EASTMAN
Eastman Chemical Company
P. O. Box 511
Kingsport, Tennessee 37662

December 19, 2014

CERTIFIED
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Mr. Barry Stephens
TN Department of Environment & Conservation
Division of Air Pollution Control
Tennessee Tower William R. Snodgrass Building
312 Rosa L. Parks Avenue
Nashville, Tennessee 37243

Dear Mr. Stephens:

Subject: Notification of Compliance for Liquid Chemical Destructor Confirmatory Performance Test; Hazardous Waste Combustor MACT (40 CFR 63 Subpart EEE); PES B-248-2; MSOP-32

Please find enclosed a Notification of Compliance (NOC) report on compact disk for Tennessee Operations of Eastman Chemical Company's (Eastman) Liquid Chemical Destructor. Pursuant to 40 CFR 63.1210(d)(1)(ii), this NOC is required to be submitted to report the results of Confirmatory Performance Tests completed on September 30, 2014. The Confirmatory Test Plan and associated Continuous Monitoring System Performance Evaluation Test Plan were approved by your agency in a letter from Mr. Jeryl W. Stewart dated July 2, 2014.

Since no operating parameter limits (OPLs) were set or changed as a result of this test, the OPLs identified in the previous NOC submitted January 15, 2010 continue to apply.

If you or your staff has any questions concerning this submittal, please call me at (423) 229-2327.

Sincerely,

Stephen R. Gossett
Environmental Affairs
P. O. Box 511, B-54D

Enclosure

cc: Mr. Travis Blake and Mr. Jeryl Stewart, TDAPC, Nashville, TN (Letter Only)
Mr. Preston Pierce, TDAPC, Johnson City (Letter and Enclosure)
Mr. Rick Whitson, TDSWM (Letter)
Mr. John Webb, TDSWM (Letter and Enclosure)

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Franklin, TN 37064
615/591-0058 voice
615/591-8979 fax

CONFIRMATORY TEST REPORT AND NOTIFICATION OF COMPLIANCE FOR THE LIQUID CHEMICAL DESTRUCTOR

Prepared for:
Eastman Chemical Company
Tennessee Operations
Kingsport, Tennessee

Prepared By:
Franklin Engineering Group, Inc.
Franklin, Tennessee

December 2014

Revision 0

www.franklinengineering.com

RESPONSIBLE OFFICIAL CERTIFICATION

I, the undersigned, am the responsible official as defined in 40 CFR Part 63 for the source for which this document is being submitted. I hereby certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements made and data contained in this document are true, accurate, and complete. Eastman's Liquid Chemical Destructor (PES B-248-2) is in compliance with the relevant standards of 40 CFR Part 63, Subpart EEE.

Brian K. Miller	Utilities Division Superintendent
Name of Responsible Official	Title of Responsible Official
Brian K Miller	12/19/2014
Signature of Responsible Official	Date of Signature

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Brian K. Miller	Utilities Division Superintendent
Name of Responsible Official	Title of Responsible Official
Brian K Miller	12/19/2014
Signature of Responsible Official	Date of Signature

EXECUTIVE SUMMARY

Eastman Chemical Company, Tennessee Operations (Eastman) owns and operates a hazardous waste incinerator at its facility in Kingsport, Tennessee designated as the liquid chemical destructor (LCD). The LCD is permitted as source B-248-2 in Eastman's Major Source Operating Permit 32.

On October 12, 2005, US EPA promulgated the "Final Standards for Hazardous Air Pollutants for Hazardous Waste Combustors; Final Rule" (70 FR 59402) which established replacement Hazardous Waste Combustor Maximum Achievable Control Technology (HWC MACT) emission standards for hazardous waste incinerators (see 40 CFR §63.1219). Initial compliance with the standards was demonstrated by Eastman by conducting and submitting results of a Comprehensive Performance Test (CPT) on September 12, 2008. Eastman conducted the periodic CPT on December 11 and 12, 2012 and provided the required Notice of Compliance for that testing on March 6, 2013. Compliance with the applicable final standards in 40 CFR §63.1219 was demonstrated during the most recent CPT.

The HWC MACT Standard requires Eastman to complete a Confirmatory Performance Test (CfPT) to demonstrate compliance with the dioxin/furan emission standard when the source operates under normal operating conditions (see 40 CFR §63.1207(b)(2)) which is defined as maintaining conditions for selected operating parameter limits between the annual average value and the allowable limit. The applicable dioxin/furan emission standard is listed in 40 CFR §63.1219(a)(1)(ii) and is 0.40 ng/dscm TEQ, corrected to 7% oxygen, where TEQ is the toxic equivalent quotient to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin.

The standard also requires that Eastman conduct a performance evaluation of continuous monitoring systems (CMS) required for compliance assurance with the dioxin/furan emission standard under 40 CFR §63.1209(k). Prior to conducting the CfPT, Eastman must submit a CfPT Plan that includes information required in 40 CFR §63.1207(f)(2).

The Confirmatory Performance Test Plan and associated Continuous Monitoring System Performance Evaluation Test Plan was approved by the Division of Air Pollution Control (TDAPC) in a letter from Mr. Jeryl W. Stewart dated July 2, 2014. Pursuant to 40 CFR §63.1207(b)(2), Eastman completed a Confirmatory Performance Test on September 30, 2014, based on the approved Confirmatory Performance Test Plan, to demonstrate on-going compliance of the incinerator with the dioxin/furan (PCDD/PCDF) standard when the source operates under normal operating conditions. The Confirmatory Performance Test was conducted

at normal conditions for emissions of PCDD/PCDF. The Confirmatory Performance Test was conducted at above-average gas flow rate and hazardous waste feedrate, normal or greater chlorine feedrate, and below-average combustion temperature. Total hydrocarbon emissions levels were within the range of the average to the maximum value (10 ppmv, dry, corrected to 7% O_2) allowed.

The process and spiking streams fed to the LCD during the Confirmatory Performance Test included the Mixed Solvent Waste feedstream, the Waste EDA feedstream, and a chlorine surrogate waste spike.

Stack gas emission samples were collected and analyzed for dioxins/furans, and the results demonstrated that dioxin and furan emissions from the LCD continue to be well below the applicable HWC MACT emission limit.

Prior to conducting the Confirmatory Performance Test, performance evaluations of the continuous emissions and parametric monitoring systems required for assuring compliance with the dioxin/furan emission standard were conducted**.**

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LIST OF ACRONYMS

APCS	Air Pollution Control System
AWFCO	Automatic Waste Feed Cutoff System
CEC	Civil & Environmental Consultants, Inc. of Charlotte, North Carolina
CEMS	Continuous Emissions Monitoring System
CfPT	Confirmatory Performance Test
CFR	Code of Federal Regulations
CMS	Continuous Monitoring System
CMS PET	Continuous Monitoring System Performance Evaluation Test
CPMS	Continuous Parameter Monitoring System
CPT	Comprehensive Performance Test
DCS	Distributed Control System
Eastman	Tennessee Operations of Eastman Chemical Company
EMPC	Estimated Maximum Possible Concentration
HAP	Hazardous Air Pollutant
HRA	Hourly Rolling Average
HWC MACT	Hazardous Waste Combustor Maximum Achievable Control Technologies
LCD	Liquid Chemical Destructor
NOC	Notification of Compliance
OMA	One Minute Average
OPL	Operating Parameter Limit
QA/QC	Quality Assurance/Quality Control
RATA	Relative Accuracy Test Audit
RKI	Rotary Kiln Incinerator
SGS	SGS Environmental Services of Wilmington, North Carolina
TDAPC	Tennessee Division of Air Pollution Control
TDSWM	Tennessee Division of Solid Waste Management
TEQ	Toxicity Equivalence Quotient
THC	Total Hydrocarbons (as propane)
US EPA	United States Environmental Protection Agency
WESP	Wet Electrostatic Precipitator

LIST OF UNITS AND MEASUREMENTS

%	Percent
°F	Degrees Fahrenheit
dscfm	Dry standard cubic feet per minute
lb/hr	Pounds per hour
ng /dscm TEQ	Nanograms per dry standard cubic meter, expressed as toxic equivalence
ppmv	Parts per million volume

LIST OF CHEMICAL SYMBOLS AND FORMULAS

EDA	Ethylidene Diacetate
O_2	Oxygen
PCDD	Polychlorinated dibenzo-p-dioxins
PCDF	Polychlorinated dibenzofurans
TCDD	Tetrachlorodibenzo-*p*-dioxin

1.0 INTRODUCTION

1.1 Facility and Regulatory Overview

On October 12, 2005, the United States Environmental Protection Agency (US EPA) promulgated "Final Standards for Hazardous Air Pollutants for Hazardous Waste Combustors; Final Rule" (70 FR 59402). Among other things, this rule established final MACT emission standards for hazardous waste incinerators. Facilities were required to comply with the final standards by October 14, 2008, unless an extension of the compliance date was granted.

Eastman Chemical Company, Tennessee Operations (Eastman) is a major source for hazardous air pollutants (as defined in 40 CFR §63.2) and owns and operates two rotary kiln incinerators (RKIs) and one liquid chemical destructor (LCD) incinerator which are subject to 40 CFR, Part 63, Subpart EEE (HWC MACT). On October 3 and 4, 2007 Eastman conducted the initial Comprehensive Performance Test (CPT) on the LCD, as required by 40 CFR §63.1207(b)(1). In accordance with 40 CFR §63.1210(d), Eastman submitted a Notification of Compliance (NOC), including results of the CPT, to the Tennessee Division of Air Pollution Control (TDAPC) and Tennessee Division of Solid Waste Management (TDSWM) on September 12, 2008. Results of the CPT demonstrated that Eastman's LCD met the applicable final emission standards under the HWC MACT. Eastman conducted the periodic CPT on December 11 and 12, 2012 and provided the required NOC for that testing on March 6, 2013.

40 CFR §63.1207(b)(2) requires Eastman to conduct (1) confirmatory performance tests to demonstrate compliance with the dioxin/furan emission standard when the source operates under normal operating conditions and (2) conduct a performance evaluation of continuous monitoring systems (CMS) required for compliance assurance with the dioxin/furan standard.

40 CFR §63.1207(d)(2) requires Eastman to commence a confirmatory performance test for dioxins and furans no later than 31 months after the date of commencing the previous CPT.

Eastman submitted the Confirmatory Performance Test Plan and associated Continuous Monitoring System Performance Evaluation Test Plan on June 5, 2014 and those plans were approved by TDAPC in a letter from Mr. Jeryl W. Stewart dated July 2, 2014.

Eastman conducted the Confirmatory Performance Test on September 30, 2014. Prior to conducting the Confirmatory Performance Test, Eastman completed the performance evaluation of the LCD continuous monitoring system, according to the submitted plan.

1.2 Scope and Purpose

This document reports the results of the LCD's Confirmatory Performance Test and Continuous Monitoring System Performance Evaluation Test (CMS PET). The Confirmatory Performance Test and CMS PET were conducted according to the respective test plans submitted in June 2014. The purpose of this document is to:

- Describe the activities associated with the Confirmatory Test Report, including emissions, feedstream sampling and analysis, and process operating conditions;
- Present the results of the Confirmatory Performance Test;
- Discuss non-standard test activities or deviations from the approved plan and the impact of those activities on data quality;
- Present results of the CMS PET; and
- Comply with NOC requirements.

The specific regulatory requirements included in the HWC MACT NOC are presented in Table 1-1. The section that addresses each requirement is also provided in Table 1-1.

Table 1-1
Regulatory Requirements for the Notification of Compliance

40 CFR Citation	Description	Report Section
§63.7(g)(1)	Submit results of a performance test that include: analysis of samples, determination of emissions, and raw data.	5.0, Appendix I
§63.9 (h)(3); Title V Permit Condition B4.	NOC must be certified for truth, accuracy, and completeness by the responsible official. The NOC shall list §63.9 (h)(2)(i)(A) - §63.9 (h)(2)(i)(G). (Since the Title V permit does not specify requirements for the NOC, Eastman will follow the requirements in §63.9 (h)(2)).	Page i, Table 1-1
§63.9(h)(2)(i)(A)	Methods used to determine compliance	4.0, Appendix I
§63.9(h)(2)(i)(B)	Performance test results, opacity or visible emission observations, CMS Performance Evaluations, and/or monitoring procedures or methods used	3.0, 4.0, 5.0, Appendix I, Appendix II
§63.9(h)(2)(i)(C)	Methods for determining continuing compliance, including a description of monitoring and reporting requirements and test methods	5.0
§63.9(h)(2)(i)(D)	Type and quantity of HAPs emitted by the source reported in appropriate units and averaging times	5.0
§63.9(h)(2)(i)(E)	Analysis demonstrating whether the affected source is a major source	1.1
§63.9(h)(2)(i)(F)	Description of air pollution control equipment (or method) for each emissions point, including each control device (or method) for each HAP and the control efficiency (%) for each control device	2.0
§63.9(h)(2)(i)(G)	Statement by owner or operator of whether source has complied with the relevant standard or other requirements	Page i
§63.10(d)(2)	Performance test results	5.0, Appendix I
§63.10(e)(2)(i)	Submit CMS Performance Evaluation Report simultaneously with Performance Test Results	3.5, Appendix II
§63.1206(b)(11)	Calculation of Hazardous Waste Residence Time	3.1
§63.1207(j)(2)	Within 90 days of confirmatory performance test completion, the NOC must be postmarked documenting compliance or noncompliance with the applicable dioxin/furan emission standards.	page i

2.0 PROCESS DESCRIPTION

Hazardous and non-hazardous waste liquids are treated in the LCD. The LCD consists of the following systems:

- Waste receiving and storage system;
- Waste feed system;
- Combustion system;
- Air pollution control system (APCS);
- Instrumentation and control system;
- Automatic waste feed cutoff system (AWFCO); and
- Continuous emissions monitoring system.

A process schematic is included as Figure 2-1.

Liquid waste materials for treatment in the LCD are received in tanker trailers and in "dumpsters" (i.e. portable tanks). These materials are stored in one of seven waste chemical storage tanks or fed directly from the trailer or "dumpster" to the LCD.

The waste liquids can be routed through a switching station, which allows feeding to the waste burners or nozzles from multiple feed locations. Wastes pass from the switching station through feed lines. The waste feedrate in each line is monitored by a flowmeter and is regulated by means of a control valve.

The LCD accepts only pumpable liquids for treatment. Liquid wastes are injected into the combustion chamber through three nozzles, while supplemental fuel is burned in the main burner as needed. One of the waste feed nozzles is air atomized; the other two utilize steam atomization. Combustion air can be added to the system through one of the waste nozzles, the main burner and induced air ports around the burners. Auxiliary fuel can be fed to a dedicated burner (Burner F) for supplemental thermal input.

The combustion chamber is a horizontal, rectangular, refractory-lined chamber. Wastes are treated at temperatures ranging from 1650°F to 2100°F. The combustion chamber is operated at a vacuum (draft). The resulting combustion gas exits the combustion chamber through a refractory-lined duct and enters the air pollution control system.

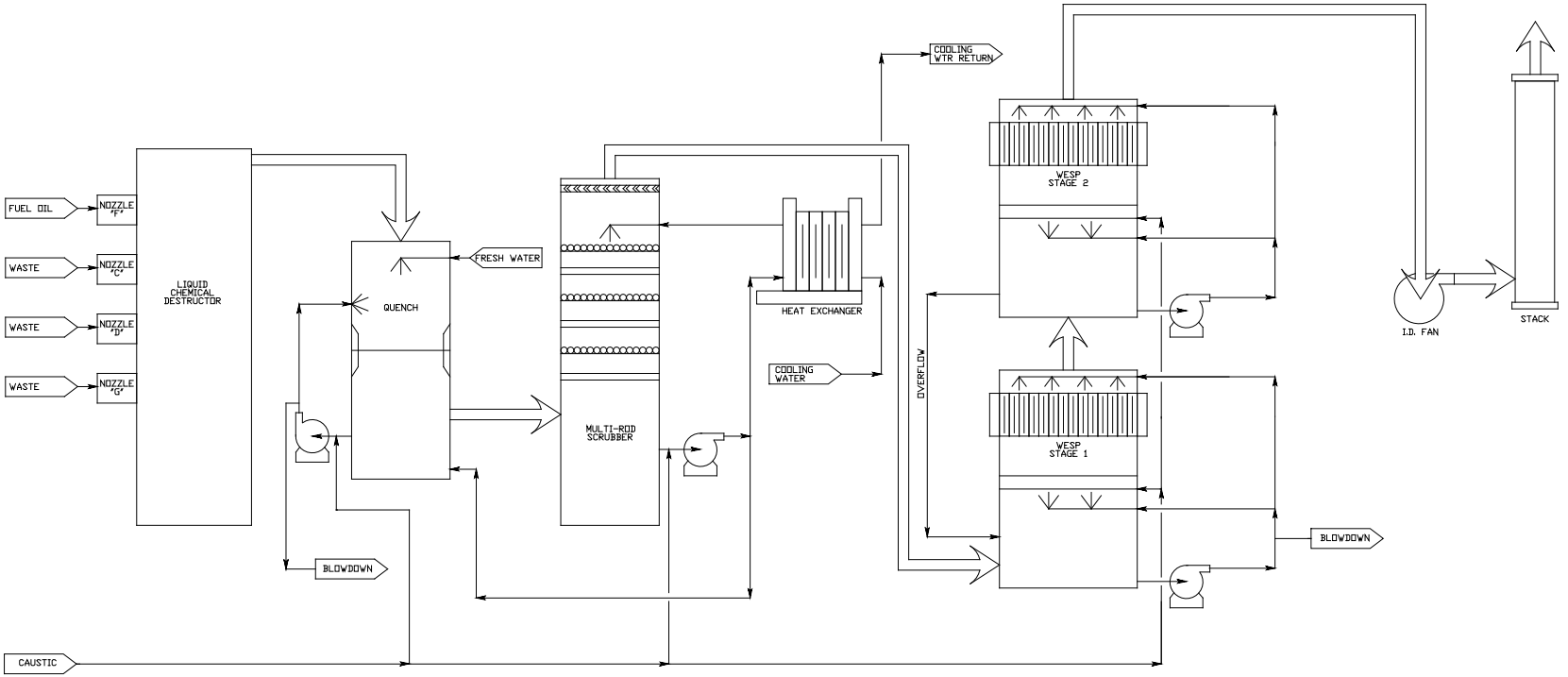


Figure 2-1
Process Flow Diagram for the Liquid Chemical Destructor System

Gas from the combustion chamber is ducted to the air pollution control system for conditioning and removal of particulate matter, toxic metals and acid gas. The induced draft fan maintains a vacuum throughout the combustion system and APCS, and the treated gas is released to the atmosphere through a stack. The APCS consists of the following components:

- Quench chamber;
- Condensing multi-rod scrubber;
- Two wet electrostatic precipitators (WESPs) in series, each of which is preceded by an irrigated marble bed scrubber; and
- Induced draft fan.

Hot combustion gas enters the quench chamber where it is cooled by water sprays to adiabatic saturation temperature. The saturated gas enters the multi-rod scrubber and flows upward through a series of six rod decks. Each deck consists of closely spaced rods. Recirculation water flows downward through the chamber and creates a froth layer at each of the rod decks. As the gas flows upward through this froth layer, acids and large particles are removed by absorption and inertial impaction. The recirculation water is cooled in a plate and frame heat exchanger and provides direct contact cooling of the gas. The gas is subcooled which causes condensation of excess water vapor. The subcooling and condensation decrease the volumetric flowrate of gas and create flux force/condensation scrubbing effects. These effects result in particle growth, making particles easier to remove in the downstream marble bed/WESP control devices.

Subcooled, saturated gas exits the multi-rod scrubber and enters the bottom of the first of two WESPs in series. The gas flows upward through a distribution bed consisting of a layer of marbles. Recirculation water is sprayed upward onto the marble bed, creating a froth zone immediately above the bed. The marble bed provides even distribution of the gas before it enters the electrode tubes. The intimate gas-liquid contact in the marble bed also provides additional surface area for acid gas absorption and particle removal via inertial impaction.

Gas exits the marble bed and flows upward through electrode tubes. A charging electrode is suspended in the center of each tube. The charging electrode ionizes the gas stream, which in turn charges the suspended particles. The charged particles are attracted to the wall of the tube, which acts as a collecting electrode.

The gas exits the first WESP and enters an identical marble bed/WESP that provides an additional level of particulate removal. The cleaned, cooled gas exits the second WESP and is

drawn through a variable speed ID fan, which provides the motive force throughout the APCS and combustion system. The ID fan exhausts to a stack.

The LCD is equipped with a distributed control system (DCS) that is connected to field instruments and controls. The DCS provides for monitoring and control of process parameters. An Automatic Waste Feed Cutoff (AWFCO) system is integral to the DCS and shuts off waste feeds should a process parameter exceed its permitted value.

The concentrations of total hydrocarbon (THC) and O_2 in the stack gas are continuously monitored and recorded by a continuous emissions monitoring system (CEMS). For compliance with the HWC MACT Standard, Eastman monitors THC rather than CO, per 40 CFR §63.1219(b)(5)(ii). The CEMS is integrated with the DCS and AWFCO system.

3.0 TESTING PROGRAM OVERVIEW

The purpose of this section is to provide an overview of the Confirmatory Performance Test. This overview includes a description of the test protocol, the test operating conditions, and the test execution. Essentially, the test was executed in accordance with the approved Confirmatory Performance Test Plan. Section 3.4 addresses the deviations from the Confirmatory Test Plan and Quality Assurance Project Plan. Additional details for sampling activities are provided in Section 4.0.

3.1 Confirmatory Performance Test Protocol

The Confirmatory Performance Test consisted of one test condition with three replicate runs. The test was conducted to demonstrate the performance of the LCD for controlling emissions of dioxins/furans (PCDD/PCDF) under normal operating conditions.

Table 3-1 presents a summary of the test protocol and the operating conditions under which the test was conducted.

Maximum gas flowrate is a worst-case condition for all pollutants. This condition represents minimum residence time in the combustion chamber, which minimizes the destruction of organic compounds as well as minimizing the time that the APCS will have to act on the pollutants. The objective for the Confirmatory Performance Test was to operate with an above average gas flowrate.

