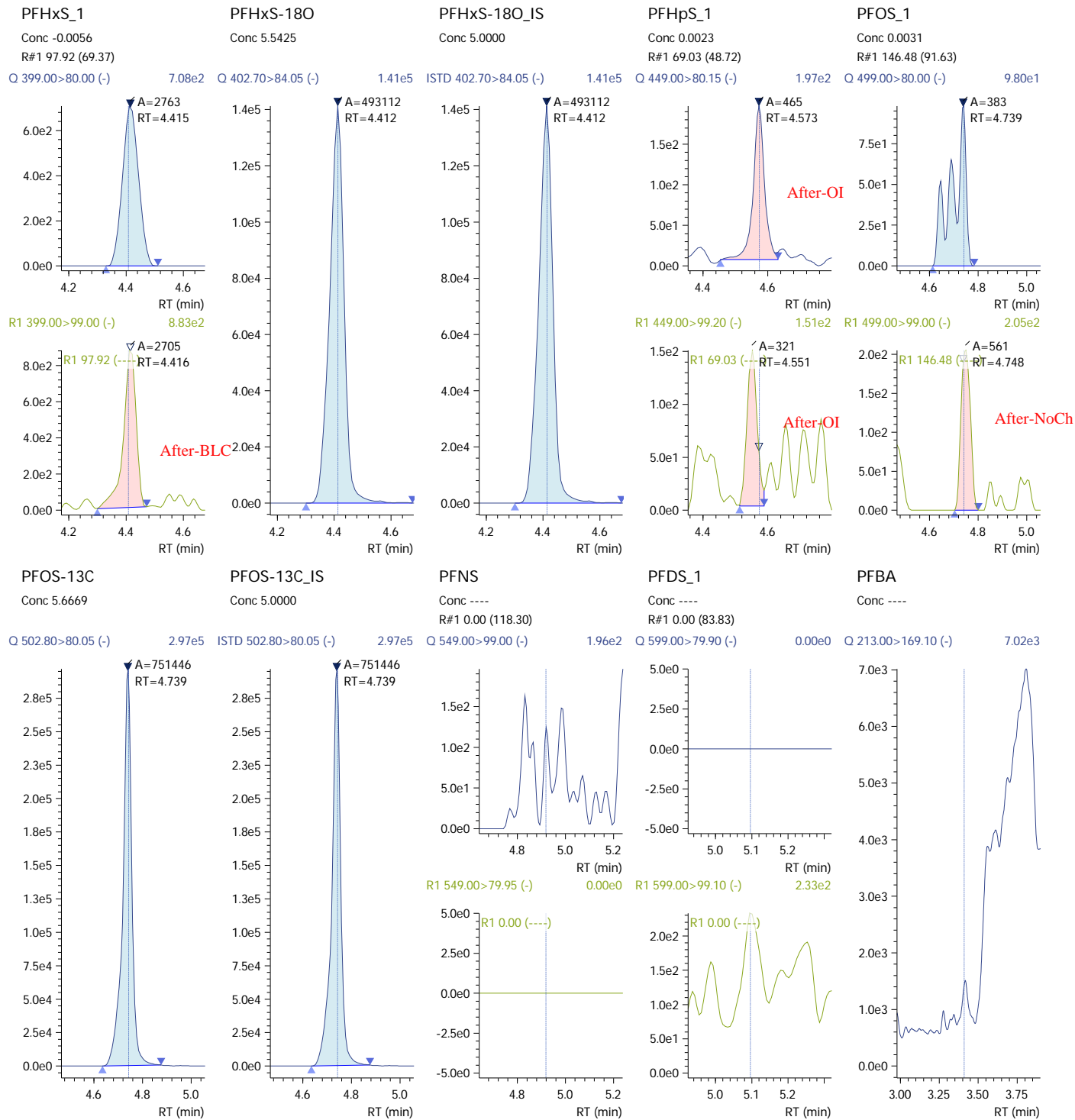
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	M	5.610	1623	424228	N-MeFOSE-d7_IS	----	0.0082	ng/mL
N-MeFOSE-d7	Auto	5.602	424228	5415746	13C7-PFUnDA_IS	----	4.5034	ng/mL
N-MeFOSE-d7_IS	Auto	5.602	424228	424228	----	----	5.0000	ng/mL
N-EtFOSE	M	5.743	1853	466369	N-EtFOSE-d9_IS	----	0.0087	ng/mL
N-EtFOSE-d9	Auto	5.731	466369	5415746	13C7-PFUnDA_IS	----	4.4563	ng/mL
N-EtFOSE-d9_IS	Auto	5.731	466369	466369	----	----	5.0000	ng/mL
N-MeFOSAA	M	5.046	4342	350979	N-MeFOSAA-d3_IS	----	0.0967	ng/mL
N-MeFOSAA-d3	Auto	5.034	350979	5415746	13C7-PFUnDA_IS	----	5.3541	ng/mL
N-MeFOSAA-d3_IS	Auto	5.034	350979	350979	----	----	5.0000	ng/mL
N-EtFOSAA	MI R1	5.139	5241	362516	N-EtFOSAA-d5_IS	----	0.0840	ng/mL
N-EtFOSAA-d5	Auto	5.131	362516	5415746	13C7-PFUnDA_IS	----	5.6323	ng/mL
N-EtFOSAA-d5_IS	Auto	5.131	362516	362516	----	----	5.0000	ng/mL
4_2-FTS_1	M	4.202	384	1205496	4_2-FTS-13C_IS	----	0.0015	ng/mL
4_2-FTS-13C	Auto	4.207	1205496	5415746	13C7-PFUnDA_IS	----	5.8125	ng/mL
4_2-FTS-13C_IS	Auto	4.207	1205496	1205496	----	----	5.0000	ng/mL
6_2-FTS_1	Auto	4.572	505	656320	6_2-FTS-13C_IS	----	0.0031	ng/mL
6_2-FTS-13C	Auto	4.571	656320	5415746	13C7-PFUnDA_IS	----	5.8950	ng/mL
6_2-FTS-13C_IS	Auto	4.571	656320	656320	----	----	5.0000	ng/mL
8_2-FTS_1	M	4.931	306	311507	8_2-FTS-13C_IS	----	0.0042	ng/mL
8_2-FTS-13C	Auto	4.933	311507	5415746	13C7-PFUnDA_IS	----	5.6959	ng/mL
8_2-FTS-13C_IS	Auto	4.933	311507	311507	----	----	5.0000	ng/mL
10_2-Fts_1	M	5.302	237	311507	8_2-FTS-13C_IS	----	0.0055	ng/mL
HPFO_DA	M	4.301	696	2086224	HPFO_DA-13C_IS	----	0.0019	ng/mL
HPFO_DA-13C	Auto	4.298	2086224	5415746	13C7-PFUnDA_IS	----	5.7917	ng/mL
HPFO_DA-13C_IS	Auto	4.298	2086224	2086224	----	----	5.0000	ng/mL



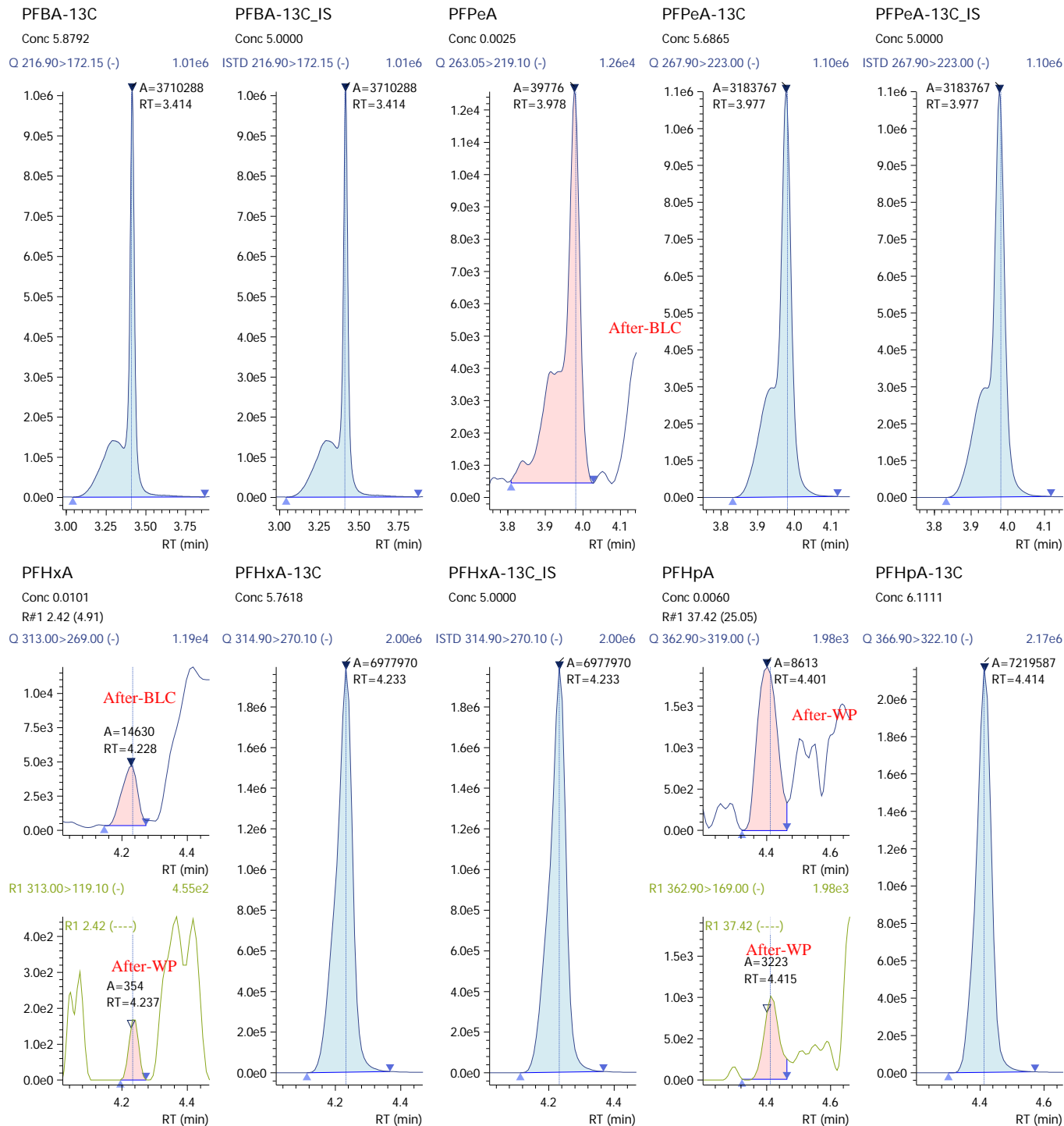


### 210413\_041 (continued)



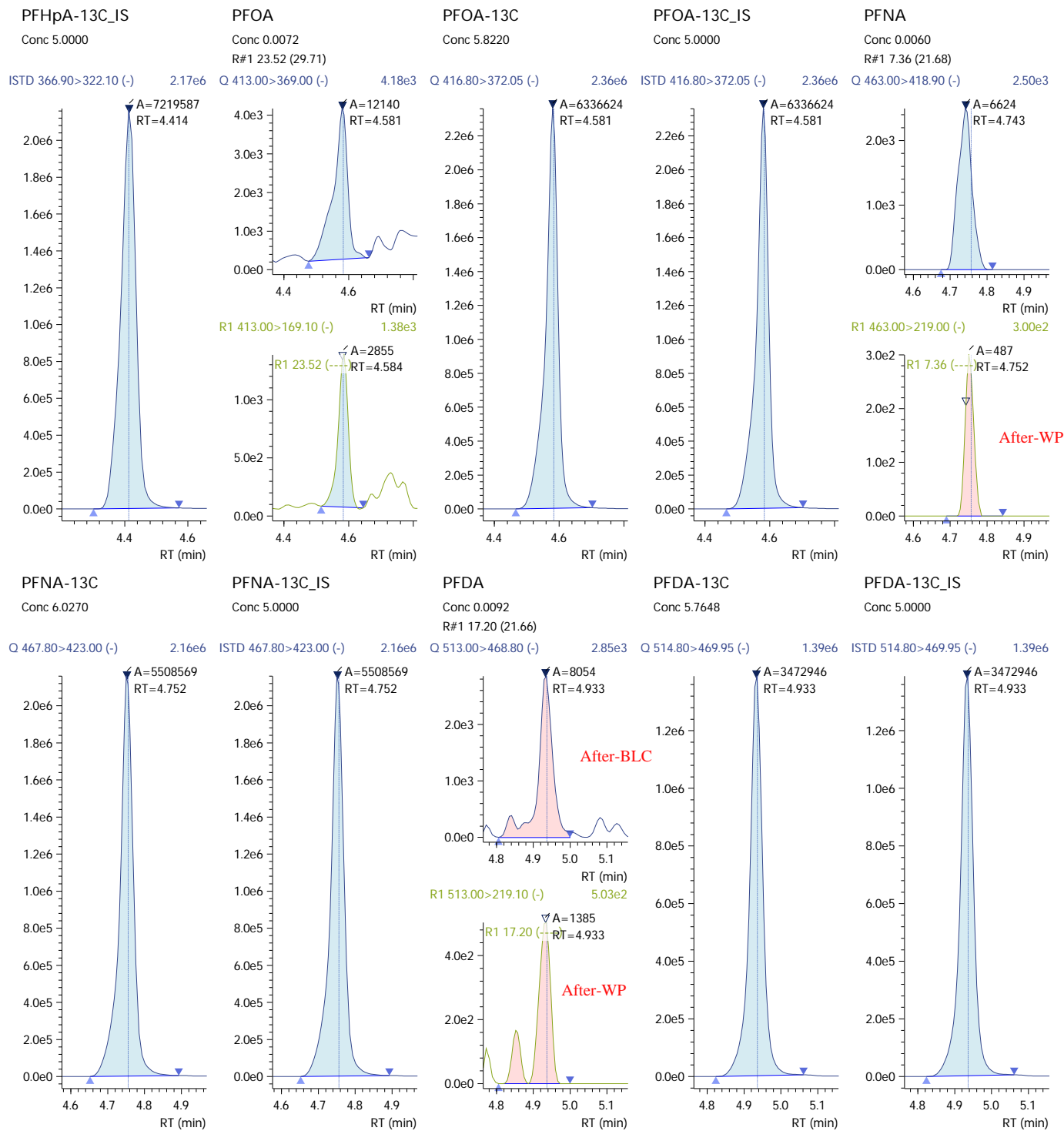


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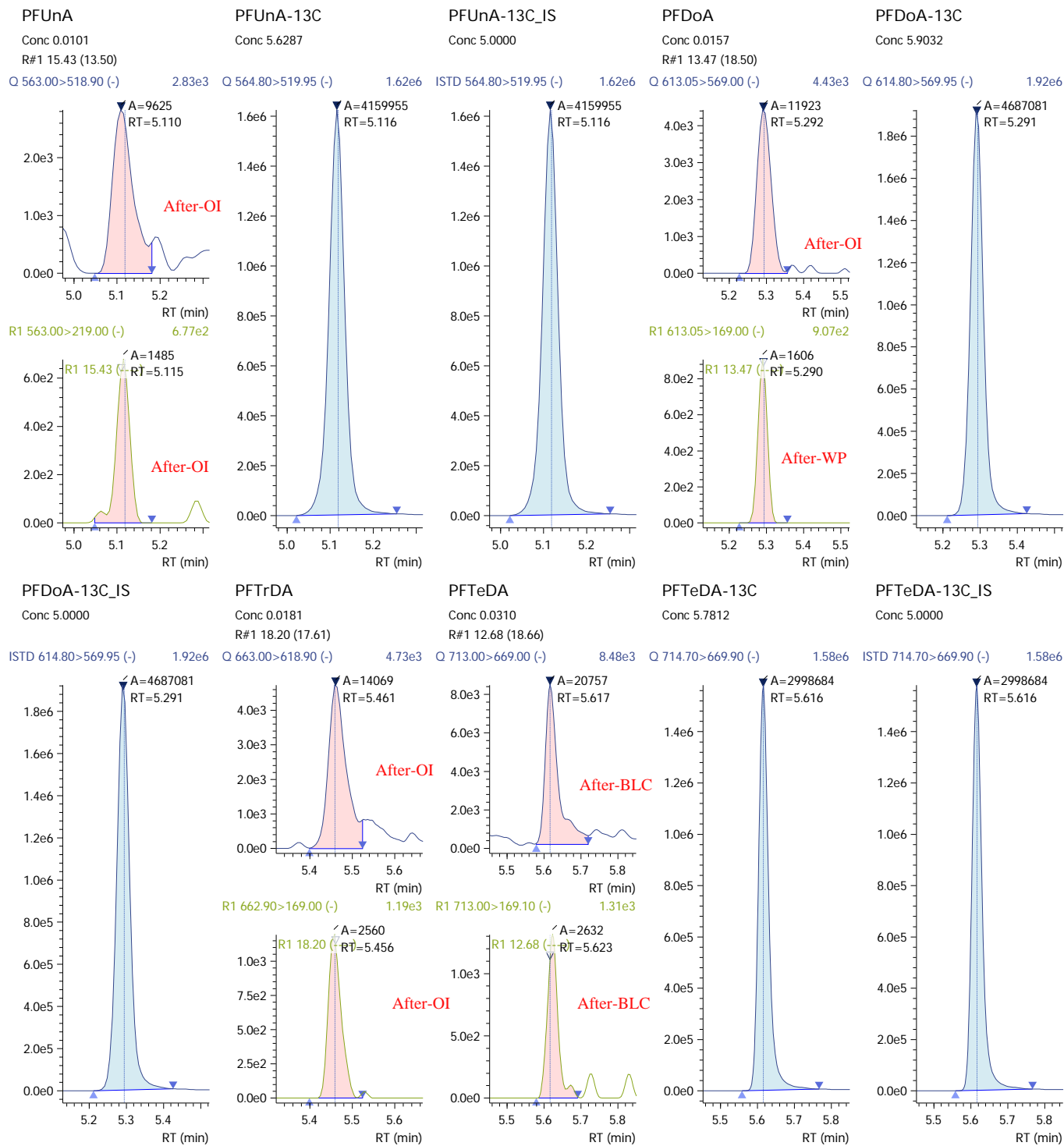


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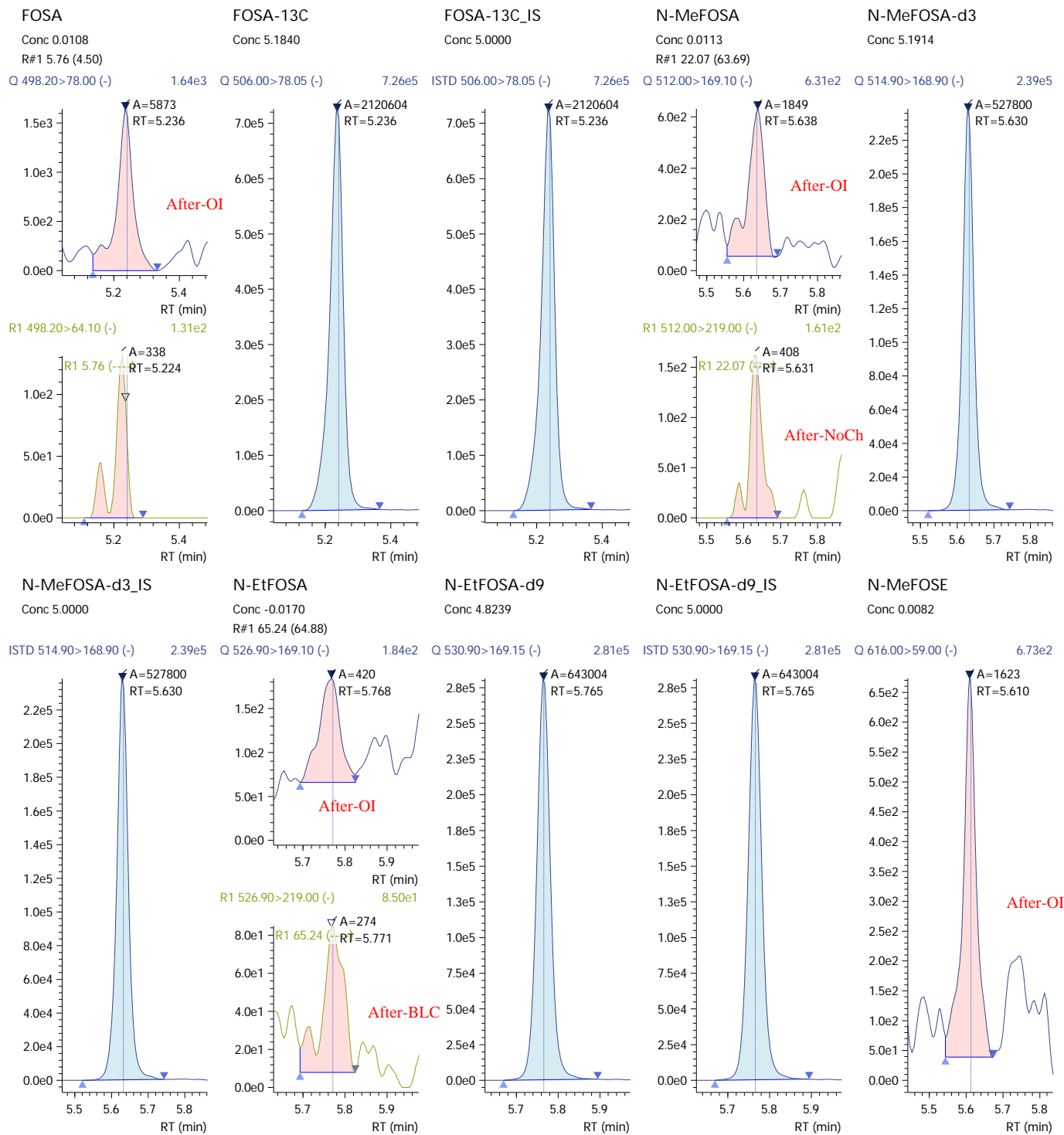


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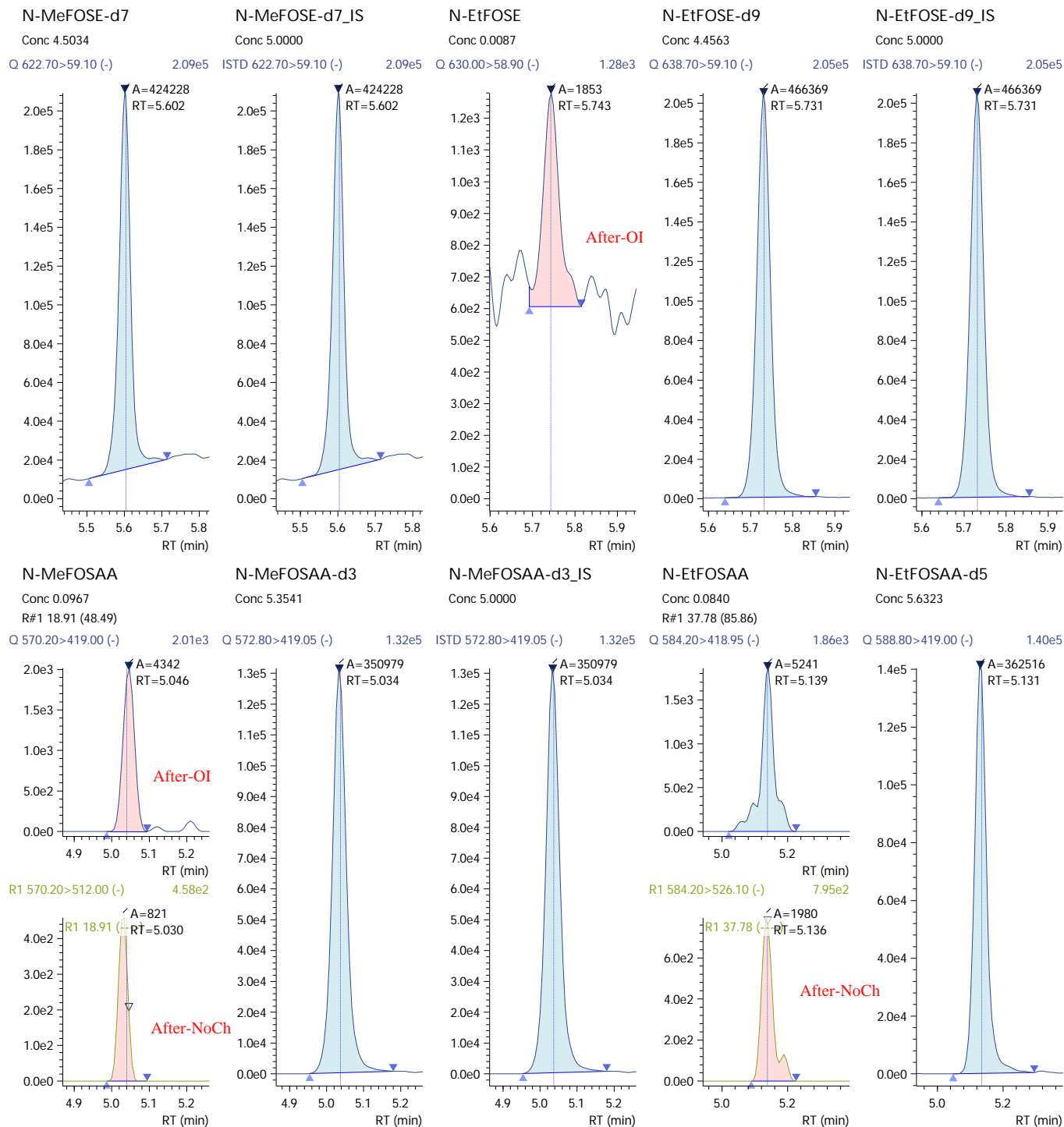


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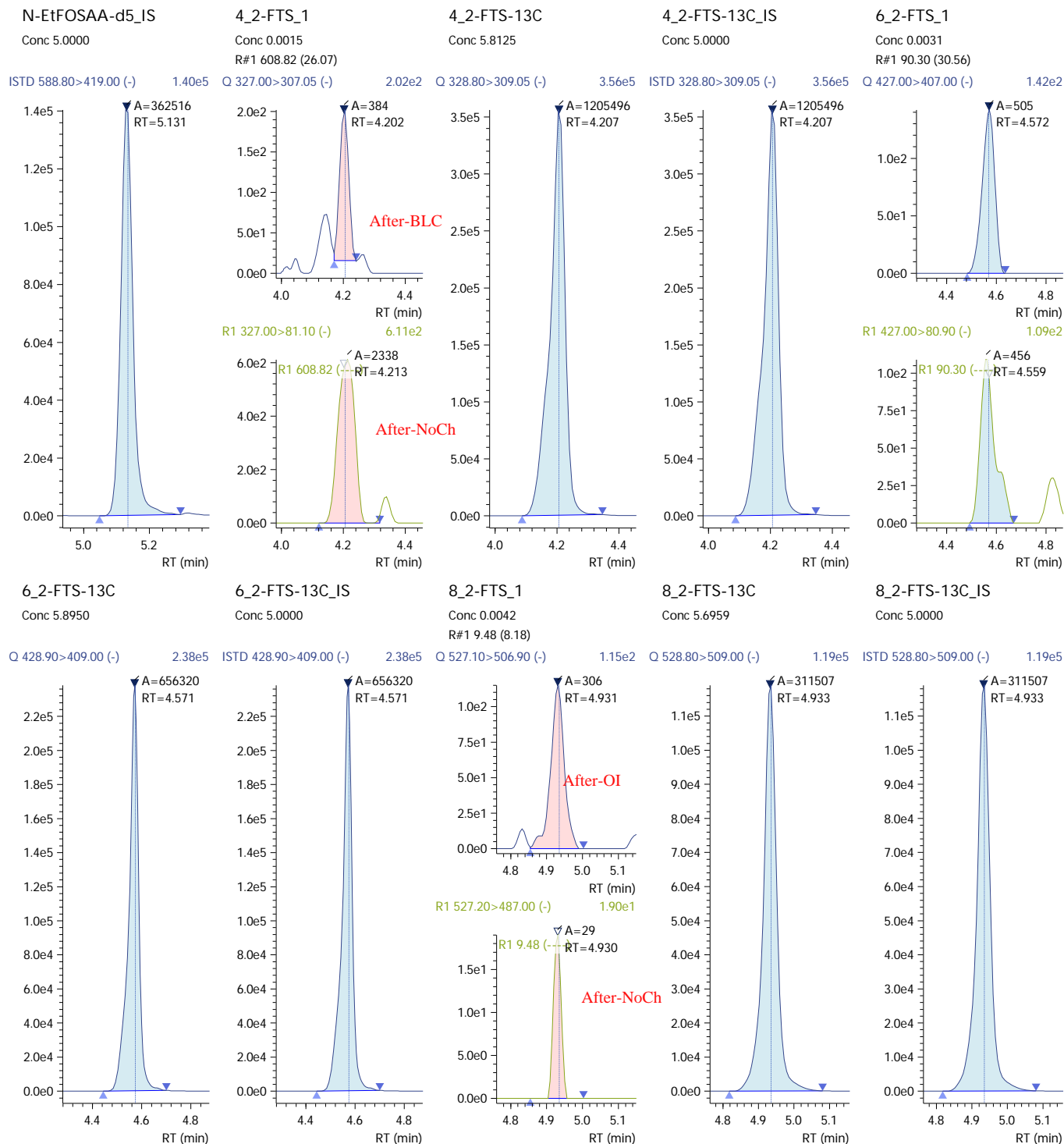
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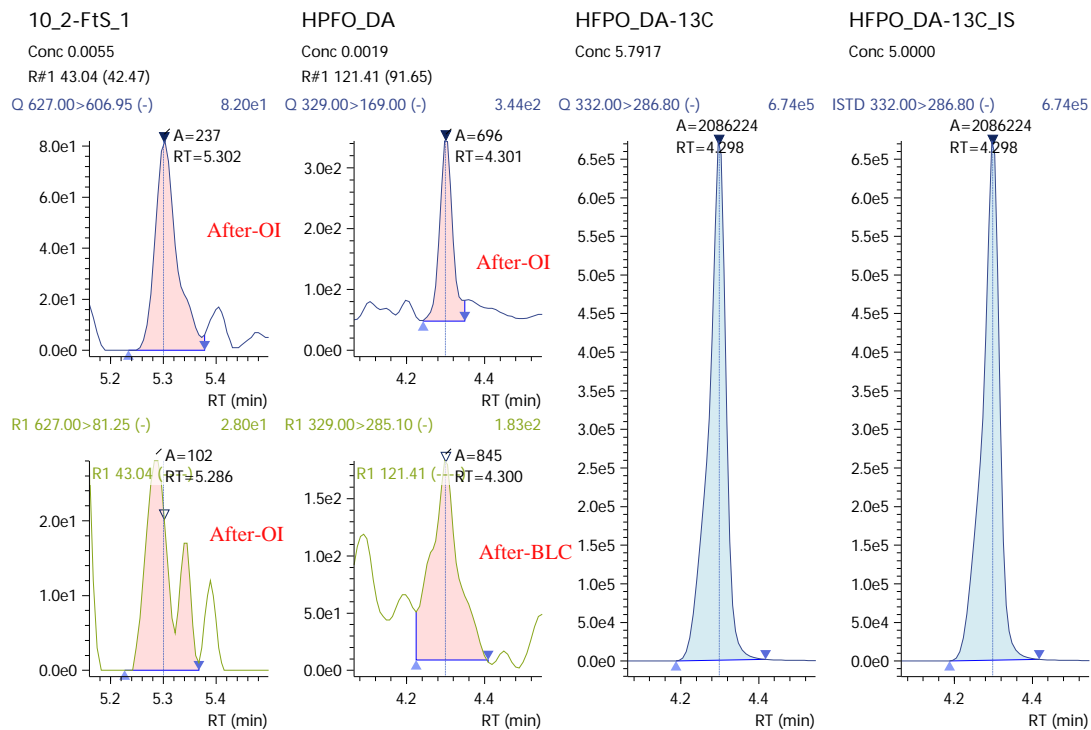