Each NOC must provide the calculation for residence time per 40 CFR §63.1206(b)(11). This calculation was documented in the previous NOC submitted September 12, 2008 to be 1.6 seconds.

Feeding chlorine creates the potential for formation and emissions of dioxin/furan compounds. A low combustion chamber temperature enhances the possibility for PCDD/PCDF formation. A normal or greater chlorine feedrate and low combustion temperature are worst-case conditions for the formation of PCDD/PCDF. The objectives for this Confirmatory Performance Test were normal or greater chlorine feedrates and below average combustion chamber temperature. Also, the regulations require total hydrocarbon levels to be within the range of the past 12 month average and the maximum level allowed.

Table 3-1
LCD Confirmatory Performance Test Protocol Summary

Key Operating Conditions	Emission Test Parameters	Spiking Materials	Feed Streams
• Below average combustion chamber temperature • Above average total (pumpable) hazardous waste feedrate to LCD • Above average total chlorine feedrate (organic plus inorganic) • THC[a] within the range of the past 12 months average value and the maximum (10 ppmv, dry, @ 7% O_2) value allowed.	• PCDD/PCDF • THC	• Chlorine as perchloroethylene & methanol blend	<u>Waste Feedstreams</u> • Mixed Solvent Waste • Waste EDA <u>Chlorine Spike</u> • Archived Samples

<u>Notes:</u>

[a] Eastman continuously monitors THC rather than CO, as provided by 40 CFR §63.1219(a)(5).

The test was conducted using two actual waste streams, Waste EDA (which is primarily ethylidene diacetate), and Mixed Solvent Waste. The Mixed Solvent Waste feedstream was formulated from several wastes on hand at the time of testing and is representative of the feedstreams typically burned in the incinerator.

One additional stream was fed to the incinerator to provide spiking of chlorine. Perchloroethylene and methanol comprised the feedstream referred to as the chlorine spike. The chlorine spike was formulated to approximately 2% perchloroethylene and approximately 98% methanol. The waste streams and spikes fed to the incinerator during the Confirmatory Performance Test are listed and described in Table 3-2.

Samples of these wastes were collected during the test but were not analyzed. The feedstream and stack gas sampling and analysis activities are presented in Section 4.0.

During the test, stack sampling was performed to determine the emission levels of polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) emissions. The stack gas concentration for THC was also recorded. Emission performance results are presented in Section 5.0.

3.2 Confirmatory Performance Test Operating Conditions

The Confirmatory Performance Test was conducted under normal process operating conditions. Testing was performed using actual waste. Additionally, a chlorine enhanced stream was fed to meet the test objectives.

The process operating conditions were monitored and recorded by the CMS. The CMS continuously samples parameters and evaluates the detector response at least once every 15 seconds. The CMS uses these values to compute one-minute averages for each parameter. These one-minute averages are recorded in a database.

Table 3-2
Confirmatory Performance Test Waste and Spike Feeding

Feedstream	**Feed location**
Mixed Solvent Waste	C Burner
Waste EDA	G Burner
Chlorine Spike (Perchloroethylene - 2 wt % Methanol - 98 wt %)	D Burner

Operating conditions during the Confirmatory Performance Test represented the normal operating conditions specified by 40 CFR §63.1207(g)(2). These conditions are:

(1) Carbon monoxide (or hydrocarbon) CEMS emissions levels within the range of the average value to the maximum value allowed, as defined as the sum of the hourly rolling average values recorded (each minute) over the previous 12 months, divided by the number of rolling averages recorded during that time (excluding calibration data, startup data, shutdown data, malfunction data, and data obtained when not burning hazardous waste);

(2) Each operating limit (specified in §63.1209) established to maintain compliance with the dioxin/furan emission standard must be held within the range of the average value over the previous 12 months and the maximum or minimum, as appropriate, that is allowed. The average value is defined as the sum of the rolling average values recorded over the previous 12 months, divided by the number of rolling averages recorded during that time (excluding calibration data, startup data, shutdown data, malfunction data, and data obtained when not burning hazardous waste); and

(3) Chlorine at normal feedrates or greater.

Target operating conditions are presented in Table 4-1 of the approved Confirmatory Test Plan. A comparison of the target values and the average of the one-minute average values from the Confirmatory Performance Test can be seen in Table 3-3. The values shown in this table are not the regulatory operating parameter limit (OPL) values. Detailed operating parameter data collected during the Confirmatory Performance Test are included as Appendix III.

3.3 Confirmatory Performance Test Chronology

The Confirmatory Performance Test was conducted on September 30, 2014. The test was executed effectively and successfully met all test objectives defined in the Confirmatory Performance Test Plan. A chronology of the Confirmatory Performance Test is provided in Table 3-4. Additional sampling and analysis details are included in the Sampling and Analysis Report in Appendix I.

Prior to conducting the Confirmatory Performance Test, a CMS PET was conducted according to the approved CMS PET Plan. The continuous parameter monitoring system (CPMS) calibration data and the Continuous Emissions Monitoring System (CEMS) calibration results are presented in Appendix II. All calibrations were within acceptable limits.

Table 3-3
Confirmatory Performance Test Operating Conditions

Parameter	Units	Target Value	**Run 1** (9:11-12:20)	**Run 2** (12:42-15:49)	**Run 3** (16:06-19:12)	**3-Run Average**
Combustion Chamber Temperature [a]	°F	1,674 - 1,882	1,736	1,743	1,740	1,739
Total Hazardous (Pumpable) Waste Feedrate [a]	lb/hr	2,788 -7,172	3,602	3,611	3,617	3,610
Total Chlorine Feedrate [a] [b]	lb/hr	5 - 729	10.2	10.3	11.0	10.5
Combustion Gas Flowrate [a]	dscfm	14,058 - 16,766	15,301	15,162	15,255	15,240
Total Hydrocarbons (THC as propane) [c]	ppmv, dry corrected to 7% O_2	0 - 10	0.00	0.00	0.00	0.00

Notes:

[a] Values shown for Runs 1-3 are the averages of the OMA values for each run of the D/F sampling train.

[b] Only chlorine from the spike is counted in the total chlorine feedrate. Chlorine in other feedstreams is assumed to be zero.

[c] The values shown for THC are the maximum HRAs for each run. The average value shown is the maximum HRA value for all three runs.

Table 3-4
Operating and Sampling Chronology

Run/Date/Time	Event
Run 1 - 9/30/14	
9:11	Begin Sampling
	Method 23 - Dioxin/Furan
	Collect Waste Samples for Archive
10:41-10:49 (approx.)	Sampling Paused for Port Change
	Method 23 - Dioxin/Furan
12:20	Complete Sampling
	Method 23 - Dioxin/Furan
Run 2 - 9/30/14	
12:42	Begin Sampling
	Method 23 - Dioxin/Furan
	Collect Waste Samples
14:12-14:18 (approx.)	Sampling Paused for Port Change
	Method 23 - Dioxin/Furan
15:49	Complete Sampling
	Method 23 - Dioxin/Furan
Run 3 - 9/30/14	
16:06	Begin Sampling
	Method 23 - Dioxin/Furan
	Collect Waste Samples
17:36-17:41 (approx.)	Sampling Paused for Port Change
	Method 23 - Dioxin/Furan
19:12	Complete Sampling

Section 4.0 provides a summary of the Confirmatory Performance Test sampling and analysis activities. Additional details are provided in the Sampling and Analysis Report in Appendix I. The data package for emissions sampling and stack sampling calibrations are included as appendices to the Sampling and Analysis Report.

Facility personnel began establishing test feedstreams and operating conditions several hours before the Confirmatory Performance Test sampling began. After all operating conditions were established and steady-state was achieved, Run 1 was commenced at 9:11 on September 30, 2014. Similarly, steady-state test conditions were verified prior to the commencement of each subsequent test run. Table 3-4 presents a chronology of test events. Sampling activities for the Confirmatory Performance Test was completed at 19:12 on September 30, 2014.

Civil & Environmental Consultants, Inc. (CEC) of Charlotte, North Carolina, conducted stack sampling using Methods 1 through 4 and Method 23. Once the samples were collected, CEC packaged and shipped the samples to the laboratory at SGS Environmental Services (SGS) of Wilmington, North Carolina, for analysis of PCDDs and PCDFs.

Eastman personnel collected waste and spike samples. Since only the chlorine input from the spiking stream was used in the calculations to demonstrate the target chlorine feedrate, analyses for chlorine in the waste streams are not presented in this report. The chlorine spike concentration was established by formulation; samples of this stream were archived for analysis, if needed.

Air emissions sampling train data and analytical results are presented in the Sampling and Analysis Report in Appendix I to this report.

3.4 Quality Assurance / Quality Control

The Confirmatory Performance Test Plan Quality Assurance/Quality Control (QA/QC) program defined the objectives and protocols for the performance test. The test was executed in a manner consistent with the test plan. The purpose of this section is to discuss the QA/QC results and any deviations from the test plan. There were no deviations from the test plan.

3.4.1 QA/QC Results

Quantitative QA/QC measures, also called quality assurance objectives, are presented in Section 6.5 of the Confirmatory Performance Test Plan and in the Quality Assurance Project Plan, Appendix I to the Confirmatory Performance Test Plan. The QA/QC results for the test are

presented and described in detail in the Sampling and Analysis Report in Appendix I. There were no QA/QC issues with the sample collection and analysis.

3.4.2 Non-Standard Test Events

There were no non-standard test events related to operation of the LCD or sampling equipment during testing.

3.4.3 Deviations from the Test Plan and QA/QC Program

There were no deviations between actual test execution and the Confirmatory Performance Test Plan and QA/QC program.

3.5 Continuous Monitoring System Performance Evaluation Test

The CMS PET was conducted according to the CMS PET Plan submitted in June of 2014 along with the Confirmatory Performance Test Plan. In accordance with the CMS PET Plan, the CMS instruments associated with dioxin and furan emissions were calibrated prior to conducting the Confirmatory Performance Test. Eastman used manufacturer's procedures and working knowledge of specific instruments to conduct the calibrations. All instruments were within the calibration specifications noted in the calibration procedures. A record of the calibrations for the CPMS instruments is presented in Appendix II.

The performance evaluations for the permanently-installed THC and O_2 CEMS followed the requirements in Performance Specification 4B for O_2 CEMS and 8A for THC CEMS, found in 40 CFR Part 60, Appendix B. These calibrations consisted of a calibration drift test, calibration error test, response time test, and relative accuracy test. All instruments were within the calibration specifications according to the calibration procedures. The results of the calibrations and Relative Accuracy Test Audit (RATA) for the CEMS are presented in Appendix II.

4.0 STACK GAS AND PROCESS SAMPLING AND ANALYSIS

The purpose of this section is to provide an overview of sampling and analysis activities for the Confirmatory Performance Test. The LCD feedstreams, spiking stream, and the stack emissions were sampled during the test and subsequently analyzed or archived. Quantitative results are summarized in Section 5.0. A detailed Sampling and Analysis Report and the associated data packages are included in Appendix I.

4.1 Stack Gas Sampling and Analysis

The stack gas sampling and analytical methods shown in Table 4-1 were used to generate emissions performance data. CEC performed US EPA Method 23, as well as Methods 1 through 4. The permanently-installed CEMS were used for THC and O_2 measurements.

The HWC MACT rule at 40 CFR §63.1208(b)(1) requires that EPA SW-846 Method 0023A, or after approval by the Administrator, Method 23 (40 CFR Part 60, Appendix A) be used to determine compliance with the emission standard for dioxins and furans. 40 CFR §63.1208(b)(1)(i)(B)(1) specifies that the request to use Method 23 rather than Method 0023A is to be included in the performance test plan. Eastman requested and was granted approval to use Method 23 for the Confirmatory Performance Test.

Detailed descriptions of the sampling and analytical methods are included in the QA/QC program for the Confirmatory Performance Test. SGS performed the dioxin/furan analysis.

4.2 Process Sampling and Analysis

The LCD Confirmatory Performance Test feedstreams included the waste feedstreams and the spiking feedstream. All feedstreams were sampled by Eastman's LCD operations staff. The samples of the waste feedstreams and of the chlorine spike were archived, but were not analyzed.

Eastman personnel formulated the liquid chlorine spike mixture at on-site facilities. The Certificate of Formulation for this stream was used in lieu of analysis. The Certificate of Formulation for the chlorine spike is included in Appendix IV. Grab samples of the chlorine spiking feedstream were collected during each test run. The chlorine spike samples were archived in case future analysis was needed.

Table 4-1
Confirmatory Performance Test Stack Gas Sampling and Analysis

Sampling Method	Number of Sampling Runs	Sampling Time per Run (hours) [a]	Analytical Parameters	Analytical Method [b]
EPA Method 1	1	N/A	Sampling and Traverse Point Locations	US EPA Method 1
EPA Method 2	3	Continuous	Volumetric Flowrate	US EPA Method 2
EPA Method 3	3	Continuous	Molecular Weight	US EPA Method 3/3A
EPA Method 4	3	Continuous	Moisture	US EPA Method 4
EPA Method 23/ ALT-052 [c]	3	3	PCDD/PCDF	US EPA Method 23/ ALT-052 [c]
CEMS	3	Continuous	O_2	Installed O_2 CEMS
			THC	Installed THC CEMS

Notes:
[a] Methods 2, 3/3A, 4, and CEMS spanned the duration of each run.
[b] Methods are from 40 CFR Part 60 Appendix A.
[c] ALT-052 is from the US EPA Technology Transfer Network/Emission Measurement Center.

5.0 CONFIRMATORY PERFORMANCE TEST RESULTS

The quantitative results from the Confirmatory Performance Test are presented in this section. The data collected during the test verify that the emissions performance of the LCD is in compliance with the dioxin/furan emissions standard specified in 40 CFR §63.1219(a)(1)(ii).

The Confirmatory Performance Test consisted of three replicate runs performed at one test condition. The operating conditions during the test are summarized in Table 3-3 and are representative of normal operating conditions for the LCD. The test was conducted to demonstrate the performance of the LCD for controlling emissions of dioxins/furans under normal operating conditions. These results establish that the LCD system sufficiently controlled emissions to levels required by the standards.

The results of these emissions tests are summarized in this report and detailed in Appendix I to this report, *Stationary Source Sampling Report, Tennessee Operations, Liquid Chemical Destructor, Test Date September 30, 2014* for Eastman Chemical Company, dated December 11, 2014 by CEC of Charlotte, North Carolina.

The Confirmatory Performance Test successfully demonstrated that the LCD system performance under normal operating conditions for dioxin/furan emissions was well below the level required by the HWC MACT standard. The performance test results are presented in Table 5-1. This table shows the results from each run, the three run average, and the applicable HWC MACT emission standard.

Table 5-1
Confirmatory Performance Test Emissions Results

Parameter	Units	Run 1	Run 2	Run 3	Average	HWC MACT Standard (§63.1219(a)(1)(ii))
Dioxins/Furans (PCDD/PCDF) [a]	ng/dscm TEQ, corrected to 7% O_2	0.0044	0.0039	0.0053	0.0045	0.40

Notes:

[a] TEQ is toxic equivalent quotient to 2,3,7,8-TCDD. The results presented represent the theoretical worst-case emissions, where values that were not detected are assumed to be present at the detection limit. EMPC values are assumed to be equal to the EMPC value.

APPENDIX I

SAMPLING AND ANALYSIS REPORT

Stationary Source Sampling Report, Tennessee Operations, Liquid Chemical Destructor, Test Date September 30, 2014 (Civil & Environmental Consultants, Inc.)

Appendix A – Summary of Results and Example Calculations
Appendix B – Field Data Sheets
Appendix C – Laboratory Data
Appendix D – Equipment Calibrations
Appendix E – Process Oxygen Data

STATIONARY SOURCE SAMPLING REPORT

TENNESSEE OPERATIONS
LIQUID CHEMICAL DESTRUCTOR
TEST DATE SEPTEMBER 30, 2014

Prepared For:

EASTMAN CHEMICAL COMPANY
100 EASTMAN ROAD
KINGSPORT, TENNESSEE 37660

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
CHARLOTTE, NORTH CAROLINA

CEC Project 142-644

December 15, 2014

REPORT CERTIFICATION

This report, testing details, and approach have been developed under the supervision (including review) of the persons named below. Results contained in this report relate only to the sources tested and the parameters included in the test program. CEC operates in conformance with the requirements of ASTM D7036-04 (Reapproved 2011).

Date 12/15/14 Signature 

W. Quentin Best
Senior Project Manager
Civil & Environmental Consultants, Inc.

Date 12/15/14 Signature 

Paul R. Jenkins, Jr.
Senior Project Manager
Civil & Environmental Consultants, Inc.

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1.0 INTRODUCTION

Eastman Chemical Company, Tennessee Operations (Eastman) owns and operates a RCRA-hazardous waste incineration facility consisting of two rotary kiln incinerators and a Liquid Chemical Destructor (LCD), at its facility in Kingsport, Tennessee. The purpose of this sampling project was to perform a Confirmatory Performance Test where the concentrations and emission rates of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) from the LCD were determined at the Tennessee Operations facility.

The emission testing on the exhaust of the LCD was performed on September 30, 2014. Three 180-minute sampling runs were conducted for PCDDs/PCDFs. United States Environmental Protection Agency (US EPA) Method 23 with US EPA Approved Alternative ALT-052 was used for the determination of the target pollutant concentrations and emission rates. Eastman provided data from a continuous emission monitoring system (CEMS) for oxygen. Civil & Environmental Consultants, Inc. (CEC) performed Method 3/3A for the determination of carbon dioxide. The test runs were conducted concurrently during normal plant operations. The sampling and analytical procedures used in this test program were those established by the US EPA and the Tennessee Department of Environmental Conservation (TDEC) in standard reference test methods and appropriate sampling and analytical procedures.

Table 1 – List of Project Participants Eastman Chemical Company – Tennessee Operations Kingsport, Tennessee			
Participant	**Title**	**Affiliation**	**Contact**
Paul R. Jenkins, Jr.	Senior Project Manager	CEC, Inc.	Telephone: 980.237.0373 Facsimile: 980.237.0372 pjenkins@cecinc.com
Bryan L. Starnes	Project Manager	CEC, Inc.	
Kevin M. Dunham	Technician	CEC, Inc.	
John C. Webb, PE	Environmental Engineer	TDEC Division of Solid Waste Management	Telephone: 423.854.5465 Facsimile: 423.854.5401 john.c.webb@tn.gov
Joseph L. Kellogg	Chemist, Air Emissions Testing	Eastman Chemical Company	jkellogg@eastman.com
Richard L. Zimmerman	Test Coordinator, Air Emissions Testing	Eastman Chemical Company	Telephone: 423.229.6555 Facsimile: 423.224.0199 rlzimmer@eastman.com

Messrs. Joseph Kellogg and Richard Zimmerman of Eastman were responsible for coordinating the referenced process and for the collection of CEMS process oxygen data. This data is presented in Appendix E.

This report contains the results of the emission tests conducted during the test program. Copies of reference method field data sheets, sample analysis data, example calculations and equipment calibration records are included as appendices to this report.

2.0 SUMMARY OF TEST RESULTS

This section presents a summary of the PCDD/PCDF sampling. Detailed sampling results and example calculations for the test program can be found in Appendix A. Field data sheets and sample recovery documentation are presented in Appendix B. Appendix C contains the laboratory report. Appendix D presents copies of the current reference method equipment calibration records. Appendix E contains process oxygen data from the continuous emissions monitoring system during the Confirmatory Performance Test.

2.1 SAMPLING RESULTS

The summary of the results for the tests performed at the LCD is presented in Tables 2 and 3. The emission rates presented in Table 2 were calculated based upon emission stream conditions measured during the test period. The calculations were conducted in accordance with the appropriate test methods.

The tables in this section represent a synopsis of the dioxins/furans sampling conducted at the LCD Outlet Stack. The oxygen data recorded by Eastman's installed CEMS unit were used in the calculations of emission rates and to correct the concentration data to seven percent oxygen.

Table 2 – Emission Rates in Pounds per Hour [a] Eastman Chemical Company – Tennessee Operations Kingsport, Tennessee				
Compound	**Run 1**	**Run 2**	**Run 3**	**Average**
Emission Rate	**lbs/hr**	**lbs/hr**	**lbs/hr**	**lbs/hr**
2,3,7,8-TCDD	ND 5.30E-11	ND 4.23E-11	ND 5.91E-11	< 5.15E-11
1,2,3,7,8-PeCDD	ND 6.42E-11	ND 4.40E-11	ND 8.55E-11	< 6.46E-11
1,2,3,4,7,8-HxCDD	ND 5.60E-11	ND 4.55E-11	ND 7.05E-11	< 5.74E-11
1,2,3,6,7,8-HxCDD	ND 5.82E-11	ND 4.87E-11	ND 7.79E-11	< 6.16E-11
1,2,3,7,8,9-HxCDD	ND 6.06E-11	ND 4.79E-11	ND 8.32E-11	< 6.39E-11
1,2,3,4,6,7,8-HpCDD	ND 1.06E-10	ND 7.37E-11	ND 1.16E-10	< 9.84E-11
OCDD	1.98E-10 [b,c]	EMPC 2.08E-10 [b,c]	ND 1.95E-10	< 2.00E-10
2,3,7,8-TCDF	EMPC 9.98E-11 [c]	EMPC 7.67E-11 [c]	ND 5.49E-11	< 7.71E-11
1,2,3,7,8-PeCDF	ND 3.19E-11	ND 2.78E-11	ND 4.69E-11	< 3.55E-11
2,3,4,7,8-PeCDF	ND 3.30E-11	5.21E-11 [c]	ND 5.05E-11	< 4.52E-11
1,2,3,4,7,8-HxCDF	ND 4.18E-11	ND 3.55E-11	ND 4.06E-11	< 3.93E-11
1,2,3,6,7,8-HxCDF	ND 3.75E-11	ND 3.33E-11	ND 3.76E-11	< 3.61E-11
2,3,4,6,7,8-HxCDF	ND 3.79E-11	ND 3.57E-11	ND 3.99E-11	< 3.78E-11
1,2,3,7,8,9-HxCDF	ND 5.11E-11	ND 4.59E-11	ND 5.68E-11	< 5.13E-11
1,2,3,4,6,7,8-HpCDF	ND 5.07E-11	ND 4.30E-11	ND 5.70E-11	< 5.02E-11
1,2,3,4,7,8,9-HpCDF	ND 8.30E-11	ND 6.90E-11	ND 8.19E-11	< 7.80E-11
OCDF	ND 1.71E-10	ND 1.30E-10	ND 2.08E-10	< 1.70E-10
ITEF TEQ (ND=DL;EMPC=EMPC)	< 1.50E-10	< 1.31E-10	< 1.79E-10	< 1.53E-10

ND = non detect; DL = detection limit; EMPC = estimated maximum possible concentration

Notes:

[a] Values that were not detected are assumed to be present at the detection limit. EMPC values are assumed to be equal to the EMPC value. Therefore, the values in this table represent the theoretical maximum concentration.

[b] This analyte was found in the method blank at a concentration that was at least 10% of the concentration in the sample.

[c] This analyte has a concentration below the reporting limit and is an estimated value.

Table 3 – Concentration Corrected to 7% Oxygen [a] Eastman Chemical Company – Tennessee Operations Kingsport, Tennessee				
Compound	**Run 1**	**Run 2**	**Run 3**	**Average**
Concentration Data	**ng/dscm @ 7% O_2**	**ng/dscm @ 7% O_2**	**ng/dscm @ 7% O_2**	**ng/dscm @ 7% O_2**
2,3,7,8-TCDD	ND 1.55E-03	ND 1.25E-03	ND 1.77E-03	< 1.53E-03
1,2,3,7,8-PeCDD	ND 1.88E-03	ND 1.30E-03	ND 2.56E-03	< 1.91E-03
1,2,3,4,7,8-HxCDD	ND 1.64E-03	ND 1.35E-03	ND 2.11E-03	< 1.70E-03
1,2,3,6,7,8-HxCDD	ND 1.71E-03	ND 1.44E-03	ND 2.33E-03	< 1.83E-03
1,2,3,7,8,9-HxCDD	ND 1.78E-03	ND 1.42E-03	ND 2.49E-03	< 1.89E-03
1,2,3,4,6,7,8-HpCDD	ND 3.10E-03	ND 2.18E-03	ND 3.46E-03	< 2.92E-03
OCDD	5.79E-03 [b,c]	EMPC 6.16E-03 [b,c]	ND 5.83E-03	< 5.93E-03
2,3,7,8-TCDF	EMPC 2.93E-03 [c]	EMPC 2.27E-03 [c]	ND 1.64E-03	< 2.28E-03
1,2,3,7,8-PeCDF	ND 9.35E-04	ND 8.23E-04	ND 1.40E-03	< 1.05E-03
2,3,4,7,8-PeCDF	ND 9.67E-04	1.54E-03 [c]	ND 1.51E-03	< 1.34E-03
1,2,3,4,7,8-HxCDF	ND 1.23E-03	ND 1.05E-03	ND 1.21E-03	< 1.16E-03
1,2,3,6,7,8-HxCDF	ND 1.10E-03	ND 9.87E-04	ND 1.12E-03	< 1.07E-03
2,3,4,6,7,8-HxCDF	ND 1.11E-03	ND 1.06E-03	ND 1.19E-03	< 1.12E-03
1,2,3,7,8,9-HxCDF	ND 1.50E-03	ND 1.36E-03	ND 1.70E-03	< 1.52E-03
1,2,3,4,6,7,8-HpCDF	ND 1.48E-03	ND 1.27E-03	ND 1.71E-03	< 1.49E-03
1,2,3,4,7,8,9-HpCDF	ND 2.43E-03	ND 2.04E-03	ND 2.45E-03	< 2.31E-03
OCDF	ND 5.01E-03	ND 3.85E-03	ND 6.22E-03	< 5.03E-03
ITEF TEQ (ND=DL;EMPC=EMPC)	< 4.40E-03	< 3.87E-03	< 5.34E-03	< 4.54E-03

ND = non detect; DL = detection limit; EMPC = estimated maximum possible concentration
ng/dscm = nanograms per dry standard cubic meter

Notes:

[a] Values that were not detected are assumed to be present at the detection limit. EMPC values are assumed to be equal to the EMPC value. Therefore, the values in this table represent the theoretical maximum concentration.

[b] This analyte was found in the method blank at a concentration that was at least 10% of the concentration in the sample.

[c] This analyte has a concentration below the reporting limit and is an estimated value.

Eastman's testing program will be used to demonstrate compliance with the current Air Permit and the requirements for Existing Hazardous Waste Incinerators. The emission performance requirement for Existing Hazardous Waste Incinerators for Dioxins/Furans is 0.40 ng/dscm Toxic Equivalence (TEQ) corrected to 7% oxygen. The results from this test program will be provided to TDEC to determine compliance with the applicable air quality regulations.

2.2 SAMPLING DATES AND TIMES

Table 4 presents the sampling dates and times for the process tested at the Eastman Kingsport, Tennessee facility.

Table 4 – Sampling Dates and Times
Eastman Chemical Company – Tennessee Operations
Kingsport, Tennessee

Sample Location	Run 1	Run 2	Run 3
LCD Exhaust	09/30/14	09/30/14	09/30/14
	0911-1220	1242-1549	1606-1912

3.0 SUMMARY OF THE REFERENCE TEST METHODS

This section provides descriptions and methodologies of the sampling techniques employed during the Confirmatory Performance Test. There were no deviations from the specified methodologies.

3.1 SAMPLING STRATEGY

The US EPA methods that were utilized in this sampling program were:

- Method 1 for the location of sampling ports and points, and determination of cyclonic flow;
- Method 2 for velocity / volumetric flow rate determination;
- Method 3 / 3A for the determination of dry molecular weight of the stack gas;
- Method 4 for the determination of moisture in the stack gas; and
- Method 23 & ALT-052 for the determination of PCDD/PCDF

These test methods are available in the Code of Federal Regulations Volume 40, Part 60, US EPA's web site www.epa.gov/ttn/emc/, and/or by request from CEC.

3.2 SAMPLING AND ANALYTICAL PROCEDURES

A sampling and analysis synopsis for these methods is discussed briefly in the following subsections.

3.2.1 US EPA Method 1-Sampling Point Determination

For this test program, US EPA Method 1 was used to determine the appropriateness of the existing ports as the sampling location at the LCD stack. The duct diameters upstream and downstream from the sampling ports were determined prior to sampling. The number of traverse points was chosen with respect to sampling port location. For isokinetic traverses, Method 1 specifies a minimum of 8 traverse points for sampling ports located >8/>2 downstream/upstream stack diameters from flow disturbances and a maximum of 24 (or 25 on a rectangular stack) traverse points when located >2/>0.5 downstream/ upstream stack diameters from flow disturbances.

The dimensions of the stack and the location of the sampling ports and points are detailed in Figure 2. Method 1 sampling criteria were maintained. The LCD stack was a circular duct divided into 12 equal traverse areas with ports labeled A and B (six sample points per port). During the Method 23 sampling runs, the individual points were sampled for a period of 15 minutes (two data records per traverse point every 7.5 minutes), which yielded a total test time of 180 minutes.

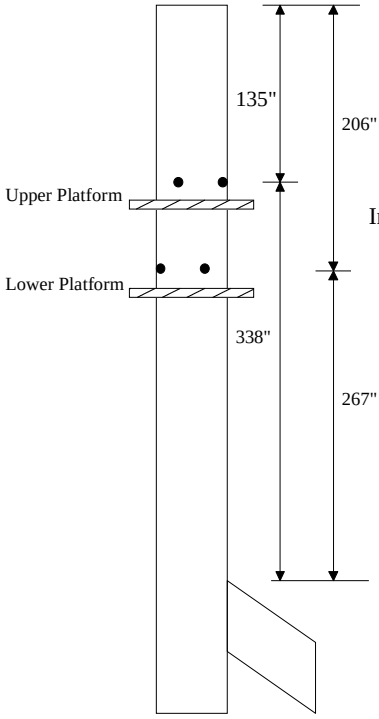
The average absolute value rotation angle at the LCD "upper" sampling location was determined to be less than 20° and in compliance with US EPA Method 1, Section 11.4.2 for cyclonic flow. A copy of this data can be found in Appendix B.

Tennessee Operations LCD Exhaust Stack

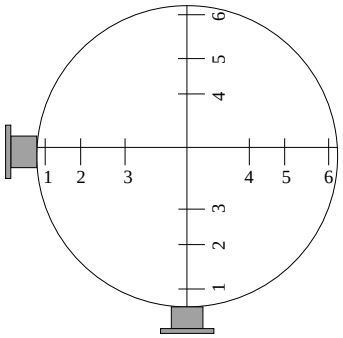
Table 5 – Stack Diameter and Upstream/Downstream Measurements for LCD Stack
Eastman Chemical Company
Kingsport, Tennessee Operations - Method 1

Test Location	Stack Dimensions (inches)	Upstream (inches)	Downstream (inches)	Total number of sampling points per run
LCD Upper Sampling Platform & Ports Utilized	42	135	338	12

Liquid Chemical Destructor Traverse Points

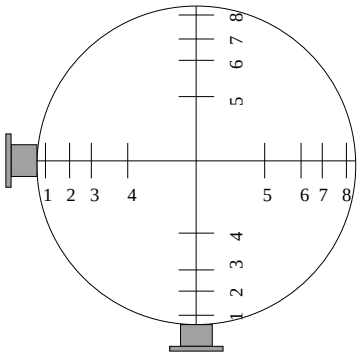


Inside Stack Diameter = 42"



Upper Sampling Platform
Distance Upstream from Flow Disturbance = 135 inches = 3.2 diameters
Distance Downstream from Flow Disturbance = 338 inches = 8 diameters
Total Number of Traverse Points = 12

Traverse Pt	% of ID	Distance from Inside of Duct Wall, inches
1	4.4	1.85
2	14.6	6.13
3	29.6	12.43
4	70.4	29.57
5	85.4	35.87
6	95.6	40.15



Lower Sampling Platform
Distance Upstream from Flow Disturbance = 206 inches = 4.8 diameters
Distance Downstream from Flow Disturbance = 267 inches = 6.3 diameters
Total Number of Traverse Points = 16

Traverse Pt	% of ID	Distance from Inside of Duct Wall, inches
1	3.2	1.34
2	10.5	4.41
3	19.4	8.15
4	32.3	13.57
5	67.7	28.43
6	80.6	33.85
7	89.5	37.59
8	96.8	40.66

Not to Scale

Figure 1 – Location of Sampling Ports and Points

3.2.2 US EPA Method 2 Velocity and Volumetric Flow Rate Determination

Method 2 was used for determining the average gas velocity from measurements of gas density and the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube (0.84 coefficient). This method is applicable for quantifying gas flows for stacks that are 12 inches and over in diameter (or equivalent diameter) which meet the criteria of Method 1.

During this project, the sampling location met the criteria detailed in Method 1. Gas stream density was determined using Methods 3 / 3A. Moisture determination was performed by Method 4. The velocity traverses were performed using Method 2 where the principal components of the gas velocity measurement system were sequentially:

- A calibrated stainless steel Type S pitot tube and Type K thermocouple;
- Leak-free interface tubing between pitot tube and differential pressure gauge;
- A 0 to 10 inch inclined manometer; and
- An NIST traceable pyrometer.

The apparatus was set-up according to manufacturer and reference method recommendations. Pre-test and post-test leak checks were conducted using procedures outlined in Method 2, Section 8.0. Velocity head and temperature measurements were performed during each sampling run at the traverse points specified by Method 1. The effluent gas temperature was measured with chromel-alumel thermocouples equipped with a digital temperature indicator. The atmospheric and static pressure of the LCD stack was also determined during each sample run. The volumetric flow rate calculations used were those specified in Method 2, Section 12. Figure No. 3 shows a typical S-type Pitot tube velocity measurement system.

CEC conducted measurements of the face opening alignments, external tubing diameter, and base-to-opening plane distances of the pitot tubes. These measurements met the design criteria in US EPA Method 2 for a Type "S" pitot tube, and therefore a baseline coefficient value of 0.84 was assigned to the Pitot tube. Verification of these measurements were recorded onto a Pitot tube calibration worksheet and are presented in Appendix D of the final report.

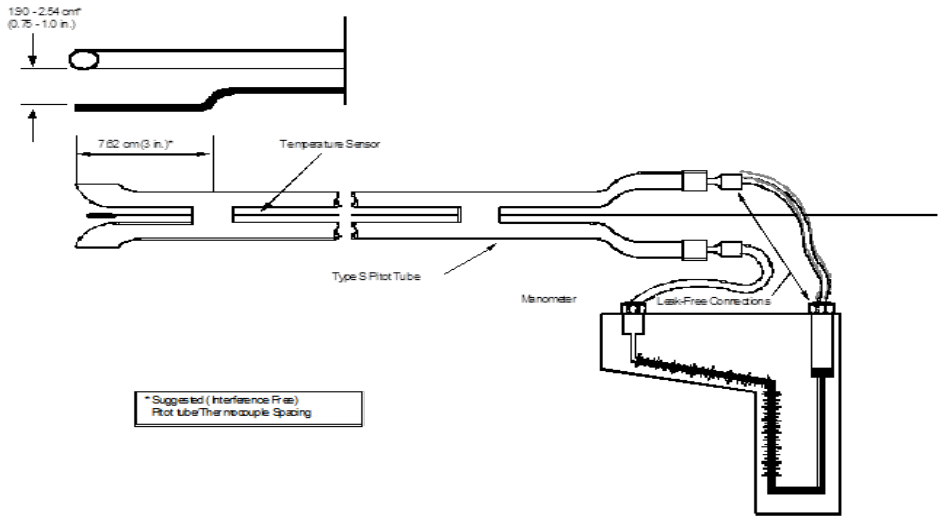


Figure 2 – S-Type Pitot Velocity Measurements System

3.2.3 US EPA Method 3 / 3A Molecular Weight Rate Determination

Method 3 is applicable for determining carbon dioxide and oxygen concentrations and dry molecular weight of a sample from a gas stream of a fossil-fuel combustion process. This method may also be applicable to other processes where it has been determined that compounds other than carbon dioxide, oxygen, carbon monoxide, and nitrogen are not present in concentrations sufficient to affect the results. One integrated sample was collected in a flexible bag for each test run using the procedures of Method 3. The carbon dioxide concentration in the sample was determined using Method 3A (instrumental analyzer method) analysis of each sample. The oxygen concentration in the flue gas stream was determined from the Eastman CEMS, which operated continuously throughout the duration of each run.

3.2.4 US EPA Method 4 Moisture Determination

Method 4 involves the determination of stack gas moisture. The moisture content is used to correct the emission concentration or mass emission rate to a dry basis. EPA Method 4 and *Field*

Procedure 4 of the QA Handbook were used to measure stack gas moisture content. *Field Procedure 4* provides detailed information on the application of Method 4.

Preliminary flue gas moisture content (for purposes of setting the isokinetic flow rate) was determined using wet bulb/dry bulb thermometers and partial pressure, vapor and saturated vapor pressure equations. This technique is described in Method 4 and is summarized below:

- Moisten the wet bulb thermometer wick with deionized water;
- Insert both thermometers into the flue gas stream and monitor the wet bulb temperature;
- When the wet bulb temperature has stabilized, record both the wet bulb and dry bulb thermometer temperatures; and
- Calculate the flue gas moisture content (PMV) using the appropriate equations.

The moisture content for emission rate calculations was determined in conjunction with the Method 23 isokinetic sampling train. The reference method involves the withdrawal of gaseous and particulate pollutants from the emission source at an isokinetic rate using a Method 5 type sampling system. The sampling and analytical procedure for reference Method 4 will be discussed in detail in Section 4.2.5 with the isokinetic sampling procedures.

3.2.5 US EPA Method 23 Polychlorinated Dibenzo (p) dioxins and furans Sampling and Analysis

The sampling and analytical procedures outlined in EPA Method 23 were used to collect samples for determination of selected polychlorinated dibenzo-(p)-dioxin and dibenzofurans concentrations during the Confirmatory Performance Test.

Using this method, stack gas emissions were withdrawn from each sampling point at an isokinetic sampling rate, and were collected in the sample probe, on a glass fiber filter, and on a packed column of adsorbent.

A diagram of the sampling train, which is similar to that used in EPA Method 5, is presented in Figure 4. In addition to those components included in the EPA Method 5 train, the Method 23

train includes a Teflon filter support, a condenser, and an adsorbent module. The following provides a description of the sample extraction and filter system:

Probe Nozzle:	Quartz or borosilicate glass
Probe Liner:	Borosilicate or quartz glass tubing
Pitot Tube:	Type S (meeting specifications of EPA Method 2)
Filter:	Glass fiber, without organic binder
Filter Holder:	Borosilicate glass with a Teflon filter support
Heating System:	Capable of maintaining a temperature of 120 ± 14°C around the probe and filter holder during sampling

After the filter holder, sample gas passes through a vertical condenser and into the adsorbent module. The adsorbent module is sized to contain 20 to 40 g of XAD-2 resin, and may be oriented vertically so that condensate drains from the condenser through the sorbent, but other physical configurations of the resin trap/condenser assembly are acceptable. In addition to the resin, the sorbent trap includes a coarse glass or Teflon frit and glass wool plugs in order to retain the sorbent. Surrogate standards are applied to the sorbent in the analytical lab prior to sampling. A temperature sensor capable of measuring to within 1°C is placed at the inlet of the adsorbent module.

The remainder of the sampling train consisted of five impingers connected in series. The first impinger was an empty short-stem impinger used as a knockout. The second impinger was a Greenburg-Smith impinger with the standard tip and plate, containing 100 mL of reagent water. The third impinger also contained 100 mL of reagent water and was of the Greenburg-Smith design, but modified so that the glass tube had an unconstricted 13-mm inner diameter and extended to within 13 mm of the flask bottom. The final two impingers each contained a known weight (200 to 300 g) of silica gel and were of the Greenburg-Smith design, modified as described for the third impinger. A temperature sensor capable of measuring to within 1°C was placed at the outlet of the final impinger.

The sampling train also included a pump to circulate cooling water from the ice bath surrounding the impingers to the condenser and the adsorbent module and back to the ice bath. The gas temperature entering the adsorbent module did not exceed 20 °C during sampling.

To ensure proper operation of the sampling train, both pre-test and post-test leak checks were conducted per EPA Method 5 procedures for each sampling run. Additionally, a leak check was conducted during each test run between port changes. The leakage rates for all leak checks were recorded and did not exceed 4% of the average sampling rate or 0.02 cfm, whichever was less.

During each sampling run, the sample train was operated in accordance with the procedures and specifications outlined EPA Method 23. Special attention was given to the following operating specifications:

- The temperature around the probe and filter holder was maintained at 120 ± 14 °C;
- The temperature at the inlet of the adsorbent module was maintained at 20 °C or less;
- The temperature at the outlet of the final (silica gel) impinger was maintained at less than 20 °C; and
- An isokinetic sampling rate within 90 – 110% was maintained.

After completing each sampling run and post-run leak check, the nozzle end of the sampling probe was sealed with Teflon tape and the probe was disconnected from the filter holder. Once the probe had cooled enough to be handled, any excess particulate matter was wiped from the tip of the probe. The nozzle tip & ball joint of the sample probe and all openings on the filter holder, connecting glassware, condenser, sorbent trap, and impingers were sealed with Teflon tape.

During sample recovery, all sampling train components were transferred to CEC's mobile laboratory to minimize sample contamination or loss. Recovery procedures followed those outlined in EPA Method 23, except as described below, and are shown in Figure 5. In addition to the adsorbent module, three sample containers, outlined below, were created during the recovery process.

Container 1	Filter
Adsorbent Module	Capped tightly Teflon tape and covered with aluminum foil
Container 2	Nozzle, probe, filter holder, condenser, and connecting glassware rinses with acetone
Container 3	Nozzle, probe, filter holder, condenser, and connecting glassware rinses with toluene

EPA Approved Alternative ALT-052 allows the substitution of toluene for methylene chloride as a recovery solvent for EPA Method 23. Therefore, the acetone rinses & brushing described in EPA Method 23 section 4.2.3 were performed and placed in Container 2 during sample recoveries. The toluene rinses described in EPA Method 23 section 4.2.4 were performed separately from the acetone rinses during the field sampling recoveries and placed separately in Container 3. Per ALT-052 procedures, the toluene rinses need not be analyzed separately and were combined with the acetone sample fractions at the SGS North America Inc. Laboratory prior to extraction and analysis. Figure 5 shows the Method 23 field cleanup procedures with EPA Approved Alt-052 Sample Recovery Diagram.

The amounts of water contained in the first three impingers and in the fourth and fifth impingers were measured to within 1-mL or weighed to within 0.5 g. The color and condition of the silica gel was noted, and the weights of the silica gel plus the impingers were recorded to within 0.5 g. Both the water and the silica gel were discarded.

One full set of field blank samples were submitted with the EPA Method 23 emissions samples. A complete sampling train, not used to collect any emissions samples, was assembled in the staging area and taken to the sampling area, where the same numbers of leak checks were performed as anticipated for a Method 23 emissions sampling train used to conduct a sampling run. Field blank samples were recovered from the blank train as described above for sample recovery from an EPA Method 23 sampling train, as if the blank train had been used for emissions sampling. All samples recovered from the blank train were submitted as field blank

samples. Reagent blank samples, including aliquots of sample recovery solvents, an unused filter, and an unused adsorbent module, were also submitted.