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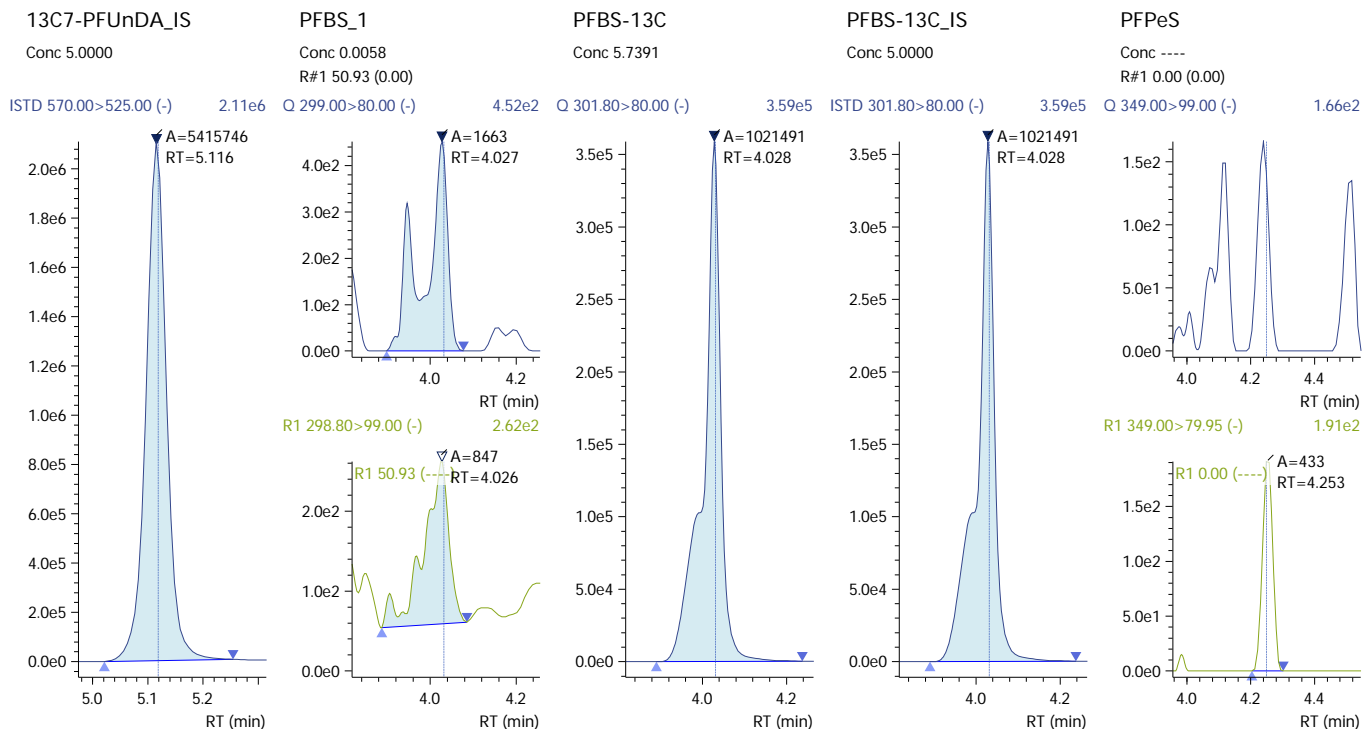
### 210413\_041 (continued)





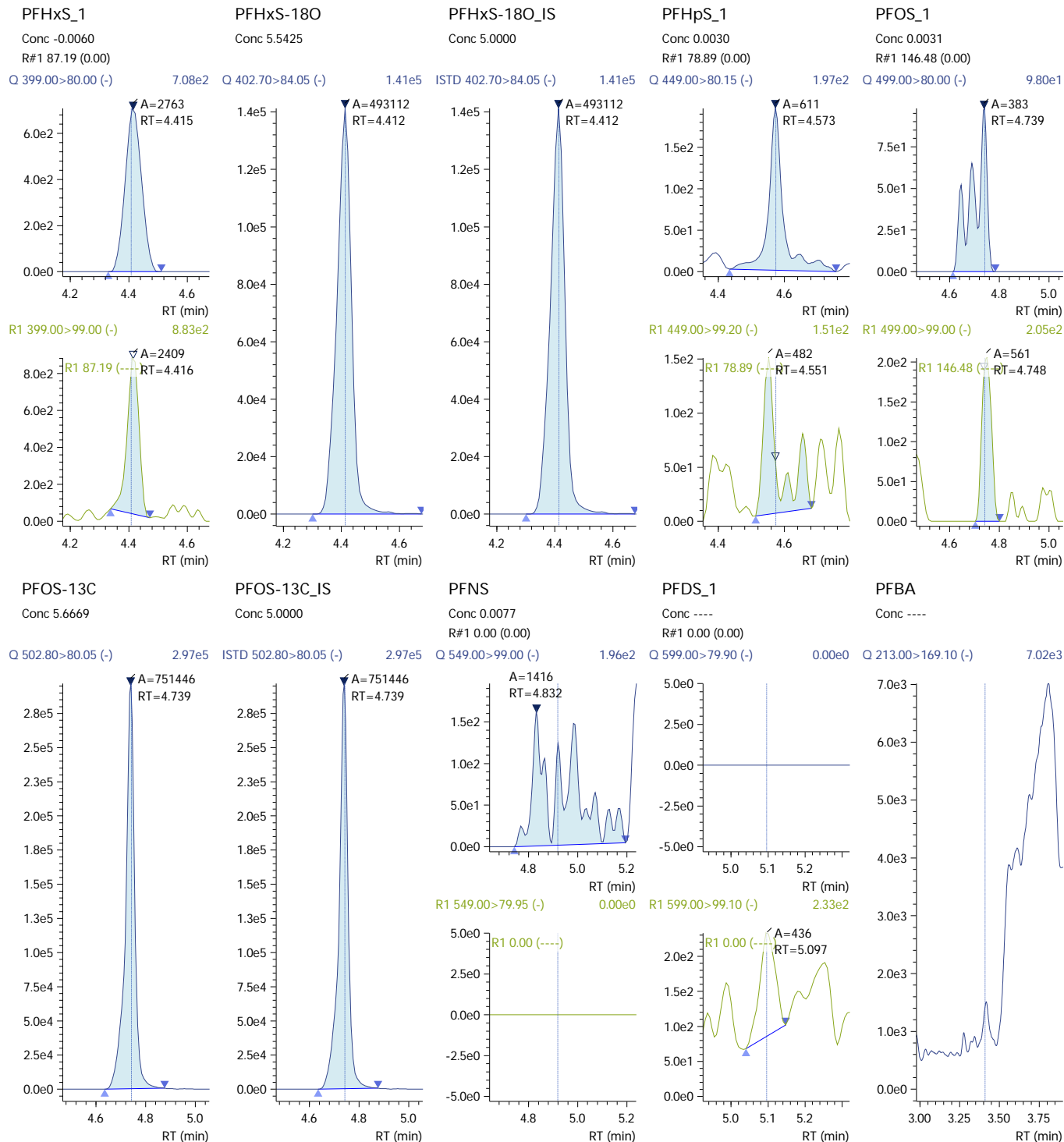
### 210413\_041

Sample ID: CCB  
Date Acquired: 4/13/2021 6:53:06 PM  
Acquired by: System Administrator  
Data File: 210413\_041  
Vial: 11 | Inj. Volume: 15.0000uL | Tray: 1



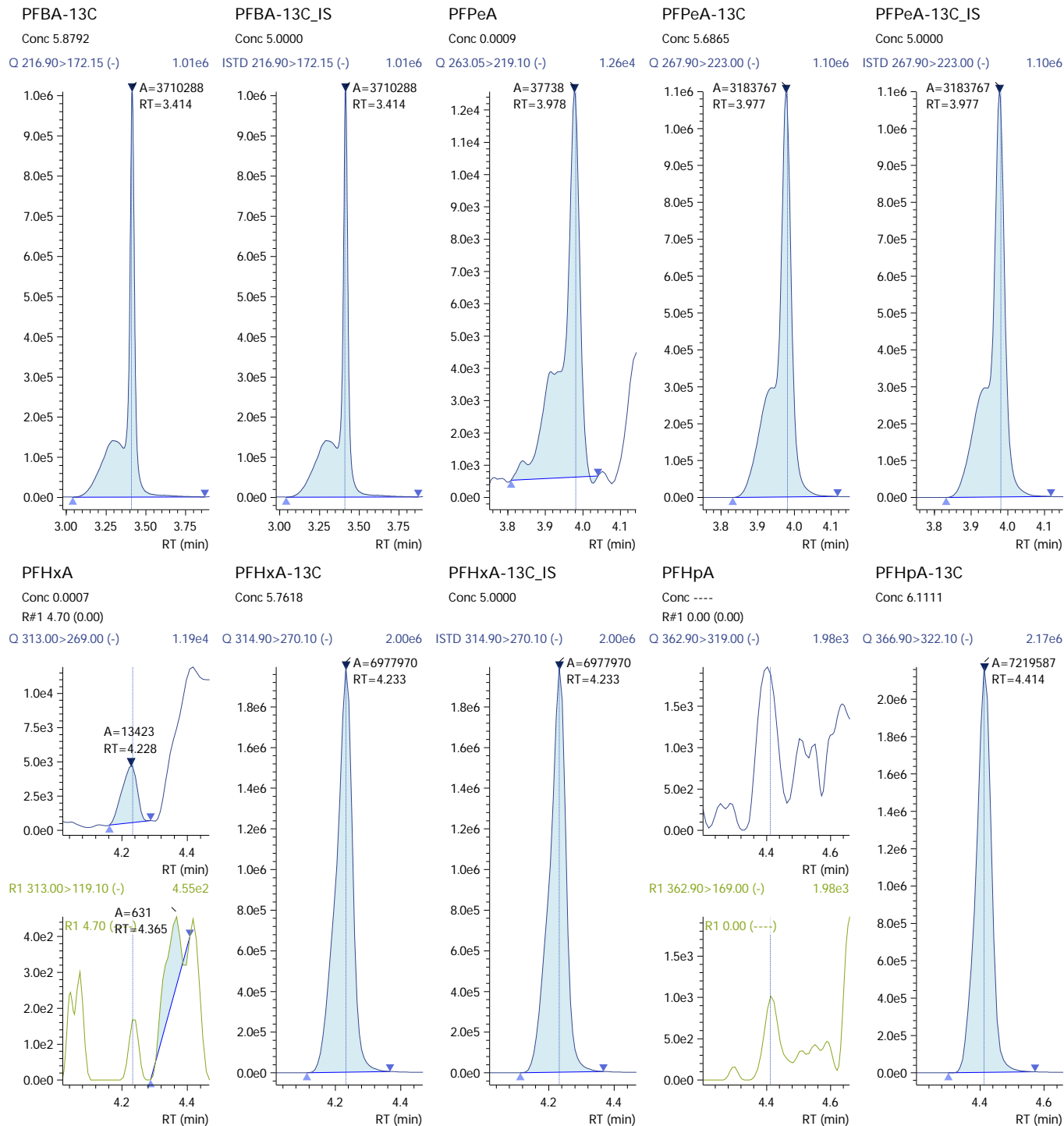


### 210413\_041 (continued)



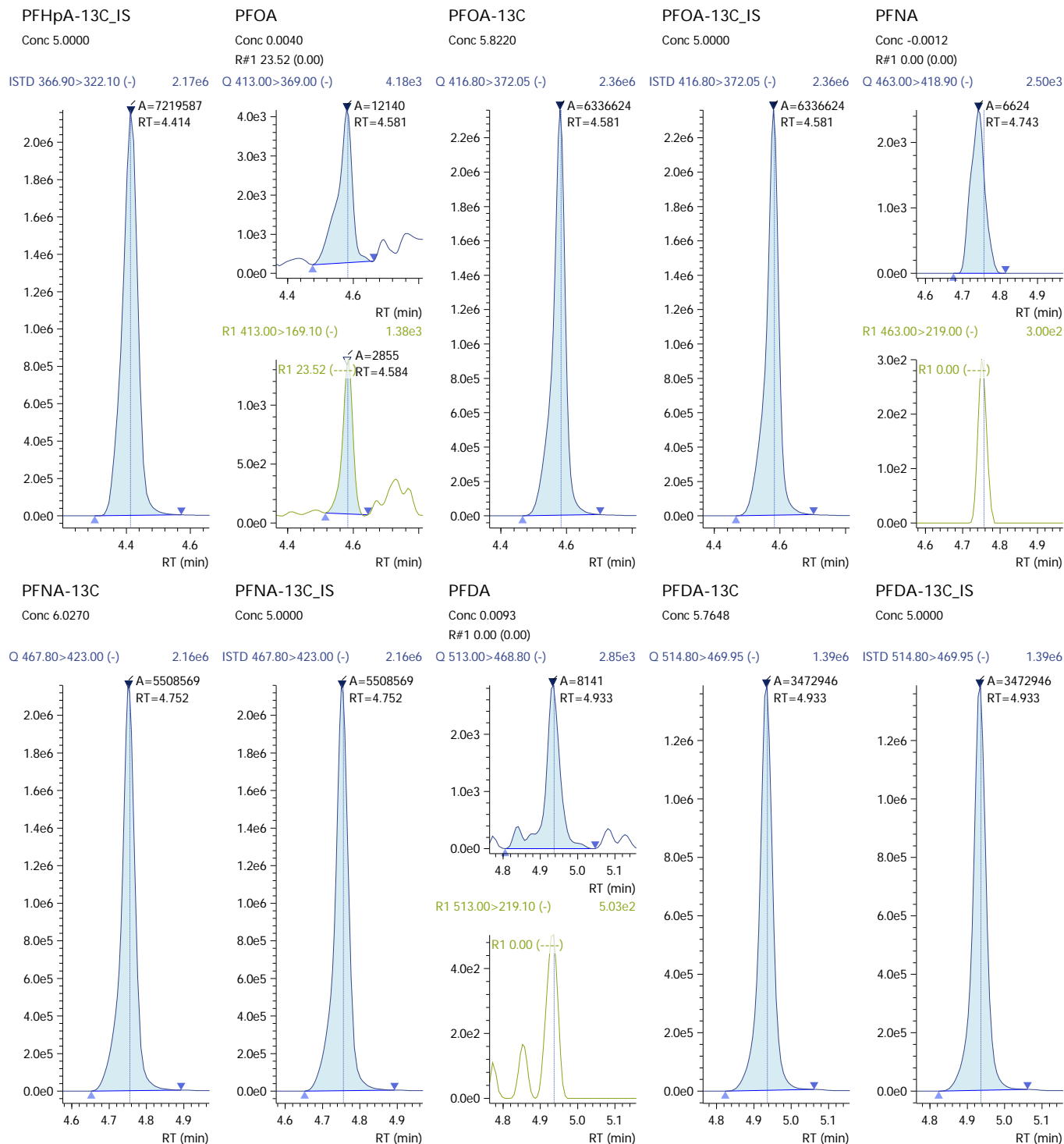


### 210413\_041 (continued)



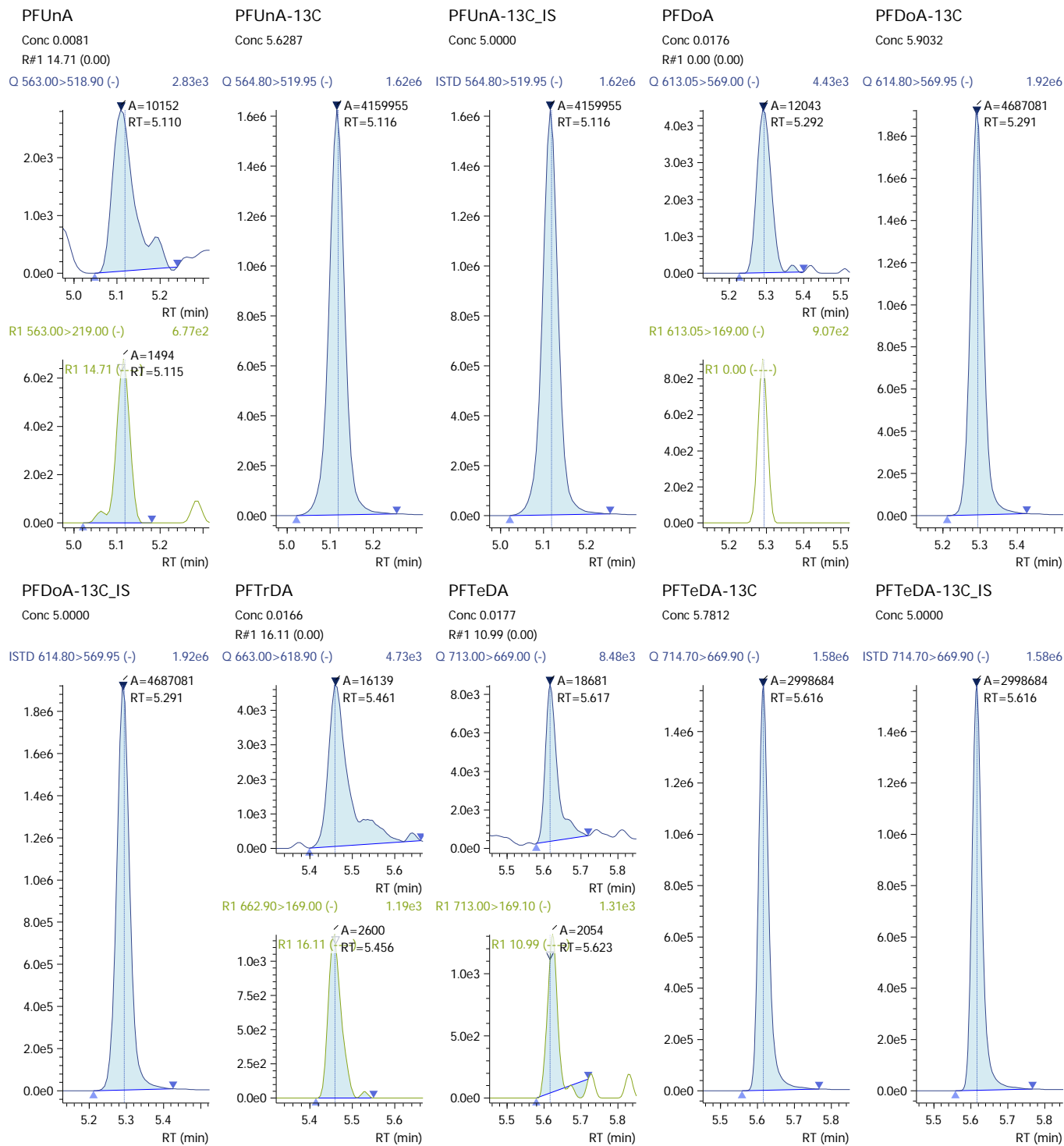


### 210413\_041 (continued)



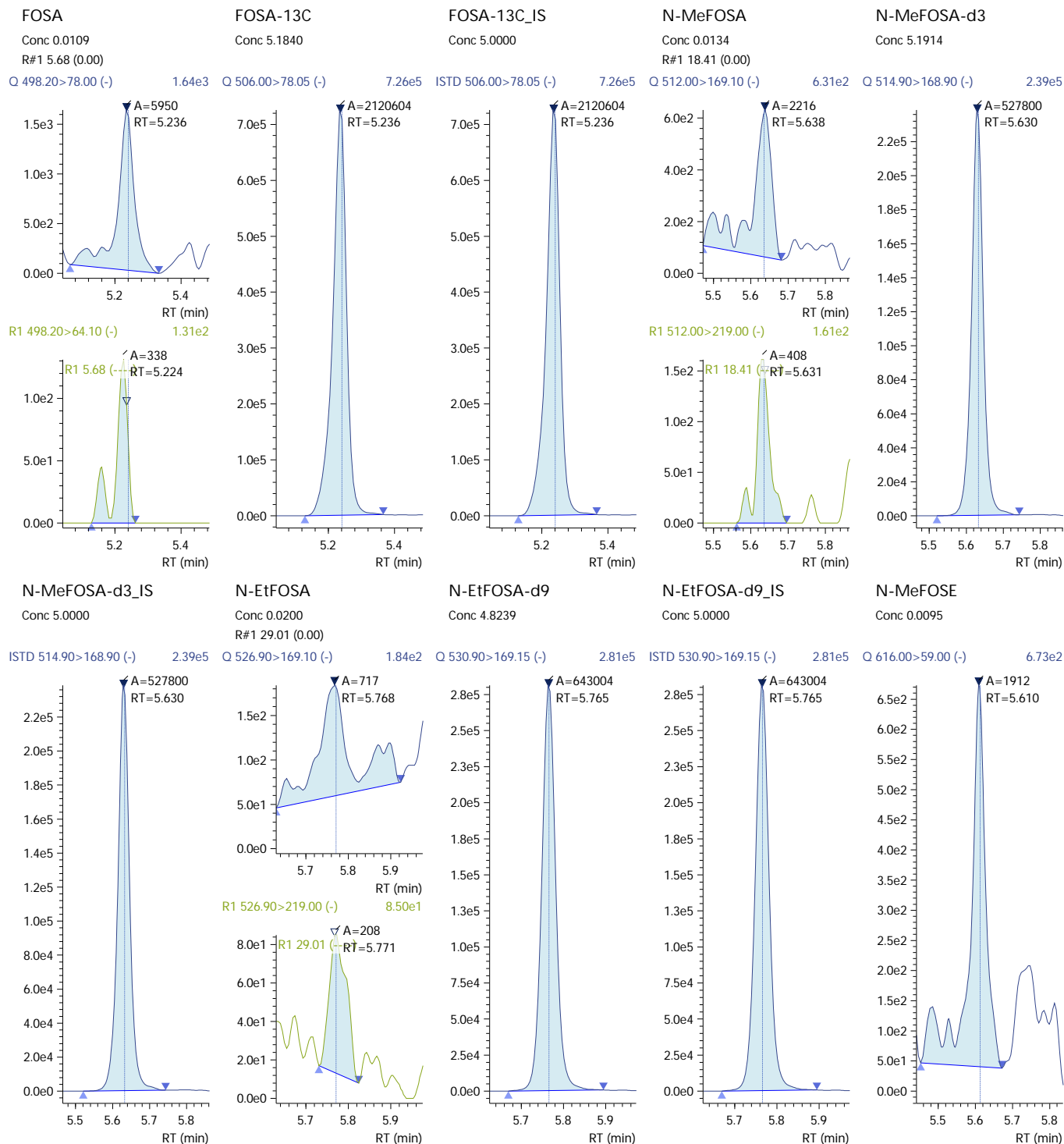


### 210413\_041 (continued)





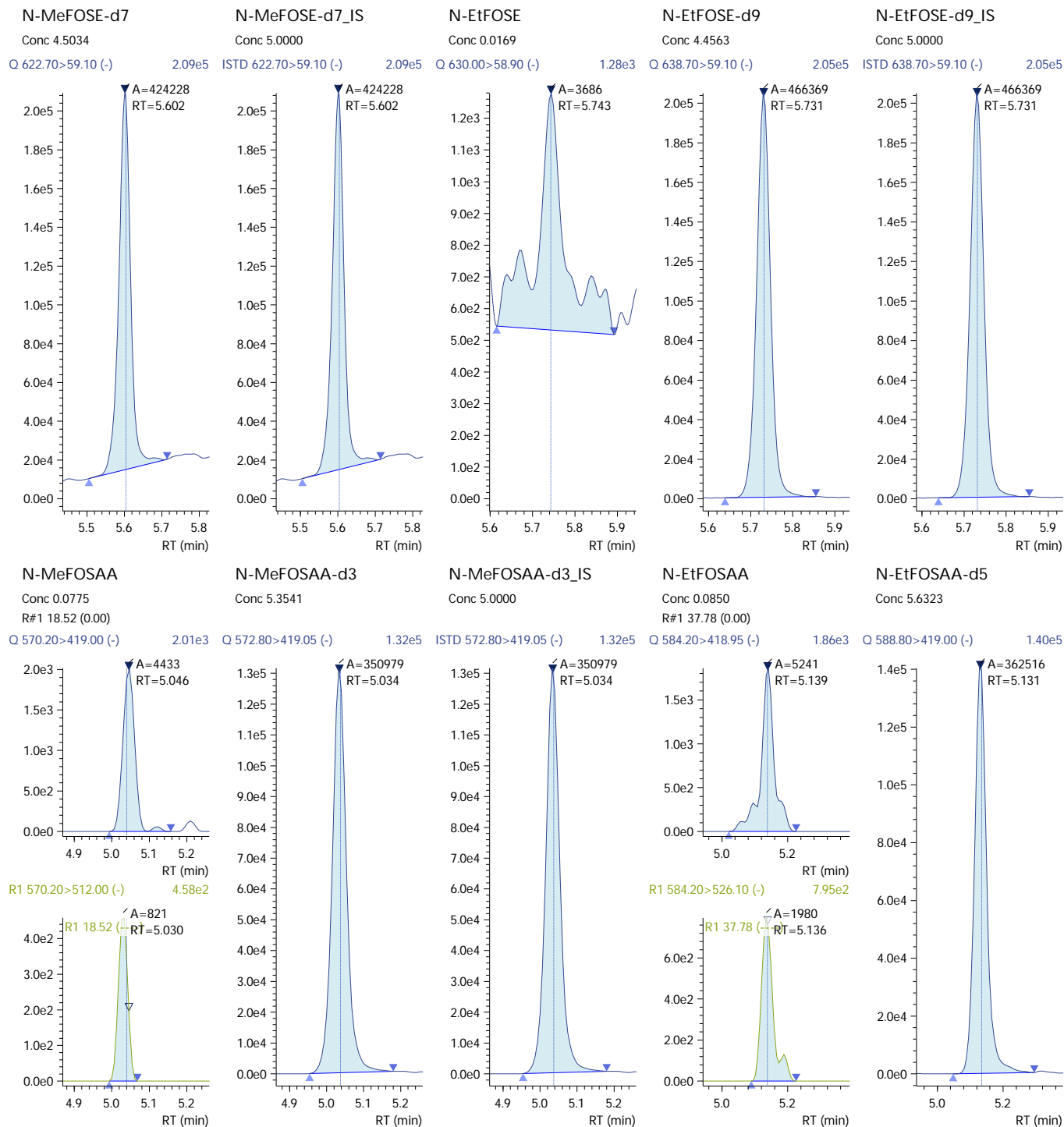
210413\_041 (continued)





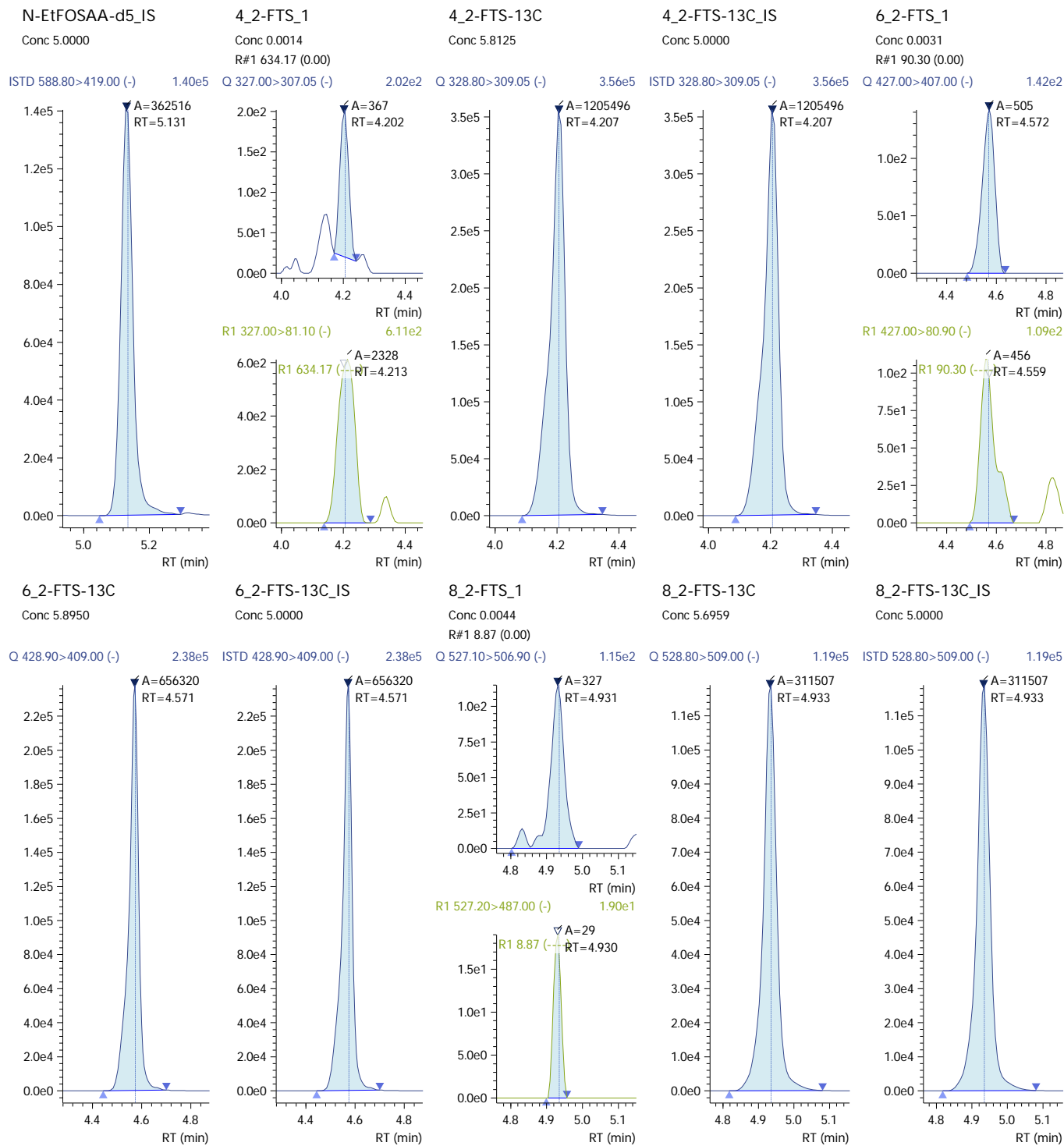


210413\_041 (continued)