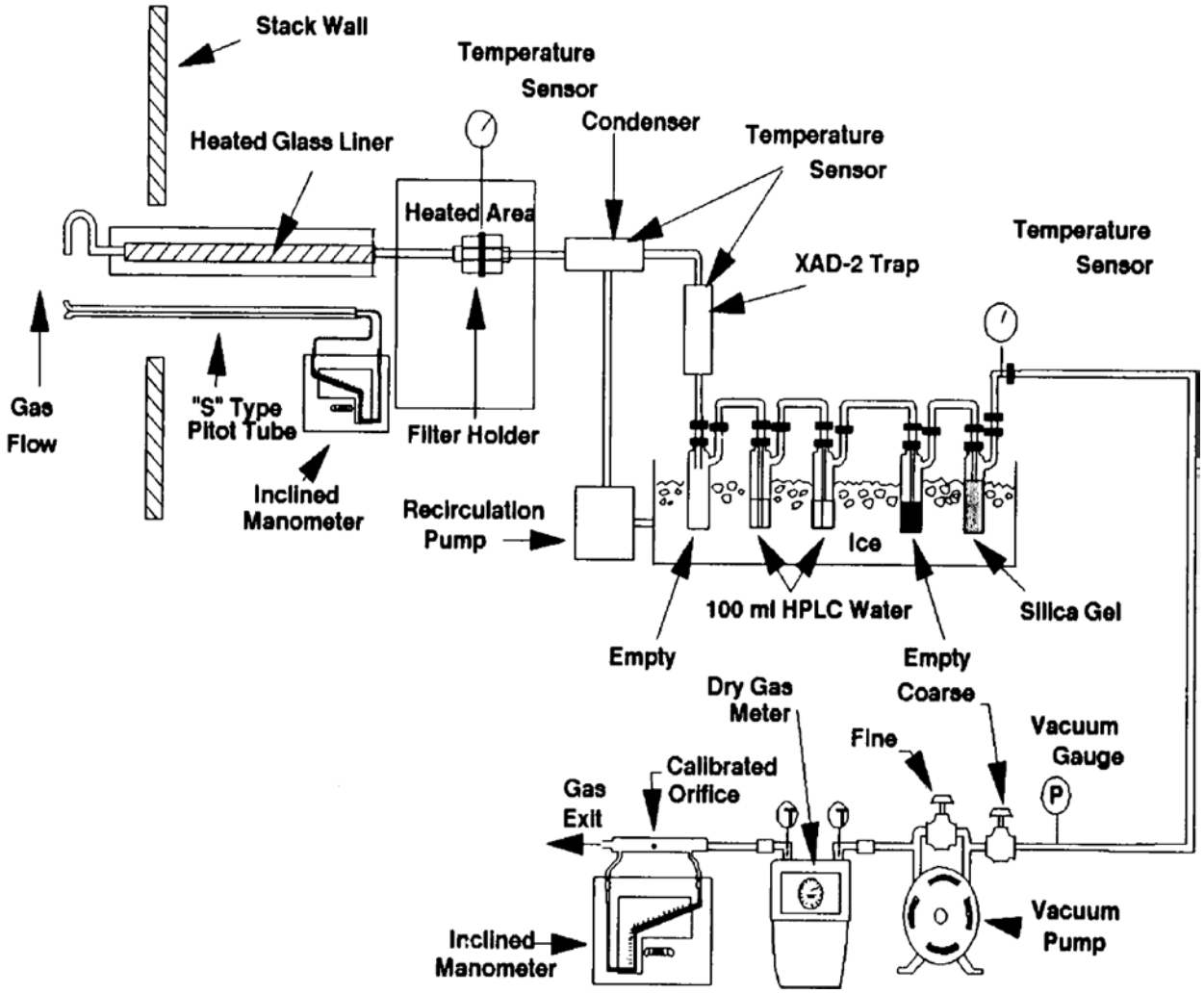


Figure 3 – Diagram of EPA Method 23 Sampling Train

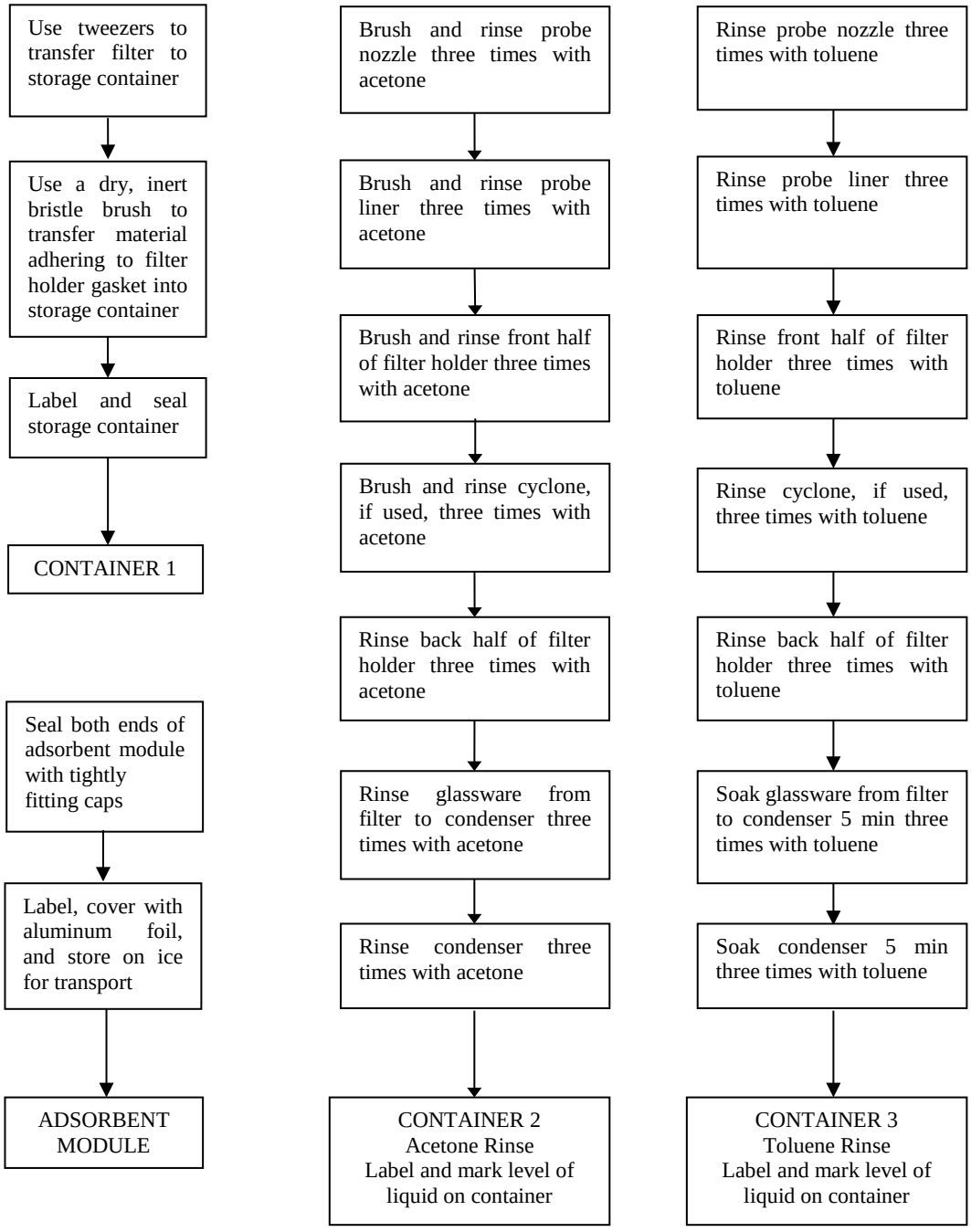


Figure 4 – Method 23 with EPA Approved ALT-052 Sample Recovery Diagram

4.0 QUALITY ASSURANCE / QUALITY CONTROL RESULTS

CEC has established quality assurance and quality control (QA/QC) guidelines for providing quality sampling and analytical data from source tests. These QA/QC procedures were implemented to ensure the acceptability and reliability of the data generated.

In summary, an appropriate degree of data quality was maintained throughout this project. Leak checks and isokinetic QA criteria were met for each sampling run. The sampling trains were leak checked prior to each sampling run, during port changes and immediately after each sampling run. Leak rates for the isokinetic sampling trains were less than the maximum criterion of 0.02 cubic feet per minute. The sampling rates were also within the 100% ±10% criterion established for isokinetic sampling. Quality control procedures for the dioxins and furans determination included the analysis of reagent blanks and field blanks. The results of the blanks and pertinent quality assurance data are reported in Appendix C with the laboratory data.

Table 6 – Quality Assurance and Quality Control Data – Method 23
Eastman Chemical Company – Tennessee Operations
Kingsport, Tennessee

LCD Stack		Run 1	Run 2	Run 3	**Criteria**
Final Leak Checks	Method 23	0.002	0.002	0.002	< 0.020 cu. ft.
Isokinetics		97.1	98.7	99.0	100 $\pm$ 10%
Post Meter Calibration – Alternative Method 4 Post-Test Calibration (ALT-009) Post Meter Calibration			Meter Box 300.388 Avg. Y = 1.028		1.022 $\pm$ 0.05

Field data and final laboratory results were entered into CEC's air quality data system by a staff professional, and reviewed by a project manager for verification of data. After the QC review by the project manager, a senior professional verified the final report for completeness and reasonableness of data. The report was returned to the staff professional for review and preparation of the final draft. The report requires the signature of the staff professional and a project manager before release to the client. Data and final reports are archived in a secured area for a minimum period of seven years.

CEC's field and laboratory test equipment has been maintained and calibrated in accordance with quality assurance procedures established by the US EPA in the QA handbook. Equipment calibrations including pre-test and post-test calibration data are presented in Appendix D.

5.0 APPENDICES

This section contains detailed supportive documentation that encompasses the relevant aspects of the emission test program. Its contents serve as the foundation for the test report. The emission test report presents a summary of the information gathered during the sampling activities. The information contained in the appendices is necessary to facilitate the review of the emission test report and determine whether proper procedures were used to accomplish the test plan objectives.

Defensible data and the subsequent pollutant concentrations and emission rates are the primary objectives of any emission test program. To this end, the test results, example calculations, field data sheets, sample recovery, laboratory results, chain-of-custody documentation, and equipment calibrations have been provided to support these objectives.

APPENDIX A

SUMMARY OF RESULTS AND EXAMPLE CALCULATIONS

SUMMARY OF RESULTS
EPA METHOD 23 and Alt.-052
Determination of Polychlorinated Dibenzo-P-Dioxins and Polychlorinated Dibenzofurans

Run Number		1	2	3	Average
	Sample Identification	142644-02	142644-03	142644-04	----
	Date:	9/30/2014	9/30/2014	9/30/2014	----
q	Net Time of Test, minutes	180.0	180.0	180.0	----
	Sample Time, 24-hour clock	0911-1220	1242-1549	1606-1912	----
P_{bar}	Barometric Pressure, in. Hg	28.67	28.64	28.56	28.62
P_g	Static Pressure, in. H_2O	-0.280	-0.280	-0.280	-0.280
P_S	Stack Pressure, Absolute, in. Hg	28.649	28.619	28.539	28.603
V_M	Actual Meter Volume Sampled, cu. ft.	113.753	115.531	117.052	115.445
DH	Avg. Delta H, in. H_20	1.30	1.29	1.33	1.31
T_M	Avg. Gas Meter Temp., Deg. F	74.0	90.3	91.3	85.2
$V_{m(STD}$	Volume Sampled at Stand. Cond., cu. ft.	110.523	108.810	109.746	109.693
V_C	Volume of Water Collected, ml	197.7	211.6	208.9	206.1
$V_{wc(std)}$	Volume of Water Vapor at Std. Cond.,SCF	9.30	9.96	9.83	9.70
W_C	Volume of Water Collected in Silica Gel, g	37.40	29.30	29.80	32.17
$V_{wsg(std}$	Vol. of Water Vapor in Silica Gel at Std. Cond., SCF	1.76	1.38	1.41	1.52
B_{WS1}	Moisture Content of Gas Stream	0.091	0.094	0.093	0.093
P_{MV1}	Calculated Percent Moisture in Stack	9.1	9.4	9.3	9.3
P_{MV1S}	Saturated Percent Moisture in Stack	9.6	12.7	12.9	11.7
P_{MV1R}	Reported Percent Moisture in Stack	9.1	9.4	9.3	9.3
M_{FD1}	Mole Fraction of Dry Gas	0.909	0.906	0.907	0.907
$\%O_2$	Percent Oxygen, Dry	13.87	13.77	13.82	13.82
$\%CO_2$	Percent Carbon Dioxide, Dry	5.83	5.88	5.81	5.84
%CO	Percent Carbon Monoxide, Dry	0.00	0.00	0.00	0.00
M_d	Mole. Wt. Stack Gas, Dry Basis, lb/lb mole	29.488	29.492	29.482	29.487
M_S	Mole. Wt. Stack Gas, Wet Basis, lb/lb mole	28.442	28.407	28.416	28.422
Cp	Pitot Tube Coefficient	0.84	0.84	0.84	0.84
DPS	Avg. Sqrt. Delta P, in. H20	0.646	0.638	0.636	0.640
T_S	Avg. Stack Temp., Deg. F	112.2	122.0	122.3	118.8
V_S	Avg. Stack Velocity, ft/sec	38.8	38.8	38.7	38.8
A	Area Stack, ft^2	9.621	9.621	9.621	9.621

SUMMARY OF RESULTS
EPA METHOD 23 and Alt.-052
Determination of Polychlorinated Dibenzo-P-Dioxins and Polychlorinated Dibenzofurans

Run Number		1	2	3	Average
Q_{SD}	Gas Volume Flow, Dry Std. Cond. CFM	18,009	17,580	17,523	17,704
Q_A	Actual Gas Volume Flow, CFM	22,424	22,369	22,336	22,376
Q_{SW}	Gas Volume Flow, Wet Std. Cond., CFM	19,813	19,412	19,317	19,514
D_n	Sample Nozzle Diameter, inches	0.249	0.248	0.249	0.249
A_n	Area of Nozzle, ft^2	0.00034	0.00034	0.00034	0.00034
I	Percent Isokinetic	97.1	98.7	99.0	98.3
Mb #	Meter Box Number	300.388D	300.388D	300.388D	---
DH@	DH@ of Meter Box @ 0.75 SCFM	1.788	1.788	1.788	---
Y_{qa}	Alt. Mthd 5 Posttest Calibration (ALT-009)	1.030	1.026	1.028	1.028
Y	Meter Calibration Factor	1.022	1.022	1.022	---

CEC Project No. 142-644 Task 0001

Eastman Chemical Kingsport, Tennessee
Liquid Chemical Destructor Stack

EPA METHOD 23
Determination of Dioxin/Furans Concentrations and Emission Rates

Compound	Run 1	Run 2	Run 3	Run 4	Average
Mass Data (m_n)	pg	pg	pg	pg	pg
2,3,7,8-TCDD	ND 2.46	ND 1.98	ND 2.8		ND 2.41
1,2,3,7,8-PeCDD	ND 2.98	ND 2.06	ND 4.05		ND 3.03
1,2,3,4,7,8-HxCDD	ND 2.6	ND 2.13	ND 3.34		ND 2.69
1,2,3,6,7,8-HxCDD	ND 2.7	ND 2.28	ND 3.69		ND 2.89
1,2,3,7,8,9-HxCDD	ND 2.81	ND 2.24	ND 3.94		ND 3.00
1,2,3,4,6,7,8-HpCDD	ND 4.91	ND 3.45	ND 5.48		ND 4.61
OCDD	9.17	EMPC 9.73	ND 9.23		9.38
2,3,7,8-TCDF	EMPC 4.63	EMPC 3.59	ND 2.6		3.61
1,2,3,7,8-PeCDF	ND 1.48	ND 1.3	ND 2.22		ND 1.67
2,3,4,7,8-PeCDF	ND 1.53	2.44	ND 2.39		2.12
1,2,3,4,7,8-HxCDF	ND 1.94	ND 1.66	ND 1.92		ND 1.84
1,2,3,6,7,8-HxCDF	ND 1.74	ND 1.56	ND 1.78		ND 1.69
2,3,4,6,7,8-HxCDF	ND 1.76	ND 1.67	ND 1.89		ND 1.77
1,2,3,7,8,9-HxCDF	ND 2.37	ND 2.15	ND 2.69		ND 2.40
1,2,3,4,6,7,8-HpCDF	ND 2.35	ND 2.01	ND 2.7		ND 2.35
1,2,3,4,7,8,9-HpCDF	ND 3.85	ND 3.23	ND 3.88		ND 3.65
OCDF	ND 7.93	ND 6.09	ND 9.84		ND 7.95
ITEF TEQ					
(ND=0;EMPC=0)	0.00917	1.22	0		0.41
(ND=0;EMPC=EMPC)	0.472	1.59	0		0.69
(ND=DL/2;EMPC=0)	3.38	3.58	4.23		3.73
)	3.72	3.85	4.23		3.93
(ND=DL;EMPC=EMPC)	6.97	6.12	8.46		7.18
Totals					
Total - TCDDs	18.4	25.1	19.1		20.9
Total - PeCDDs	4.84	13.4	4.38		7.54
Total - HxCDDs	6.53	6.22	5.53		6.09
Total - HpCDDs	0	0	0		0
Total - OCDD	9.17	0	0		3.06
Total - TCDFs	8.22	24.2	3.57		12.0
Total - PeCDFs	3.22	6.06	3.62		4.30
Total - HxCDFs	2.01	2.65	0		1.55
Total - HpCDFs	0	0	0		0
Total - OCDF	0	0	0		0.00
Total PCDD/Fs (ND=0; EMPC=0)	52.4	77.6	36.2		55.4
Total PCDD/Fs (ND=0; EMPC=EMPC)	68.9	105	36.2		70.0
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	112	139	101		117

ND = non detect
EMPC = estimated maximum possible concentration

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Eastman Chemical Kingsport, Tennessee
Liquid Chemical Destructor Stack

EPA METHOD 23
Determination of Dioxin/Furans Concentrations and Emission Rates

Compound	Run 1	Run 2	Run 3	Run 4	Average
Concentration Data (C_s)	gr/dscf	gr/dscf	gr/dscf	gr/dscf	gr/dscf
2,3,7,8-TCDD	ND 3.43E-13	ND 2.81E-13	ND 3.94E-13		ND 3.39E-13
1,2,3,7,8-PeCDD	ND 4.16E-13	ND 2.92E-13	ND 5.70E-13		ND 4.26E-13
1,2,3,4,7,8-HxCDD	ND 3.63E-13	ND 3.02E-13	ND 4.70E-13		ND 3.78E-13
1,2,3,6,7,8-HxCDD	ND 3.77E-13	ND 3.23E-13	ND 5.19E-13		ND 4.06E-13
1,2,3,7,8,9-HxCDD	ND 3.92E-13	ND 3.18E-13	ND 5.54E-13		ND 4.21E-13
1,2,3,4,6,7,8-HpCDD	ND 6.86E-13	ND 4.89E-13	ND 7.71E-13		ND 6.48E-13
OCDD	1.28E-12	EMPC 1.38E-12	ND 1.30E-12		1.32E-12
2,3,7,8-TCDF	EMPC 6.46E-13	EMPC 5.09E-13	ND 3.66E-13		5.07E-13
1,2,3,7,8-PeCDF	ND 2.07E-13	ND 1.84E-13	ND 3.12E-13		ND 2.34E-13
2,3,4,7,8-PeCDF	ND 2.14E-13	3.46E-13	ND 3.36E-13		2.99E-13
1,2,3,4,7,8-HxCDF	ND 2.71E-13	ND 2.35E-13	ND 2.70E-13		ND 2.59E-13
1,2,3,6,7,8-HxCDF	ND 2.43E-13	ND 2.21E-13	ND 2.50E-13		ND 2.38E-13
2,3,4,6,7,8-HxCDF	ND 2.46E-13	ND 2.37E-13	ND 2.66E-13		ND 2.49E-13
1,2,3,7,8,9-HxCDF	ND 3.31E-13	ND 3.05E-13	ND 3.78E-13		ND 3.38E-13
1,2,3,4,6,7,8-HpCDF	ND 3.28E-13	ND 2.85E-13	ND 3.80E-13		ND 3.31E-13
1,2,3,4,7,8,9-HpCDF	ND 5.38E-13	ND 4.58E-13	ND 5.46E-13		ND 5.14E-13
OCDF	ND 1.11E-12	ND 8.64E-13	ND 1.38E-12		ND 1.12E-12
ITEF TEQ					
(ND=0;EMPC=0)	1.28E-15	1.73E-13	0.00E+00		5.81E-14
(ND=0;EMPC=EMPC)	6.59E-14	2.26E-13	0.00E+00		9.71E-14
(ND=DL/2;EMPC=0)	4.72E-13	5.08E-13	5.95E-13		5.25E-13
(ND=DL/2;EMPC=EMPC)	5.19E-13	5.46E-13	5.95E-13		5.53E-13
(ND=DL;EMPC=EMPC)	9.73E-13	8.68E-13	1.19E-12		1.01E-12
Totals					
Total - TCDDs	2.57E-12	3.56E-12	2.69E-12		2.94E-12
Total - PeCDDs	6.76E-13	1.90E-12	6.16E-13		1.06E-12
Total - HxCDDs	9.12E-13	8.82E-13	7.78E-13		8.57E-13
Total - HpCDDs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDD	1.28E-12	0.00E+00	0.00E+00		4.27E-13
Total - TCDFs	1.15E-12	3.43E-12	5.02E-13		1.69E-12
Total - PeCDFs	4.50E-13	8.59E-13	5.09E-13		6.06E-13
Total - HxCDFs	2.81E-13	3.76E-13	0.00E+00		2.19E-13
Total - HpCDFs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDF	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total PCDD/Fs (ND=0; EMPC=0)	7.32E-12	1.10E-11	5.09E-12		7.80E-12
Total PCDD/Fs (ND=0; EMPC=EMPC)	9.62E-12	1.49E-11	5.09E-12		9.87E-12
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	1.56E-11	1.97E-11	1.42E-11		1.65E-11

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Eastman Chemical Kingsport, Tennessee
Liquid Chemical Destructor Stack

EPA METHOD 23
Determination of Dioxin/Furans Concentrations and Emission Rates

Compound	Run 1	Run 2	Run 3	Run 4	Average
Emission Rate (C_{AW})	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr
2,3,7,8-TCDD	ND 5.30E-11	ND 4.23E-11	ND 5.91E-11		ND 5.15E-11
1,2,3,7,8-PeCDD	ND 6.42E-11	ND 4.40E-11	ND 8.55E-11		ND 6.46E-11
1,2,3,4,7,8-HxCDD	ND 5.60E-11	ND 4.55E-11	ND 7.05E-11		ND 5.74E-11
1,2,3,6,7,8-HxCDD	ND 5.82E-11	ND 4.87E-11	ND 7.79E-11		ND 6.16E-11
1,2,3,7,8,9-HxCDD	ND 6.06E-11	ND 4.79E-11	ND 8.32E-11		ND 6.39E-11
1,2,3,4,6,7,8-HpCDD	ND 1.06E-10	ND 7.37E-11	ND 1.16E-10		ND 9.84E-11
OCDD	1.98E-10	EMPC 2.08E-10	ND 1.95E-10		2.00E-10
2,3,7,8-TCDF	EMPC 9.98E-11	EMPC 7.67E-11	ND 5.49E-11		7.71E-11
1,2,3,7,8-PeCDF	ND 3.19E-11	ND 2.78E-11	ND 4.69E-11		ND 3.55E-11
2,3,4,7,8-PeCDF	ND 3.30E-11	5.21E-11	ND 5.05E-11		4.52E-11
1,2,3,4,7,8-HxCDF	ND 4.18E-11	ND 3.55E-11	ND 4.06E-11		ND 3.93E-11
1,2,3,6,7,8-HxCDF	ND 3.75E-11	ND 3.33E-11	ND 3.76E-11		ND 3.61E-11
2,3,4,6,7,8-HxCDF	ND 3.79E-11	ND 3.57E-11	ND 3.99E-11		ND 3.78E-11
1,2,3,7,8,9-HxCDF	ND 5.11E-11	ND 4.59E-11	ND 5.68E-11		ND 5.13E-11
1,2,3,4,6,7,8-HpCDF	ND 5.07E-11	ND 4.30E-11	ND 5.70E-11		ND 5.02E-11
1,2,3,4,7,8,9-HpCDF	ND 8.30E-11	ND 6.90E-11	ND 8.19E-11		ND 7.80E-11
OCDF	ND 1.71E-10	ND 1.30E-10	ND 2.08E-10		ND 1.70E-10
ITEF TEQ					
(ND=0;EMPC=0)	1.98E-13	2.61E-11	0.00E+00		8.76E-12
(ND=0;EMPC=EMPC)	1.02E-11	3.40E-11	0.00E+00		1.47E-11
(ND=DL/2;EMPC=0)	7.29E-11	7.65E-11	8.93E-11		7.96E-11
(ND=DL/2;EMPC=EMPC)	8.02E-11	8.23E-11	8.93E-11		8.39E-11
(ND=DL;EMPC=EMPC)	1.50E-10	1.31E-10	1.79E-10		1.53E-10
Totals					
Total - TCDDs	3.97E-10	5.36E-10	4.03E-10		4.45E-10
Total - PeCDDs	1.04E-10	2.86E-10	9.25E-11		1.61E-10
Total - HxCDDs	1.41E-10	1.33E-10	1.17E-10		1.30E-10
Total - HpCDDs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDD	1.977E-10	0.00E+00	0.00E+00		6.59E-11
Total - TCDFs	1.77E-10	5.17E-10	7.54E-11		2.57E-10
Total - PeCDFs	6.94E-11	1.30E-10	7.65E-11		9.18E-11
Total - HxCDFs	4.33E-11	5.66E-11	0.00E+00		3.33E-11
Total - HpCDFs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDF	0.000E+00	0.00E+00	0.00E+00		0.00E+00
Total PCDD/Fs (ND=0; EMPC=0)	1.13E-09	1.66E-09	7.65E-10		1.18E-09
Total PCDD/Fs (ND=0; EMPC=EMPC)	1.49E-09	2.24E-09	7.65E-10		1.50E-09
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	2.41E-09	2.97E-09	2.13E-09		2.51E-09

CEC Project No. 142-644 Task 0001

Eastman Chemical Kingsport, Tennessee
Liquid Chemical Destructor Stack

EPA METHOD 23
Determination of Dioxin/Furans Concentrations and Emission Rates

Compound	Run 1	Run 2	Run 3	Run 4	Average
Concentration Data (C_{s2})	ng/dscm	ng/dscm	ng/dscm	ng/dscm	ng/dscm
2,3,7,8-TCDD	ND 7.86E-04	ND 6.43E-04	ND 9.01E-04		ND 7.77E-04
1,2,3,7,8-PeCDD	ND 9.52E-04	ND 6.69E-04	ND 1.30E-03		ND 9.75E-04
1,2,3,4,7,8-HxCDD	ND 8.31E-04	ND 6.91E-04	ND 1.07E-03		ND 8.66E-04
1,2,3,6,7,8-HxCDD	ND 8.63E-04	ND 7.40E-04	ND 1.19E-03		ND 9.30E-04
1,2,3,7,8,9-HxCDD	ND 8.98E-04	ND 7.27E-04	ND 1.27E-03		ND 9.64E-04
1,2,3,4,6,7,8-HpCDD	ND 1.57E-03	ND 1.12E-03	ND 1.76E-03		ND 1.48E-03
OCDD	2.93E-03	EMPC 3.16E-03	ND 2.97E-03		3.02E-03
2,3,7,8-TCDF	EMPC 1.48E-03	EMPC 1.17E-03	ND 8.37E-04		1.16E-03
1,2,3,7,8-PeCDF	ND 4.73E-04	ND 4.22E-04	ND 7.14E-04		ND 5.36E-04
2,3,4,7,8-PeCDF	ND 4.89E-04	7.92E-04	ND 7.69E-04		6.83E-04
1,2,3,4,7,8-HxCDF	ND 6.20E-04	ND 5.39E-04	ND 6.18E-04		ND 5.92E-04
1,2,3,6,7,8-HxCDF	ND 5.56E-04	ND 5.06E-04	ND 5.73E-04		ND 5.45E-04
2,3,4,6,7,8-HxCDF	ND 5.62E-04	ND 5.42E-04	ND 6.08E-04		ND 5.71E-04
1,2,3,7,8,9-HxCDF	ND 7.57E-04	ND 6.98E-04	ND 8.66E-04		ND 7.74E-04
1,2,3,4,6,7,8-HpCDF	ND 7.51E-04	ND 6.52E-04	ND 8.69E-04		ND 7.57E-04
1,2,3,4,7,8,9-HpCDF	ND 1.23E-03	ND 1.05E-03	ND 1.25E-03		ND 1.18E-03
OCDF	ND 2.53E-03	ND 1.98E-03	ND 3.17E-03		ND 2.56E-03
ITEF TEQ					
(ND=0;EMPC=0)	2.93E-06	3.96E-04	0.00E+00		1.33E-04
(ND=0;EMPC=EMPC)	1.51E-04	5.16E-04	0.00E+00		2.22E-04
(ND=DL/2;EMPC=0)	1.08E-03	1.16E-03	1.36E-03		1.20E-03
(ND=DL/2;EMPC=EMPC)	1.19E-03	1.25E-03	1.36E-03		1.27E-03
(ND=DL;EMPC=EMPC)	2.23E-03	1.99E-03	2.72E-03		2.31E-03
Totals					
Total - TCDDs	5.88E-03	8.15E-03	6.15E-03		6.72E-03
Total - PeCDDs	1.55E-03	4.35E-03	1.41E-03		2.43E-03
Total - HxCDDs	2.09E-03	2.02E-03	1.78E-03		1.96E-03
Total - HpCDDs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDD	2.93E-03	0.00E+00	0.00E+00		9.77E-04
Total - TCDFs	2.63E-03	7.85E-03	1.15E-03		3.88E-03
Total - PeCDFs	1.03E-03	1.97E-03	1.16E-03		1.39E-03
Total - HxCDFs	6.42E-04	8.60E-04	0.00E+00		5.01E-04
Total - HpCDFs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDF	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total PCDD/Fs (ND=0; EMPC=0)	1.67E-02	2.52E-02	1.16E-02		1.79E-02
Total PCDD/Fs (ND=0; EMPC=EMPC)	2.20E-02	3.41E-02	1.16E-02		2.26E-02
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	3.58E-02	4.51E-02	3.25E-02		3.78E-02

CEC Project No. 142-644 Task 0001

Eastman Chemical Kingsport, Tennessee
Liquid Chemical Destructor Stack

EPA METHOD 23
Determination of Dioxin/Furans Concentrations and Emission Rates

Compound	Run 1	Run 2	Run 3	Run 4	Average
Concentration Data (C_{s3})	ng/dscm @ 7% O_2	ng/dscm @ 7% O_2	ng/dscm @ 7% O_2	ng/dscm @ 7% O_2	ng/dscm @ 7% O_2
2,3,7,8-TCDD	ND 1.55E-03	ND 1.25E-03	ND 1.77E-03		ND 1.53E-03
1,2,3,7,8-PeCDD	ND 1.88E-03	ND 1.30E-03	ND 2.56E-03		ND 1.91E-03
1,2,3,4,7,8-HxCDD	ND 1.64E-03	ND 1.35E-03	ND 2.11E-03		ND 1.70E-03
1,2,3,6,7,8-HxCDD	ND 1.71E-03	ND 1.44E-03	ND 2.33E-03		ND 1.83E-03
1,2,3,7,8,9-HxCDD	ND 1.78E-03	ND 1.42E-03	ND 2.49E-03		ND 1.89E-03
1,2,3,4,6,7,8-HpCDD	ND 3.10E-03	ND 2.18E-03	ND 3.46E-03		ND 2.92E-03
OCDD	5.79E-03	EMPC 6.16E-03	ND 5.83E-03		5.93E-03
2,3,7,8-TCDF	EMPC 2.93E-03	EMPC 2.27E-03	ND 1.64E-03		2.28E-03
1,2,3,7,8-PeCDF	ND 9.35E-04	ND 8.23E-04	ND 1.40E-03		ND 1.05E-03
2,3,4,7,8-PeCDF	ND 9.67E-04	1.54E-03	ND 1.51E-03		1.34E-03
1,2,3,4,7,8-HxCDF	ND 1.23E-03	ND 1.05E-03	ND 1.21E-03		ND 1.16E-03
1,2,3,6,7,8-HxCDF	ND 1.10E-03	ND 9.87E-04	ND 1.12E-03		ND 1.07E-03
2,3,4,6,7,8-HxCDF	ND 1.11E-03	ND 1.06E-03	ND 1.19E-03		ND 1.12E-03
1,2,3,7,8,9-HxCDF	ND 1.50E-03	ND 1.36E-03	ND 1.70E-03		ND 1.52E-03
1,2,3,4,6,7,8-HpCDF	ND 1.48E-03	ND 1.27E-03	ND 1.71E-03		ND 1.49E-03
1,2,3,4,7,8,9-HpCDF	ND 2.43E-03	ND 2.04E-03	ND 2.45E-03		ND 2.31E-03
OCDF	ND 5.01E-03	ND 3.85E-03	ND 6.22E-03		ND 5.03E-03
ITEF TEQ					
(ND=0;EMPC=0)	5.79E-06	7.72E-04	0.00E+00		2.59E-04
(ND=0;EMPC=EMPC)	2.98E-04	1.01E-03	0.00E+00		4.35E-04
(ND=DL/2;EMPC=0)	2.14E-03	2.27E-03	2.67E-03		2.36E-03
(ND=DL/2;EMPC=EMPC)	2.35E-03	2.44E-03	2.67E-03		2.49E-03
(ND=DL;EMPC=EMPC)	4.40E-03	3.87E-03	5.34E-03		4.54E-03
Totals					
Total - TCDDs	1.16E-02	1.59E-02	1.21E-02		1.32E-02
Total - PeCDDs	3.06E-03	8.48E-03	2.77E-03		4.77E-03
Total - HxCDDs	4.13E-03	3.94E-03	3.49E-03		3.85E-03
Total - HpCDDs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDD	5.79E-03	0.00E+00	0.00E+00		1.93E-03
Total - TCDFs	5.19E-03	1.53E-02	2.26E-03		7.59E-03
Total - PeCDFs	2.03E-03	3.83E-03	2.29E-03		2.72E-03
Total - HxCDFs	1.27E-03	1.68E-03	0.00E+00		9.82E-04
Total - HpCDFs	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total - OCDF	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Total PCDD/Fs (ND=0; EMPC=0)	3.31E-02	4.91E-02	2.29E-02		3.50E-02
Total PCDD/Fs (ND=0; EMPC=EMPC)	4.35E-02	6.64E-02	2.29E-02		4.43E-02
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	7.08E-02	8.79E-02	6.38E-02		7.42E-02

CEC Project No. 142-644 Task 0001

Eastman Chemical Kingsport, Tennessee
Liquid Chemical Destructor Stack

Summary of Results
EPA METHOD 23

Determination of Dioxin/Furans Concentrations and Emission Rates

Example Calculations Run 1

Stack Pressure, Absolute, in. Hg $P_S = P_{bar} + (P_g / 13.6) =$	28.649
Volume Sampled at Stand. Cond., cu. ft. $Vm(std) =$ (Vm * Y *(Pbar + DH / 13.6) * Tstd) / (Pstd * (Tm + 460) =	110.523
Method 4 Calculations: Volume of Water Vapor at Std. Cond., SCF $V_{WC(std)} = 0.04706 * V_C =$	9.30
Vol. of Water Vapor in Silica Gel at Std. Cond., SCF $V_{wsg(std)} = 0.04715 * W_C =$	1.76
Moisture Content of Gas Stream $B_{WS1} = (V_{WC(std)} + V_{wsg(std)}) / (V_{m(std)} + V_{WC(std)} + V_{wsg(std)}) =$	0.091
Percent Moisture in Stack $P_{MV1} = 100 * (V_{WC(std)} + V_{wsg(std)}) / (V_{m(std)} + V_{WC(std)} + V_{wsg(std)}) =$	9.1
Saturated Stack Moisture using Stack Temperature (°F): Note if $\%S_{VP} > 100\% = 100\%$ $P_{MV1S} = \%S_{VP} = (100/Ps) * 10^{(6.6921-(3144/(T+390.86)))}$	9.6
Reported Stack Moisture according to Method 4 Section 12.1.7 In saturated or moisture laden gas streams, the lower Bws (PMV1 or PMV1S) is considered correct	9.1
Mole Fraction of Dry Gas $M_{FD1} = (100 - P_{MV}) / 100 =$	0.909
Mole. Wt. Stack Gas, Dry Basis, lb/lb mole $Md = 0.44 * \%CO2 + 0.32 * \%O2 + 0.28 * (100 - \%CO2 - \%O2) =$	29.488
Mole. Wt. Stack Gas, Wet Basis, lb/lb mole $M_S = M_d * (1 - B_{ws}) + 18.0 * B_{ws} =$	28.442
Avg. Stack Velocity, ft/sec $VS = 85.49 * CP * \sqrt{DPavg} * \sqrt{(TS + 460) / (PS * MS)} =$	38.8
Gas Volume Flow, Dry Std. Cond. CFM $Q_{SD} = (60 \text{ sec/min} * (1-B_{ws}) * V_s * A * ((T_{std} * P_s) / (T_{s(abs)} * P_{std}))$	18,009
Actual Gas Volume Flow, CFM $Q_A = V_S * A * 60 \text{ sec/min} =$	22,424
Gas Volume Flow, Wet Std. Cond., CFM $Q_{SW} = Q_{SD} * [1/(1-B_{WS})] =$	19,813

Summary of Results
EPA METHOD 23

Determination of Dioxin/Furans Concentrations and Emission Rates

Example Calculations Run 1

Area of Nozzle, ft^2
$A_n = ((D_n / 2)^{\wedge 2} * 3.14159)/144 =$ 0.00034

Percent Isokinetic
$I = (0.0945 * (TS + 460) * Vm (STD)) / (q * VS * PS * (1 - Bws) * An) =$ 97.1

Alternative Method 5 Posttest Calibration (ALT-009) Criteria: (Y± 0.05)
$Yqa = (\theta/Vm) * ((0.319*Tm)/(\Delta H@*(Pb+(\Delta H_{avg}/13.6)))*(29/Md))^{\wedge 1/2} * (\Delta H_{avg})^{\wedge 1/2} =$ 1.030

Determination of Dioxin/Furans Concentrations and Emission Rates

2,3,7,8-TCDD, gr/dscf (At Standard Conditions)
$C_S =$ mn picogram * (1gram / 1E+12 picogram) *(15.43235835 grains/gram) / $V_{m\,STD}$= ND 3.43E-13

2,3,7,8-TCDD, lbs/hr (At Standard Conditions)
$C_{AW} = C_s * Q_{SD}$ / (7000 grains/lb) * (60 mins/hr) = ND 5.30E-11

2,3,7,8-TCDD, ng/dscm (At Standard Conditions)
$C_{S2} =$ mn picogram * (1ngram /1000 picogram) / (Vm STD * 0.028316847 m^3 / ft^3) = ND 7.86E-04

2,3,7,8-TCDD, ng/dscm corrected to 7% O2 (At Standard Conditions)
$C_{S3} = C_{s2}$ * ((20.9 - 7) / (20.9 - measured O_2 concentration dry basis)) = ND 1.55E-03

Standard Conditions 68 Deg. F, 29.92 in. Hg
Pstd = 29.92 in. Hg
Tstd = 528 °R

APPENDIX B

FIELD DATA SHEETS

EPA Method 1
Determination of Sampling Ports and Points

Client Eastman Chemical City/State Kingsport, TN

Sampling Location LCD Stack Date 09/30/2014

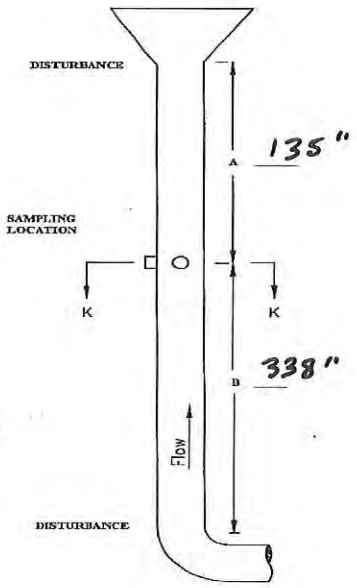
Sampling Location Dimensions, in inches:

From Far Wall to Outside of Port 45.50 ✓

Nipple Length 3.50

Depth of Duct 42.00

Width (Rectangular Duct) —



Equivalent Diameter Calculation (DE):

$$DE = \frac{2 \times \text{Length} \times \text{Width}}{\text{Length} + \text{Width}} = \frac{2(\ -\ )(\ -\ )}{(\ -\ +\ -\ )} = -$$

Distance to Ports From Nearest Flow Disturbance:

	Upstream - A	Downstream - B
Dimensions in Inches	135" ✓	338" ✓
Duct Diameters	3.21 ✓	8.05 ✓

Stack Area, in Square Feet 9.621 ✓

Calculations By PRS

Schematic of Sampling Location

Location of Traverse Points in Circular Stacks					
	4	6	8	10	12
1	6.7	4.4	3.2	2.6	2.1
2	25.0	14.6	10.5	8.2	6.7
3	75.0	29.6	19.4	14.6	11.8
4	93.3	70.4	32.3	22.6	17.7
5		85.4	67.7	34.2	25.0
6		95.6	80.6	65.8	35.6
7			89.5	77.4	64.4
8			96.8	85.4	75.0
9				91.8	82.3
10				97.4	88.2
11					93.3
12					97.9

Location of Traverse Points in Rectangular Stacks							
	2	3	4	5	6	7	8
1	25.0	16.7	12.5	10.0	8.3	7.1	6.3
2	75.0	50.0	37.5	30.0	25.0	21.4	18.8
3		83.3	62.5	50.0	41.7	35.7	31.3
4			87.5	70.0	58.3	50.0	43.8
5				90.0	75.0	64.3	56.3
6					91.7	78.6	68.8
7						92.9	81.3
8							93.8
9							
10							
11							
12							

Point	% of Stack ID	Stack ID, in.	Distance From Inside Wall, in.	Nipple Length, in.	Distance From Outside of Port, in.
1	4.4	42"	1.85	3.5	5.35
2	14.6		6.13		9.63
3	29.6		12.43		15.93
4	70.4		29.57		33.07
5	85.4		35.87		39.37
6	95.6		40.15		43.65

Stack Diameter = 12 - 24 inches Relocate to 0.50 inches from stack wall
Stack Diameter > 24 inches Relocate to 1.00 inches from stack wall

Audited by: BU (Personnel) Date: 10/14/14 Completeness ✓ Legibility ✓ Accuracy ✓

Audited by: WDB (Team Leader) Date: 10/14/14 Specifications ✓ Reasonableness ✓

EPA Method 2
Determination of Stack Gas Velocity, Volumetric Flow Rate and Cyclonic Flow

Client Eastman Chemical
Sampling Location Liquid Chemical Destructor
Run Date 09/29/14
Barometric Pressure, in. Hg 28.64
Static Pressure, in. H_2O -0.28
Pitot Tube Coefficient 0.84

City, State Kingsport, TN
Operators BLL, KBD
Time 1606
Pitot Tube I.D. No. 200,711
Date Calibrated 06/13/14
Leak Check, in. H_2O <0.1 @ +4.5/-3.0

Field Data

Traverse Point Number	Velocity Head Δp Inches H_2O		Stack Temperature °F		Cyclonic Flow Determination			
					Δp, at 0° Reference		Angle Which Yields a Null Δp	
	A	B	A	B				
1	0.40	0.44	120	122	0.06	0.06	6	7
2	0.43	0.48	121	122	0.02	0.02	3	3
3	0.45	0.46	121	123	0.01	0.0	2	0
4	~~0.49~~ 0.50	0.46	122	123	-0.13	-0.15	10	9
5	0.51	0.48	123	123	-0.06	-0.06	17	17
6	0.43	0.42	122	122	-0.04	-0.04	18	22
		✓		✓				✓
Averages		0.455		122.0				9.50°

Stack Temperature, Dry, °F (A) 114
Stack Temperature, Wet °F (B) 112 ✓
Difference (A - B) 2
Preliminary Percent Moisture 9.5

Comments

Audited by: KMO (Personnel) Date: 1/30/14 Completeness ✓ Legibility ✓ Accuracy ✓
Audited by: WDG (Team Leader) Date: 10/14/14 Specifications ✓ Reasonableness ✓

Civil & Environmental Consultants, Inc.