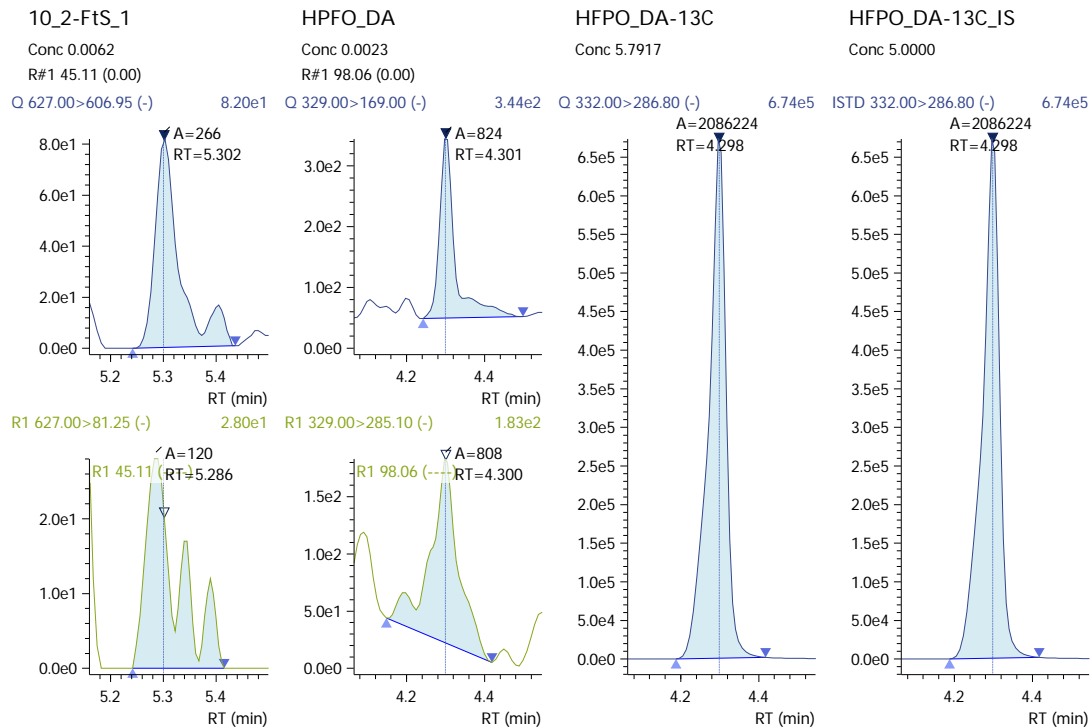


### 210413\_041 (continued)





### 210413\_041 (continued)





## 210413\_042

Sample ID: PFC ICV 1.0PPB

Date Acquired: 4/13/2021 7:03:33 PM

Acquired by: System Administrator

Data File: 210413\_042

Vial: 8 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.115	-0.003	----	6113557	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.030	-0.002	0.00	252646	113364	44.87	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.030	-0.002	-1.09	1035258	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.030	-0.002	----	1035258	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.249	0.000	0.22	128575	187345	145.71	148.77	74.38 -223.15	
PFHxS_1	399.00>80.00	399.00>99.00	4.412	0.004	0.00	156994	113197	72.10	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.415	0.002	-0.70	490807	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.415	0.002	----	490807	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.573	-0.002	0.16	181510	84279	46.43	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.741	-0.001	0.00	116858	99665	85.29	91.63	45.82 -137.45	
PFOS-13C	502.80>80.05	----	4.741	-0.001	-0.37	744549	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	4.741	-0.001	----	744549	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.916	-0.002	0.18	104481	124689	119.34	118.30	59.15 -177.45	
PFDS_1	599.00>79.90	599.00>99.10	5.093	-0.003	0.35	134852	120452	89.32	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	3.418	0.008	0.00	811607	----	----	----		
PFBA-13C	216.90>172.15	----	3.418	0.009	-1.70	3708582	----	----	----		
PFBA-13C_IS	216.90>172.15	----	3.418	0.009	----	3708582	----	----	----		
PFPeA	263.05>219.10	----	3.980	-0.001	0.00	1342592	----	----	----		
PFPeA-13C	267.90>223.00	----	3.980	-0.001	-1.14	3149148	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.980	-0.001	----	3149148	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.235	0.002	0.00	1477425	61471	4.16	4.91	2.46-7.37	
PFHxA-13C	314.90>270.10	----	4.235	0.003	-0.88	7451398	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.235	0.003	----	7451398	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.416	0.004	0.00	1448223	384713	26.56	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.416	0.004	-0.70	7491889	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.416	0.004	----	7491889	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.583	-0.001	0.00	1653026	486906	29.46	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.582	-0.002	-0.53	6248244	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.582	-0.002	----	6248244	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.753	-0.003	0.00	1045552	239161	22.87	21.68	10.84-32.52	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_042 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.753	-0.003	-0.36	5063264	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.753	-0.003	----	5063264	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.935	-0.002	0.00	854036	176569	20.68	21.66	10.83-32.49	
PFDA-13C	514.80>469.95	----	4.934	-0.002	-0.18	3358599	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.934	-0.002	----	3358599	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.115	-0.004	0.00	923173	123701	13.40	13.50	6.75-20.25	
PFUnA-13C	564.80>519.95	----	5.115	-0.004	0.00	4056677	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.115	-0.004	----	4056677	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.291	-0.002	0.00	752329	154777	20.57	18.50	9.25-27.75	
PFDaA-13C	614.80>569.95	----	5.291	-0.003	0.18	4381892	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.291	-0.003	----	4381892	----	----	----	0-0	
PFTTrDA	663.00>618.90	662.90>169.00	5.458	-0.001	-0.16	789929	132146	16.73	17.61	8.8-26.41	
PFTTeDA	713.00>669.00	713.00>169.10	5.616	0.000	0.00	639202	111714	17.48	18.66	9.33-27.99	
PFTTeDA-13C	714.70>669.90	----	5.616	0.000	0.50	2863325	----	----	----	0-0	
PFTTeDA-13C_IS	714.70>669.90	----	5.616	0.000	----	2863325	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	5.236	-0.005	0.00	619848	26965	4.35	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.236	-0.005	0.12	2419914	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.236	-0.005	----	2419914	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.633	-0.002	0.00	164131	107751	65.65	63.69	31.85-95.54	
N-MeFOSA-d3	514.90>168.90	----	5.629	-0.004	0.51	564531	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	5.629	-0.004	----	564531	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	5.769	-0.002	0.01	34352	23205	67.55	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.764	-0.002	0.65	754914	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.764	-0.002	----	754914	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.609	-0.004	0.01	232733	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	5.601	-0.003	0.49	533911	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	5.601	-0.003	----	533911	----	----	----		
N-EtFOSE	630.00>58.90	----	5.740	-0.002	0.01	250103	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.730	-0.002	0.62	593505	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.730	-0.002	----	593505	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.036	-0.004	0.00	72098	28894	40.08	48.49	24.24-72.73	
N-MeFOSAA-d3	572.80>419.05	----	5.034	-0.003	-0.08	352522	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.034	-0.003	----	352522	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.134	-0.004	0.00	62695	57428	91.60	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	5.130	-0.005	0.02	348084	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	5.130	-0.005	----	348084	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.209	0.003	0.00	223680	59554	26.63	26.07	13.03-39.1	
4_2-FTS-13C	328.80>309.05	----	4.209	0.002	-0.91	1104678	----	----	----	0-0	

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Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_042 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	4.209	0.002	----	1104678	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.571	0.002	0.00	150270	46428	30.90	30.56	15.28-45.84	
6_2-FTS-13C	428.90>409.00	----	4.573	-0.001	-0.54	618920	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	4.573	-0.001	----	618920	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.933	-0.002	0.00	70576	5471	7.75	8.18	4.09-12.27	
8_2-FTS-13C	528.80>509.00	----	4.934	-0.001	-0.18	304963	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	4.934	-0.001	----	304963	----	----	----	0-0	
10_2-FTS_1	627.00>606.95	627.00>81.25	5.298	-0.003	0.36	38301	16636	43.44	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.300	0.001	0.00	345631	305017	88.25	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.300	0.001	-0.82	1911328	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.300	0.001	----	1911328	----	----	----		



## 210413\_042

Sample ID: PFC ICV 1.0PPB  
 Date Acquired: 4/13/2021 7:03:33 PM  
 Acquired by: System Administrator  
 Data File: 210413\_042  
 Vial: 8 | Inj. Volume: 15.000uL | Tray: 0

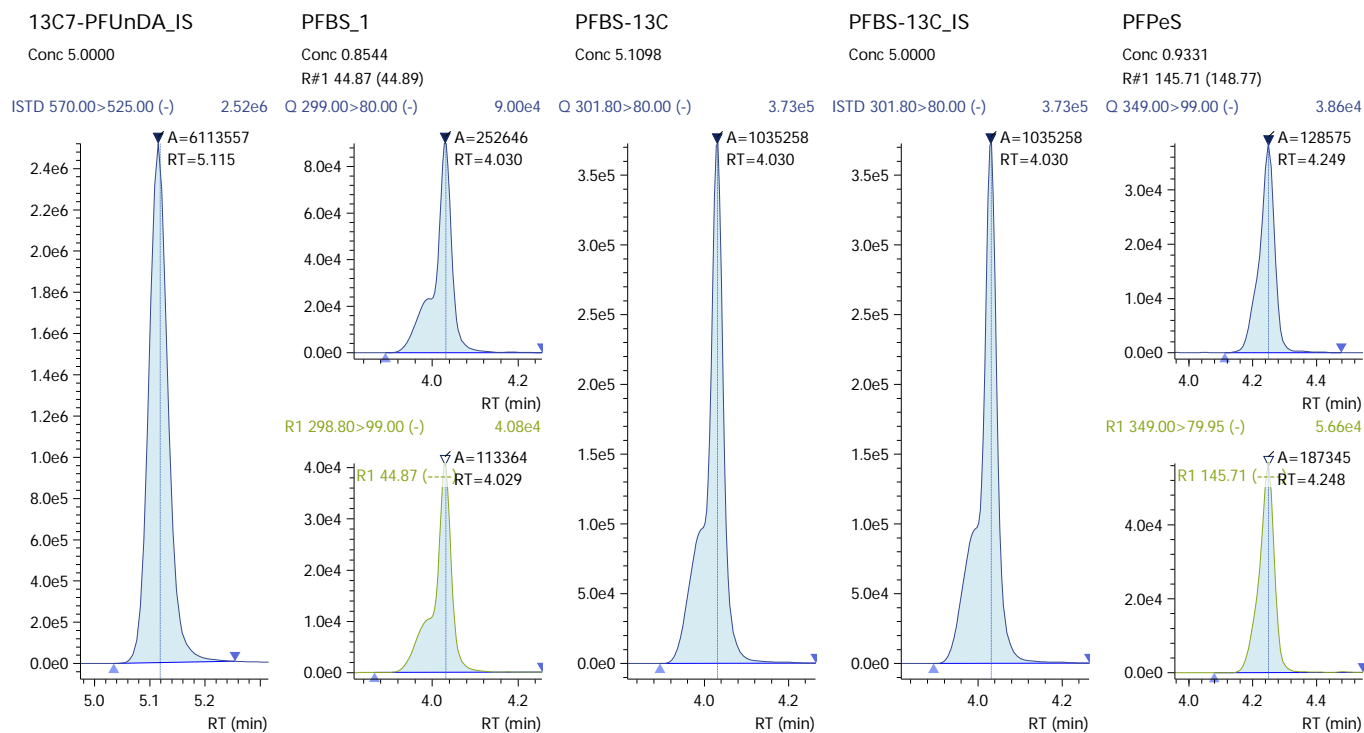
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	Auto	5.115	6113557	6113557	----	5.0000	5.0000	ng/mL
PFBS_1	Auto	4.030	252646	1035258	PFBS-13C_IS	0.8874	0.8544	ng/mL
PFBS-13C	Auto	4.030	1035258	6113557	13C7-PFUnDA_IS	5.0000	5.1098	ng/mL
PFBS-13C_IS	Auto	4.030	1035258	1035258	----	5.0000	5.0000	ng/mL
PFPeS	Auto	4.249	128575	1035258	PFBS-13C_IS	0.9409	0.9331	ng/mL
PFHxS_1	Auto	4.412	156994	490807	PFHxS-18O_IS	0.9131	0.9495	ng/mL
PFHxS-18O	Auto	4.415	490807	6113557	13C7-PFUnDA_IS	5.0000	4.8870	ng/mL
PFHxS-18O_IS	Auto	4.415	490807	490807	----	5.0000	5.0000	ng/mL
PFHpS_1	Auto	4.573	181510	490807	PFHxS-18O_IS	0.9534	0.8896	ng/mL
PFOS_1	Auto	4.741	116858	744549	PFOS-13C_IS	0.9292	0.9471	ng/mL
PFOS-13C	Auto	4.741	744549	6113557	13C7-PFUnDA_IS	5.0000	4.9740	ng/mL
PFOS-13C_IS	Auto	4.741	744549	744549	----	5.0000	5.0000	ng/mL
PFNS	Auto	4.916	104481	744549	PFOS-13C_IS	0.9616	0.9696	ng/mL
PFDS_1	Auto	5.093	134852	744549	PFOS-13C_IS	0.9647	0.8947	ng/mL
PFBA	M	3.418	811607	3708582	PFBA-13C_IS	1.0000	1.0139	ng/mL
PFBA-13C	Auto	3.418	3708582	6113557	13C7-PFUnDA_IS	5.0000	5.2058	ng/mL
PFBA-13C_IS	Auto	3.418	3708582	3708582	----	5.0000	5.0000	ng/mL
PFPeA	Auto	3.980	1342592	3149148	PFPeA-13C_IS	1.0000	1.0226	ng/mL
PFPeA-13C	Auto	3.980	3149148	6113557	13C7-PFUnDA_IS	5.0000	4.9827	ng/mL
PFPeA-13C_IS	Auto	3.980	3149148	3149148	----	5.0000	5.0000	ng/mL
PFHxA	Auto	4.235	1477425	7451398	PFHxA-13C_IS	1.0000	0.9573	ng/mL
PFHxA-13C	Auto	4.235	7451398	6113557	13C7-PFUnDA_IS	5.0000	5.4504	ng/mL
PFHxA-13C_IS	Auto	4.235	7451398	7451398	----	5.0000	5.0000	ng/mL
PFHpA	Auto	4.416	1448223	7491889	PFHpA-13C_IS	1.0000	0.9677	ng/mL
PFHpA-13C	Auto	4.416	7491889	6113557	13C7-PFUnDA_IS	5.0000	5.6178	ng/mL
PFHpA-13C_IS	Auto	4.416	7491889	7491889	----	5.0000	5.0000	ng/mL
PFOA	Auto	4.583	1653026	6248244	PFOA-13C_IS	1.0000	0.9905	ng/mL
PFOA-13C	Auto	4.582	6248244	6113557	13C7-PFUnDA_IS	5.0000	5.0855	ng/mL
PFOA-13C_IS	Auto	4.582	6248244	6248244	----	5.0000	5.0000	ng/mL
PFNA	Auto	4.753	1045552	5063264	PFNA-13C_IS	1.0000	1.0229	ng/mL
PFNA-13C	Auto	4.753	5063264	6113557	13C7-PFUnDA_IS	5.0000	4.9075	ng/mL
PFNA-13C_IS	Auto	4.753	5063264	5063264	----	5.0000	5.0000	ng/mL
PFDA	Auto	4.935	854036	3358599	PFDA-13C_IS	1.0000	1.0116	ng/mL
PFDA-13C	Auto	4.934	3358599	6113557	13C7-PFUnDA_IS	5.0000	4.9387	ng/mL
PFDA-13C_IS	Auto	4.934	3358599	3358599	----	5.0000	5.0000	ng/mL
PFUnA	Auto	5.115	923173	4056677	PFUnA-13C_IS	1.0000	0.9933	ng/mL
PFUnA-13C	Auto	5.115	4056677	6113557	13C7-PFUnDA_IS	5.0000	4.8625	ng/mL
PFUnA-13C_IS	Auto	5.115	4056677	4056677	----	5.0000	5.0000	ng/mL
PFDaA	Auto	5.291	752329	4381892	PFDaA-13C_IS	1.0000	1.0587	ng/mL
PFDaA-13C	Auto	5.291	4381892	6113557	13C7-PFUnDA_IS	5.0000	4.8889	ng/mL
PFDaA-13C_IS	Auto	5.291	4381892	4381892	----	5.0000	5.0000	ng/mL
PFTeDA	M	5.458	789929	2863325	PFTeDA-13C_IS	1.0000	1.0646	ng/mL
PFTeDA	Auto	5.616	639202	2863325	PFTeDA-13C_IS	1.0000	1.0004	ng/mL
PFTeDA-13C	Auto	5.616	2863325	6113557	13C7-PFUnDA_IS	5.0000	4.8902	ng/mL
PFTeDA-13C_IS	Auto	5.616	2863325	2863325	----	5.0000	5.0000	ng/mL
FOSA	Auto	5.236	619848	2419914	FOSA-13C_IS	1.0000	0.9959	ng/mL
FOSA-13C	Auto	5.236	2419914	6113557	13C7-PFUnDA_IS	5.0000	5.2405	ng/mL
FOSA-13C_IS	Auto	5.236	2419914	2419914	----	5.0000	5.0000	ng/mL
N-MeFOSA	Auto	5.633	164131	564531	N-MeFOSA-d3_IS	1.0000	0.9401	ng/mL
N-MeFOSA-d3	Auto	5.629	564531	6113557	13C7-PFUnDA_IS	5.0000	4.9189	ng/mL
N-MeFOSA-d3_IS	Auto	5.629	564531	564531	----	5.0000	5.0000	ng/mL
N-EtFOSA	Auto	5.769	34352	754914	N-EtFOSA-d9_IS	1.0000	0.9060	ng/mL
N-EtFOSA-d9	Auto	5.764	754914	6113557	13C7-PFUnDA_IS	5.0000	5.0170	ng/mL
N-EtFOSA-d9_IS	Auto	5.764	754914	754914	----	5.0000	5.0000	ng/mL



### 210413\_042 (continued)

(Table continued from previous page)

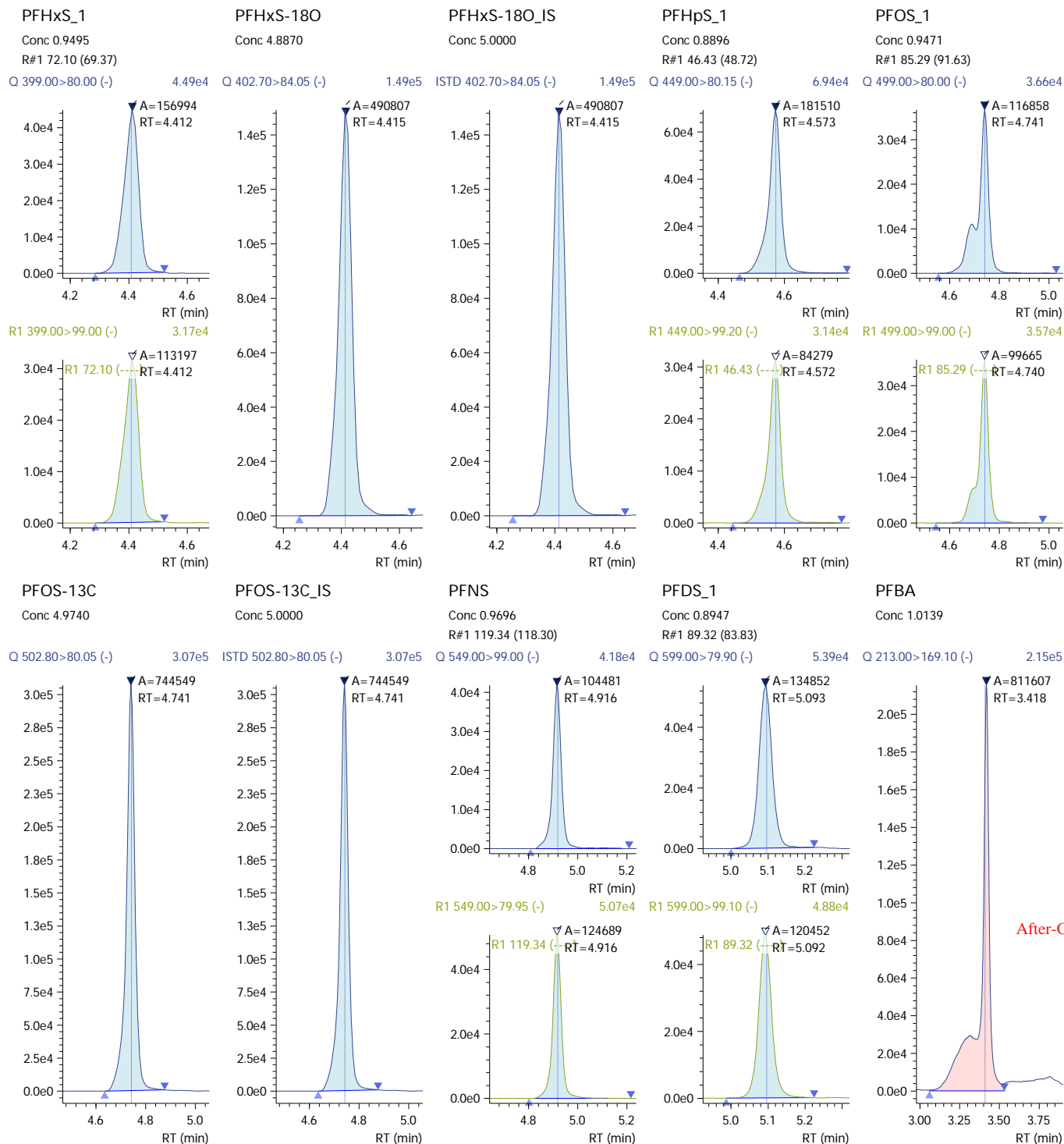
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.609	232733	533911	N-MeFOSE-d7_IS	1.0000	0.9314	ng/mL
N-MeFOSE-d7	Auto	5.601	533911	6113557	13C7-PFUnDA_IS	5.0000	5.0208	ng/mL
N-MeFOSE-d7_IS	Auto	5.601	533911	533911	----	5.0000	5.0000	ng/mL
N-EtFOSE	Auto	5.740	250103	593505	N-EtFOSE-d9_IS	1.0000	0.9185	ng/mL
N-EtFOSE-d9	Auto	5.730	593505	6113557	13C7-PFUnDA_IS	5.0000	5.0239	ng/mL
N-EtFOSE-d9_IS	Auto	5.730	593505	593505	----	5.0000	5.0000	ng/mL
N-MeFOSAA	Auto	5.036	72098	352522	N-MeFOSAA-d3_IS	1.0000	1.1800	ng/mL
N-MeFOSAA-d3	Auto	5.034	352522	6113557	13C7-PFUnDA_IS	5.0000	4.7639	ng/mL
N-MeFOSAA-d3_IS	Auto	5.034	352522	352522	----	5.0000	5.0000	ng/mL
N-EtFOSAA	M	5.134	62695	348084	N-EtFOSAA-d5_IS	1.0000	1.0468	ng/mL
N-EtFOSAA-d5	Auto	5.130	348084	6113557	13C7-PFUnDA_IS	5.0000	4.7908	ng/mL
N-EtFOSAA-d5_IS	Auto	5.130	348084	348084	----	5.0000	5.0000	ng/mL
4_2-FTS_1	Auto	4.209	223680	1104678	4_2-FTS-13C_IS	0.9372	0.9288	ng/mL
4_2-FTS-13C	Auto	4.209	1104678	6113557	13C7-PFUnDA_IS	5.0000	4.7184	ng/mL
4_2-FTS-13C_IS	Auto	4.209	1104678	1104678	----	5.0000	5.0000	ng/mL
6_2-FTS_1	Auto	4.571	150270	618920	6_2-FTS-13C_IS	0.9512	0.9924	ng/mL
6_2-FTS-13C	Auto	4.573	618920	6113557	13C7-PFUnDA_IS	5.0000	4.9246	ng/mL
6_2-FTS-13C_IS	Auto	4.573	618920	618920	----	5.0000	5.0000	ng/mL
8_2-FTS_1	Auto	4.933	70576	304963	8_2-FTS-13C_IS	0.9600	0.9823	ng/mL
8_2-FTS-13C	Auto	4.934	304963	6113557	13C7-PFUnDA_IS	5.0000	4.9398	ng/mL
8_2-FTS-13C_IS	Auto	4.934	304963	304963	----	5.0000	5.0000	ng/mL
10_2-FIS_1	Auto	5.298	38301	304963	8_2-FTS-13C_IS	0.9662	0.9149	ng/mL
HPFO_DA	Auto	4.300	345631	1911328	HPFO_DA-13C_IS	1.0000	1.0441	ng/mL
HPFO_DA-13C	Auto	4.300	1911328	6113557	13C7-PFUnDA_IS	5.0000	4.7005	ng/mL
HPFO_DA-13C_IS	Auto	4.300	1911328	1911328	----	5.0000	5.0000	ng/mL





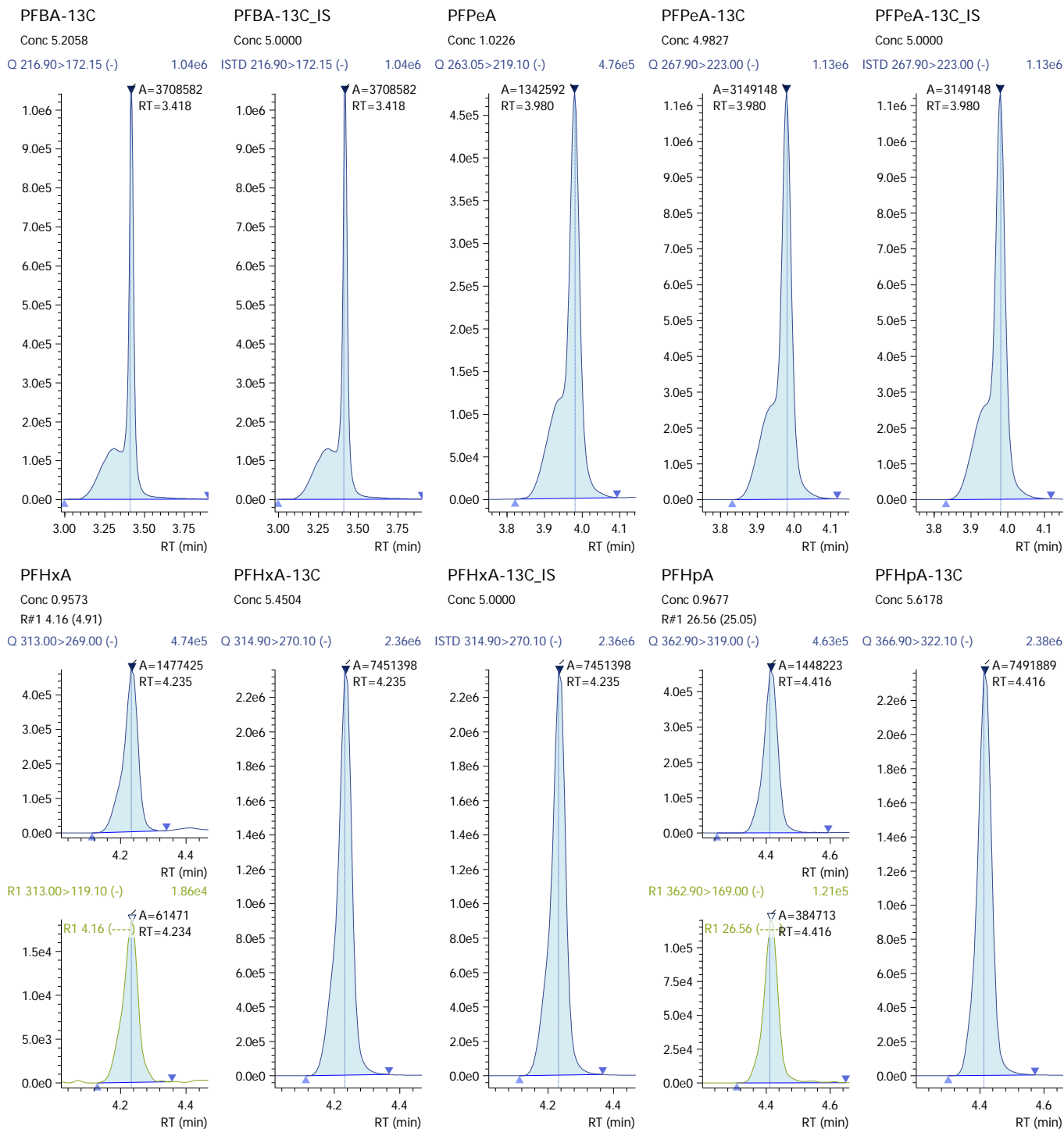


210413\_042 (continued)



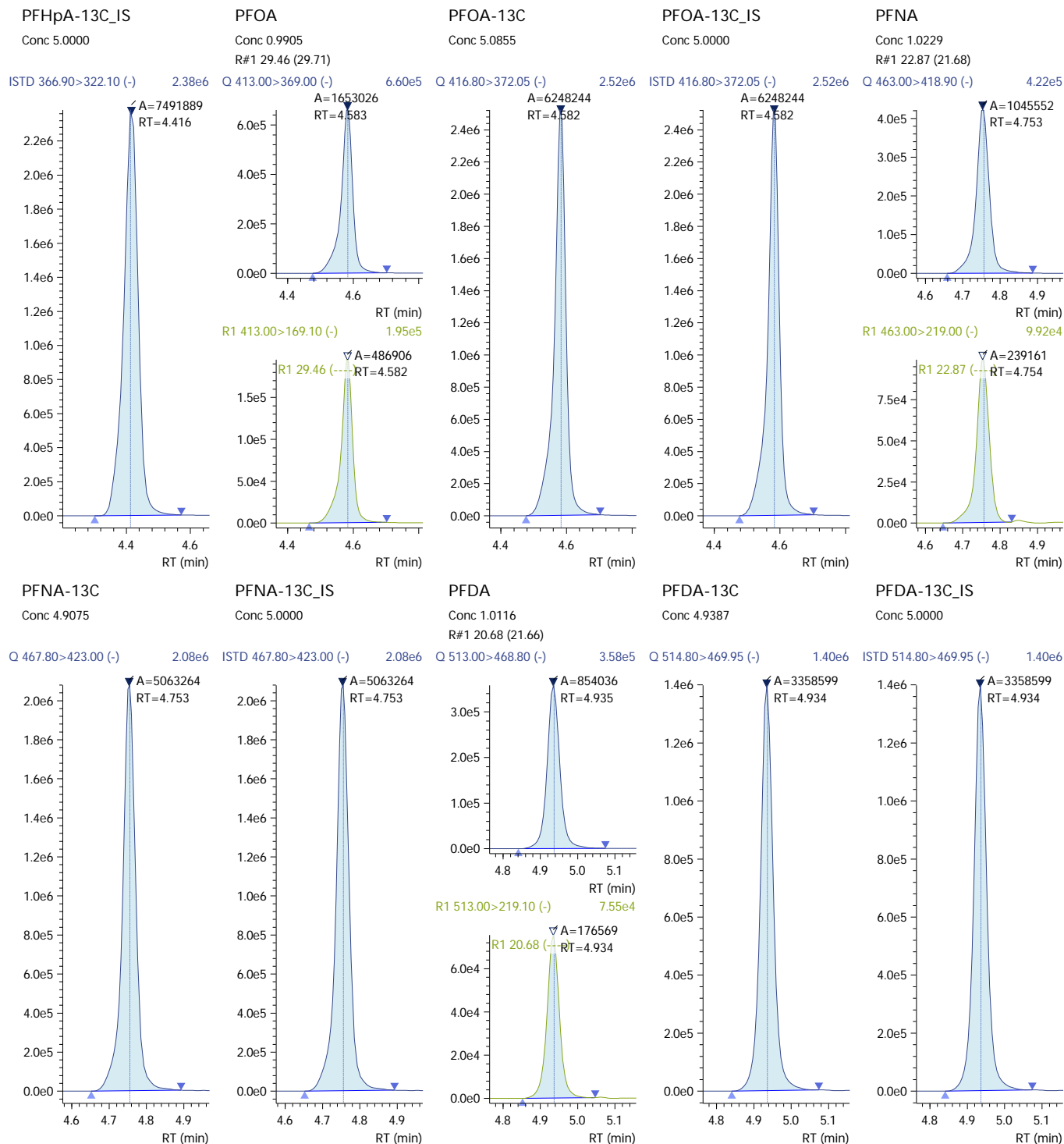


### 210413\_042 (continued)



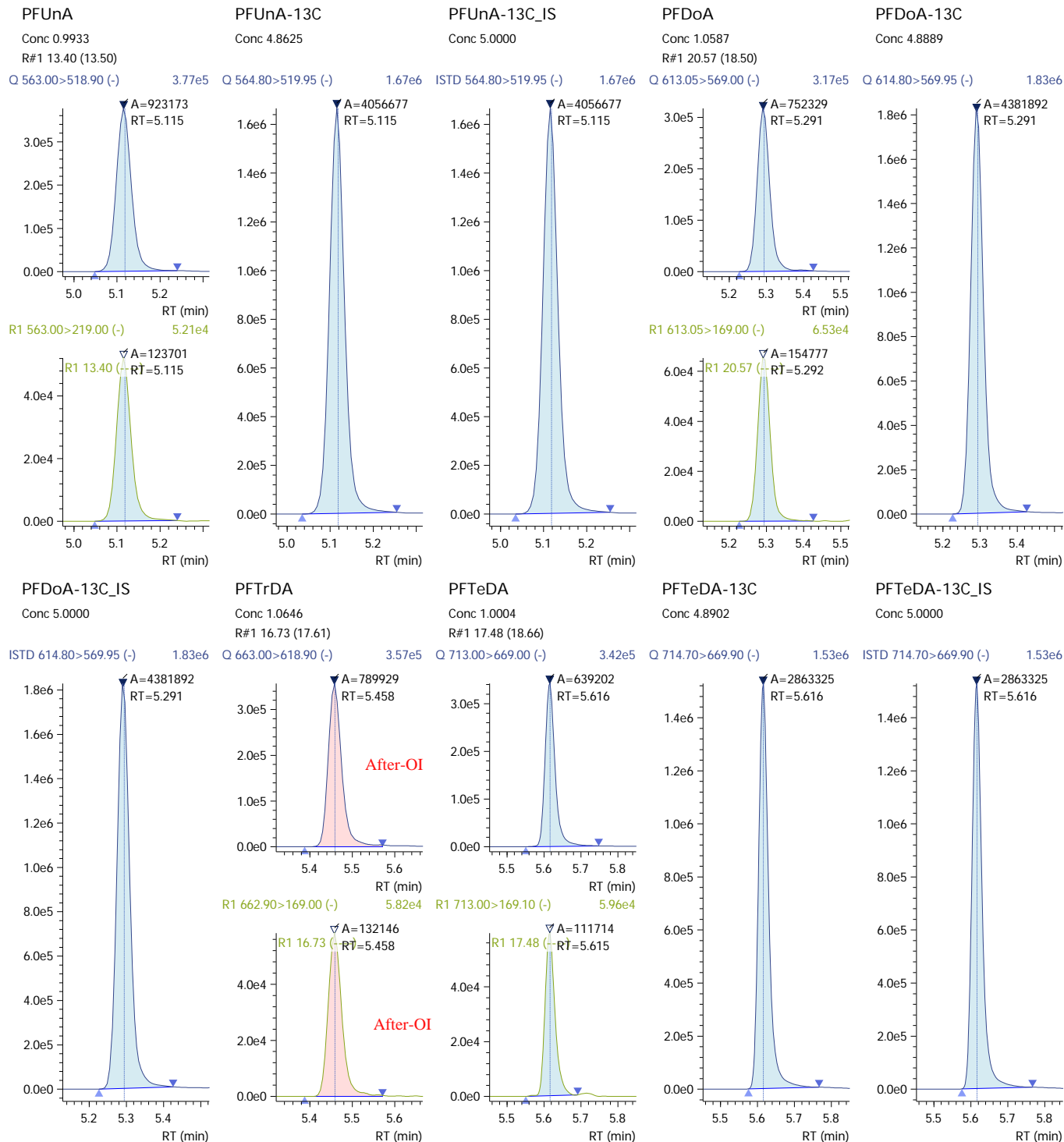


### 210413\_042 (continued)



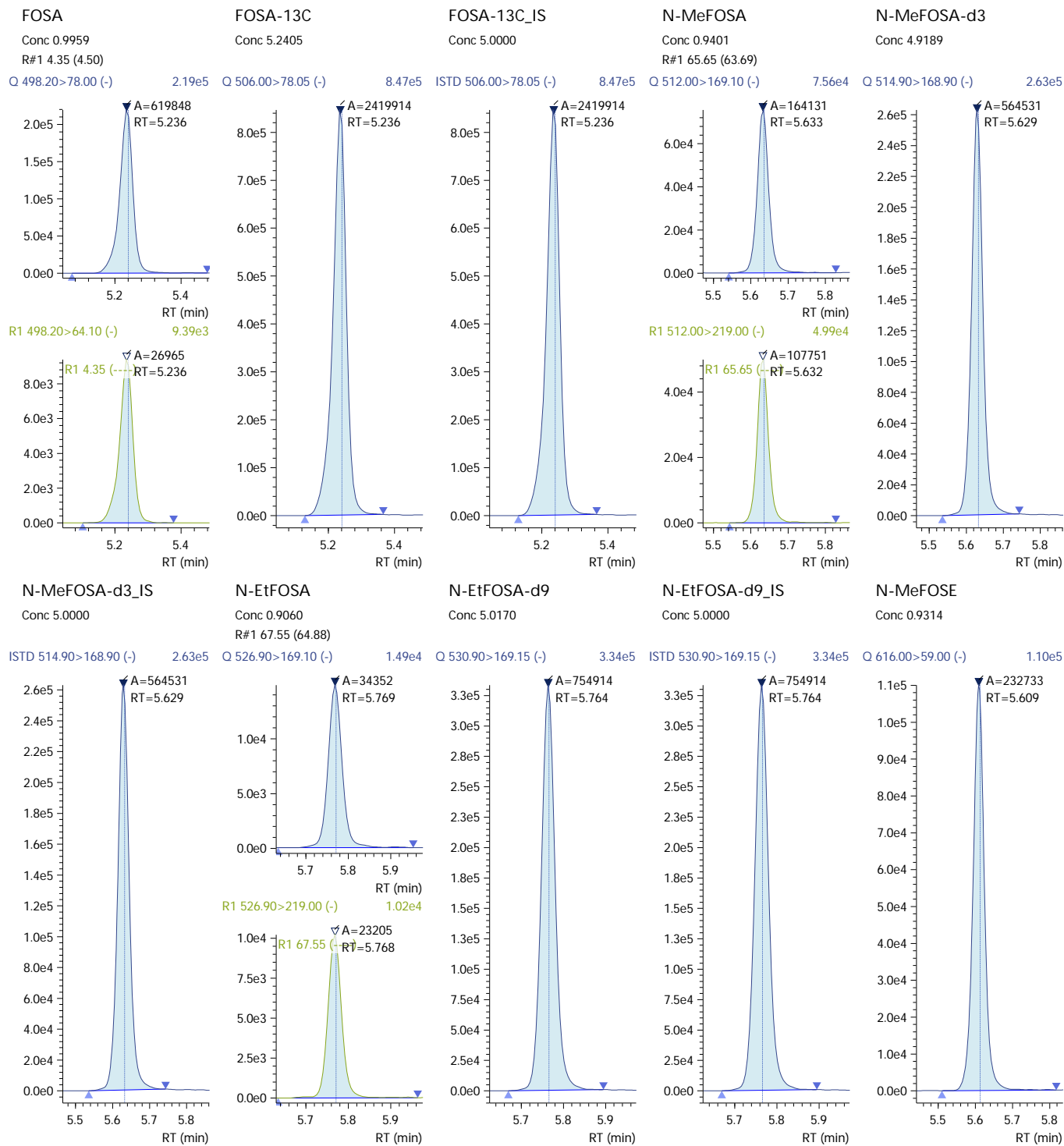


### 210413\_042 (continued)



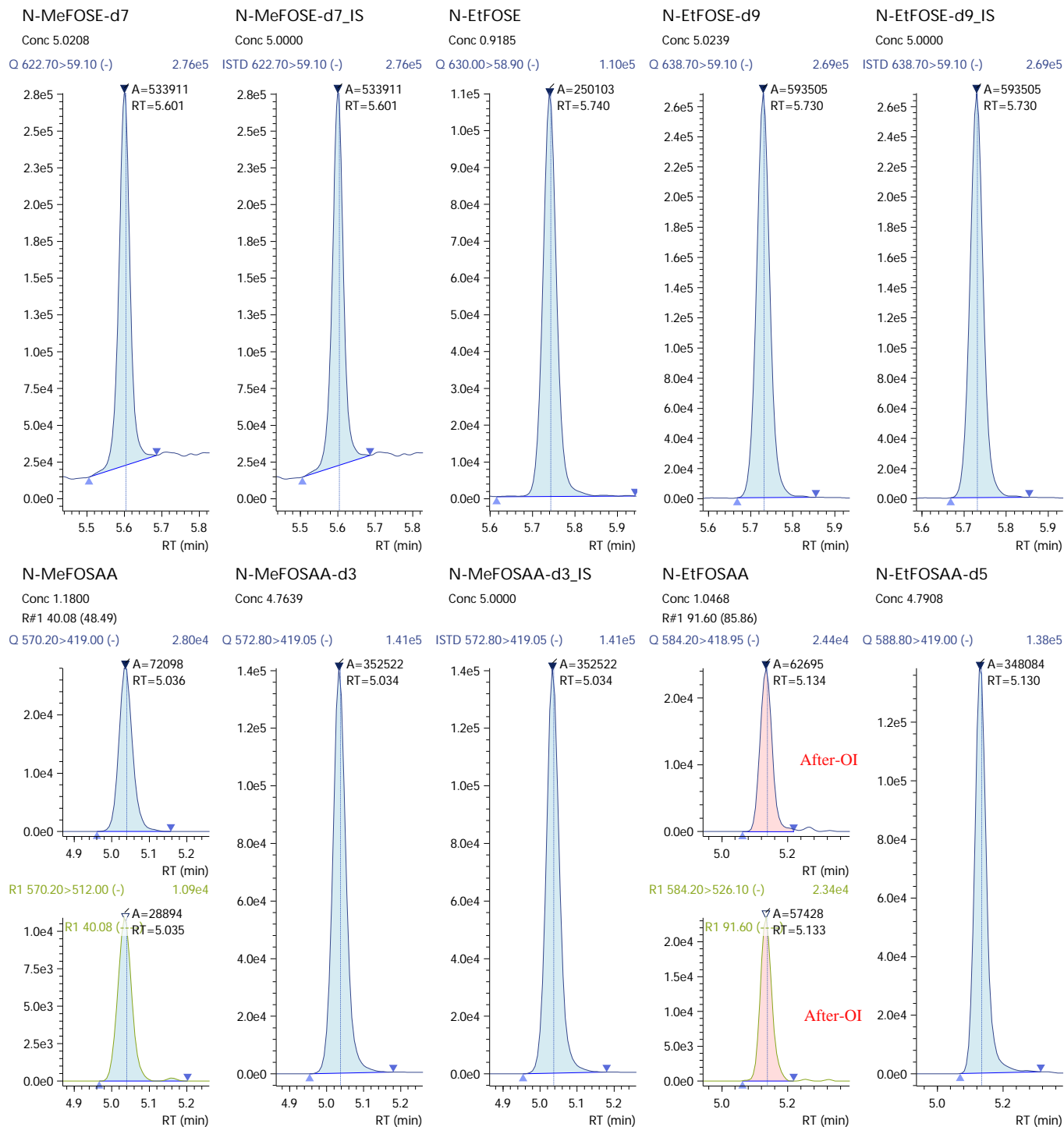


### 210413\_042 (continued)





210413\_042 (continued)





### 210413\_042 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.9288  
R#1 26.63 (26.07)

4\_2-FTS-13C  
Conc 4.7184

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.9924  
R#1 30.90 (30.56)

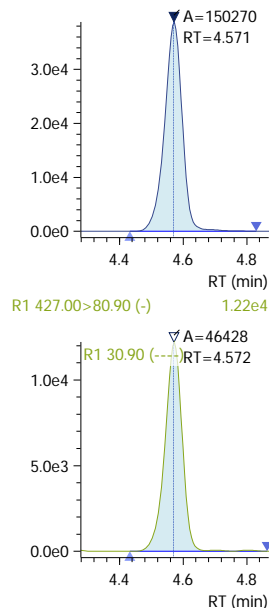
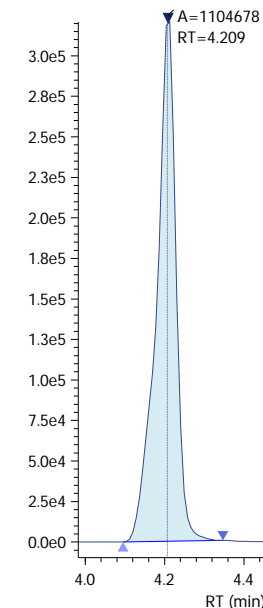
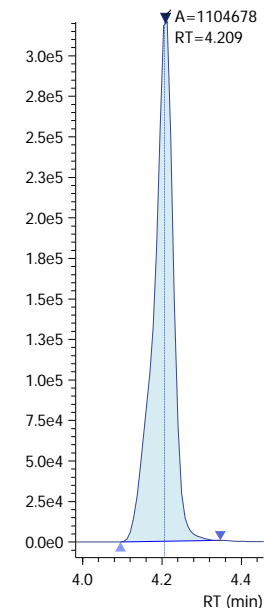
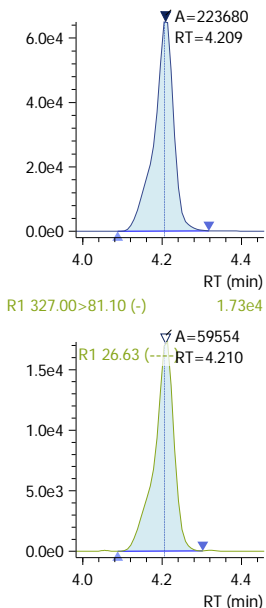
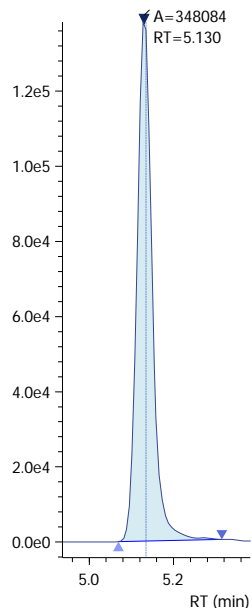
ISTD 588.80>419.00 (-) 1.38e5

Q 327.00>307.05 (-) 6.50e4

Q 328.80>309.05 (-) 3.21e5

ISTD 328.80>309.05 (-) 3.21e5

Q 427.00>407.00 (-) 3.88e4



6\_2-FTS-13C  
Conc 4.9246

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.9823  
R#1 7.75 (8.18)

8\_2-FTS-13C  
Conc 4.9398

8\_2-FTS-13C\_IS  
Conc 5.0000

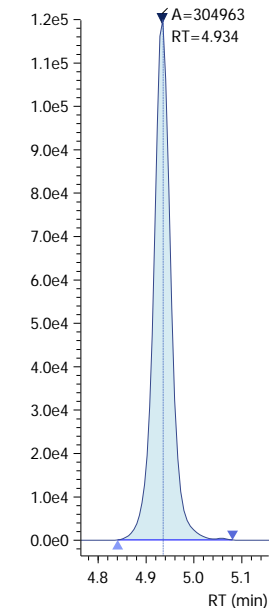
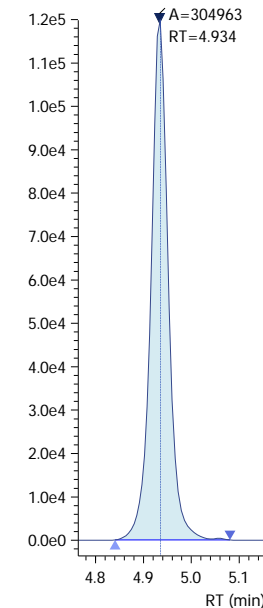
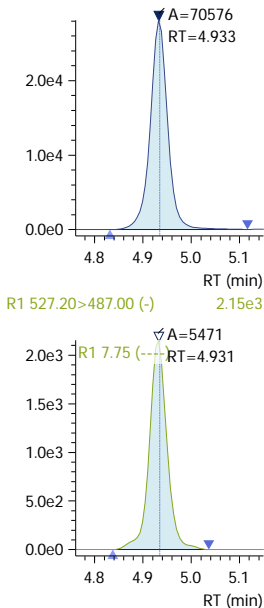
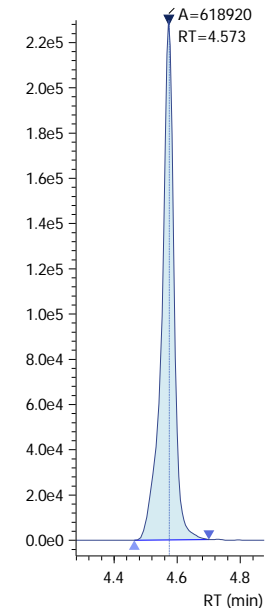
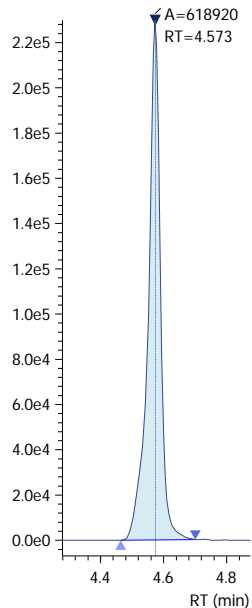
Q 428.90>409.00 (-) 2.30e5

ISTD 428.90>409.00 (-) 2.30e5

Q 527.10>506.90 (-) 2.81e4

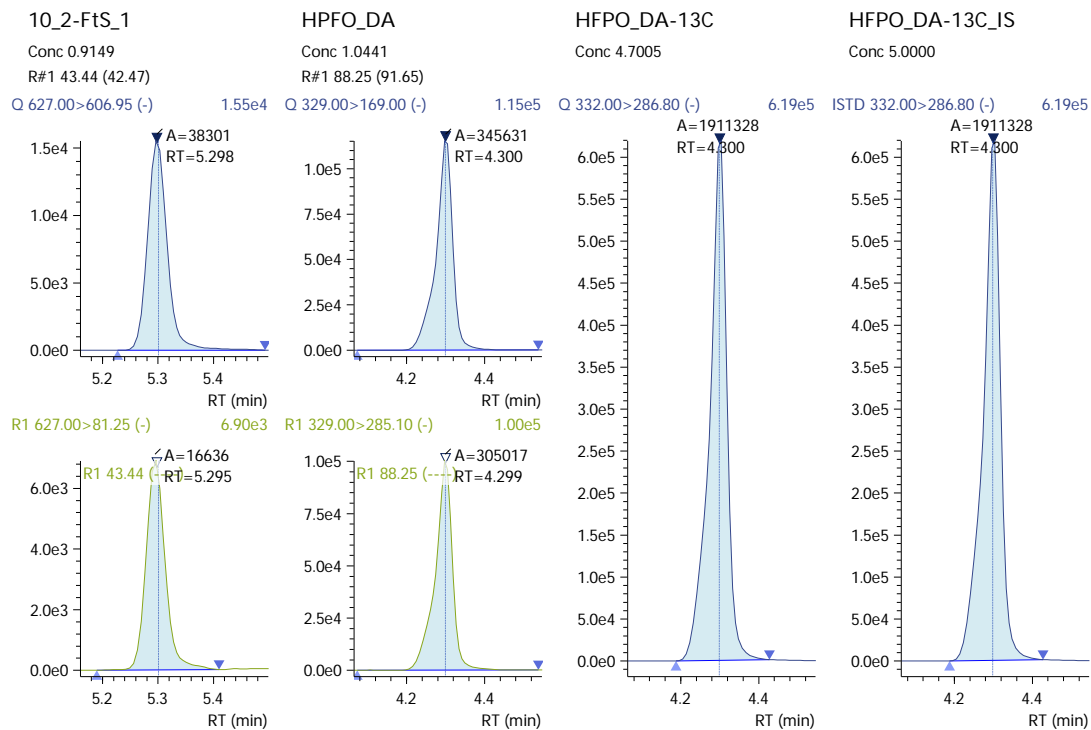
Q 528.80>509.00 (-) 1.20e5

ISTD 528.80>509.00 (-) 1.20e5





### 210413\_042 (continued)

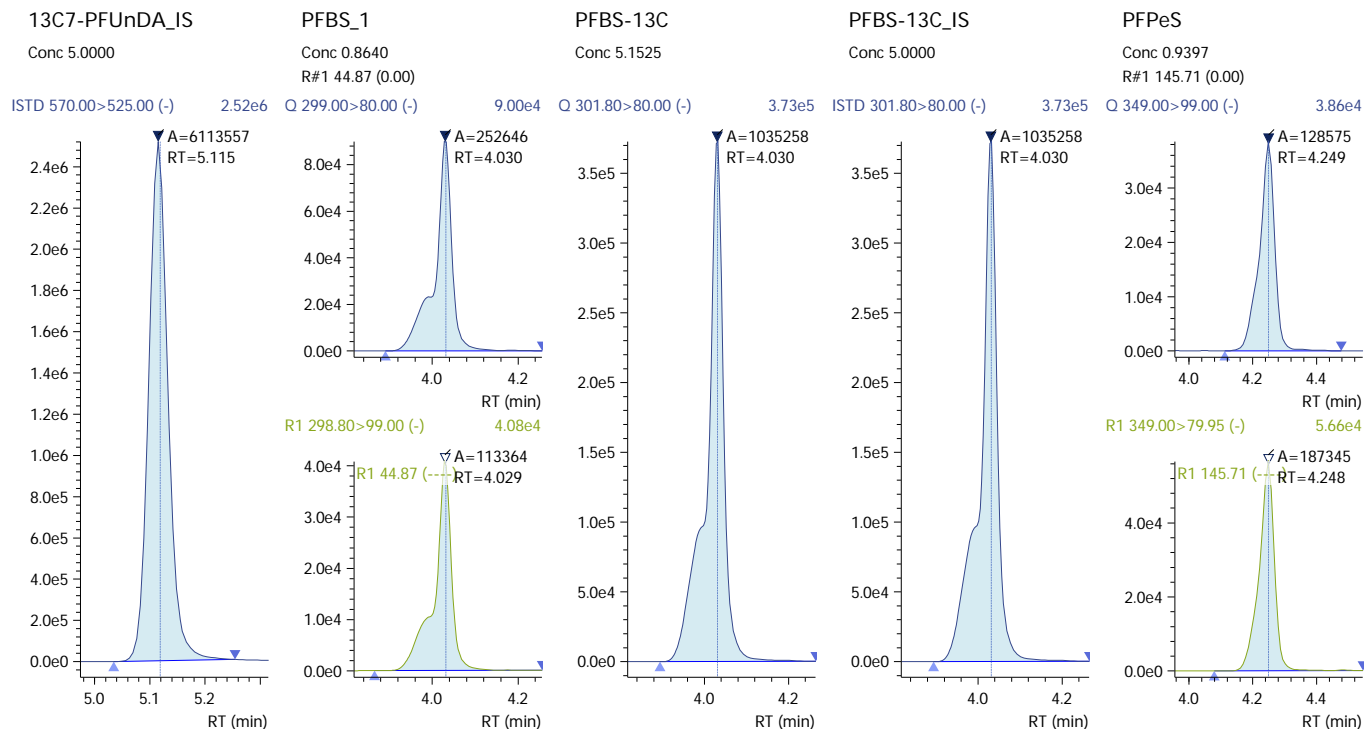






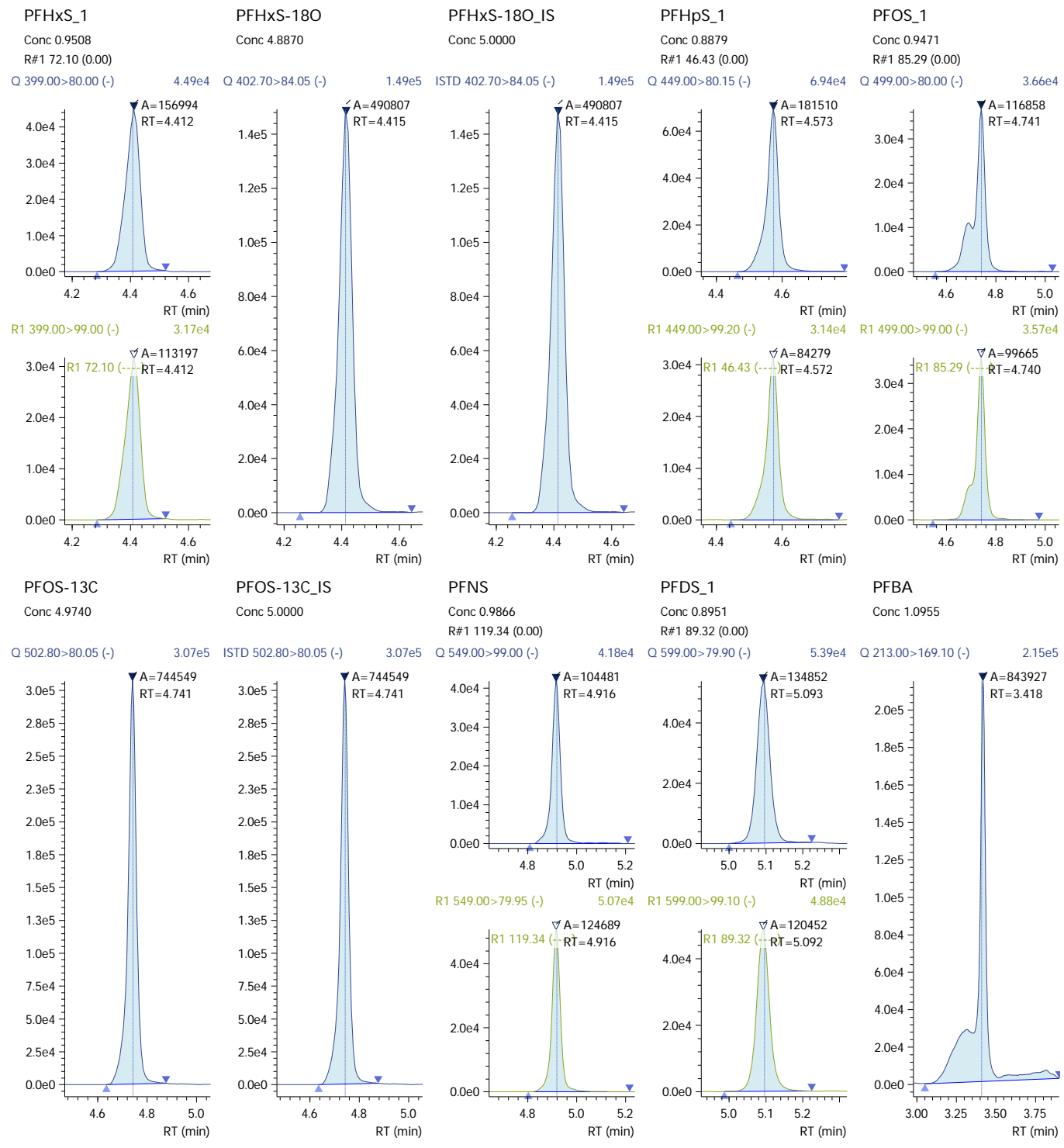
### 210413\_042

Sample ID: PFC ICV 1.0PPB  
Date Acquired: 4/13/2021 7:03:33 PM  
Acquired by: System Administrator  
Data File: 210413\_042  
Vial: 8 | Inj. Volume: 15.0000uL | Tray: 0