Method 23 – Moisture Determination and Sample Recovery for Dioxins/Furans
Data Analysis Sheet & ALT52

Client Name: Eastman Chemical
City/State: Kingsport, TN
Sampling Location: Liquid Chemical Destructor
Clean-Up Box Number: M23
Chain of Custody: Date Received: 10/02/14

Project Number: 142-644
Sample Date: 09/30/14
Samples Recovered: BU
Recovery Date: 09/30/14
Received By: PRJ Locked? ✓

Equipment Documentation

Run Number	1	2	3	Field Blank – For Pre Run 2
Sample ID Number	142644-02	142644-03	142644-04	142644-01
Sample Box Number	BU 142644-02 F	B	F	B
Probe Number	200.118	200.121	200.120	200.121

Sample Recovery – Container #1 (Filter)

Filter Container #	M23	M23	M23	M23
Particulate Description	None visible	None visible	None visible	None
Filter Container Sealed?	✓	✓	✓	✓

Sample Recovery – Container #2 (Front Rinse)

Probe Rinse Container #	142644-02	142644-03	142644-04	142644-01
Rinsing Solution	Acetone	Acetone	Acetone	Acetone
Sample Container Sealed?	✓	✓	✓	✓
Liquid Level Marked?	✓	✓	✓	✓

Sample Recovery – Container #3 (Front Rinse)

Probe Rinse Container #	142644-02	142644-03	142644-04	142644-01
Rinsing Solution	Toluene	Toluene	Toluene	Toluene
Sample Container Sealed?	✓	✓	✓	✓
Liquid Level Marked?	✓	✓	✓	✓

Sample Recovery – Container #4 (Sorbent Trap)

Trap Container #	142644-02	142644-03	142644-04	142644-01
Trap Container Ends Sealed with Teflon?	✓	✓	✓	✓
Trap Container Sealed with Tin Foil?	✓	✓	✓	✓

Sample Recovery – Container #5 (Back Half Rinse)

Probe Rinse Container #	Same as Front Rinse # 2 – Same container →			
Rinsing Solution	Acetone	Acetone	Acetone	Acetone
Sample Container Sealed?	✓	✓	✓	✓
Liquid Level Marked?	✓	✓	✓	✓

Sample Recovery – Container #6 (Back Half Rinse)

Probe Rinse Container #	Same as front rinse # 3 – Same container →			
Rinsing Solution	Toluene	Toluene	Toluene	Toluene
Sample Container Sealed?	✓	✓	✓	✓
Liquid Level Marked?	✓	✓	✓	✓

Analysis of Moisture and Sample Recovery – Container No. 7

Reagent Recovery Container	2	3	4	1
Imp. Absorbing Solution	DI H_2O	DI H_2O	DI H_2O	DI H_2O
Description of Reagent	clear	clear	clear	clear
Reagent Level Marked?	—	—	—	—
Final Volume, ml	397.7	411.6	408.9	200
Initial Volume, ml	200	200	200	200
Net Condensed Volume, ml	197.7 ✓	211.6 ✓	208.9 ✓	0 ✓
Rinse with DI H_2O	—	—	—	—
Comment:	moisture determination	moisture determination	moisture determination	moisture determination

Analysis of Moisture and Sample Recovery – Silica Gel

Silica Gel Recovery Container #	A	B	A	B	A	B	A	B
Percent Silica Gel Spent	95%	20%	90%	10%	85%	10%	0%	0%
Final Weight, g	437.4		429.3		429.8		400	
Initial Weight, g	400		400		400		400	
Net Absorbed Water, g	37.4 ✓		29.3 ✓		29.8 ✓		0 ✓	
Total Moisture Collected, g	235.1 ✓		240.9 ✓		238.7 ✓		0 ✓	

Method 23 – Moisture Determination and Sample Recovery for Dioxins/Furans
Data Analysis Sheet Continued

Reagent Blanks

Absorbing Reagent Blank	DI H_2O	Absorbing Blank ID#	NA
Absorbing Reagent Blank		Absorbing Blank ID#	
Rinsing Reagent Blank	Acetone	Rinsing Blank ID #	142644-05
Rinsing Reagent Blank	$MeCl_2$	Rinsing Blank ID #	NA-
Rinsing Reagent Blank	Toluene	Rinsing Blank ID #	142644-06
Rinsing Reagent Blank		Rinsing Blank ID #	
Filter Blank (1)	Filter Blank / XAD-2 Trap Blank	Filter Blank ID #	142644-07 / 142644-08
Analyst Initials	BLS	Reviewer Initials	

Field Balance Check

Balance ID	Wt.(200 g)	Wt. (500 g)	Wt. (1,000 g)	
600.057	200.0	499.9	1000.0	9/29/14
600.057	200.0	499.9	999.9	9/30/14

Moisture Recovery by weight

Run No.: 1	Sample Train A			
Impinger Bottle Weight	Initial wt. (g)	Final Wt (g)	Difference (gain) wt.	
1st Imp. Bottle A1	479.2	678.1	198.9 ✓	
2nd Imp. Bottle A2	693.9	680.5	-3.40 ✓	
3rd Imp. Bottle A3	701.7	700.5	-1.2 ✓	
4th Imp. Bottle A4	604.6	608.0	3.4 ✓	
5th Imp. Bottle A5	803.2	833.5	30.3 ✓	
6th Imp. Bottle A6	797.0	804.1	7.1 ✓	
7th Imp. Bottle				
		TC=	235.1 g ✓	

Run No.: 2	Sample Train B			
Impinger Bottle Weight	Initial wt. (g)	Final Wt (g)	Difference (gain) wt.	
1st Imp. Bottle B1	463.7	674.1	B1 ~~210.4~~ 210.4 ✓	
2nd Imp. Bottle B2	677.9	676.2	-1.70 ✓	
3rd Imp. Bottle B3	693.8	694.4	0.60 ✓	
4th Imp. Bottle B4	613.1	615.4	2.3 ✓	
5th Imp. Bottle B5	798.0	824.1	26.1 ✓	
6th Imp. Bottle B6	813.3	816.5	3.2 ✓	
7th Imp. Bottle				
		TC=	240.9 g ✓	

Run No.: 3	Sample Train C			
Impinger Bottle Weight	Initial wt. (g)	Final Wt (g)	Difference (gain) wt.	
1st Imp. Bottle C1	495.9	705.9	210.0 ✓	
2nd Imp. Bottle C2	692.3	690.4	-1.90 ✓	
3rd Imp. Bottle C3	701.1	696.8	-4.30 ✓	
4th Imp. Bottle C4	594.9	600.0 600.0	5.10 ✓	
5th Imp. Bottle C5	808.0	~~823.9~~ 833.9	25.90 ✓	
6th Imp. Bottle C6	800.9	804.8	3.90 ✓	
7th Imp. Bottle				
		TC=	238.7 g	

Run No.: Field Blank	Sample Train B			
Impinger Bottle Weight	Initial wt. (g)	Final Wt (g)	Difference (gain) wt.	
1st Imp. Bottle	463.7	463.7	0	
2nd Imp. Bottle	677.9	677.9	0	
3rd Imp. Bottle	693.8	693.8	0 ✓	
4th Imp. Bottle	613.1	613.1	0	
5th Imp. Bottle	798.0	798.0	0	
6th Imp. Bottle	813.3	813.3	0	
7th Imp. Bottle				

Isokinetic Field Data Sheet - EPA Method 23

Client: Eastman Chemical | Run Number: 1
City/State: Kingsport, Tennessee | Date: 09/30/2014
Sampling Location: Liquid Chemical Destructor (LCD) Stack | Operators: KMD, BW

Bar. Press., In. Hg: 28.67
Static Press., In. H_2O: -0.28
Meter Box No.: 300.388 D
Sample Box No.: F
Probe/Pitot No.: 200. 118
Probe Temp. Setting: 250
Sample ID No.: 142644-02
Filter No.: Method 23 Toluene Rinse

NOMOGRAPH SET-UP: K Factor ~~3.14~~ BW 3.1372
ΔH @ 1.788 Y = 1.022
Meter Temp. ~~75~~ 80
Stack Temp. 122
Pitot Coeff. 0.84
% Moisture 11
C Factor —
Start Time 0911

Avg. Δ P: 0.46
Ref. Δ P: —
Desired Nozzle: 0.26
Nozzle No.: 0.249
Nozzle Calibration: .248, .249, .249
Nozzle Diameter: 0.249
End Time: 1220

LEAK CHECKS
Pre-Test 0.002 @ 13 In. Hg.
Post-Test 0.002 @ 8 In. Hg.
Pre-Test Pitot <0.1 @ +5.4, -8.2 In. H_2O
Post-Test Pitot <0.1 @ +2.6, -3.5 In. H_2O
Observer: John Webb
Agency: TDEC

Sample Point		Clock Time	Dry Gas Meter Cubic Feet	Pitot Reading Δ P In. H_2O	Orifice Setting ΔH Inches H_2O Ideal	Orifice Setting ΔH Inches H_2O Actual	Dry Gas Meter Temp. °F	Pump Vacuum Inches Hg	Stack Temp °F	Probe Temp °F	Filter Box °F	Imp. Temp °F	< 68 Cond. °F
	A 1	0	713.022	0.40	1.25	1.25	~~70~~ 52	4	96	250	253	36	40
	1	7.5	717.52	0.45	1.41	1.40	69	5	116	248	250	52	58
	2	15	722.05	0.46	1.44	1.45	50	5	92	251	251	30	30
	2	22.5	726.60	0.45	1.41	1.40	50	6	104	251	249	43	52
	3	30	731.53	0.42	1.32	1.30	60	6.5	98	250	251	36	46
	3	37.5	736.30	0.42	1.32	1.30	59	6.5	94	250	254	27	41
	4	45	741.05	0.42	1.32	1.30	57	6.5	94	248	242	33	42
	4	52.5	745.75	0.42	1.32	1.30	68	6	104	246	250	43	52
	5	60	750.40	0.40	1.25	1.25	~~70~~ 77	6	115	246	247	55	61
	5	67.5	754.51	0.40	1.25	1.25	80	6	118	246	250	58	63
	6	75	759.76	0.40	1.25	1.25	80	6	117	250	247	60	64
Start B 769.482	6	82.5	764.40	0.38	1.19	1.20	80	6	118	250	247	64	66
	B 1	90	769.132	0.38	1.19	1.20	80	6	115	250	249	64	64
	1	97.5	774.00	0.37	1.16	1.15	80	6	118	253	246	53	62
	2	105	778.53	0.40	1.25	1.25	80	6.5	119	250	248	55	59
	2	112.5	783.16	0.40	1.25	1.25	81	6.5	119	250	250	51	61
	3	120	787.82	0.40	1.25	1.25	82	7	119	250	250	57	62
	3	127.5	792.50	0.40	1.25	1.25	83	7	119	248	249	59	61
ISO 99.8%	4	135	797.12	0.45	1.41	1.45	83	7	119	247	250	61	62
	4	142.5	802.15	0.45	1.41	1.40	84	7.5	120	249	246	62	63
	5	150	807.18	0.45	1.41	1.40	84	7.5	120	251	248	63	64
	5	157.5	812.27	0.45	1.41	1.40	85	7	120	251	248	62	64
	6	165	817.34	0.42	1.32	1.30	85	7	119	252	249	62	64
	6	172.5	~~822~~ 822.24	0.42	1.32	1.30	86	7	120	251	~~438~~ 438	63	63
		180	827.125										
		with Post-chg leak @	-0.350										
		113.753	114.103	~~0.405~~ 0.417	✓	1.302	73.096		112.2				

Comments: 14 0² 6 CO_2 / Post Port A 0.002 @ 13" Pre Port B leak checks 0.000 @ 15" 769.482 Final - 769.132 Initial = 0.35 cf
235.1g moisture catch 9.3%

Isokinetic Check: 97.98

Audited by: BES (Personnel) Date: 10/14/14 Completeness ✓ Legibility ~ Accuracy ✓
Audited by: _____ (Team Leader) Date: / / Specifications ✓ Reasonableness ✓

CEC Civil & Environmental Consultants, Inc.

Isokinetic Field Data Sheet - EPA Method 23

Client: Eastman Chemical | Run Number: 2
City/State: Kingsport, Tennessee | Date: 09/30/2014
Sampling Location: Liquid Chemical Destructor (LCD) Stack | Operators: KMD

Bar. Press., In. Hg: 28.64 | *NOMOGRAPH SET-UP:* K Factor: 3.1778 | *LEAK CHECKS*
Static Press., In. H_2O: -0.28 | ΔH @ 1.782 | Y = 1.022 | Avg. Δ P: 0.42 | Pre-Test: 0.001 @ 15 In. Hg.
Meter Box No.: 300.388 D | Meter Temp.: 93 | Ref. Δ P: — | Post-Test: 0.002 @ 10 In. Hg.
Sample Box No.: B | Stack Temp.: 119 | Desired Nozzle: .2626 | Pre-Test Pitot <0.1 @ +2.7, -3.3 In. H_2O
Probe/Pitot No.: 200.121 | Pitot Coeff.: 0.84 | Nozzle No.: glass | Post-Test Pitot <0.1 @ +2.1, -3.4 In. H_2O
Probe Temp. Setting: 250 | % Moisture: 11 | Nozzle Calibration: .248 .248 .247
Sample ID No.: 142644-03 | C Factor: — | Nozzle Diameter: 0.248 | Observer: John Webb
Filter No.: Method 23 | Start Time: 1242 | End Time: 1549 | Agency: TDEC

Sample Point		Clock Time	Dry Gas Meter Cubic Feet	Pitot Reading Δ P In. H_2O	Orifice Setting ΔH Inches H_2O Ideal	Orifice Setting ΔH Inches H_2O Actual	Dry Gas Meter Temp. °F	Pump Vacuum Inches Hg	Stack Temp °F	Probe Temp °F	Filter Box °F	Imp. Temp °F	Cond. °F
A	1	0	827.461	0.44	1.38	1.40	87	5.5	120	250	251	64	65
	1	7.5	832.36	0.44	1.38	1.40	88	5.5	121	250	251	64	66
	2	15	837.12	0.43	1.35	1.35	88	6.0	121	250	249	51	63
839.7	2	22.5	842.08	0.43	1.35	1.35	88	6.5	121	252	249	48	62
	3	30	847.00	0.41	1.29	1.30	89	6.5	121	250	250	47	67
	3	37.5	851.75	0.41	1.29	1.30	89	7	122	251	248	47	62
	4	45	856.50	0.41	1.29	1.30	90	6.5	122	249	249	47	61
	4	52.5	861.32	0.41	1.29	1.30	90	7	122	251	249	47	63
	5	60	866.15	0.39	1.24	1.25	90	7	122	251	250	47	65
	5	67.5	871.15	0.41	1.29	1.30	91	7	122	250	249	48	65
	6	75	875.58	0.37	1.15	1.15	91	7.5	121	250	250	49	66
	6	82.5	880.20	0.37	1.15	1.15	91	7.5	121	250	252	50	65
885.160 ice added to train →	B	1	90	884.904	0.38	1.21	1.20	90	7.5	122	253	250	55	65
	1	97.5	889.81	0.37	1.18	1.20	91	7.5	122	250	249	53	64
	2	105	894.51	0.39	1.24	1.25	91	7.5	122	249	251	55	63
	2	112.5	899.26	0.39	1.24	1.25	91	7.5	122	250	250	57	60
	3	120	904.03	0.41	1.30	1.30	91	8.0	123	248	250	56	55
	3	127.5	908.94	0.40	1.27	1.25	91	7.5	123	250	249	58	53
	4	135	913.72	0.42	1.33	1.35	91	8.0	123	251	250	56	54
	4	142.5	918.67	0.43	1.35	1.35	92	8.0	123	250	248	55	55
	5	150	923.65	0.43	1.35	1.35	93	8.0	123	249	247	55	58
	5	157.5	928.65	0.43	1.35	1.35	91	7.5	123	251	247	57	58
	6	165	933.59	0.43	1.35	1.35	91	8.0	123	252	247	58	59
	6	172.5	938.61	0.37	1.18	1.20	91	8.0	123	251	248	59	60
		180	943.248										
			-0.256	for Post change leak checks ✓									
			115.531 ✓	0.407 Bls		1.290	90.3 ✓		122.0 ✓				

Comments: Leak checks Post A 0.003 @ 12" Pre B 0.002 @ 13" Final 885.160 − Initial 884.904 = 0.256 cf
Post A 240.1 moisture content 9.6%

Isokinetic Check: 98.83

Audited by: BV (Personnel) Date: 10/14/14 Completeness ✓ Legibility ✓ Accuracy ✓
Audited by: _____ (Team Leader) Date: / / Specifications ✓ Reasonableness ✓

Civil & Environmental Consultants, Inc.

Isokinetic Field Data Sheet - EPA Method 23

Client: Eastman Chemical — Run Number: 3

City/State: Kingsport, Tennessee — Date: 09/30/2014

Sampling Location: Liquid Chemical Destructor (LCD) Stack — Operators: KMN

Bar. Press., In. Hg: 28.86

Static Press., In. H_2O: -.28

Meter Box No.: 300,388D

Sample Box No.: F

Probe/Pitot No.: 200,120

Probe Temp. Setting: 250

Sample ID No.: 142644-04

Filter No.: Method 23

NOMOGRAPH SET-UP: K Factor 3.2480

ΔH @ 1.788 — Y = 1.022

Meter Temp.: 80

Stack Temp.: 121

Pitot Coeff.: 0.84

% Moisture: 10%

C Factor: —

Start Time: 1606

Avg. Δ P: 0.41

Ref. Δ P: —

Desired Nozzle: 0.26

Nozzle No.: glass

Nozzle Calibration: .248 .249 .249

Nozzle Diameter: 0.249

End Time: ~~1942~~ 1912

LEAK CHECKS

Pre-Test: 0.003 @ 20 In. Hg.

Post-Test: 0.002 @ 9 In. Hg.

Pre-Test Pitot <0.1 @ +7.6, -4.3 In. H_2O

Post-Test Pitot <0.1 @ +8.3, -3.2 In. H_2O

Observer: John Webb

Agency: TDEC

Sample Point	Clock Time	Dry Gas Meter Cubic Feet	Pitot Reading Δ P In. H_2O	Orifice Setting ΔH Inches H_2O Ideal	Orifice Setting ΔH Inches H_2O Actual	Dry Gas Meter Temp. °F	Pump Vacuum Inches Hg	Stack Temp °F	Probe Temp °F	Filter Box °F	Imp. Temp °F	Cond. °F
1	0	943.553	0.41	1.33	1.35	90	5	123	250	248	58	53
1	7.5	948.26	0.41	1.33	1.35	90	5	123	251	250	53	51
2	15	952.86	0.40	1.30	1.30	91	5.5	123	250	250	51	51
2	22.5	957.73	0.42	1.36	1.35	92	6	123	250	250	51	52
3	30	962.70	0.41	1.33	1.35	92	6	123	251	253	51	44
3	37.5	967.60	0.41	1.35	1.35	92	6.5	123	249	250	52	44
4	45	972.51	0.41	1.35	1.35	92	6.5	123	251	247	53	43
4	52.5	977.40	0.41	1.35	1.35	92	6.5	123	250	248	53	42
5	60	982.30	0.39	1.27	1.30	93	7	123	250	248	53	46
5	67.5	987.08	0.40	1.30	1.30	91	6.5	123	251	250	54	44
6	75	991.92	0.39	1.27	1.30	92	6.5	123	250	249	55	45
6	82.5	996.73	0.39	1.27	1.30	92	6.5	122	250	250	55	45
1	90	1001.567	0.37	1.20	1.20	91	6.5	122	250	250	47	50
1	97.5	1006.45	0.37	1.20	1.20	91	6.5	122	250	248	55	40
2	105	1011.00	0.39	1.27	1.25	91	6.5	123	248	251	55	47
2	112.5	1015.63	0.37	1.20	1.20	92	7	123	249	252	55	47
3	120	1020.31	0.40	1.30	1.30	91	7	122	249	248	56	48
3	127.5	1025.12	0.40	1.30	1.30	91	7.0	122	250	249	57	49
4	135	1029.93	0.44	1.43	1.45	91	7.5	122	249	248	58	52
4	142.5	1035.26	0.45	1.46	1.45	91	7.5	122	252	250	55	46
5	150	1040.53	0.44	1.43	1.45	91	7.5	122	250	250	54	47
5	157.5	1045.71	0.44	1.43	1.45	91	7.5	121	250	249	54	48
6	165	1050.84	0.39	1.27	1.30	90	7	120	250	248	55	43
6	172.5	1055.87	0.40	1.30	1.30	90	7.5	120	250	250	54	48
	180	1060.814	Post-change									
		-0.209	bulk checks									
		117.052	0.405		1.325	91.25		122.3				

Bag of ice added

Comments: Leak checks Post Port A 0.002 @ 13" Pre Port B 0.002 @ 11 — Final 1001.776 − Initial 1001.567 = 0.209 cf

Isokinetic Check: _____

Audited by: BU (Personnel) Date: 10/14/14 Completeness ✓ Legibility ~ Accuracy ✓

Audited by: _____ (Team Leader) Date: / / Specifications ✓ Reasonableness ~

Civil & Environmental Consultants, Inc.