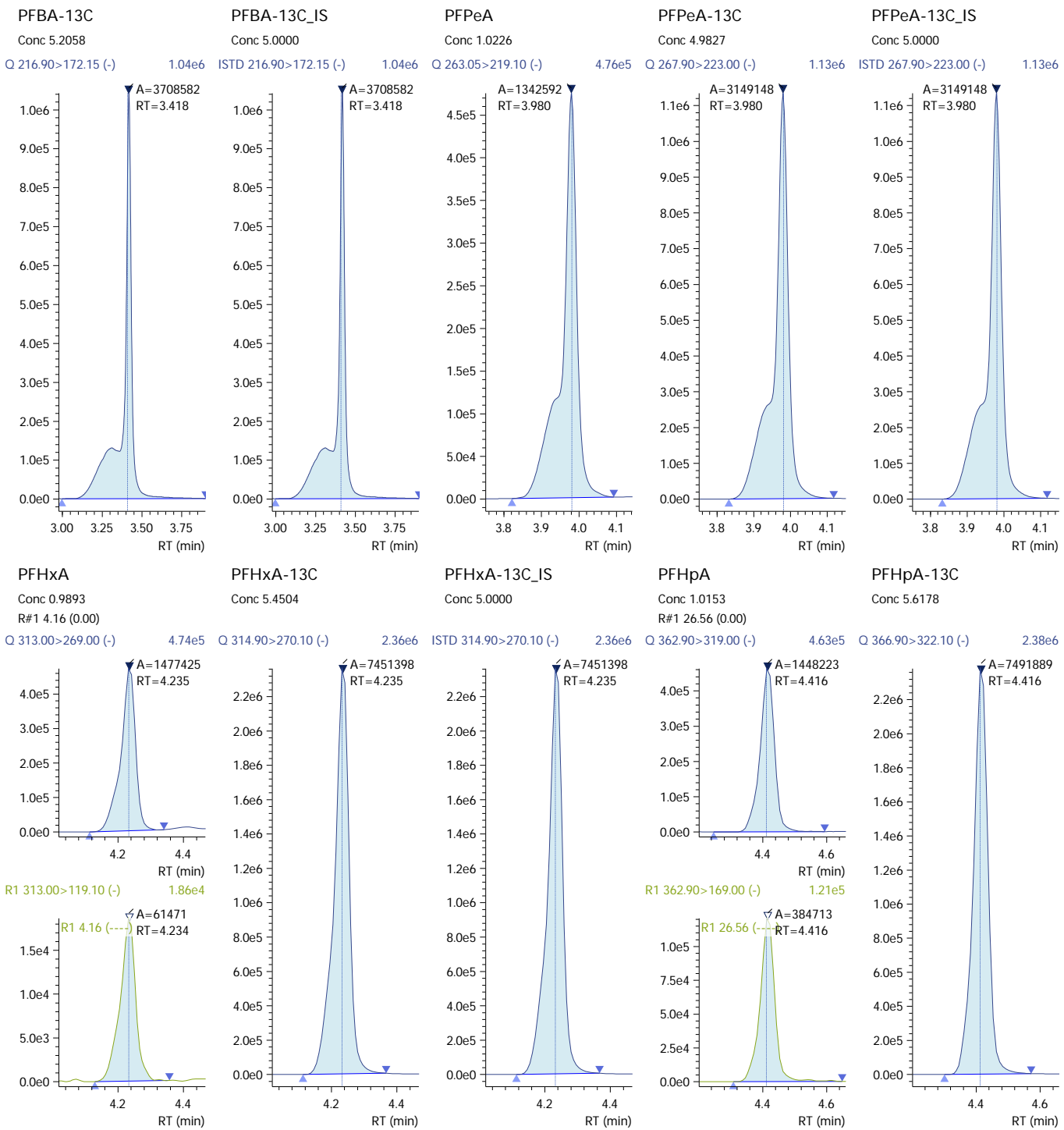


### 210413\_042 (continued)



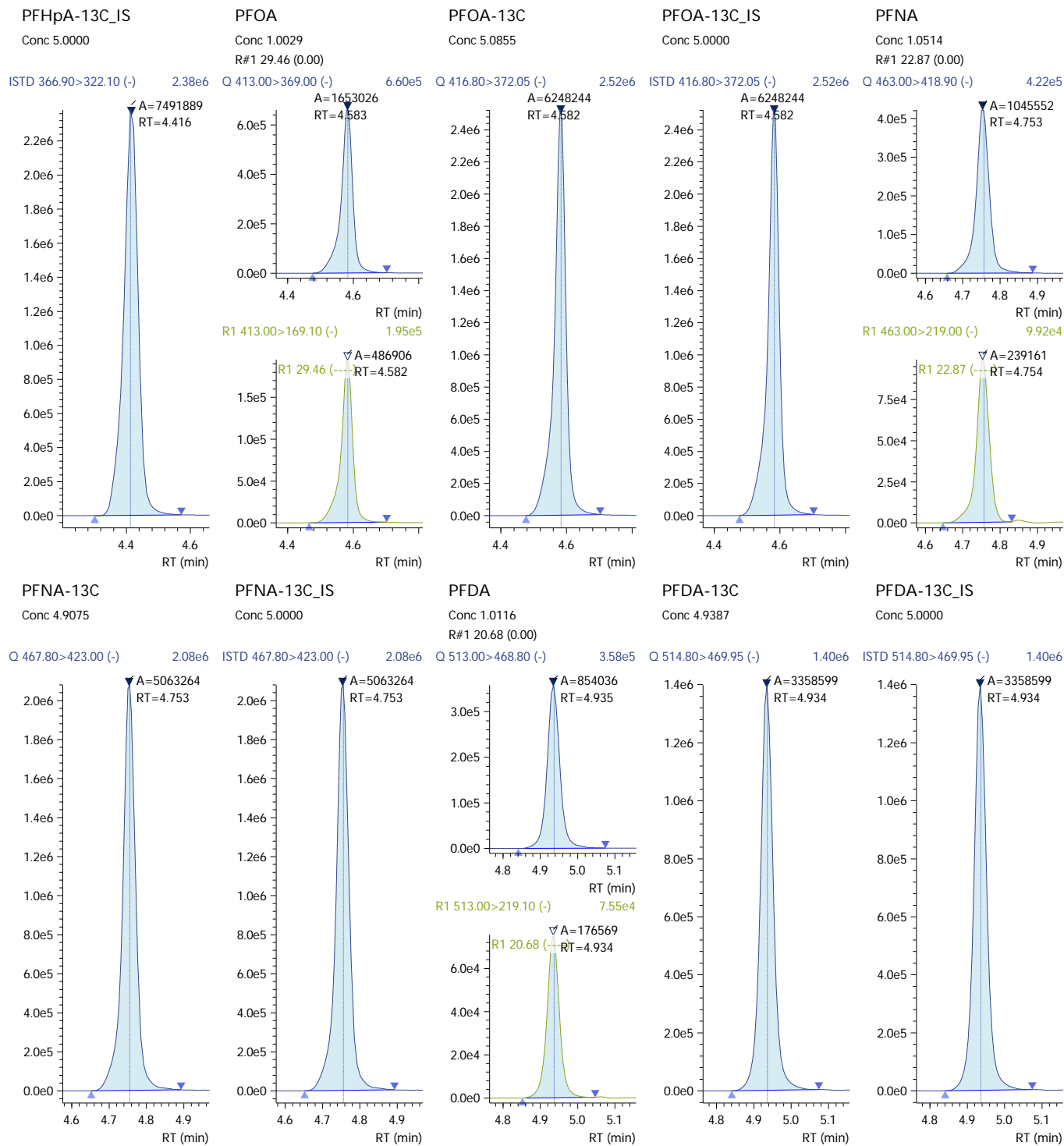


### 210413\_042 (continued)



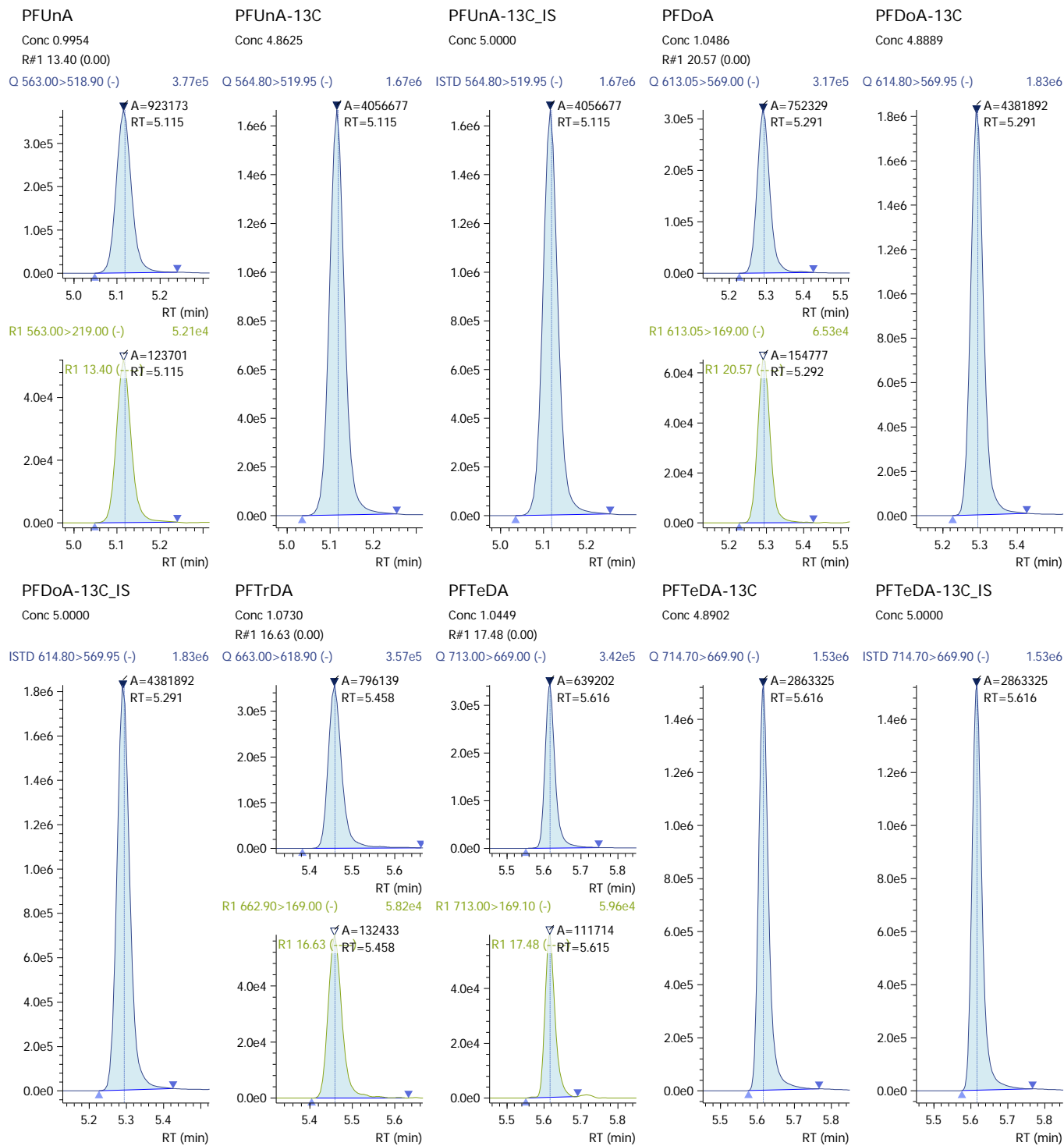


### 210413\_042 (continued)



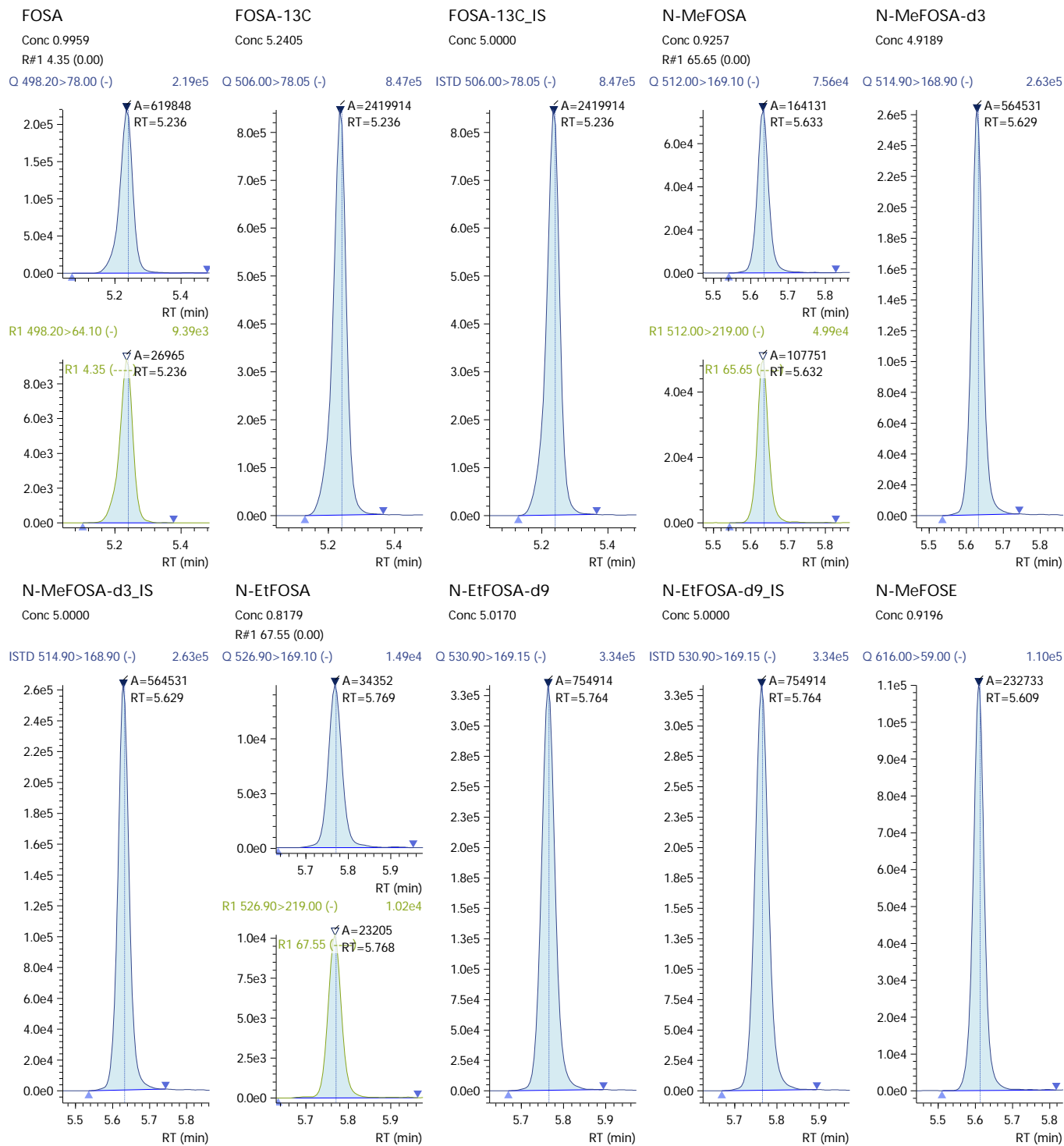


### 210413\_042 (continued)



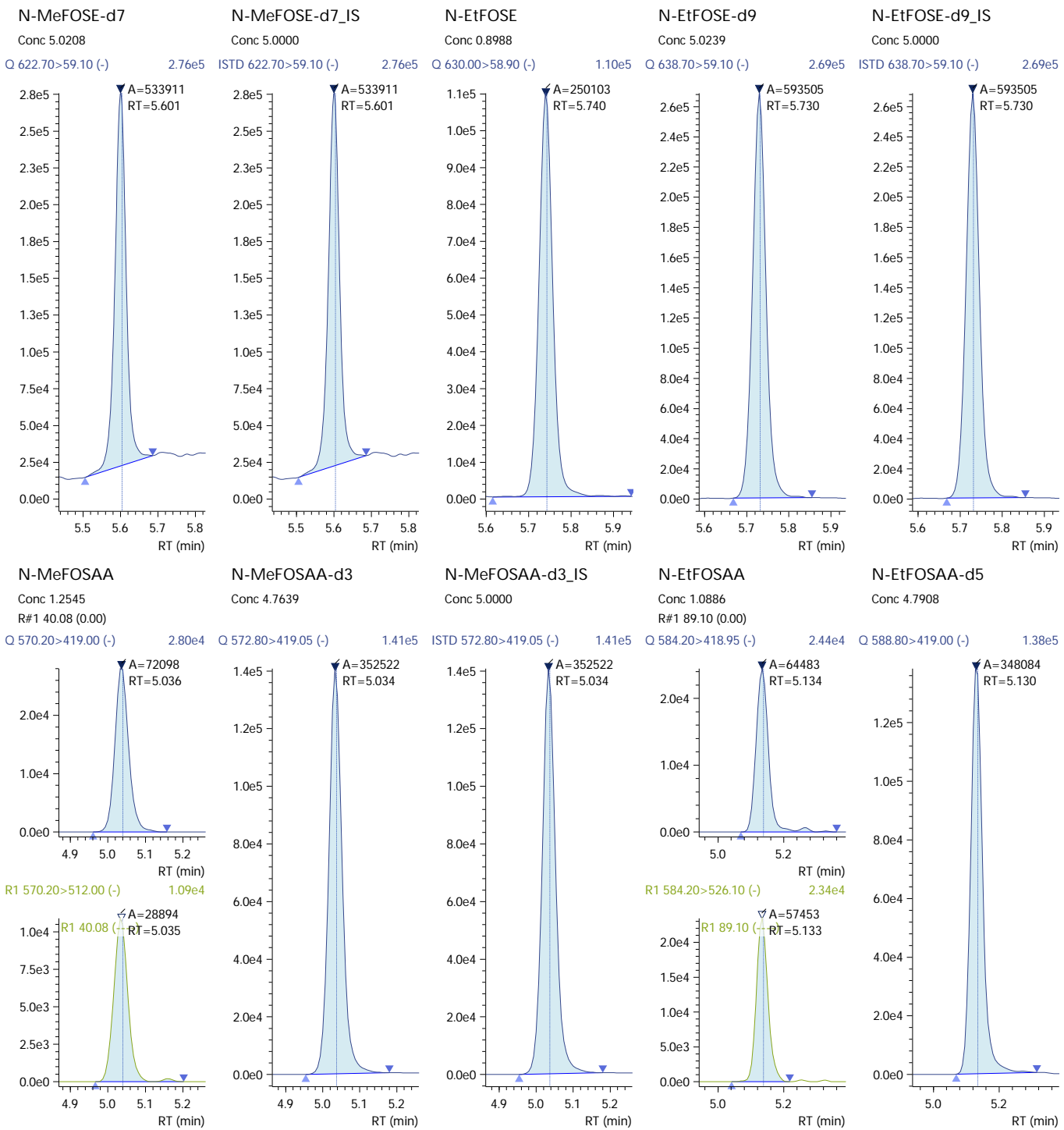


### 210413\_042 (continued)





### 210413\_042 (continued)





### 210413\_042 (continued)

N-EtFOSAA-d5\_IS  
Conc 5.0000

4\_2-FTS\_1  
Conc 0.9126  
R#1 26.63 (0.00)

4\_2-FTS-13C  
Conc 4.7184

4\_2-FTS-13C\_IS  
Conc 5.0000

6\_2-FTS\_1  
Conc 0.9924  
R#1 30.90 (0.00)

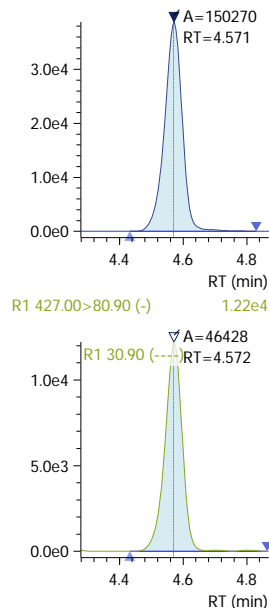
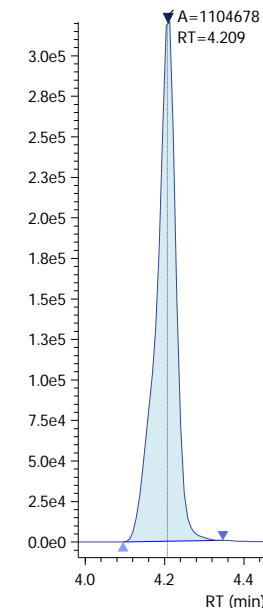
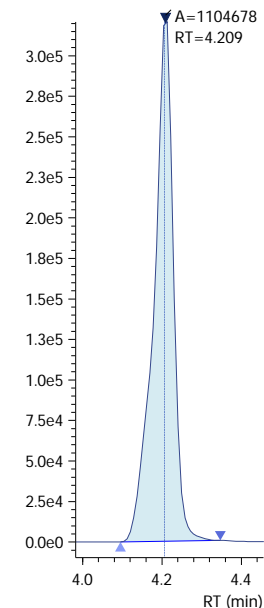
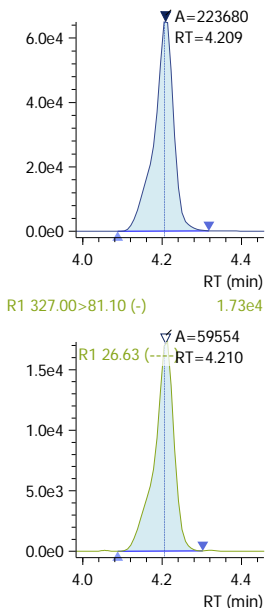
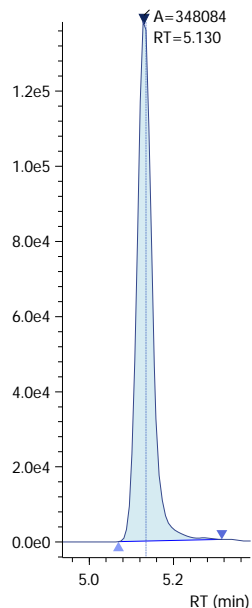
ISTD 588.80>419.00 (-) 1.38e5

Q 327.00>307.05 (-) 6.50e4

Q 328.80>309.05 (-) 3.21e5

ISTD 328.80>309.05 (-) 3.21e5

Q 427.00>407.00 (-) 3.88e4



6\_2-FTS-13C  
Conc 4.9246

6\_2-FTS-13C\_IS  
Conc 5.0000

8\_2-FTS\_1  
Conc 0.9805  
R#1 7.75 (0.00)

8\_2-FTS-13C  
Conc 4.9398

8\_2-FTS-13C\_IS  
Conc 5.0000

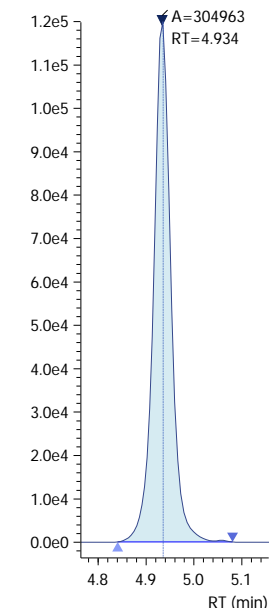
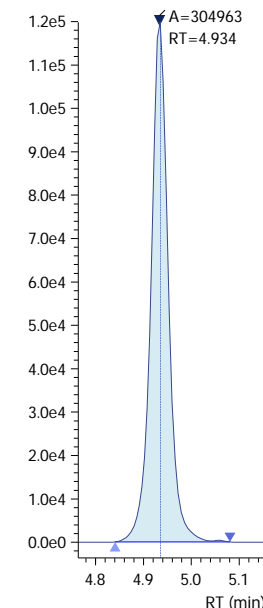
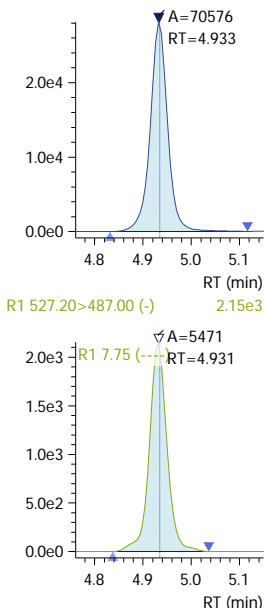
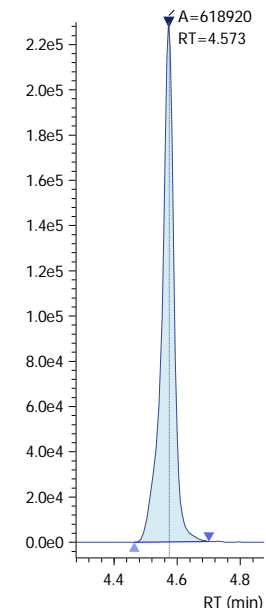
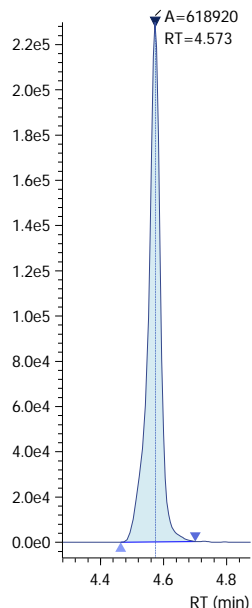
Q 428.90>409.00 (-) 2.30e5

ISTD 428.90>409.00 (-) 2.30e5

Q 527.10>506.90 (-) 2.81e4

Q 528.80>509.00 (-) 1.20e5

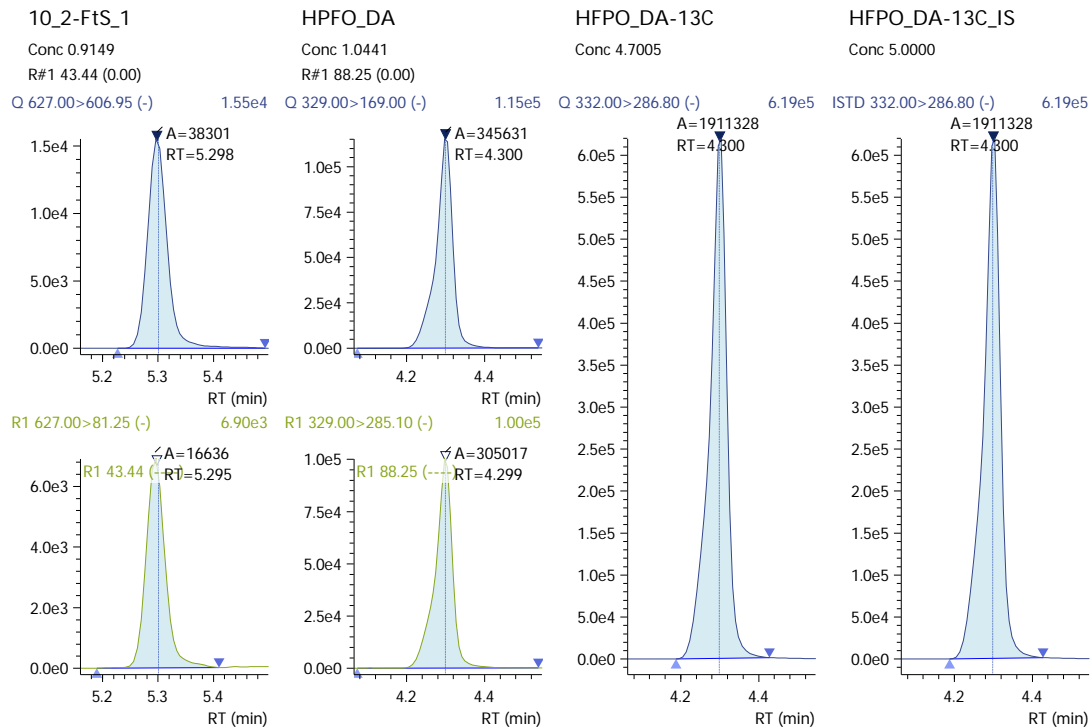
ISTD 528.80>509.00 (-) 1.20e5







### 210413\_042 (continued)





## 210413\_043

Sample ID: TECH PFOA

Date Acquired: 4/13/2021 7:14:00 PM

Acquired by: System Administrator

Data File: 210413\_043

Vial: 9 | Inj. Volume: 15.0000uL | Tray: 0

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
13C7-PFUnDA_IS	570.00>525.00	----	5.119	0.001	----	6175	----	----	----		
PFBS_1	299.00>80.00	298.80>99.00	4.031	-0.001	0.00	661	412	62.33	44.89	22.44-67.33	
PFBS-13C	301.80>80.00	----	4.031	-0.001	-1.09	357	----	----	----	0-0	
PFBS-13C_IS	301.80>80.00	----	4.031	-0.001	----	357	----	----	----	0-0	
PFPeS	349.00>99.00	349.00>79.95	4.300	0.051	0.27	544	241	44.30	148.77	74.38 -223.15	IRr
PFHxS_1	399.00>80.00	399.00>99.00	----	----	----	----	0	0.00	69.37	34.68 -104.05	
PFHxS-18O	402.70>84.05	----	4.402	-0.011	-0.72	76	----	----	----	0-0	
PFHxS-18O_IS	402.70>84.05	----	4.402	-0.011	----	76	----	----	----	0-0	
PFHpS_1	449.00>80.15	449.00>99.20	4.579	0.004	0.18	226	109	48.23	48.72	24.36-73.08	
PFOS_1	499.00>80.00	499.00>99.00	4.729	-0.013	----	85	269	316.47	91.63	45.82 -137.45	IRr
PFOS-13C	502.80>80.05	----	----	----	----	----	----	----	----	0-0	
PFOS-13C_IS	502.80>80.05	----	----	----	----	----	----	----	----	0-0	
PFNS	549.00>99.00	549.00>79.95	4.853	-0.065	----	1142	65	5.69	118.30	59.15 -177.45	IRr
PFDS_1	599.00>79.90	599.00>99.10	----	----	----	----	0	0.00	83.83	41.92 -125.75	
PFBA	213.00>169.10	----	----	----	----	----	----	----	----		
PFBA-13C	216.90>172.15	----	----	----	----	----	----	----	----		
PFBA-13C_IS	216.90>172.15	----	----	----	----	----	----	----	----		
PFPeA	263.05>219.10	----	3.937	-0.045	-0.05	9561	----	----	----		
PFPeA-13C	267.90>223.00	----	3.982	0.001	-1.14	3053	----	----	----	0-0	
PFPeA-13C_IS	267.90>223.00	----	3.982	0.001	----	3053	----	----	----	0-0	
PFHxA	313.00>269.00	313.00>119.10	4.232	-0.001	0.01	33428	0	0.00	4.91	2.46-7.37	IRr
PFHxA-13C	314.90>270.10	----	4.226	-0.006	-0.89	1338	----	----	----	0-0	
PFHxA-13C_IS	314.90>270.10	----	4.226	-0.006	----	1338	----	----	----	0-0	
PFHpA	362.90>319.00	362.90>169.00	4.414	0.002	-0.01	103759	26278	25.33	25.05	12.53-37.58	
PFHpA-13C	366.90>322.10	----	4.420	0.008	-0.70	3040	----	----	----	0-0	
PFHpA-13C_IS	366.90>322.10	----	4.420	0.008	----	3040	----	----	----	0-0	
PFOA	413.00>369.00	413.00>169.10	4.581	-0.003	-0.01	12460542	3817711	30.64	29.71	14.86-44.57	
PFOA-13C	416.80>372.05	----	4.586	0.002	-0.53	2120	----	----	----	0-0	
PFOA-13C_IS	416.80>372.05	----	4.586	0.002	----	2120	----	----	----	0-0	
PFNA	463.00>418.90	463.00>219.00	4.702	-0.054	-0.05	9806	2619	26.71	21.68	10.84-32.52	

J:\LCMS06\Data\210413\_Curve\210413\_Curve.DAML

Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_043 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
PFNA-13C	467.80>423.00	----	4.754	-0.002	-0.37	3939	----	----	----	0-0	
PFNA-13C_IS	467.80>423.00	----	4.754	-0.002	----	3939	----	----	----	0-0	
PFDA	513.00>468.80	513.00>219.10	4.926	-0.011	-0.02	3450	0	0.00	21.66	10.83-32.49	IRr
PFDA-13C	514.80>469.95	----	4.943	0.007	-0.18	2566	----	----	----	0-0	
PFDA-13C_IS	514.80>469.95	----	4.943	0.007	----	2566	----	----	----	0-0	
PFUnA	563.00>518.90	563.00>219.00	5.117	-0.002	0.00	2849	0	0.00	13.50	6.75-20.25	IRr
PFUnA-13C	564.80>519.95	----	5.121	0.002	0.00	3323	----	----	----	0-0	
PFUnA-13C_IS	564.80>519.95	----	5.121	0.002	----	3323	----	----	----	0-0	
PFDaA	613.05>569.00	613.05>169.00	5.285	-0.008	-0.01	4438	0	0.00	18.50	9.25-27.75	IRr
PFDaA-13C	614.80>569.95	----	5.291	-0.003	0.17	3647	----	----	----	0-0	
PFDaA-13C_IS	614.80>569.95	----	5.291	-0.003	----	3647	----	----	----	0-0	
PFTrDA	663.00>618.90	662.90>169.00	5.466	0.007	-0.15	6387	0	0.00	17.61	8.8-26.41	IRr
PFTeDA	713.00>669.00	713.00>169.10	5.621	0.005	0.00	5396	0	0.00	18.66	9.33-27.99	IRr
PFTeDA-13C	714.70>669.90	----	5.618	0.002	0.50	7090	----	----	----	0-0	
PFTeDA-13C_IS	714.70>669.90	----	5.618	0.002	----	7090	----	----	----	0-0	
FOSA	498.20>78.00	498.20>64.10	----	----	----	----	0	0.00	4.50	2.25-6.74	
FOSA-13C	506.00>78.05	----	5.240	-0.001	0.12	1909	----	----	----	0-0	
FOSA-13C_IS	506.00>78.05	----	5.240	-0.001	----	1909	----	----	----	0-0	
N-MeFOSA	512.00>169.10	512.00>219.00	5.680	0.045	----	1188	109	9.18	63.69	31.85-95.54	IRr
N-MeFOSA-d3	514.90>168.90	----	----	----	----	----	----	----	----	0-0	
N-MeFOSA-d3_IS	514.90>168.90	----	----	----	----	----	----	----	----	0-0	
N-EtFOSA	526.90>169.10	526.90>219.00	----	----	----	----	0	0.00	64.88	32.44-97.33	
N-EtFOSA-d9	530.90>169.15	----	5.721	-0.045	0.60	280	----	----	----	0-0	
N-EtFOSA-d9_IS	530.90>169.15	----	5.721	-0.045	----	280	----	----	----	0-0	
N-MeFOSE	616.00>59.00	----	5.625	0.012	----	1675	----	----	----		
N-MeFOSE-d7	622.70>59.10	----	----	----	----	----	----	----	----		
N-MeFOSE-d7_IS	622.70>59.10	----	----	----	----	----	----	----	----		
N-EtFOSE	630.00>58.90	----	5.737	-0.006	-0.07	1706	----	----	----		
N-EtFOSE-d9	638.70>59.10	----	5.807	0.075	0.69	720	----	----	----	0-0	
N-EtFOSE-d9_IS	638.70>59.10	----	5.807	0.075	----	720	----	----	----	0-0	
N-MeFOSAA	570.20>419.00	570.20>512.00	5.044	0.004	0.01	615	0	0.00	48.49	24.24-72.73	IRr
N-MeFOSAA-d3	572.80>419.05	----	5.035	-0.002	-0.08	2873	----	----	----	0-0	
N-MeFOSAA-d3_IS	572.80>419.05	----	5.035	-0.002	----	2873	----	----	----	0-0	
N-EtFOSAA	584.20>418.95	584.20>526.10	5.140	0.002	----	388	381	98.20	85.86	42.93 -128.79	
N-EtFOSAA-d5	588.80>419.00	----	----	----	----	----	----	----	----	0-0	
N-EtFOSAA-d5_IS	588.80>419.00	----	----	----	----	----	----	----	----	0-0	
4_2-FTS_1	327.00>307.05	327.00>81.10	4.025	-0.181	----	148	0	0.00	26.07	13.03-39.1	IRr
4_2-FTS-13C	328.80>309.05	----	----	----	----	----	----	----	----	0-0	

J:\LCMS06\Data\210413\_Curve\210413\_Curve.DAML

Comment 1 field specifies acceptance range for Ref 1 ratio.

IRr - Ion ratio outside acceptance limits. Exceedances for results above the MDL to be "K" flagged in the analytical report.



210413\_043 (continued)

(Table continued from previous page)

Name	m/z	Ref 1 m/z	Found RT	RT Diff	ISTD RT Diff	Area	Ref 1 Measured	Ref 1 Actual Ratio	Ref 1 Set Ratio	Comment 1	Flag ID
4_2-FTS-13C_IS	328.80>309.05	----	----	----	----	----	----	----	----	0-0	
6_2-FTS_1	427.00>407.00	427.00>80.90	4.573	0.004	----	484	29	5.99	30.56	15.28-45.84	IRr
6_2-FTS-13C	428.90>409.00	----	----	----	----	----	----	----	----	0-0	
6_2-FTS-13C_IS	428.90>409.00	----	----	----	----	----	----	----	----	0-0	
8_2-FTS_1	527.10>506.90	527.20>487.00	4.937	0.002	----	26	0	0.00	8.18	4.09-12.27	IRr
8_2-FTS-13C	528.80>509.00	----	----	----	----	----	----	----	----	0-0	
8_2-FTS-13C_IS	528.80>509.00	----	----	----	----	----	----	----	----	0-0	
10_2-Fts_1	627.00>606.95	627.00>81.25	5.295	-0.006	----	48	22	45.83	42.47	21.23-63.7	
HPFO_DA	329.00>169.00	329.00>285.10	4.298	-0.001	0.00	590	529	89.66	91.65	45.83 -137.48	
HFPO_DA-13C	332.00>286.80	----	4.300	0.001	-0.82	1047	----	----	----		
HFPO_DA-13C_IS	332.00>286.80	----	4.300	0.001	----	1047	----	----	----		

Flag ID key: IRr: Ion Ratio (Relative)



210413\_043

edited for PFOA only

Sample ID: TECH PFOA

Date Acquired: 4/13/2021 7:14:00 PM

Acquired by: System Administrator

Data File: 210413\_043

Vial: 9 | Inj. Volume: 15.0000uL | Tray: 0

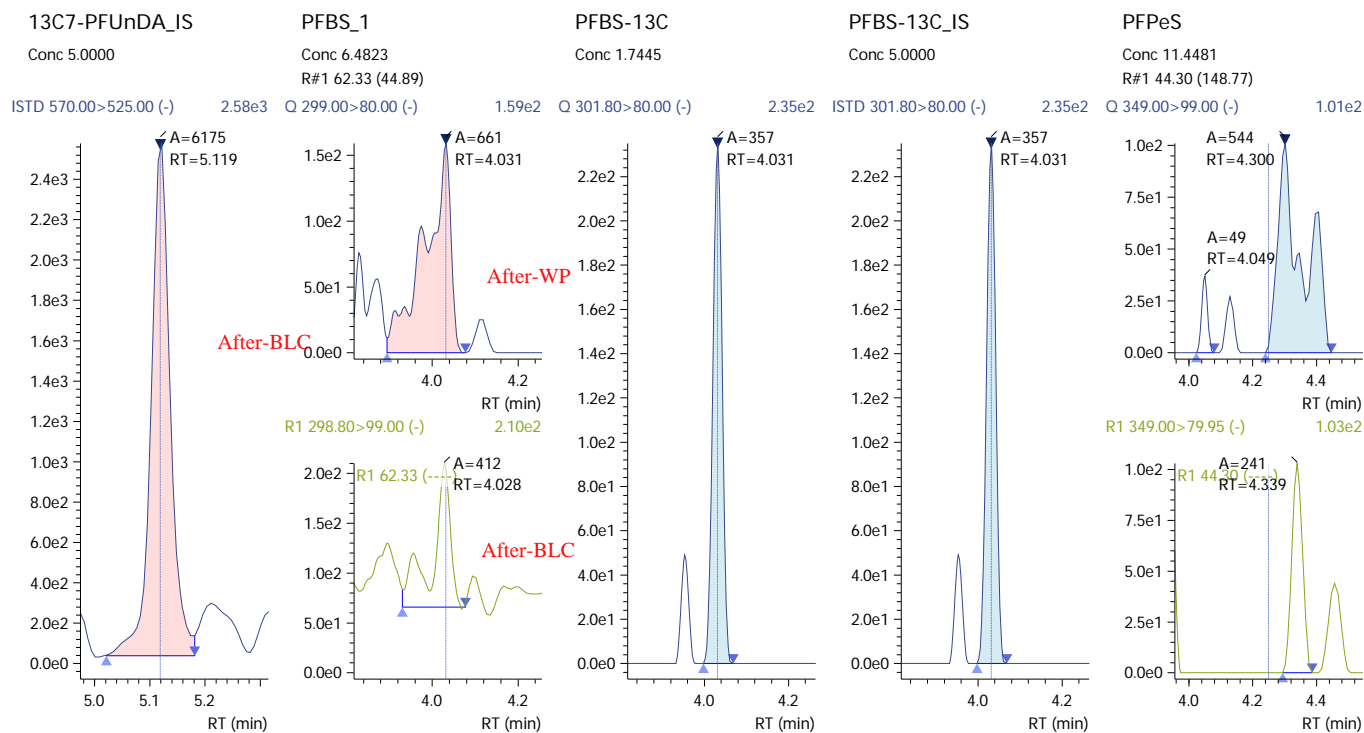
Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
13C7-PFUnDA_IS	M	5.119	6175	6175	----	----	5.0000	ng/mL
PFBS_1	M	4.031	661	357	PFBS-13C_IS	----	6.4823	ng/mL
PFBS-13C	Auto	4.031	357	6175	13C7-PFUnDA_IS	----	1.7445	ng/mL
PFBS-13C_IS	Auto	4.031	357	357	----	----	5.0000	ng/mL
PFPeS	Auto	4.300	544	357	PFBS-13C_IS	----	11.4481	ng/mL
PFHxS_1	ND(W/B)	----	----	76	PFHxS-18O_IS	----	----	ng/mL
PFHxS-18O	Auto	4.402	76	6175	13C7-PFUnDA_IS	----	0.7492	ng/mL
PFHxS-18O_IS	Auto	4.402	76	76	----	----	5.0000	ng/mL
PFHpS_1	M	4.579	226	76	PFHxS-18O_IS	----	7.1528	ng/mL
PFOS_1	Auto	4.729	85	----	PFOS-13C_IS	----	0.0000	ng/mL
PFOS-13C	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
PFOS-13C_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
PFNS	Auto	4.853	1142	----	PFOS-13C_IS	----	0.0000	ng/mL
PFDS_1	ND(W/B)	----	----	----	PFOS-13C_IS	----	----	ng/mL
PFBA	ND(W/B)	----	----	----	PFBA-13C_IS	----	----	ng/mL
PFBA-13C	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
PFBA-13C_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
PFPeA	Auto	3.937	9561	3053	PFPeA-13C_IS	----	7.6906	ng/mL
PFPeA-13C	Auto	3.982	3053	6175	13C7-PFUnDA_IS	----	4.7824	ng/mL
PFPeA-13C_IS	Auto	3.982	3053	3053	----	----	5.0000	ng/mL
PFHxA	Auto	4.232	33428	1338	PFHxA-13C_IS	----	120.6380	ng/mL
PFHxA-13C	Auto	4.226	1338	6175	13C7-PFUnDA_IS	----	0.9688	ng/mL
PFHxA-13C_IS	Auto	4.226	1338	1338	----	----	5.0000	ng/mL
PFHpA	MI R1	4.414	103759	3040	PFHpA-13C_IS	----	170.8564	ng/mL
PFHpA-13C	Auto	4.420	3040	6175	13C7-PFUnDA_IS	----	2.2569	ng/mL
PFHpA-13C_IS	Auto	4.420	3040	3040	----	----	5.0000	ng/mL
PFOA	Auto	4.581	12460542	2120	PFOA-13C_IS	----	22009.0394	ng/mL
PFOA-13C	Auto	4.586	2120	6175	13C7-PFUnDA_IS	----	1.7081	ng/mL
PFOA-13C_IS	Auto	4.586	2120	2120	----	----	5.0000	ng/mL
PFNA	Auto	4.702	9806	3939	PFNA-13C_IS	----	12.3309	ng/mL
PFNA-13C	Auto	4.754	3939	6175	13C7-PFUnDA_IS	----	3.7798	ng/mL
PFNA-13C_IS	Auto	4.754	3939	3939	----	----	5.0000	ng/mL
PFDA	Auto	4.926	3450	2566	PFDA-13C_IS	----	5.3488	ng/mL
PFDA-13C	Auto	4.943	2566	6175	13C7-PFUnDA_IS	----	3.7357	ng/mL
PFDA-13C_IS	Auto	4.943	2566	2566	----	----	5.0000	ng/mL
PFUnA	Auto	5.117	2849	3323	PFUnA-13C_IS	----	3.7416	ng/mL
PFUnA-13C	Auto	5.121	3323	6175	13C7-PFUnDA_IS	----	3.9437	ng/mL
PFUnA-13C_IS	Auto	5.121	3323	3323	----	----	5.0000	ng/mL
PFDaA	Auto	5.285	4438	3647	PFDaA-13C_IS	----	7.5023	ng/mL
PFDaA-13C	Auto	5.291	3647	6175	13C7-PFUnDA_IS	----	4.0288	ng/mL
PFDaA-13C_IS	Auto	5.291	3647	3647	----	----	5.0000	ng/mL
PFTeDA	Auto	5.466	6387	7090	PFTeDA-13C_IS	----	3.4764	ng/mL
PFTeDA	Auto	5.621	5396	7090	PFTeDA-13C_IS	----	3.4106	ng/mL
PFTeDA-13C	Auto	5.618	7090	6175	13C7-PFUnDA_IS	----	11.9880	ng/mL
PFTeDA-13C_IS	Auto	5.618	7090	7090	----	----	5.0000	ng/mL
FOSA	ND(W/B)	----	----	1909	FOSA-13C_IS	----	----	ng/mL
FOSA-13C	Auto	5.240	1909	6175	13C7-PFUnDA_IS	----	4.0926	ng/mL
FOSA-13C_IS	Auto	5.240	1909	1909	----	----	5.0000	ng/mL
N-MeFOSA	Auto	5.680	1188	----	N-MeFOSA-d3_IS	----	0.0000	ng/mL
N-MeFOSA-d3	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
N-MeFOSA-d3_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
N-EtFOSA	ND(W/B)	----	----	280	N-EtFOSA-d9_IS	----	----	ng/mL
N-EtFOSA-d9	Auto	5.721	280	6175	13C7-PFUnDA_IS	----	1.8415	ng/mL
N-EtFOSA-d9_IS	Auto	5.721	280	280	----	----	5.0000	ng/mL



### 210413\_043 (continued)

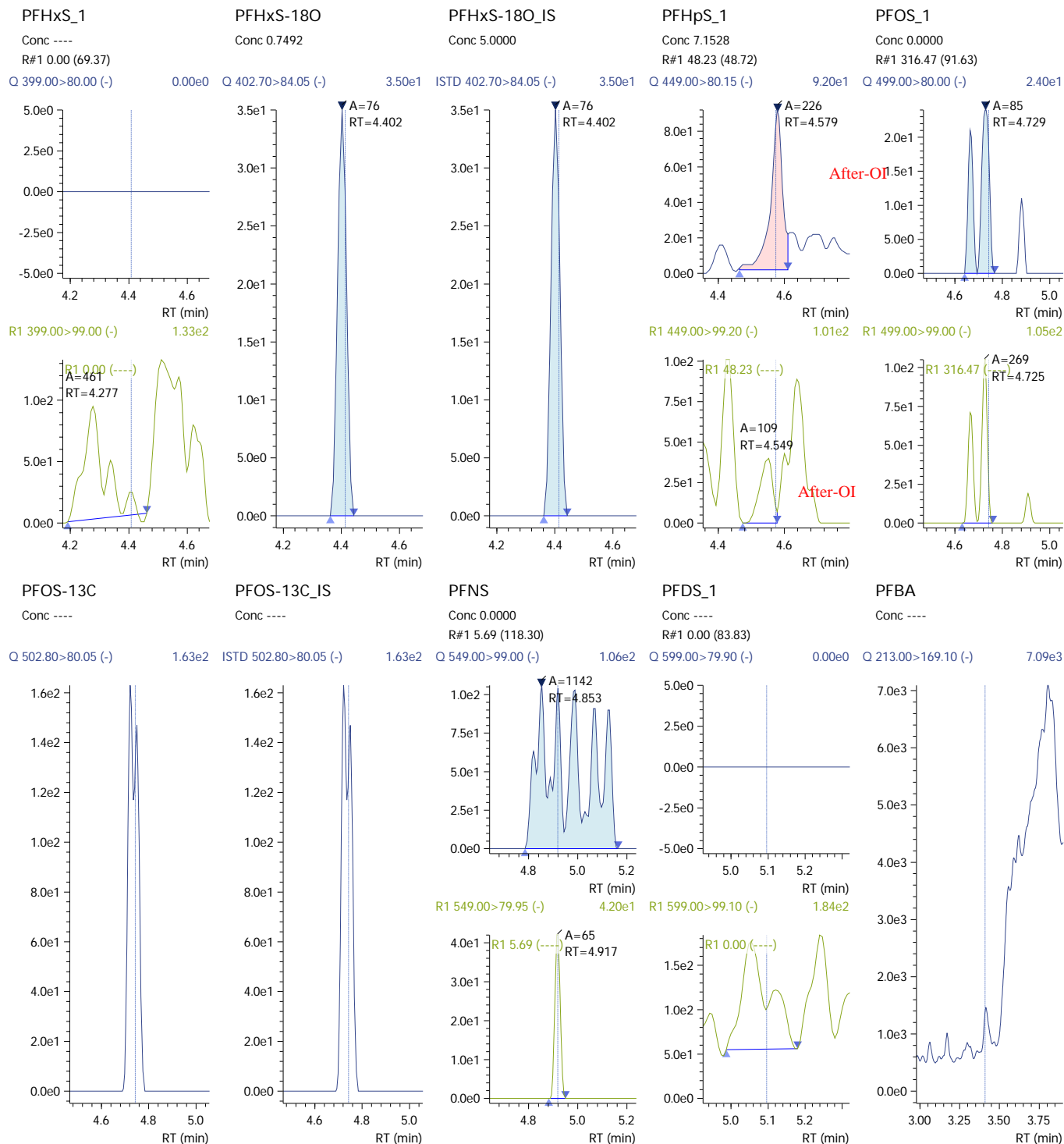
(Table continued from previous page)

Name	Mode ID	Found RT	Area	ISTD Area	ISTD Name	Std. Conc.	Conc.	Unit
N-MeFOSE	Auto	5.625	1675	----	N-MeFOSE-d7_IS	----	0.0000	ng/mL
N-MeFOSE-d7	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
N-MeFOSE-d7_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
N-EtFOSE	M	5.737	1706	720	N-EtFOSE-d9_IS	----	5.1650	ng/mL
N-EtFOSE-d9	Auto	5.807	720	6175	13C7-PFUnDA_IS	----	6.0331	ng/mL
N-EtFOSE-d9_IS	Auto	5.807	720	720	----	----	5.0000	ng/mL
N-MeFOSAA	Auto	5.044	615	2873	N-MeFOSAA-d3_IS	----	1.2339	ng/mL
N-MeFOSAA-d3	Auto	5.035	2873	6175	13C7-PFUnDA_IS	----	38.4336	ng/mL
N-MeFOSAA-d3_IS	Auto	5.035	2873	2873	----	----	5.0000	ng/mL
N-EtFOSAA	Auto	5.140	388	----	N-EtFOSAA-d5_IS	----	0.0000	ng/mL
N-EtFOSAA-d5	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
N-EtFOSAA-d5_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
4_2-FTS_1	Auto	4.025	148	----	4_2-FTS-13C_IS	----	0.0000	ng/mL
4_2-FTS-13C	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
4_2-FTS-13C_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
6_2-FTS_1	Auto	4.573	484	----	6_2-FTS-13C_IS	----	0.0000	ng/mL
6_2-FTS-13C	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
6_2-FTS-13C_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
8_2-FTS_1	Auto	4.937	26	----	8_2-FTS-13C_IS	----	0.0000	ng/mL
8_2-FTS-13C	ND(W/B)	----	----	6175	13C7-PFUnDA_IS	----	----	ng/mL
8_2-FTS-13C_IS	ND(W/B)	----	----	----	----	----	----	ng/mL
10_2-FTS_1	Auto	5.295	48	----	8_2-FTS-13C_IS	----	0.0000	ng/mL
HPFO_DA	Auto	4.298	590	1047	HPFO_DA-13C_IS	----	3.2530	ng/mL
HFPO_DA-13C	Auto	4.300	1047	6175	13C7-PFUnDA_IS	----	2.5497	ng/mL
HFPO_DA-13C_IS	Auto	4.300	1047	1047	----	----	5.0000	ng/mL



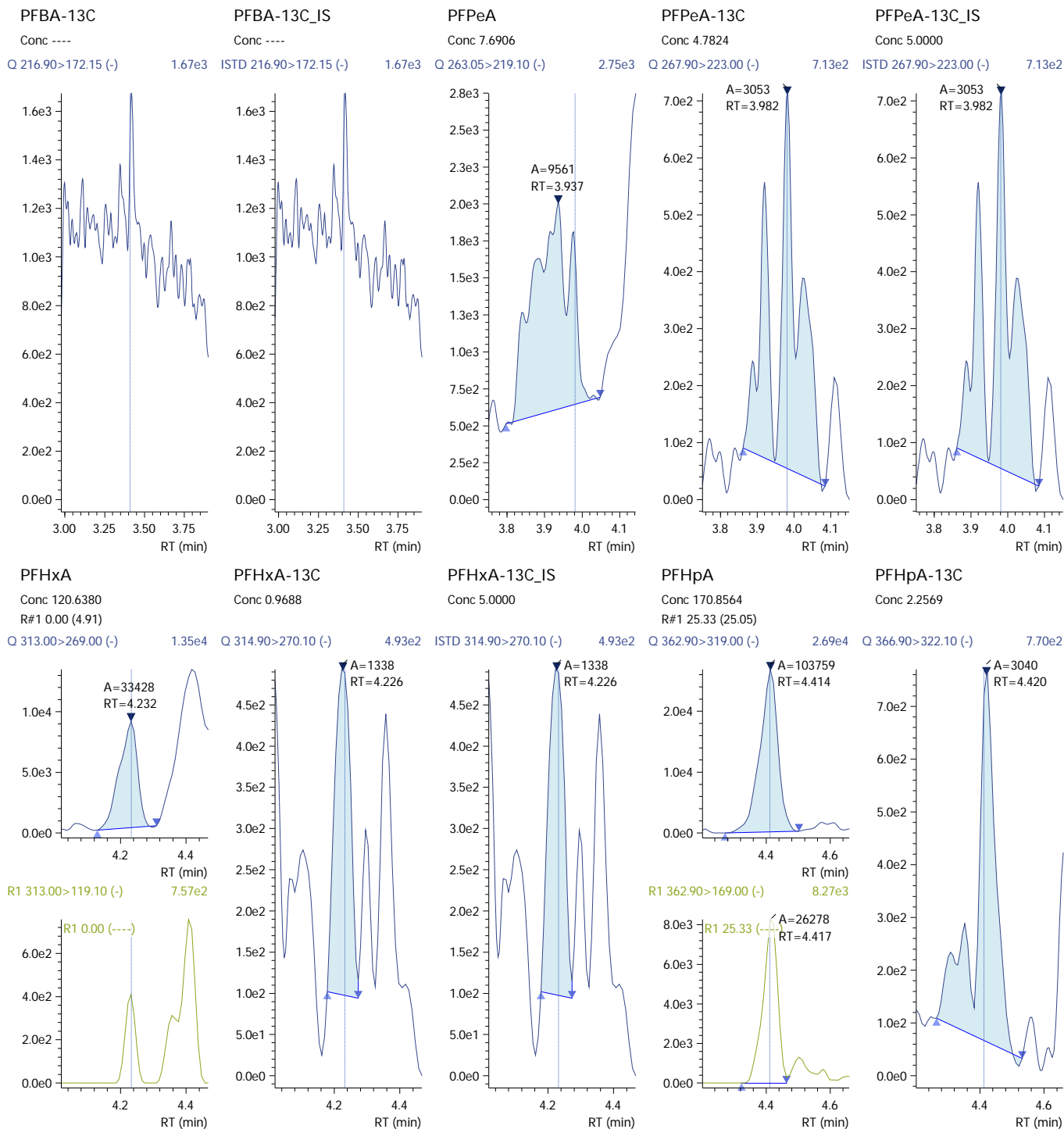


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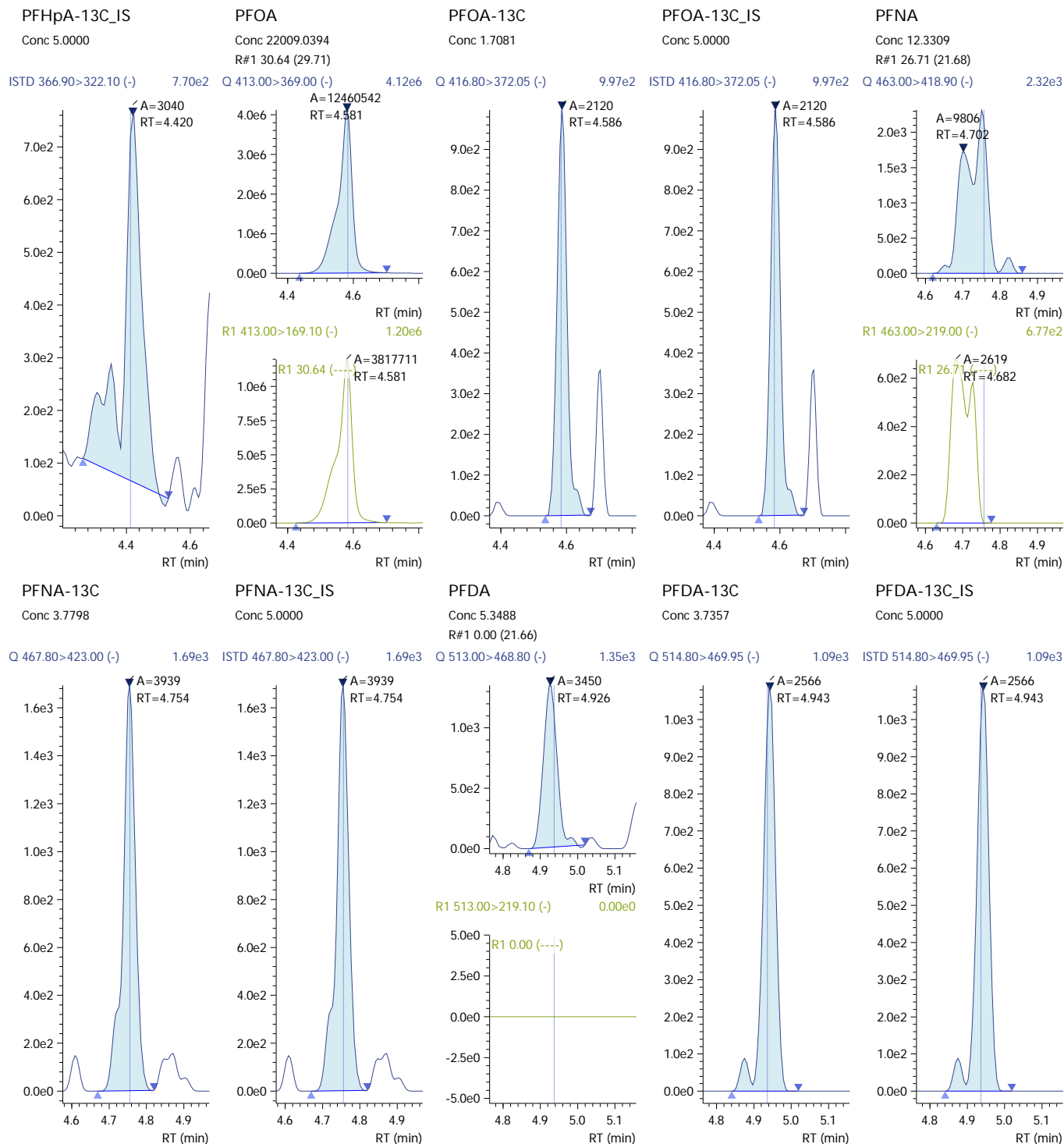
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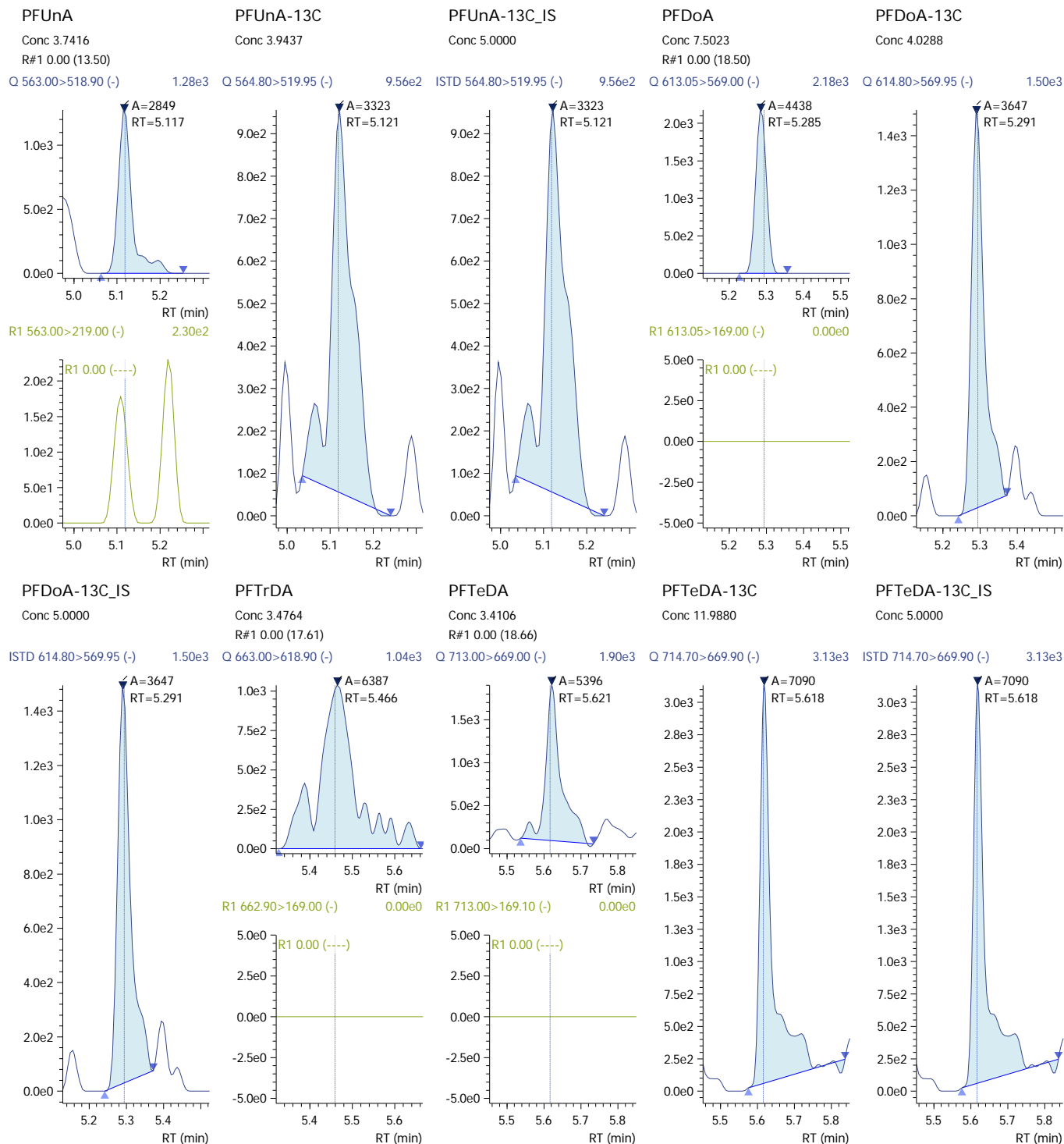