RESULTS.TXT

Run averages corrected for bias
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

Run	CO2 %	
1		
2		
3		
4		
5		
6	5.825	Run 1 BLS
7	5.876	Run 2
8	5.809	Run 3

WAO

Calibration Error Test, Run 61 STRATA Version 3.2.112
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

	Reference Cylinder Numbers			
	Zero	Low-range	Mid-range	High-range
CO2	SX36169		EB0049430	EB0020402
	SX36169		EB0049430	EB0020402

Date/Time	09-30-2014	12:10:34	PASSED
Analyte	CO2		
Units	%		
Zero Ref Cyl	0.000		
Zero Avg	-0.003		
Zero Error%	0.0%		
Low Ref Cyl			
Low Avg			
Low Error%			
Mid Ref Cyl	9.990		
Mid Avg	10.023		
Mid Error%	0.1%		
High Ref Cyl	17.900		
High Avg	17.894		
High Error%	0.0%		

Calibration Error Test End

W60

Initial System Bias Check, Run 8 | STRATA Version 3.2.112
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

	Reference Cylinder Numbers	
	Zero	Span
CO2	SX36169	EB0049430
	SX36169	EB0049430

Date/Time	09-30-2014	12:14:59	PASSED

Analyte	CO2
Units	%
Zero Ref Cyl	0.000
Zero Cal	-0.003
Zero Avg	0.002
Zero Bias%	0.0%
Zero Drift%	
Span Ref Cyl	9.990
Span Cal	10.023
Span Avg	9.912
Span Bias%	0.4%
Span Drift%	

System Bias Check End

W06

Test Run 6 | STRATA Version 3.2.112

	CO2
	%
Begin calculating run averages	
09-30-2014 12:17:47	5.548
09-30-2014 12:18:47	5.826
09-30-2014 12:19:47	5.835
09-30-2014 12:20:47	5.812
09-30-2014 12:21:47	5.830
Run Averages	CO2
	%
09-30-2014 12:21:53	5.771

Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor
Test Run 6 End

W&O

Final System Bias Check, Run 8 | STRATA Version 3.2.112
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

	Reference Cylinder Numbers	
	Zero	Span
CO2	SX36169	EB0049430
	SX36169	EB0049430

Date/Time	09-30-2014	12:26:18	PASSED
Analyte	CO2		
Units	%		
Zero Ref Cyl	0.000		
Zero Cal	-0.003		
Zero Avg	-0.003		
Zero Bias%	0.0%		
Zero Drift%	0.0%		
Span Ref Cyl	9.990		
Span Cal	10.023		
Span Avg	9.885		
Span Bias%	0.6%		
Span Drift%	-0.1%		
Ini Zero Avg	0.002		
Ini Span Avg	9.912		
Run Avg	5.771		
Co	-0.001		
Cm	9.899		
Correct Avg	5.825		

System Bias Check End

Initial System Bias Check, Run 1 2 WQ0 STRATA Version 3.2.112
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

	Reference Cylinder Numbers	
	Zero	Span
CO2	SX36169	EB0049430
	SX36169	EB0049430

Date/Time	09-30-2014	15:52:43	PASSED
Analyte	CO2		
Units	%		
Zero Ref Cyl	0.000		
Zero Cal	-0.003		
Zero Avg	-0.013		
Zero Bias%	0.0%		
Zero Drift%			
Span Ref Cyl	9.990		
Span Cal	10.023		
Span Avg	9.965		
Span Bias%	0.2%		
Span Drift%			

System Bias Check End

W06

Test Run 12 STRATA Version 3.2.112

	CO2
	%
Begin calculating run averages	
09-30-2014 15:55:19	5.775
09-30-2014 15:56:19	5.856
09-30-2014 15:57:19	5.848
09-30-2014 15:58:19	5.846
09-30-2014 15:59:20	5.834
Run Averages	CO2
	%
09-30-2014 15:59:26	5.831

Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor
Test Run 7 End

Final System Bias Check, Run 12 4025 STRATA Version 3.2.112
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

	Reference Cylinder Numbers	
	Zero	Span
CO2	SX36169	EB0049430
	SX36169	EB0049430

Date/Time 09-30-2014 16:03:56 PASSED

Analyte	CO2
Units	%
Zero Ref Cyl	0.000
Zero Cal	-0.003
Zero Avg	-0.022
Zero Bias%	0.1%
Zero Drift%	0.0%
Span Ref Cyl	9.990
Span Cal	10.023
Span Avg	9.887
Span Bias%	0.5%
Span Drift%	-0.3%
Ini Zero Avg	-0.013
Ini Span Avg	9.965
Run Avg	5.831
Co	-0.017
Cm	9.926
Correct Avg	5.876

System Bias Check End

Initial System Bias Check, Run 3 W98 STRATA Version 3.2.112
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

	Reference Cylinder Numbers	
	Zero	Span
CO2	SX36169	EB0049430
	SX36169	EB0049430

Date/Time	09-30-2014	18:52:37	PASSED
Analyte	CO2		
Units	%		
Zero Ref Cyl	0.000		
Zero Cal	-0.003		
Zero Avg	-0.015		
Zero Bias%	0.0%		
Zero Drift%			
Span Ref Cyl	9.990		
Span Cal	10.023		
Span Avg	9.910		
Span Bias%	0.4%		
Span Drift%			

System Bias Check End

Test Run 8 3 4 of 6 STRATA Version 3.2.112

	CO2
	%
Begin calculating run averages	
09-30-2014 18:55:43	5.758
09-30-2014 18:56:43	5.765
09-30-2014 18:57:43	5.740
Pause	
End Pause	
09-30-2014 19:02:44	5.750
09-30-2014 19:03:44	5.766
Run Averages	CO2
	%
09-30-2014 19:04:38	5.757

Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor
Test Run 8 End

Final System Bias Check, Run 3 3 5 2 6 STRATA Version 3.2.112
Operator: Bryan Starnes
Plant Name: Eastman Chemical
Location: Liquid Chemical Destructor

	Reference Cylinder Numbers	
	Zero	Span
CO2	SX36169	EB0049430
	SX36169	EB0049430

Date/Time	09-30-2014	19:09:02	PASSED
Analyte	CO2		
Units	%		
Zero Ref Cyl	0.000		
Zero Cal	-0.003		
Zero Avg	0.012		
Zero Bias%	0.1%		
Zero Drift%	0.1%		
Span Ref Cyl	9.990		
Span Cal	10.023		
Span Avg	9.893		
Span Bias%	0.5%		
Span Drift%	-0.1%		
Ini Zero Avg	-0.015		
Ini Span Avg	9.910		
Run Avg	5.757		
Co	-0.002		
Cm	9.902		
Correct Avg	5.809		

System Bias Check End

APPENDIX C

LABORATORY DATA

13 OCTOBER 2014

PAUL JENKINS
CIVIL & ENVIRONMENTAL CONSULTANTS, INC

1900 Center Park Drive, Suite A
Charlotte, NC 28217
t. 980 237 0373
e. pjenkins@cecinc.com

SUBJECT: CERTIFICATE OF RESULTS

Dear Paul;

Attached to this narrative are the analytical results for sample(s) submitted for the determination of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. The insert below summarizes information about the project. If applicable, QC annotations below highlight specific analytical observations and assessments made during the sample handling and data interpretation phases.

Results reported relate only to the items tested.

PROJECT INFORMATION SUMMARY *(When applicable, see QC Annotations for details)*

Client Project	CEC No. 142-644 Task 0001
SGS Project #	A7185
Analytical Protocol(s)	Method 23
No. Samples Submitted	5
Additional QC Sample(s)	0
No. Laboratory Method Blanks	1
No. OPRs / Batch CS3	1
Date Received	2-Oct-14
Condition Received	good
Temperature upon Receipt (ºC)	2 (traps and filters), 23 (solvents)
Extraction within Holding Time	yes
Analysis within Holding Time	yes

QC ANNOTATIONS:

1.	Please see Appendices attached for data qualifier/attribute and lab identifier descriptions which may be contained in the project.

SGS remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please do not hesitate to contact us.

The management and staff of SGS welcomes customer feedback, both positive and negative, as we continually improve our services. Please visit our web site at www.sgs.com/ultratrace and click on the 'Email Us' link or go to our survey here. Thank you for choosing SGS.

All services are rendered in accordance with the applicable SGS General Conditions of Service accessible via: http://www.sgs.com/terms_and_conditions.htm.

Sincerely,



Heather Distel, Ph.D.

Senior Project Scientist/Team Lead
AK/ak

APPENDIX A: GENERAL DATA QUALIFIERS / DATA ATTRIBUTES

B	The analyte was found in the method blank, at a concentration that was at least 10% of the concentration in the sample.
C	Two or more congeners co-elute. In EDDs, C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter.
E	The reported concentration exceeds the calibration range (upper point of the calibration curve) and is an estimated value.
EMPC	Represents an Estimated Maximum Possible Concentration. EMPCs arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
H/h	If the standard recovery is below the method or SOP specified value “H” is assigned. If the obtained value is less than half the specified value “h” is assigned.
J	Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve) and is an estimated value.
ND	Indicates a non-detect.
NR or R	Indicates a value that is not reportable.
PR	Due to interference, the associated congener is poorly resolved.
QI	Indicates the presence of a quantitative interference.
SI	Denotes “Single Ion Mode” and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.
U	The analyte was not detected. The estimated detection limit (EDL) may be reported for this analyte.
V	The labeled standard recovery was found to be outside of the method control limits.

APPENDIX B: DRBC/TMDL SPECIFIC DATA QUALIFIERS / DATA ATTRIBUTES

J	The reported result is an estimate. The value is less than the minimum calibration level but greater than the estimated detection limit (EDL).
U	The analyte was not detected in the sample at the estimated detection limit (EDL).
E	The reported concentration is an estimate. The value exceeds the upper calibration range (upper point of the calibration curve).
D	Dilution Data. Result was obtained from the analysis of a dilution.
B	Analyte found in the sample and associated method blank.
C	Co-eluting congener
Cxx	Co-elutes with the indicated congener, data is reported under the lowest IUPAC congener. 'Xx' denotes the IUPAC number with the lowest numerical designated congener.
NR	Analyte is not reportable because of problems in sample preparation or analysis.
V	Labeled standard recovery is not within method control limits.
X	Results from re-injection/repeat/second-column analysis.
EMPC	Estimated maximum possible concentration. Indicates that a peak is identified but did not meet the method specified ion-abundance ratio.

APPENDIX C: LAB IDENTIFIERS

AR	Indicates use of the archived portion of the sample extract.
CU	Indicates a sample that required additional clean-up prior to MS injection/processing.
D	Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
DE	Indicates a dilution performed with the addition of ES (extraction standard) solution.
DUP	Designation for a duplicate sample.
MS	Designation for a matrix spike.
MSD	Designation for a matrix spike duplicate.
RJ	Indicates a reinjection of the sample extract.
S	Indicates a sample split. The number that follows the "S" indicates the split factor.

SGS CERTIFICATIONS

Arkansas	88-0682
California (ELAP)	Interim ELAP Cert #2914
CLIA	34D1013708
Connecticut	PH-0258
USDA Soil Permit	P330-14-00135
DoD	2726.01
Florida (Primary NELAP)	E87634
ISO 17025/IEC	2726.01
Louisiana	4115
Maine	#2014020
Massachusetts	M-NC919
Minnesota (Primary NELAP For Method 23)	Lab #037-999-459 Cert #688823
New Jersey	NC100
New York	11685
North Carolina DWR	481
North Dakota	R-197
Oregon	NC200002
Pennsylvania	68-03675
South Carolina	Lab #99029 Cert #99029002
Texas	T104704260-13-5
US Coast Guard	16714/159.317/SGS
Virginia	Lab #460214 Cert #3006
Washington	C913
West Virginia	293

A7185 - TEQ

Project ID: CEC No. 142-644 Task 0001

Sample Summary Part 1

SGS

Method 23

Analyte	Method Blank A7185_12600	142644-01 Field Blank	142644-02 Run 1	142644-03 Run 2	142644-04 Run 3	Reagent Blank
	pg	pg	pg	pg	pg	pg
2,3,7,8-TCDD	(1.32)	(1.86)	(2.46)	(1.98)	(2.8)	(2.36)
1,2,3,7,8-PeCDD	(1.54)	(1.84)	(2.98)	(2.06)	(4.05)	(2.87)
1,2,3,4,7,8-HxCDD	(1.55)	(1.89)	(2.6)	(2.13)	(3.34)	(2.6)
1,2,3,6,7,8-HxCDD	(1.56)	(1.94)	(2.7)	(2.28)	(3.69)	(2.65)
1,2,3,7,8,9-HxCDD	(1.76)	(2)	(2.81)	(2.24)	(3.94)	(2.85)
1,2,3,4,6,7,8-HpCDD	(2.52)	4.28	(4.91)	(3.45)	(5.48)	5.26
OCDD	5.99	15.3	9.17	[9.73]	(9.23)	[12.5]
2,3,7,8-TCDF	(1.53)	(1.45)	[4.63]	[3.59]	(2.6)	(2.17)
1,2,3,7,8-PeCDF	(0.923)	(1.08)	(1.48)	(1.3)	(2.22)	(1.46)
2,3,4,7,8-PeCDF	(0.99)	(1.16)	(1.53)	2.44	(2.39)	(1.67)
1,2,3,4,7,8-HxCDF	(1.14)	(1.48)	(1.94)	(1.66)	(1.92)	(1.72)
1,2,3,6,7,8-HxCDF	(1.04)	(1.27)	(1.74)	(1.56)	(1.78)	(1.55)
2,3,4,6,7,8-HxCDF	(1.1)	(1.38)	(1.76)	(1.67)	(1.89)	(1.7)
1,2,3,7,8,9-HxCDF	(1.62)	(2.07)	(2.37)	(2.15)	(2.69)	(2.5)
1,2,3,4,6,7,8-HpCDF	(1.15)	[1.82]	(2.35)	(2.01)	(2.7)	(2.03)
1,2,3,4,7,8,9-HpCDF	(2.2)	(3.02)	(3.85)	(3.23)	(3.88)	(3.77)
OCDF	(3.65)	(5.6)	(7.93)	(6.09)	(9.84)	(8.53)
ITEF TEQ (ND=0; EMPC=0)	**0.00599**	**0.0581**	**0.00917**	**1.22**	**0**	**0.0526**
ITEF TEQ (ND=0; EMPC=EMPC)	**0.00599**	**0.0763**	**0.472**	**1.59**	**0**	**0.0651**
ITEF TEQ (ND=DL/2; EMPC=0)	**1.92**	**2.47**	**3.38**	**3.58**	**4.23**	**3.32**
ITEF TEQ (ND=DL/2; EMPC=EMPC)	**1.92**	**2.48**	**3.72**	**3.85**	**4.23**	**3.33**
ITEF TEQ (ND=DL; EMPC=EMPC)	**3.83**	**4.88**	**6.97**	**6.12**	**8.46**	**6.6**
Checkcode	616-785-GWX	297-434-YRK	694-399-CLF	765-747-WYN	455-311-TXS	552-578-HLD
Lab ID	MB1_12600_DF_SDS	A7185_12600_DF_001	A7185_12600_DF_002	A7185_12600_DF_003	A7185_12600_DF_004	A7185_12600_DF_005

( ) = DL
[ ] = EMPC

A7185 - WHO-2005-TEQ

Project ID: CEC No. 142-644 Task 0001

Sample Summary Part 1

SGS

Method 23

Analyte	Method Blank A7185_12600 pg	142644-01 Field Blank pg	142644-02 Run 1 pg	142644-03 Run 2 pg	142644-04 Run 3 pg	Reagent Blank pg
2,3,7,8-TCDD	(1.32)	(1.86)	(2.46)	(1.98)	(2.8)	(2.36)
1,2,3,7,8-PeCDD	(1.54)	(1.84)	(2.98)	(2.06)	(4.05)	(2.87)
1,2,3,4,7,8-HxCDD	(1.55)	(1.89)	(2.6)	(2.13)	(3.34)	(2.6)
1,2,3,6,7,8-HxCDD	(1.56)	(1.94)	(2.7)	(2.28)	(3.69)	(2.65)
1,2,3,7,8,9-HxCDD	(1.76)	(2)	(2.81)	(2.24)	(3.94)	(2.85)
1,2,3,4,6,7,8-HpCDD	(2.52)	4.28	(4.91)	(3.45)	(5.48)	5.26
OCDD	5.99	15.3	9.17	[9.73]	(9.23)	[12.5]
2,3,7,8-TCDF	(1.53)	(1.45)	[4.63]	[3.59]	(2.6)	(2.17)
1,2,3,7,8-PeCDF	(0.923)	(1.08)	(1.48)	(1.3)	(2.22)	(1.46)
2,3,4,7,8-PeCDF	(0.99)	(1.16)	(1.53)	2.44	(2.39)	(1.67)
1,2,3,4,7,8-HxCDF	(1.14)	(1.48)	(1.94)	(1.66)	(1.92)	(1.72)
1,2,3,6,7,8-HxCDF	(1.04)	(1.27)	(1.74)	(1.56)	(1.78)	(1.55)
2,3,4,6,7,8-HxCDF	(1.1)	(1.38)	(1.76)	(1.67)	(1.89)	(1.7)
1,2,3,7,8,9-HxCDF	(1.62)	(2.07)	(2.37)	(2.15)	(2.69)	(2.5)
1,2,3,4,6,7,8-HpCDF	(1.15)	[1.82]	(2.35)	(2.01)	(2.7)	(2.03)
1,2,3,4,7,8,9-HpCDF	(2.2)	(3.02)	(3.85)	(3.23)	(3.88)	(3.77)
OCDF	(3.65)	(5.6)	(7.93)	(6.09)	(9.84)	(8.53)
WHO-2005 TEQ (ND=0; EMPC=0)	**0.0018**	**0.0474**	**0.00275**	**0.732**	**0**	**0.0526**
WHO-2005 TEQ (ND=0; EMPC=EMPC)	**0.0018**	**0.0656**	**0.466**	**1.09**	**0**	**0.0563**
WHO-2005 TEQ (ND=DL/2; EMPC=0)	**2.19**	**2.79**	**3.95**	**3.59**	**4.98**	**3.85**
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	**2.19**	**2.8**	**4.29**	**3.86**	**4.98**	**3.86**
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	**4.38**	**5.53**	**8.12**	**6.62**	**9.95**	**7.66**
Checkcode	616-785-GWX	297-434-YRK	694-399-CLF	765-747-WYN	455-311-TXS	552-578-HLD
Lab ID	MB1_12600_DF_SDS	A7185_12600_DF_001	A7185_12600_DF_002	A7185_12600_DF_003	A7185_12600_DF_004	A7185_12600_DF_005

( ) = DL
[ ] = EMPC

A7185 - Totals

Project ID: CEC No. 142-644 Task 0001

Sample Summary Part 2

SGS

Method 23

Analyte	Method Blank A7185_12600 pg	142644-01 Field Blank pg	142644-02 Run 1 pg	142644-03 Run 2 pg	142644-04 Run 3 pg	Reagent Blank pg
Totals						
TCDDs	0	5.04	18.4	25.1	19.1	0
PeCDDs	0	0	4.84	13.4	4.38	0
HxCDDs	0	0	6.53	6.22	5.53	0
HpCDDs	0	8.42	0	0	0	12.3
OCDD	5.99	15.3	9.17	0	0	0
TCDFs	0	0	8.22	24.2	3.57	0
PeCDFs	0	0	3.22	6.06	3.62	0
HxCDFs	0	0	2.01	2.65	0	0
HpCDFs	0	0	0	0	0	0
OCDF	0	0	0	0	0	0
Total PCDD/Fs (ND=0; EMPC=0)	**5.99**	**28.8**	**52.4**	**77.6**	**36.2**	**12.3**
Total PCDD/Fs (ND=0; EMPC=EMPC)	**8.95**	**33**	**68.9**	**105**	**36.2**	**28.4**
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	**34.5**	**61.1**	**112**	**139**	**101**	**68.8**
Total 2378s (ND=0; EMPC=0)	**5.99**	**19.6**	**9.17**	**2.44**	**0**	**5.26**
Total 2378s (ND=0.5; EMPC=0)	**18.8**	**34.5**	**32.1**	**23.3**	**32.2**	**29.1**
Total 2378s (ND=1; EMPC=0)	**31.6**	**49.3**	**55.1**	**44.2**	**64.4**	**52.9**
Total 2378s (ND=0; EMPC=1)	**5.99**	**21.4**	**13.8**	**15.8**	**0**	**17.7**
Total 2378s (ND=0.5; EMPC=1)	**18.8**	**35.4**	**35.5**	**32.7**	**32.2**	**37.9**
Total 2378s (ND=1; EMPC=1)	**31.6**	**49.5**	**57.2**	**49.6**	**64.4**	**58.2**
Checkcode	616-785-GWX	297-434-YRK	694-399-CLF	765-747-WYN	455-311-TXS	552-578-HLD
Lab ID	MB1_12600_DF_SDS	A7185_12600_DF_001	A7185_12600_DF_002	A7185_12600_DF_003	A7185_12600_DF_004	A7185_12600_DF_005

( ) = DL
[ ] = EMPC

A7185 - Others

Project ID: CEC No. 142-644 Task 0001

Sample Summary Part 3

SGS

Method 23

Analyte	Method Blank A7185_12600	142644-01 Field Blank	142644-02 Run 1	142644-03 Run 2	142644-04 Run 3	Reagent Blank
	pg	pg	pg	pg	pg	pg
Other PCDD/Fs (ND=0, EMPC=0)						
Other TCDD	0	5.04	18.4	25.1	19.1	0
Other PeCDD	0	0	4.84	13.4	4.38	0
Other HxCDD	0	0	6.53	6.22	5.53	0
Other HpCDD	0	4.13	0	0	0	7
Other TCDF	0	0	8.22	24.2	3.57	0
Other PeCDF	0	0	3.22	3.62	3.62	0
Other HxCDF	0	0	2.01	2.65	0	0
Other HpCDF	0	0	0	0	0	0
Other PCDD/Fs (ND=0, EMPC=EMPC)						
Other TCDD	2.95	5.04	18.4	25.1	19.1	3.65
Other PeCDD	0	0	8.62	13.4	4.38	0
Other HxCDD	0	2.44	6.53	6.22	5.53	0
Other HpCDD	0	4.13	0	0	0	7
Other TCDF	0	0	13.7	33.8	3.57	0
Other PeCDF	0	0	5.83	7.89	3.62	0
Other HxCDF	0	0	2.01	2.65	0	0
Other HpCDF	0	0	0	0	0	0
Checkcode	616-785-GWX	297-434-YRK	694-399-CLF	765-747-WYN	455-311-TXS	552-578-HLD
Lab ID	MB1_12600_DF_SDS	A7185_12600_DF_001	A7185_12600_DF_002	A7185_12600_DF_003	A7185_12600_DF_004	A7185_12600_DF_005