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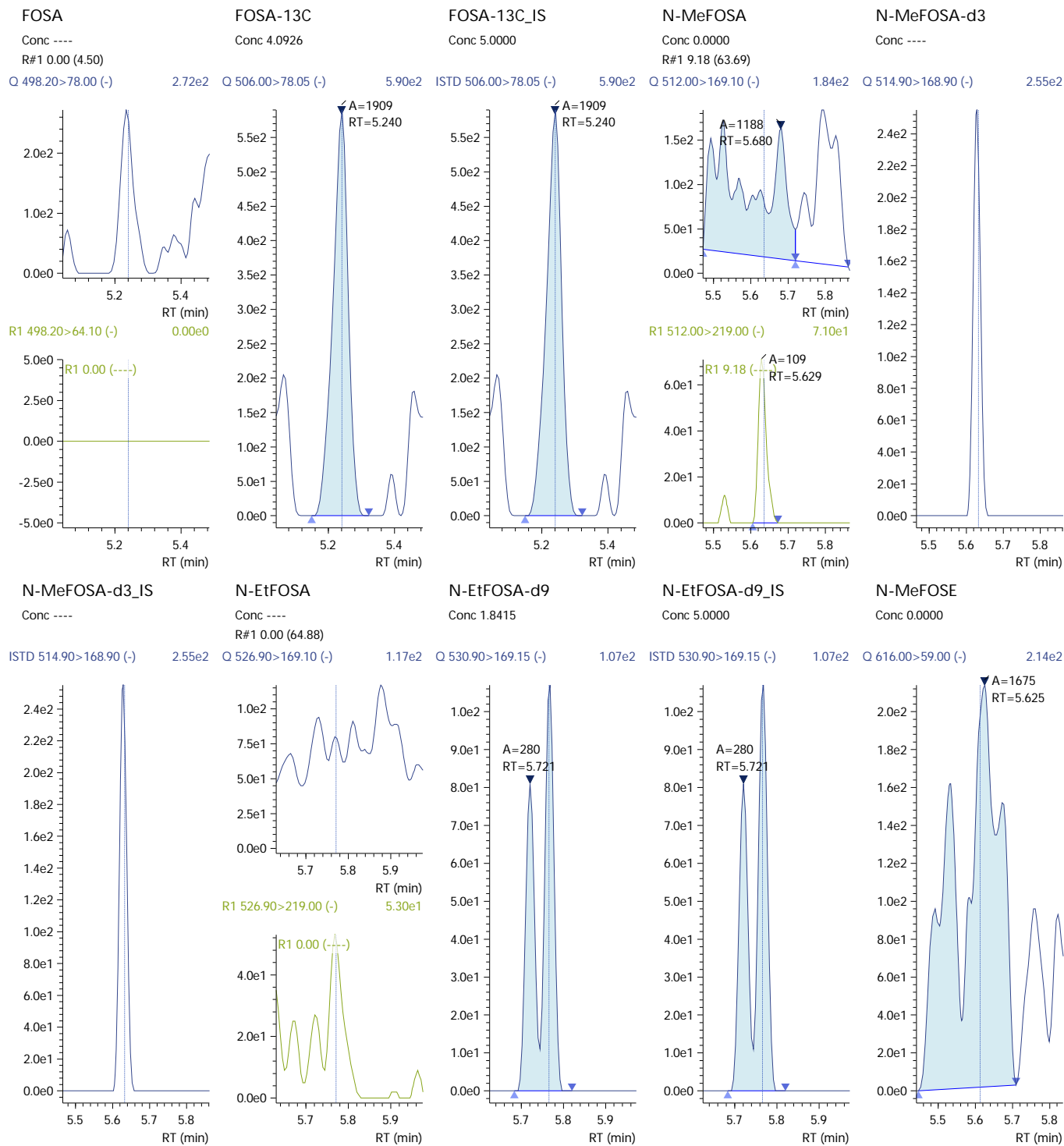


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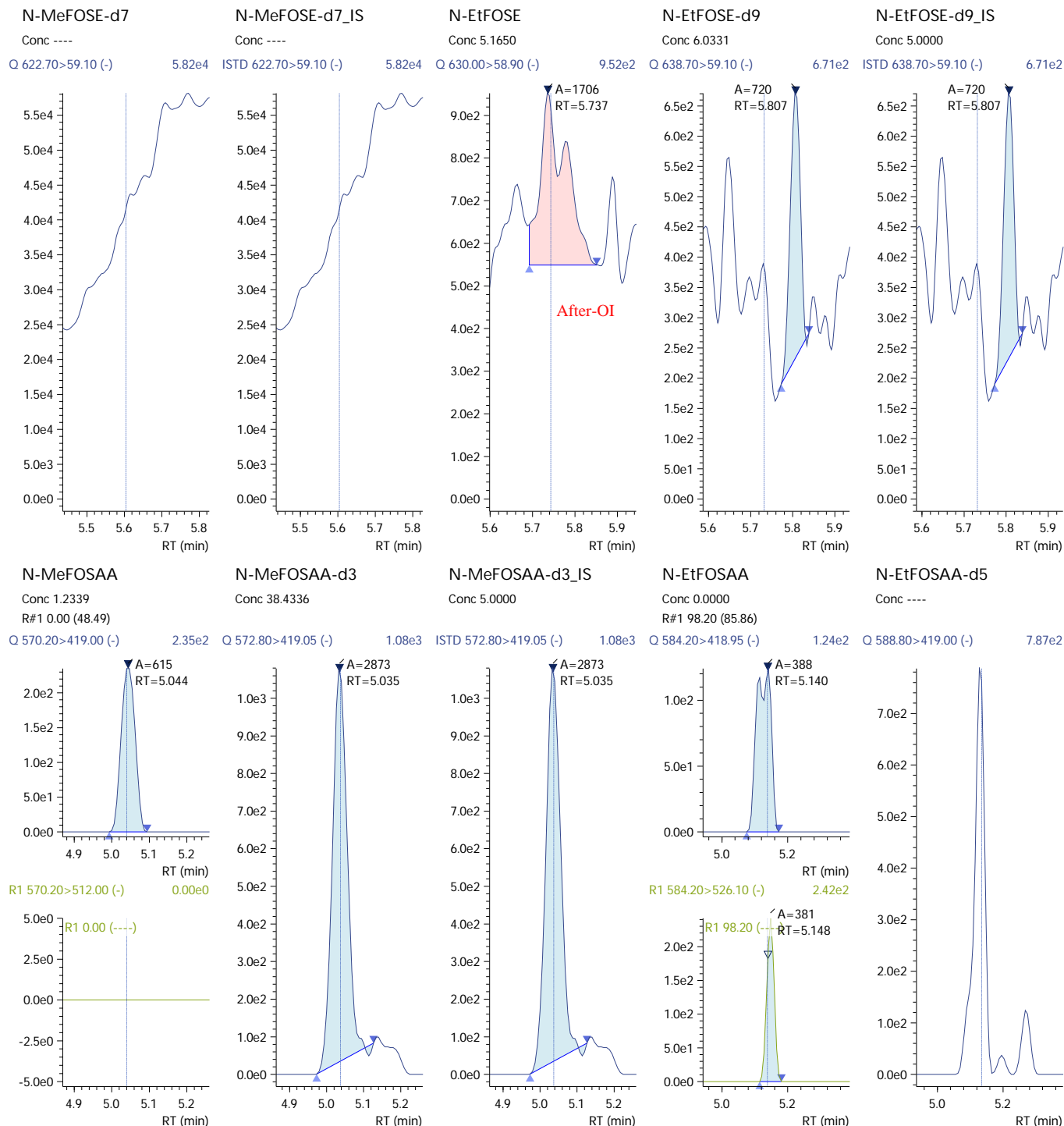


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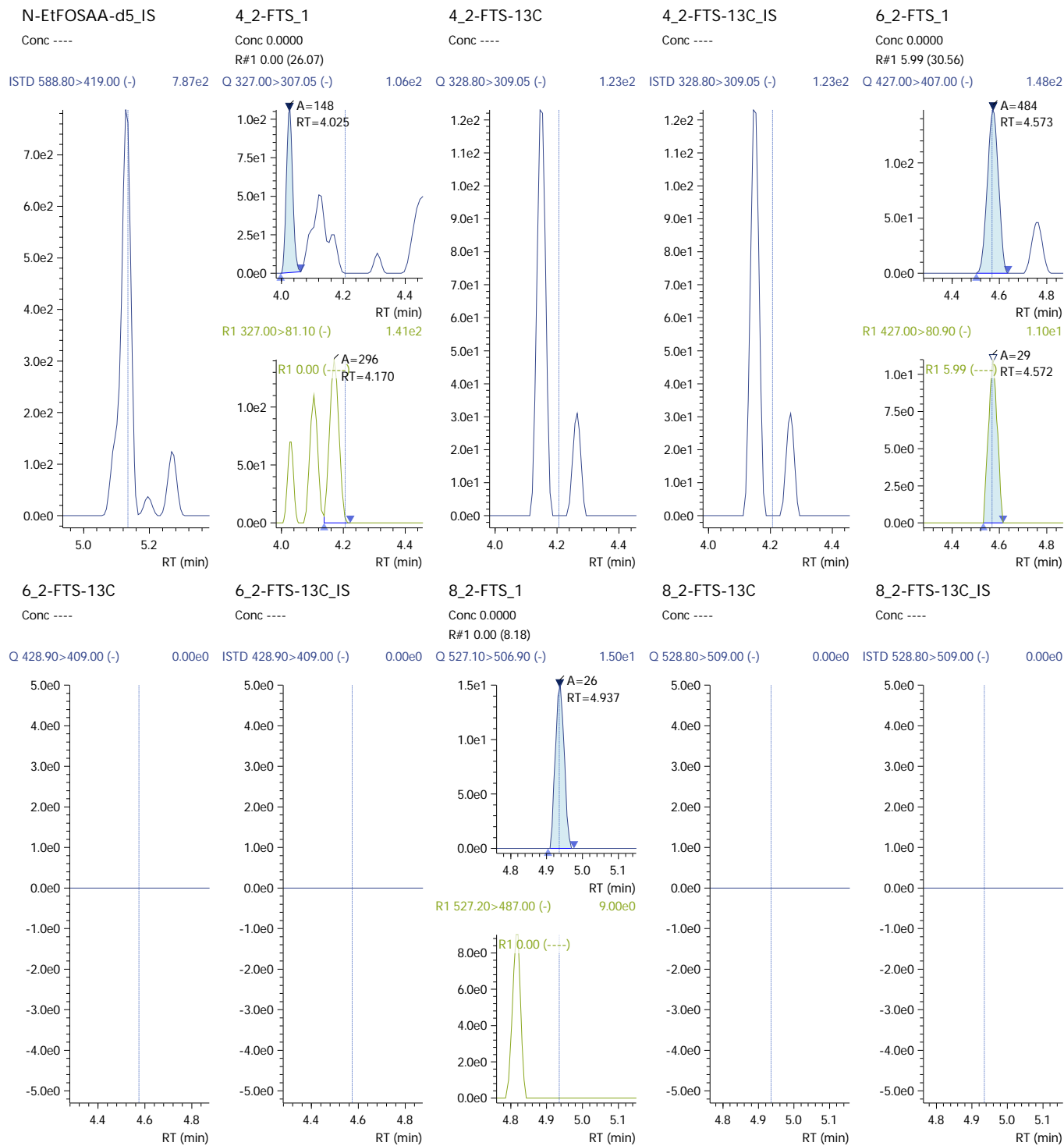


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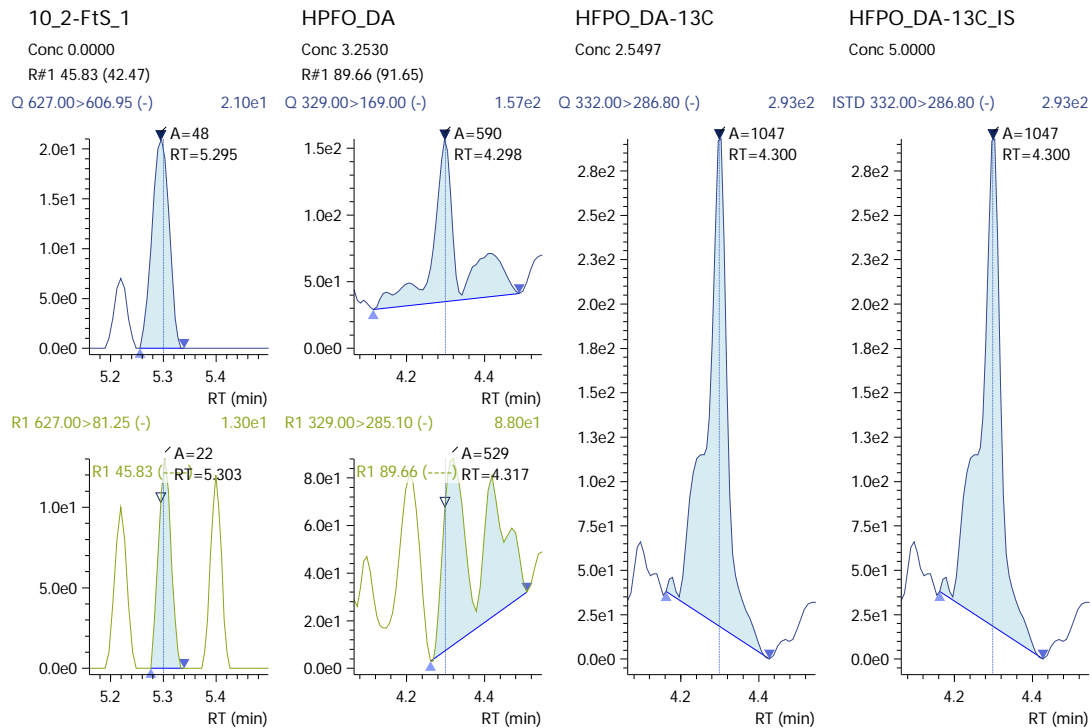


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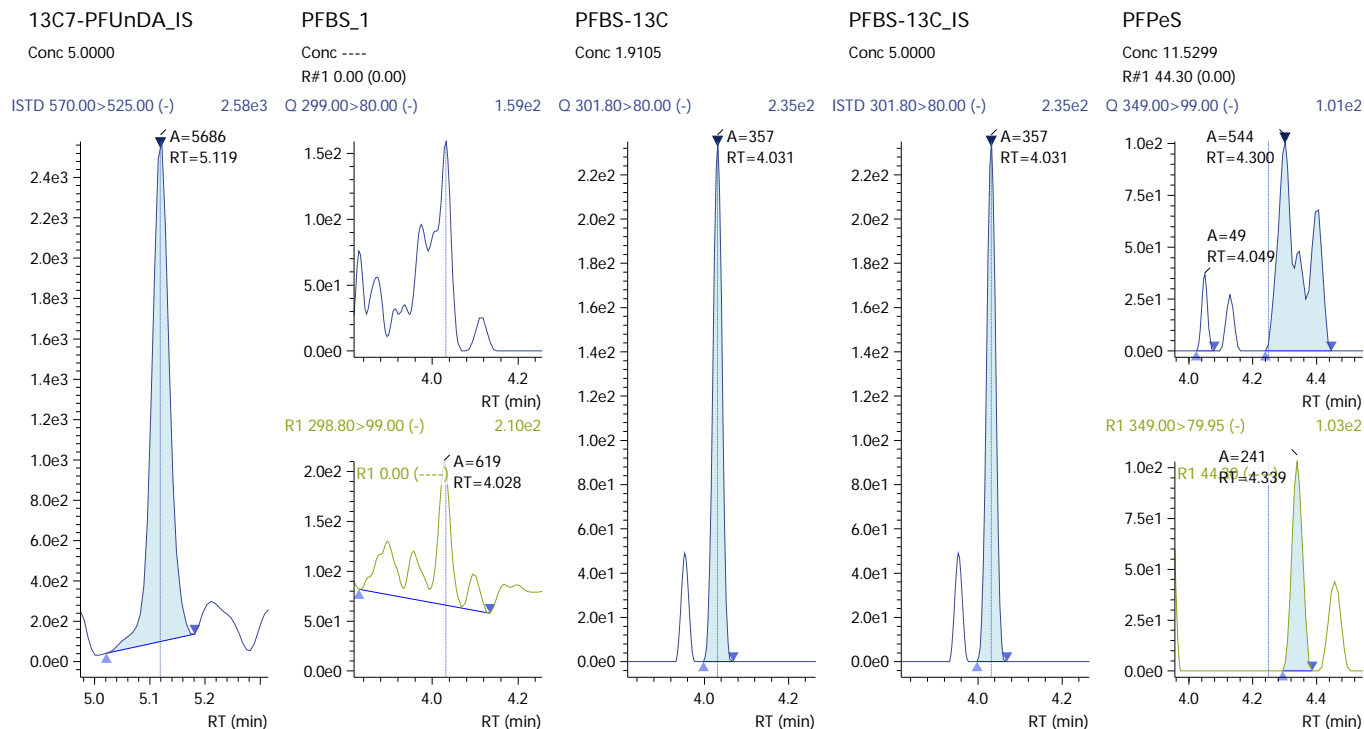
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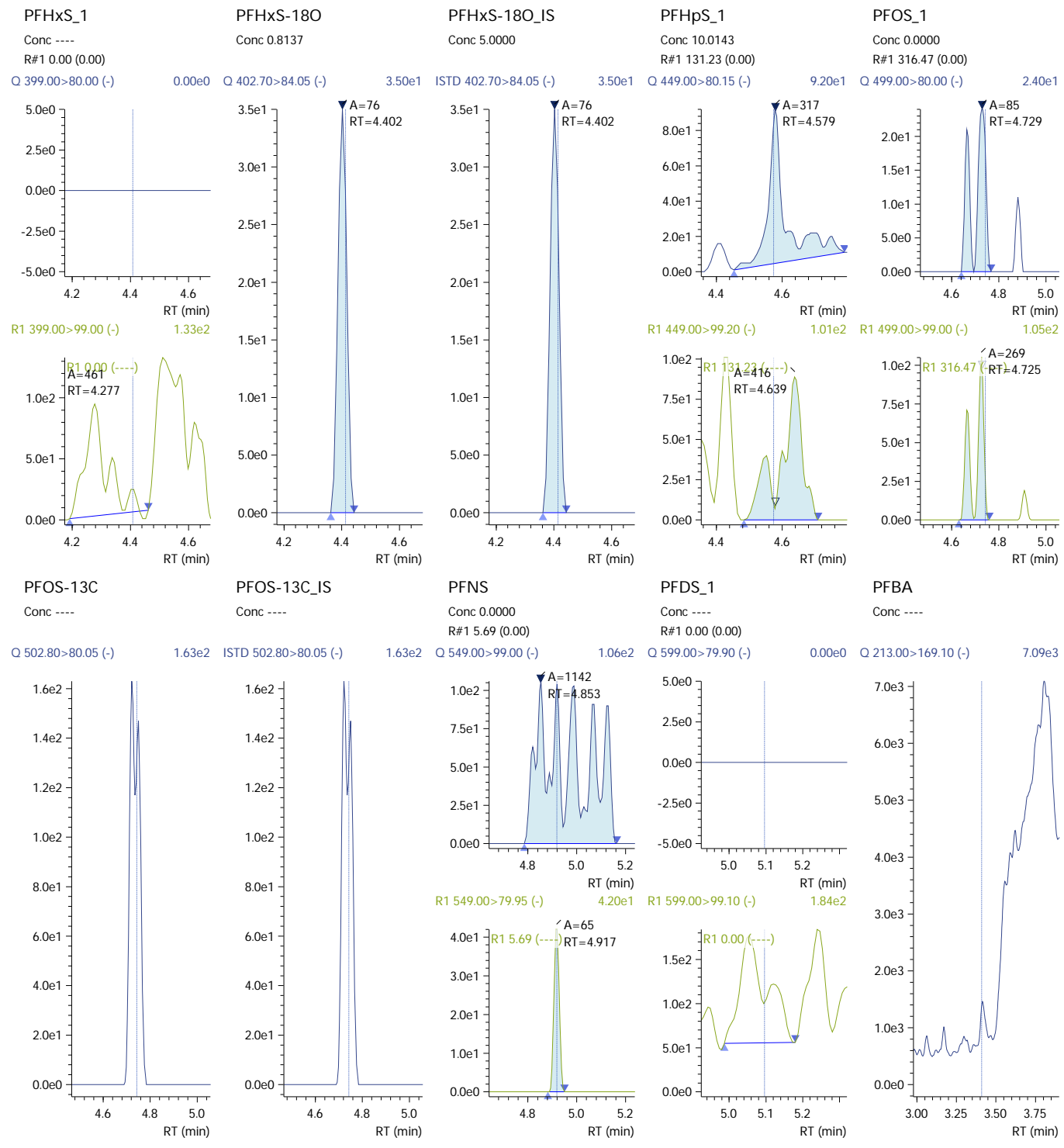
### 210413\_043

Sample ID: TECH PFOA  
Date Acquired: 4/13/2021 7:14:00 PM  
Acquired by: System Administrator  
Data File: 210413\_043  
Vial: 9 | Inj. Volume: 15.0000uL | Tray: 0





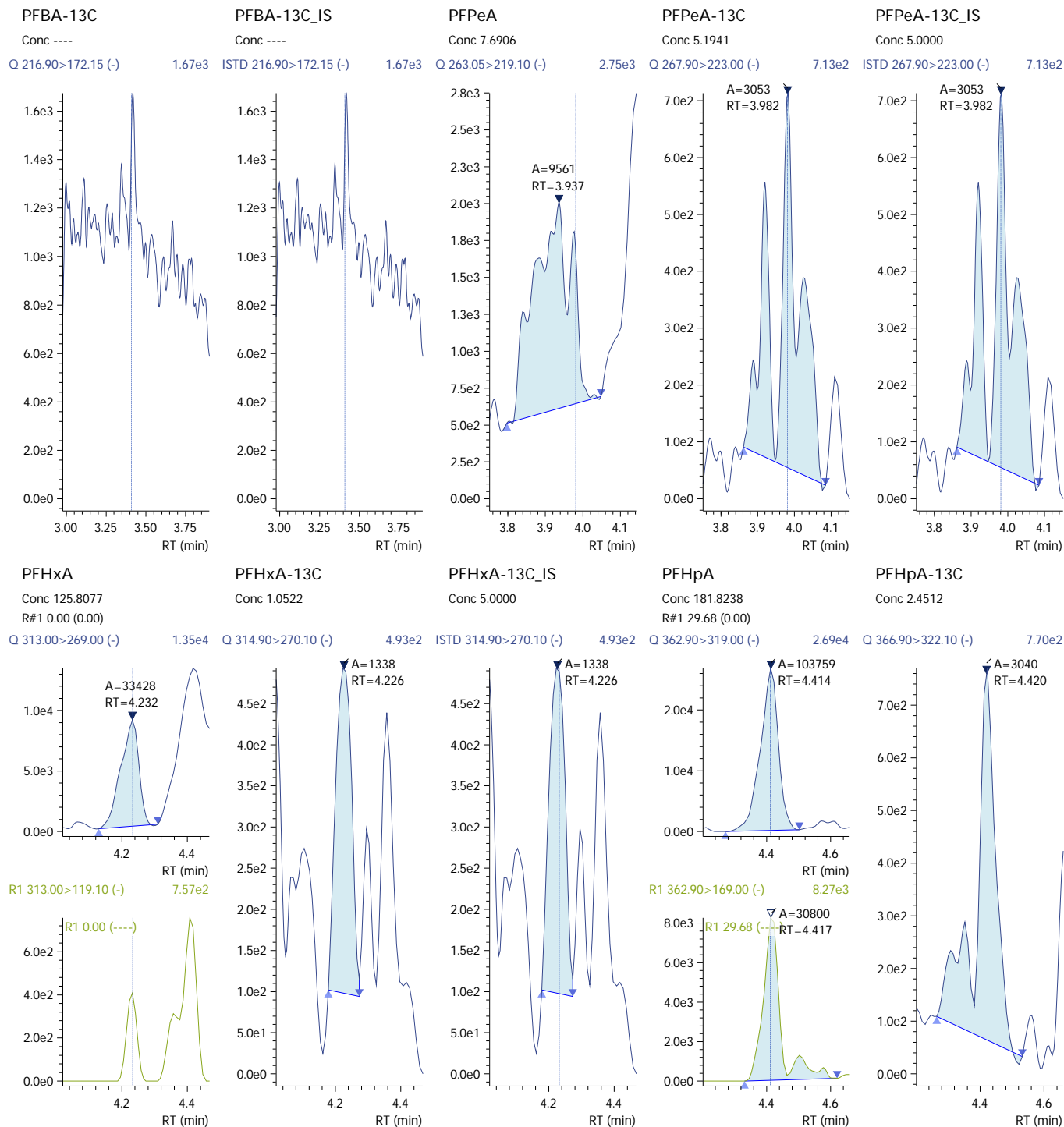
### 210413\_043 (continued)





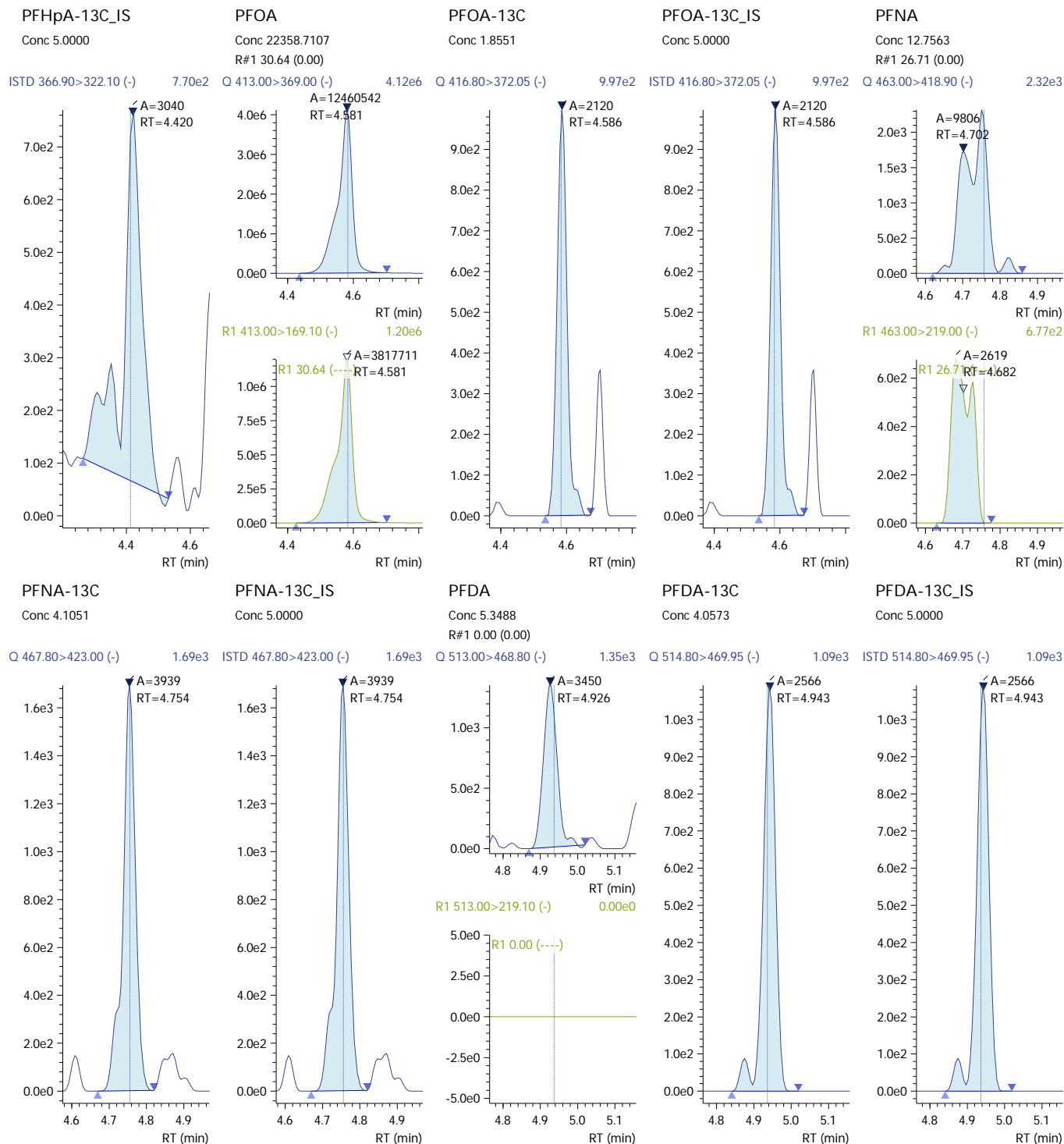


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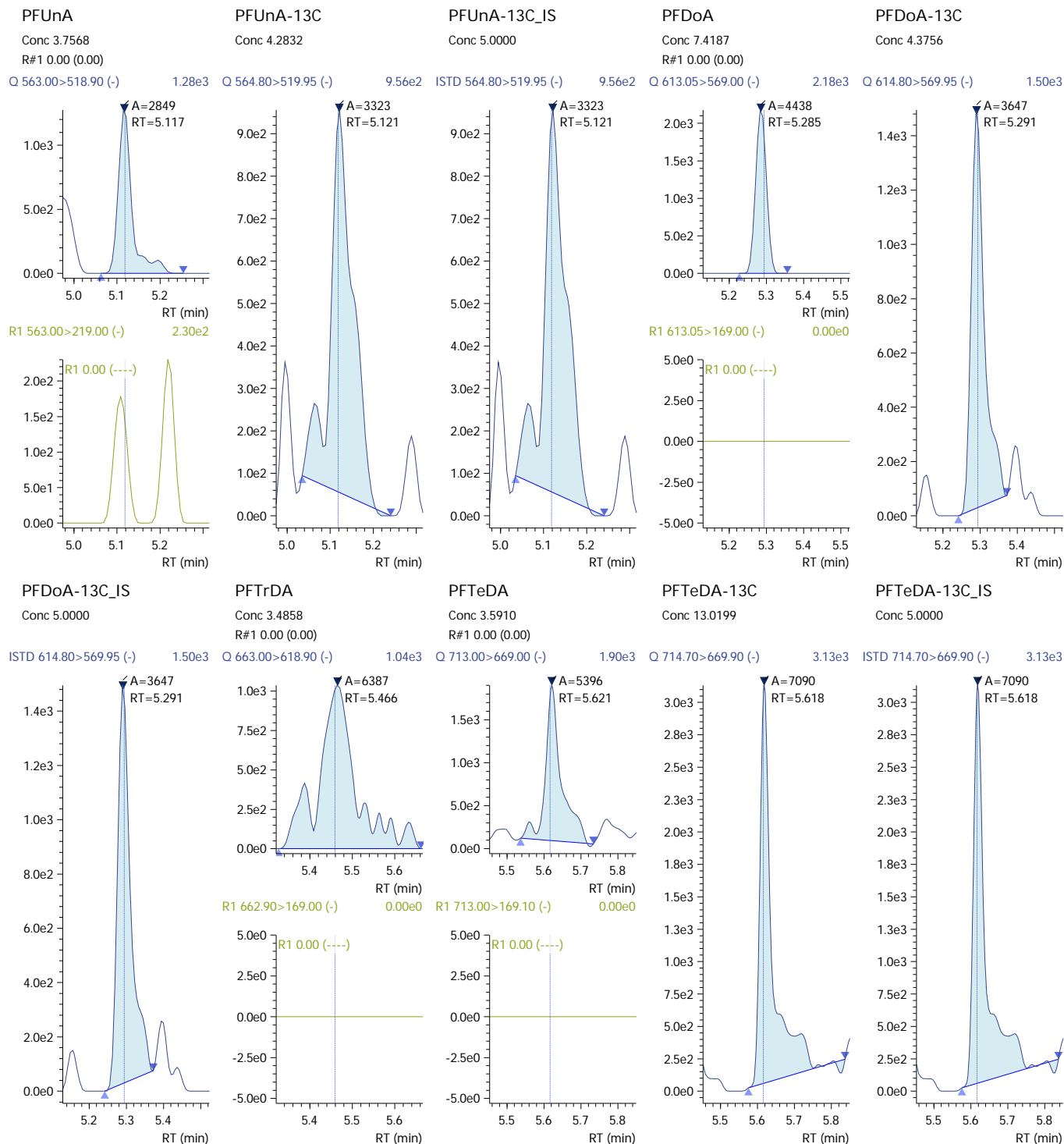


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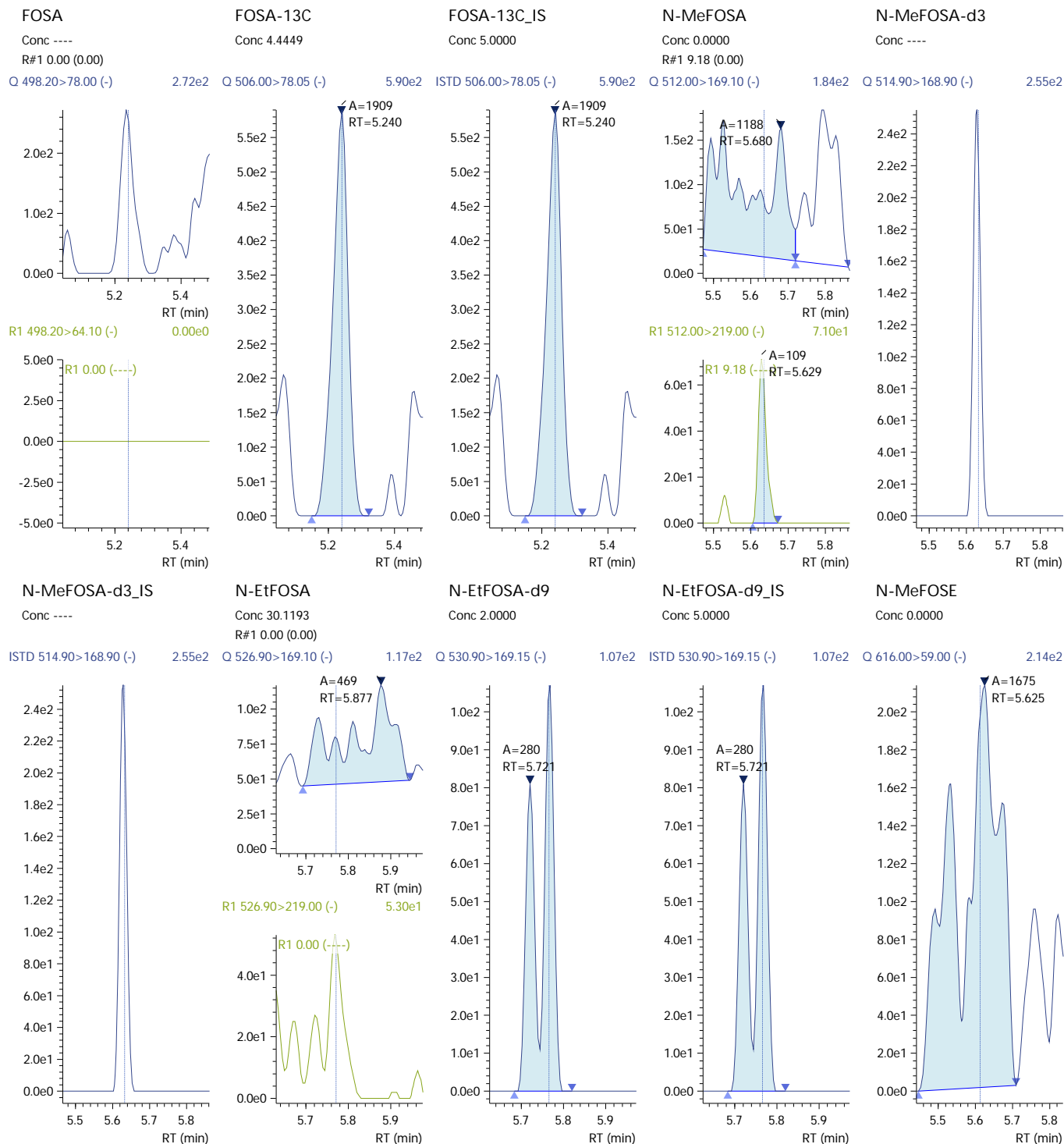


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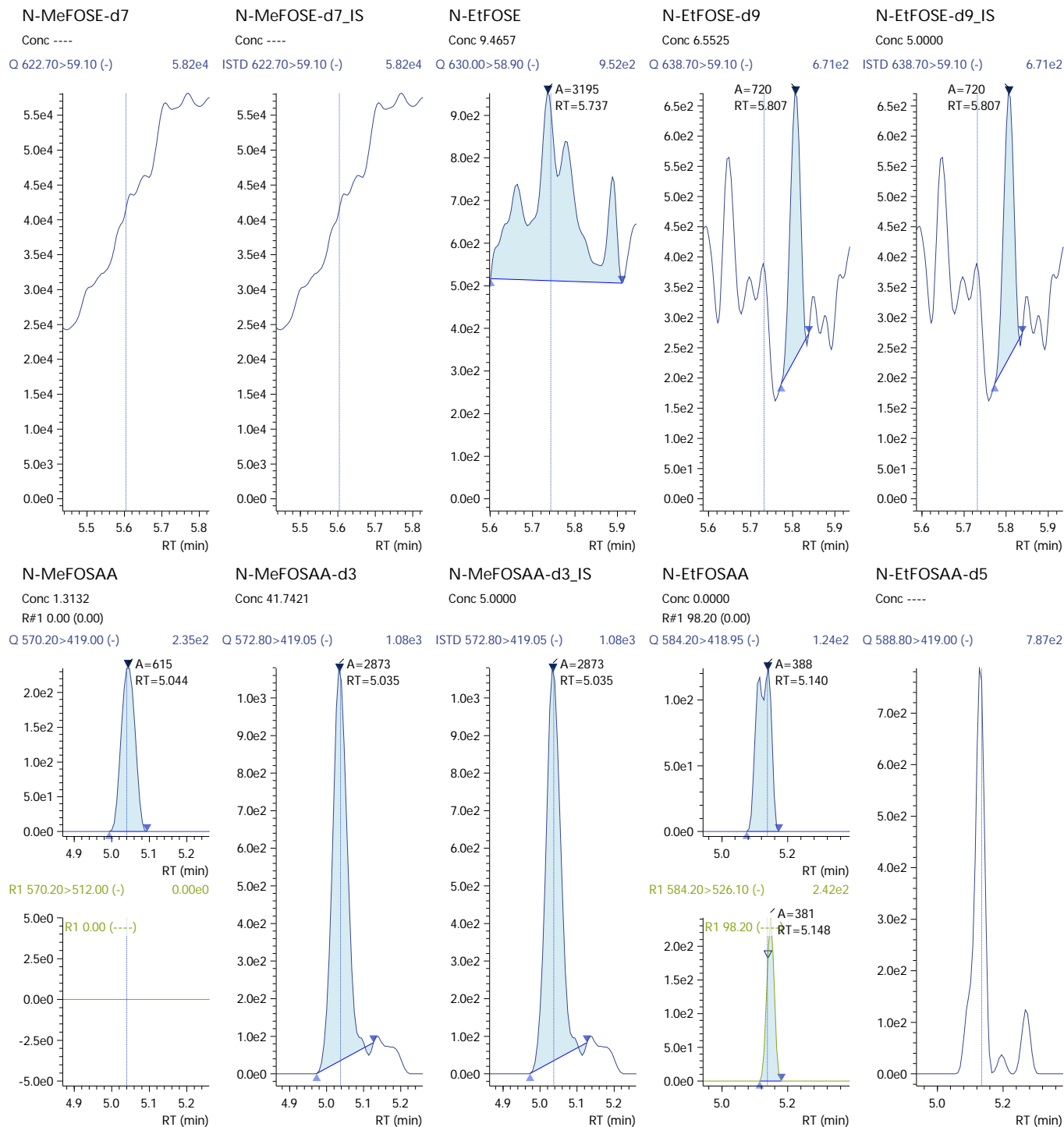


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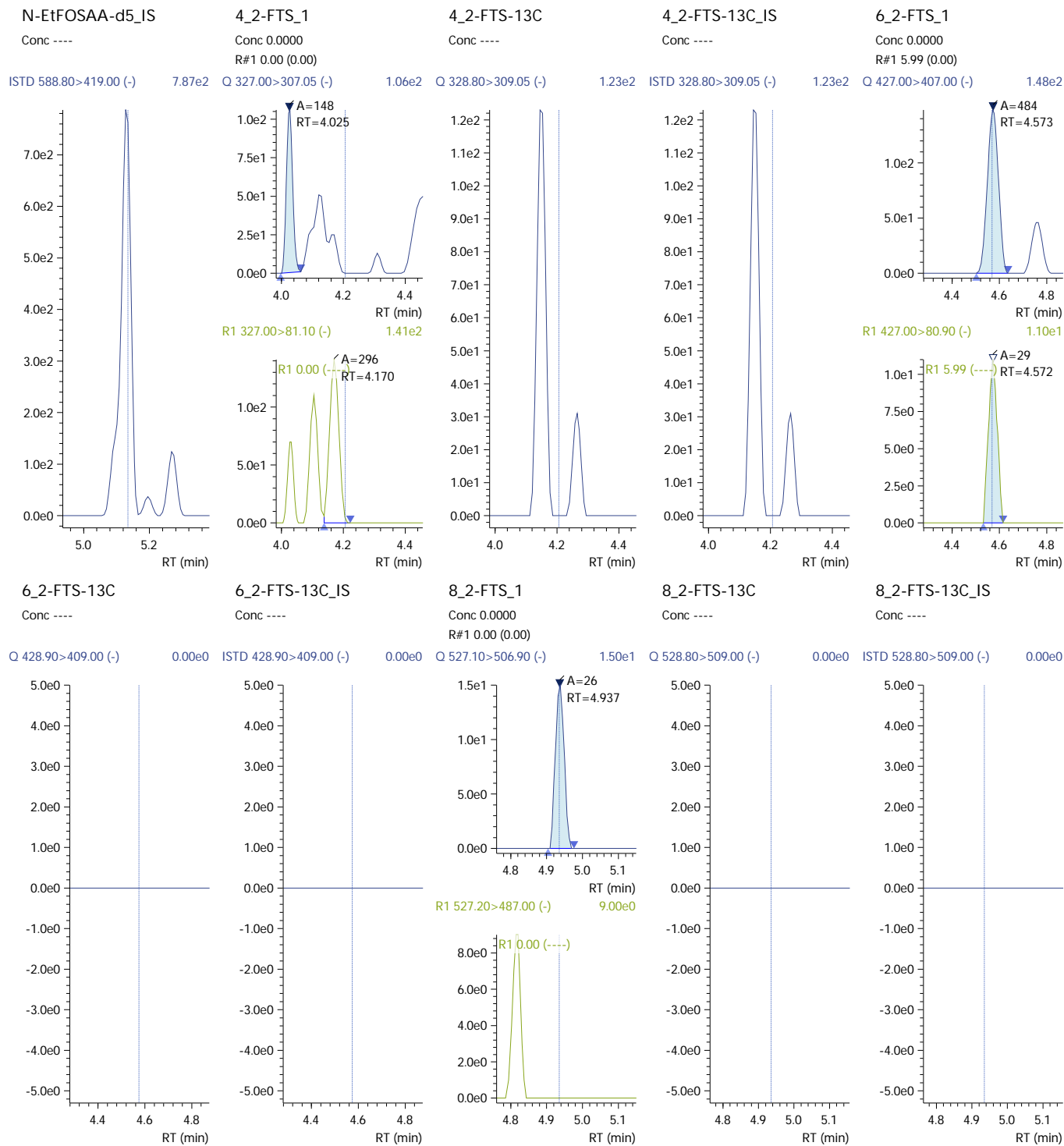


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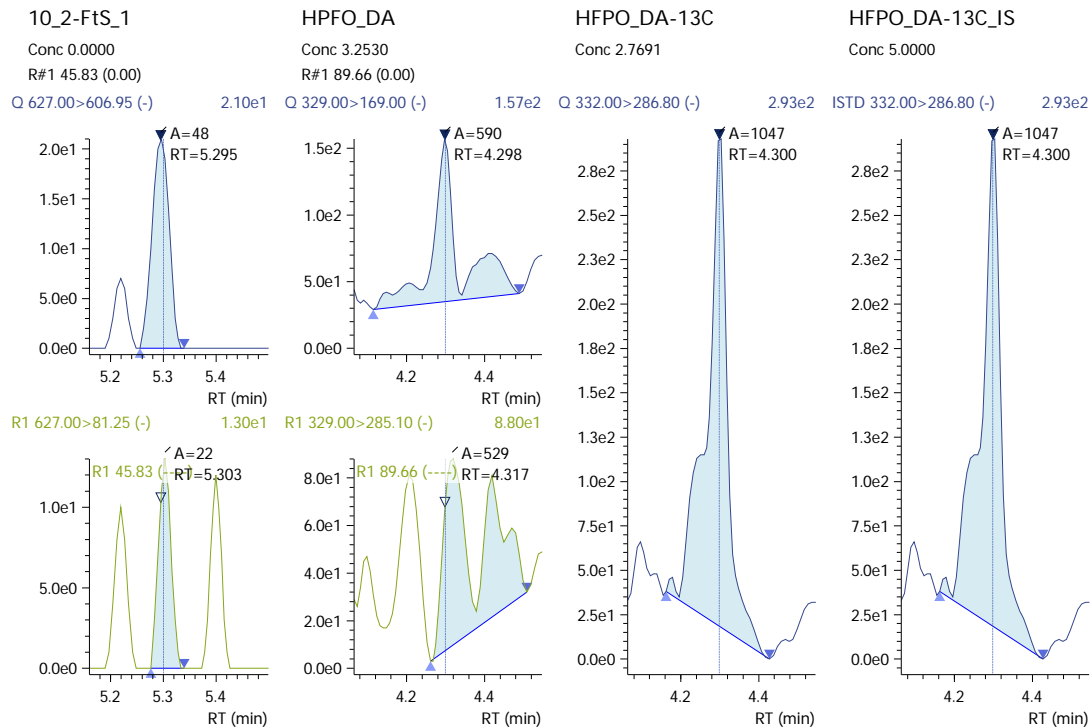


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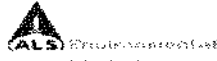




### 210413\_043 (continued)



210421\_B2



ICAL Date: 4/13/2021  
Std. xp: 5/24/21 IICV xp 5/24/21; TPFQA xp 8/16/21  
ICAL ID: KC2100210  
LIMS ID: 720740

Review: U. Amadioha  
4/23/21  
Phenomenex EVO-C18 100X4.6 mm 5/N: H2O-248472

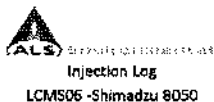
Injection Log  
LCMS06 - Shimadzu 8050

File Phases A: 5mM Ammonium Acetate in H2O 20-OLC-03-29I B: 5mM Ammonium Acetate in MeOH 20-OLC-03-19F

Sample Name	File Name	Acquisition Method	Dilution	R	
PFC CCV @ 1.0 PPB	20-OLC-02-99H	210421_019	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
CCB	20-OLC-03-30B	210421_020	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
KQ2106020-04	MS	210421_027	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
KQ2106020-03	LCS	210421_028	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
K2103455-001		210421_029	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/> RR to confirm low PFBS, PFHxS, PFBA & PFPeA
K2103455-002		210421_030	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
K2104028-001		210421_031	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
KQ2106020-01	MS	210421_032	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
KQ2106020-02	DMS	210421_033	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
PFC ISC/CCV @ 1.0 PPB	20-OLC-02-99H	210421_034	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>
CCB	20-OLC-03-30B	210421_035	PFAS_updated_210315_30_AREAS_LCMS06.lcm	1x	<input checked="" type="checkbox"/>



210422\_B2



ICAL Date: 4/13/2021
Std. xp: 5/24/21 (CV xp 5/24/21; TPEQA xp 8/16/21)
ICAL ID: KC2100210
LIMS ID: 720906

1st Review: U. Amadioha
2nd Review: 4/23/21
Column: Phenomenex EVO-C18 100x4.6 mm S/N: H20-248472

Mobile Phases A: 5mM Ammonium Acetate in H2O 20-DLC-03-291 B: 5mM Ammonium Acetate in MeOH 20-DLC-03-19F

Table with 7 columns: Sample Name, File Name, Acquisition Method, Dilution, R, and a final column for status. Rows 4-13 include 'Return to Analyst for completion' notes.

Analysis: PFC	IS/Lot/Exp.: 20-DLC03-20E	Exp.: 10-1-21	Filter lot: 00881103	Solvent/Lot: —
Pipette: Poscal	Envl-Carb: —	Final Volume: 1 mL	Dilution Factor: 1X	Centrifuge: —
Sample ID: K2103455-001	IS Amount: 10 uL	Sample Aliquot: 990 uL	Date: 4-22-21	Analyst: WJA
				Analyte: Analyte for dilution
				RR to confirm lowPFBS, PFHxS, PFBA & PFFeA

*Attachment C*  
GMax Testing

---

# ON-SITE TESTING g-MAX IMPACT EVALUATION



## Project Information

<b>Project Name</b>	City of Portsmouth Football Field ASTM F1936-19 g-max Impact Evaluation				
<b>Client Info</b>	FieldTurf USA Inc 175 Industrial Blvd. Calhoun, GA 30701	<b>Site Info</b>	City of Portsmouth 100 Campus Drive Portsmouth, NH 03801		
<b>Report Date</b>	5/21/2021	<b>Test Date</b>	5/21/2021		
<b>Report Status</b>	Final	<b>Job no.</b>	96519/6840s		
<b>Prepared by</b>	Michael Rocheleau Field Operations Manager				
<b>Checked by</b>	Jeffrey Gentile Operations Director				

*Notes:*

1. This report has been prepared by Firefly Sports Testing with all reasonable skill, care and diligence within the terms of the contract with the Client and within the limitations of the resources devoted to it.
2. This report is confidential to the Client and Firefly Sports Testing accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.
3. This report shall not be used for engineering or contractual purposes unless signed by the Author and the Checker and unless the report status is "Final."

## Summary

Firefly Sports Testing was commissioned to perform on-site g-max impact testing per ASTM F1936-19. A complete test was performed in accordance with the ASTM F1936-19 Standard. The results have been summarized in the quick reference table below. Test results herein reflect the performance of the points tested, at the time of testing and at the temperature(s) reported. Complete results and background can be found in the subsequent sections of this report.

### Quick Reference Results Summary

	Average	(min)	Range	(max)	Max per ASTM
<b>Gmax (g's)</b>	114	109	to	117	200
<b>Infill Depth (mm)</b>	38	36	to	40	n/a



# ON-SITE TESTING g-MAX IMPACT EVALUATION



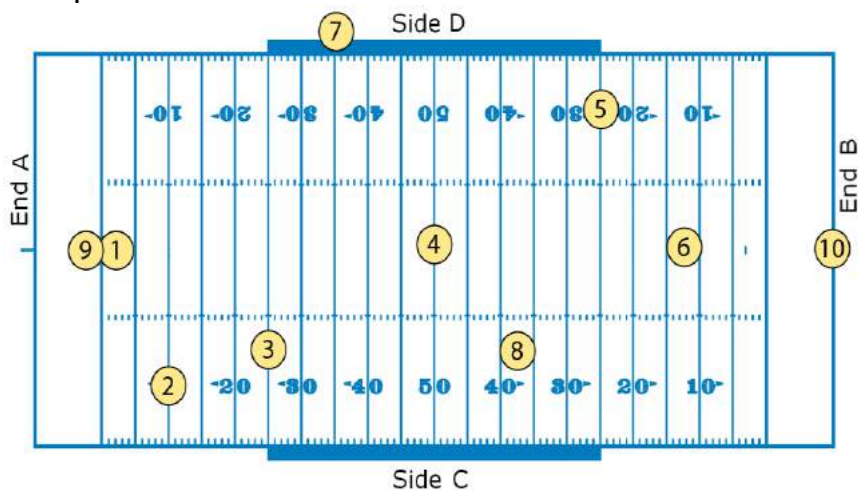
## Table of Contents

Project Information .....	1
Summary .....	1
Results Table.....	3
Results Graphs.....	4
Overall Photo.....	5
Location Photos.....	6
End of Report.....	7

## General Information

<b>Testing Device</b>	ASTM F1936 Apparatus TRIAX 2010 Data Acquisition	<b>Test Method</b>	ASTM F1936-19 ASTM F355 Procedure A
<b>Install Date</b>	2021	<b>Test Date</b>	5/21/2021
<b>Field Orientation</b>	End A= Southwest	<b>Primary Sport</b>	Football
<b>Product Info</b>	Vertex 2"	<b>Infill System</b>	SafeShell and Sand
<b>Underlayment</b>	Shockpad	<b>Air Temp (° F)</b>	72
<b>Turf Cover %</b>	n/a	<b>Soil Moisture %</b>	n/a
<b>Humidity %</b>	50	<b>Weather Conditions</b>	Clear & Sunny
<b>Misc Field Notes</b>	None	<b>Technician</b>	MRG

## Location Map



# ON-SITE TESTING g-MAX IMPACT EVALUATION



## Results Table

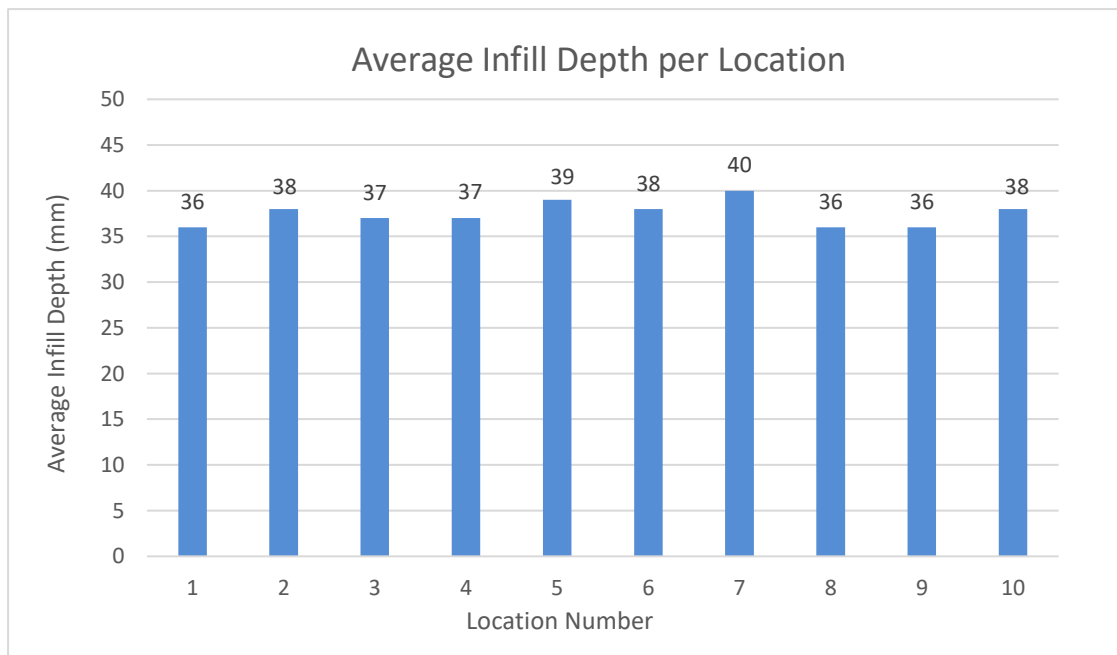
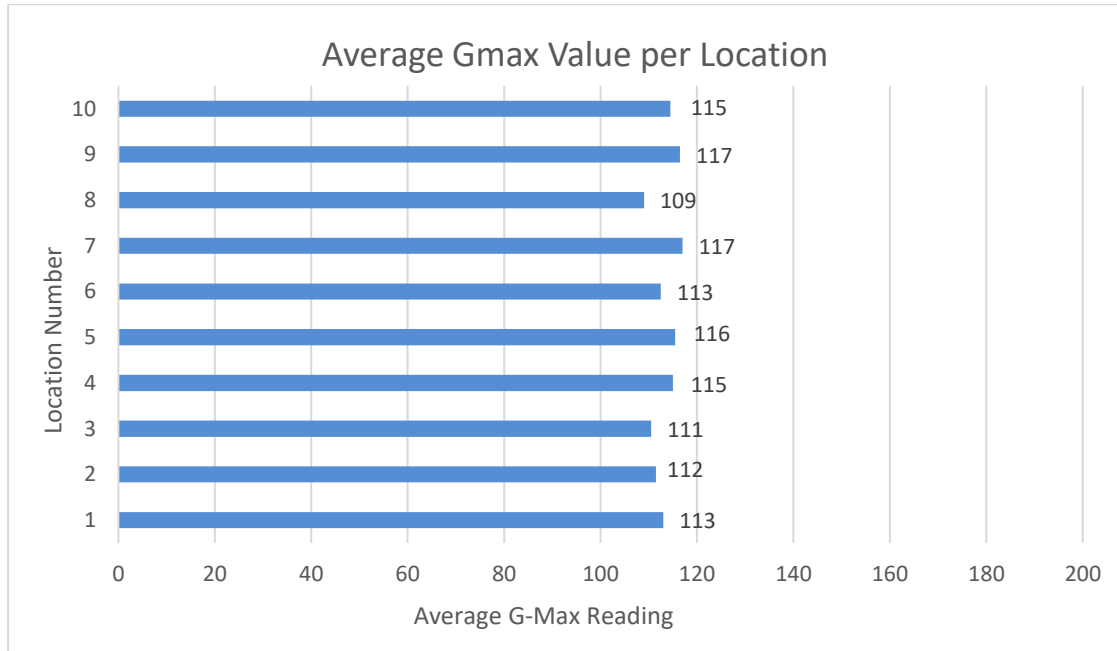
Loc #	Drop #	Gmax (g's)	Location Description	Gmax Avg (g's)	Infill Depth (mm)	Surface Temp (°F)
1	1	99	Goal Line, End A, field centerline	113	36	111
	2	112				
	3	114				
2	1	98	10 Yard Line, End A, 63 ft from field centerline to the Side C	112	38	114
	2	110				
	3	113				
3	1	98	25 Yard Line End A, 40 ft from field centerline to Side C	111	37	105
	2	109				
	3	112				
4	1	103	field centerline	115	37	113
	2	114				
	3	116				
5	1	102	25 Yard Line, East end, 63 ft from field centerline to Side D	116	39	106
	2	115				
	3	116				
6	1	100	12 Yard Line, End B, field centerline	113	38	114
	2	112				
	3	113				
7	1	107	North Team area, Side D	117	40	114
	2	115				
	3	119				
8	1	97	37 Yard Line, End B, 40 ft from the field centerline to Side C	109	36	116
	2	106				
	3	112				
9	1	105	6 ft from Goal Line to the back of the End Zone, End A, field centerline	117	36	113
	2	116				
	3	117				
10	1	104	6 ft from the back of the End Zone to the Goal Line, End B, field centerline	115	38	114
	2	112				
	3	117				
<b>Averages:</b>				<b>114</b>	<b>38</b>	<b>112</b>



# ON-SITE TESTING g-MAX IMPACT EVALUATION



## Results Graphs



# ON-SITE TESTING g-MAX IMPACT EVALUATION



## Overall Photo



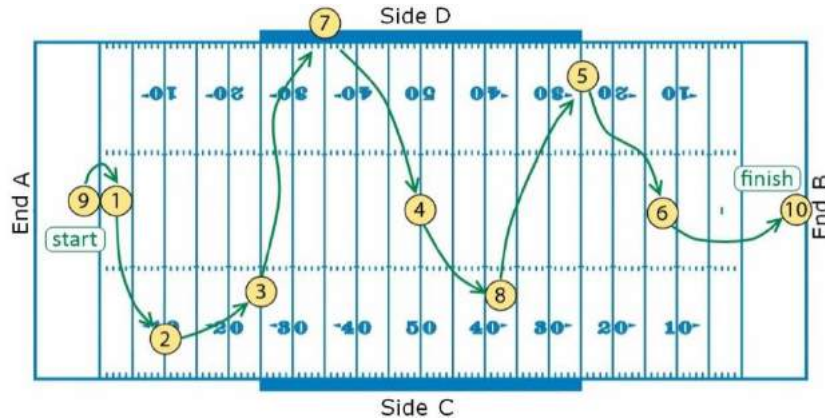


# ON-SITE TESTING g-MAX IMPACT EVALUATION



## Location Photos

Photos have been taken at each location and are displayed in the sequence on the sequence map below.



Location #9



Location #1



Location #2



Location #3





# ON-SITE TESTING g-MAX IMPACT EVALUATION



Location #7



Location #4



Location #8



Location #5



Location #6



Location #10

End of Report