( ) = DL
[ ] = EMPC

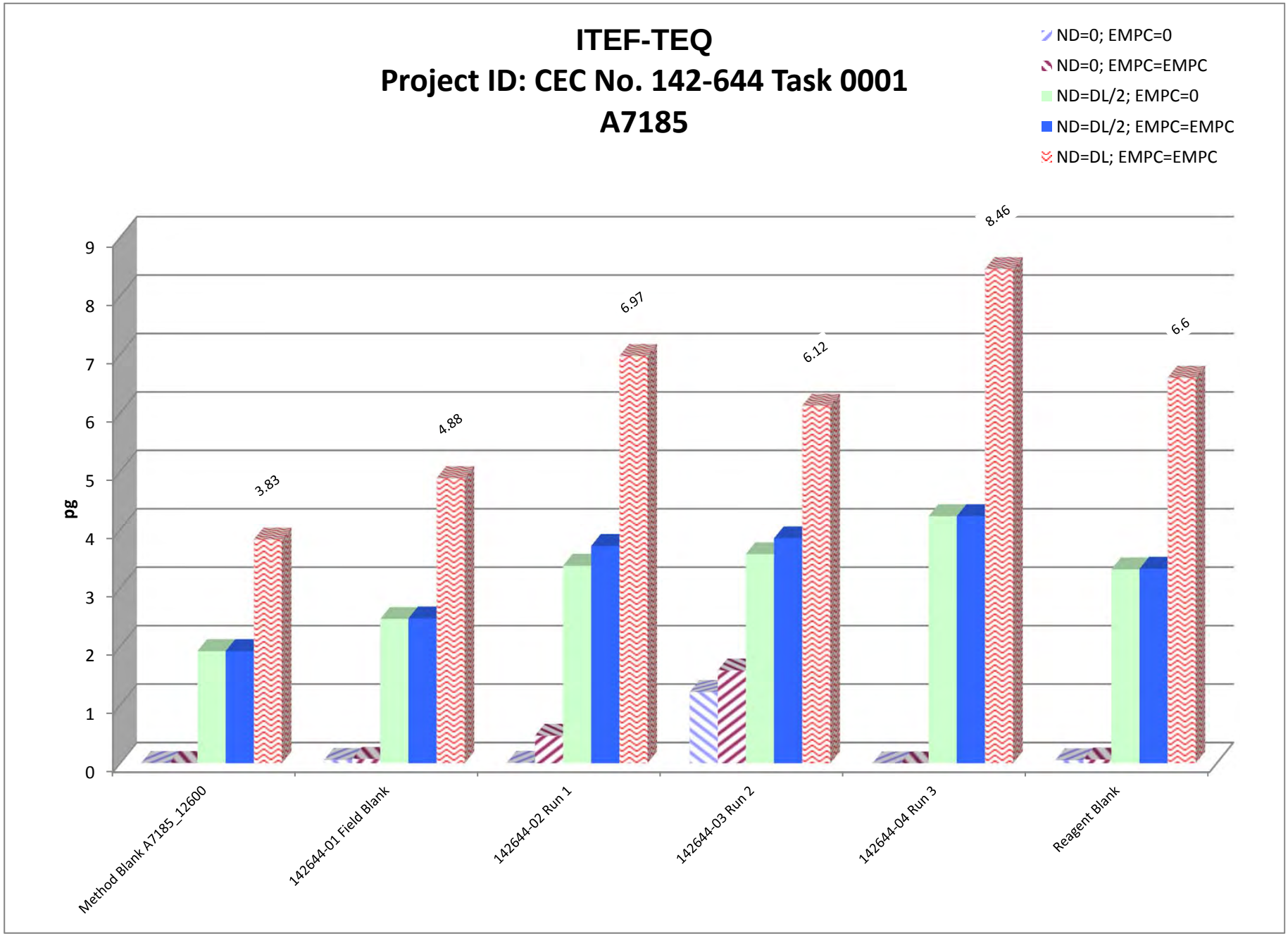
A7185 - DLs

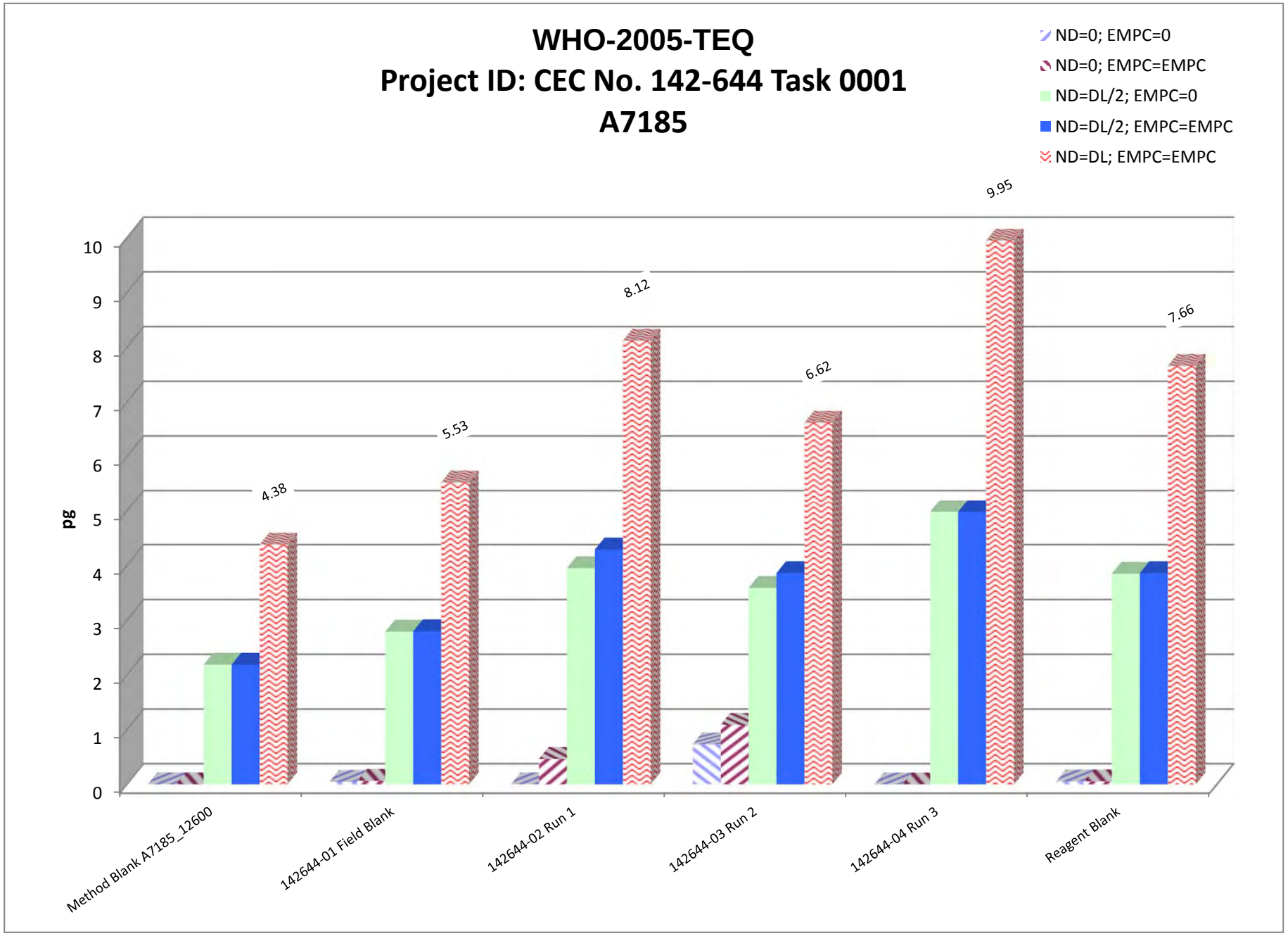
Project ID: CEC No. 142-644 Task 0001

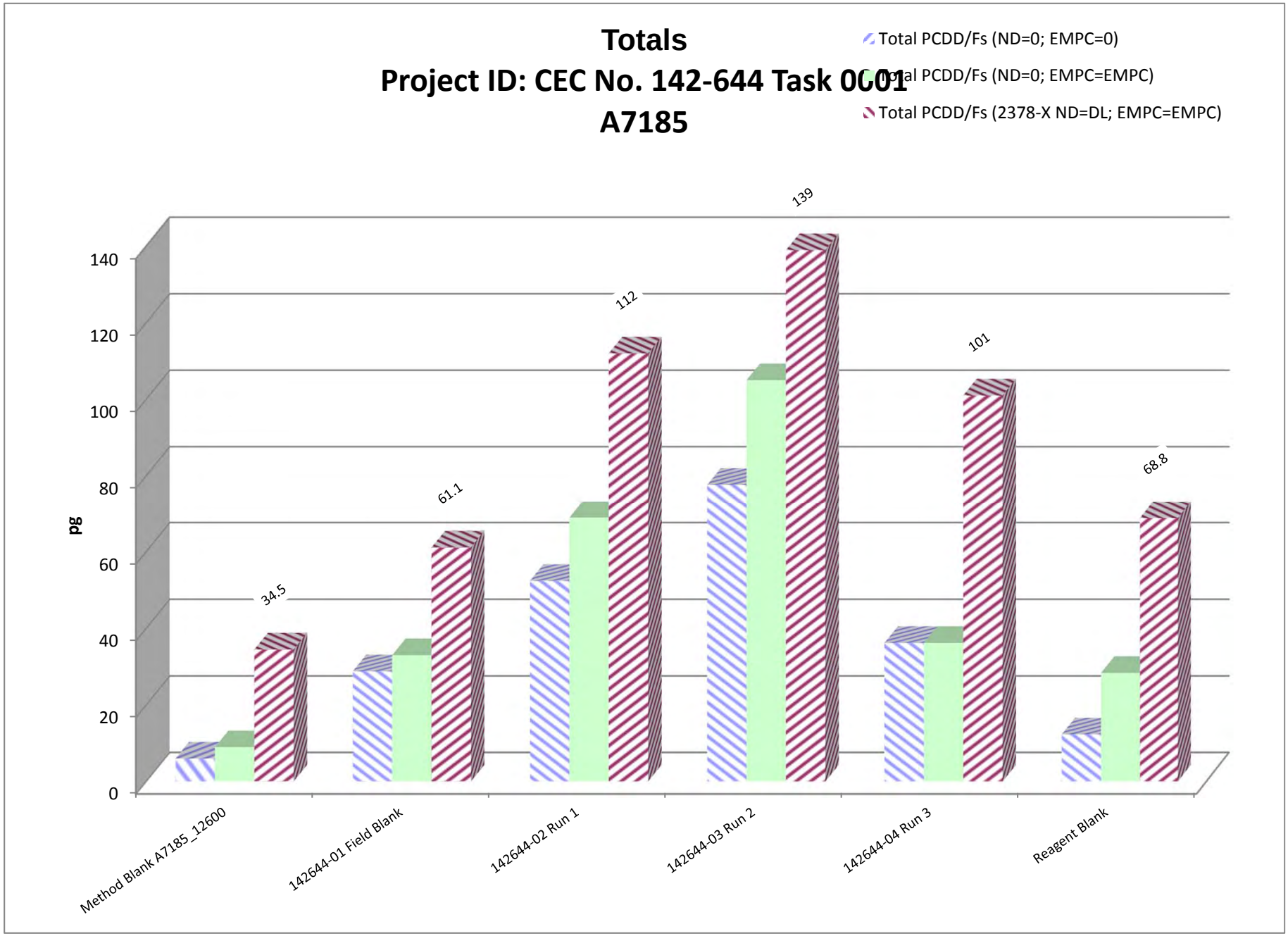
Sample Summary
Part 5 (DLs)

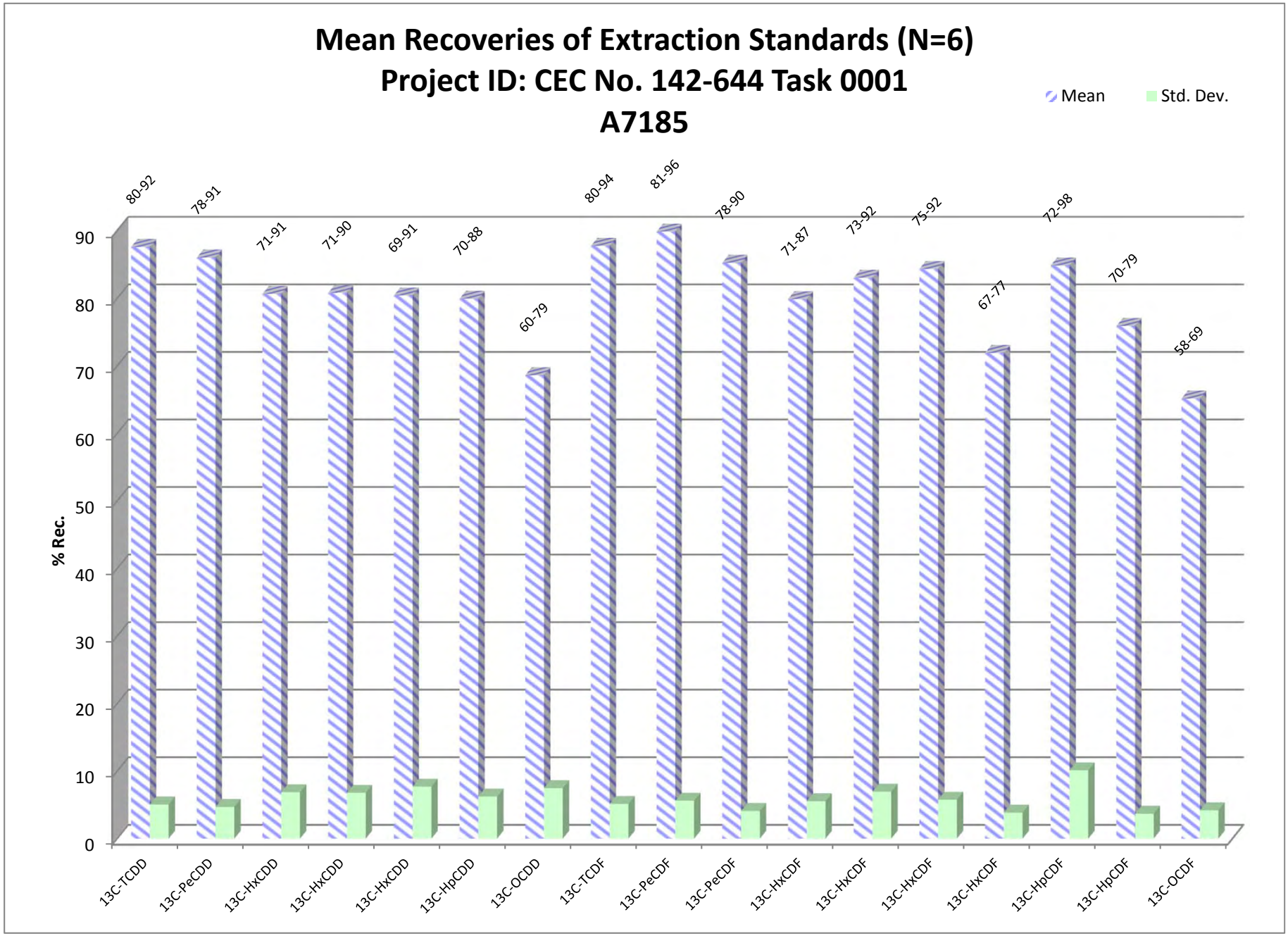
Method 23

Analyte	Method Blank A7185_12600	142644-01 Field Blank	142644-02 Run 1	142644-03 Run 2	142644-04 Run 3	Reagent Blank
	pg	pg	pg	pg	pg	pg
2,3,7,8-TCDD	1.32	1.86	2.46	1.98	2.8	2.36
1,2,3,7,8-PeCDD	1.54	1.84	2.98	2.06	4.05	2.87
1,2,3,4,7,8-HxCDD	1.55	1.89	2.6	2.13	3.34	2.6
1,2,3,6,7,8-HxCDD	1.56	1.94	2.7	2.28	3.69	2.65
1,2,3,7,8,9-HxCDD	1.76	2	2.81	2.24	3.94	2.85
1,2,3,4,6,7,8-HpCDD	2.52	2.47	4.91	3.45	5.48	3.46
OCDD	3.97	5.27	7.76	6.06	9.23	7.21
2,3,7,8-TCDF	1.53	1.45	2.51	1.88	2.6	2.17
1,2,3,7,8-PeCDF	0.923	1.08	1.48	1.3	2.22	1.46
2,3,4,7,8-PeCDF	0.99	1.16	1.53	1.38	2.39	1.67
1,2,3,4,7,8-HxCDF	1.14	1.48	1.94	1.66	1.92	1.72
1,2,3,6,7,8-HxCDF	1.04	1.27	1.74	1.56	1.78	1.55
2,3,4,6,7,8-HxCDF	1.1	1.38	1.76	1.67	1.89	1.7
1,2,3,7,8,9-HxCDF	1.62	2.07	2.37	2.15	2.69	2.5
1,2,3,4,6,7,8-HpCDF	1.15	1.68	2.35	2.01	2.7	2.03
1,2,3,4,7,8,9-HpCDF	2.2	3.02	3.85	3.23	3.88	3.77
OCDF	3.65	5.6	7.93	6.09	9.84	8.53
Total TCDD	1.32	1.86	2.46	1.98	2.8	2.36
Total PeCDD	1.54	1.84	2.98	2.06	4.05	2.87
Total HxCDD	1.61	1.94	2.69	2.21	3.64	2.69
Total HpCDD	2.52	2.47	4.91	3.45	5.48	3.46
Total TCDF	1.53	1.45	2.51	1.88	2.6	2.17
Total PeCDF	0.953	1.12	1.5	1.34	2.3	1.56
Total HxCDF	1.2	1.52	1.93	1.74	2.04	1.83
Total HpCDF	1.57	2.23	3.02	2.56	3.23	2.77
Checkcode	616-785-GWX	297-434-YRK	694-399-CLF	765-747-WYN	455-311-TXS	552-578-HLD
Lab ID	MB1_12600_DF_SDS	A7185_12600_DF_001	A7185_12600_DF_002	A7185_12600_DF_003	A7185_12600_DF_004	A7185_12600_DF_005

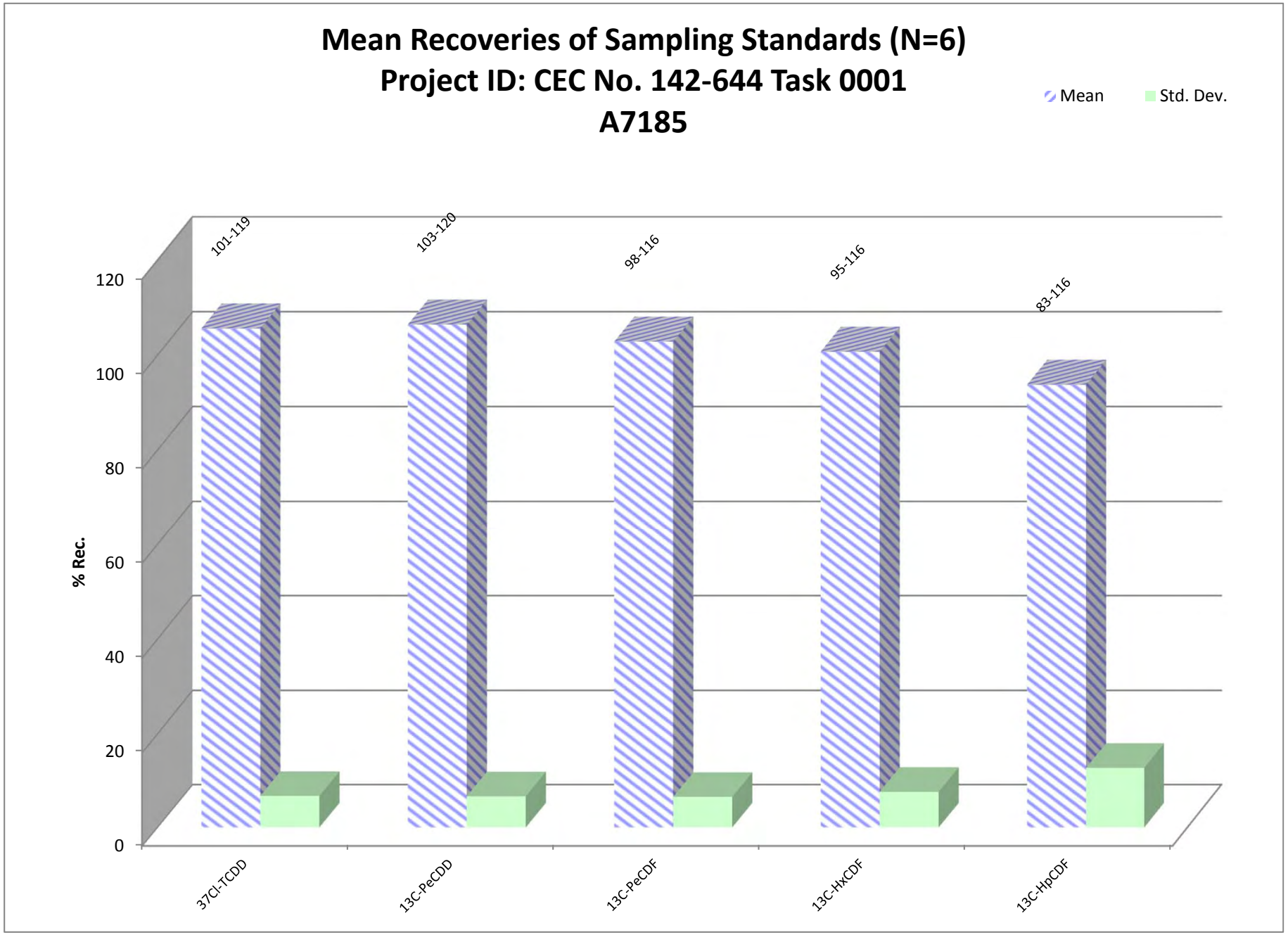

ITEF-TEQ
Project ID: CEC No. 142-644 Task 0001
A7185
ND=0; EMPC=0
ND=0; EMPC=EMPC
ND=DL/2; EMPC=0
ND=DL/2; EMPC=EMPC
ND=DL; EMPC=EMPC
pg
0
1
2
3
4
5
6
7
8
9
3.83
4.88
6.97
6.12
8.46
6.6
Method Blank A7185_12600
142644-01 Field Blank
142644-02 Run 1
142644-03 Run 2
142644-04 Run 3
Reagent Blank


WHO-2005-TEQ
Project ID: CEC No. 142-644 Task 0001
A7185
ND=0; EMPC=0
ND=0; EMPC=EMPC
ND=DL/2; EMPC=0
ND=DL/2; EMPC=EMPC
ND=DL; EMPC=EMPC
pg
0
1
2
3
4
5
6
7
8
9
10
4.38
5.53
8.12
6.62
9.95
7.66
Method Blank A7185_12600
142644-01 Field Blank
142644-02 Run 1
142644-03 Run 2
142644-04 Run 3
Reagent Blank

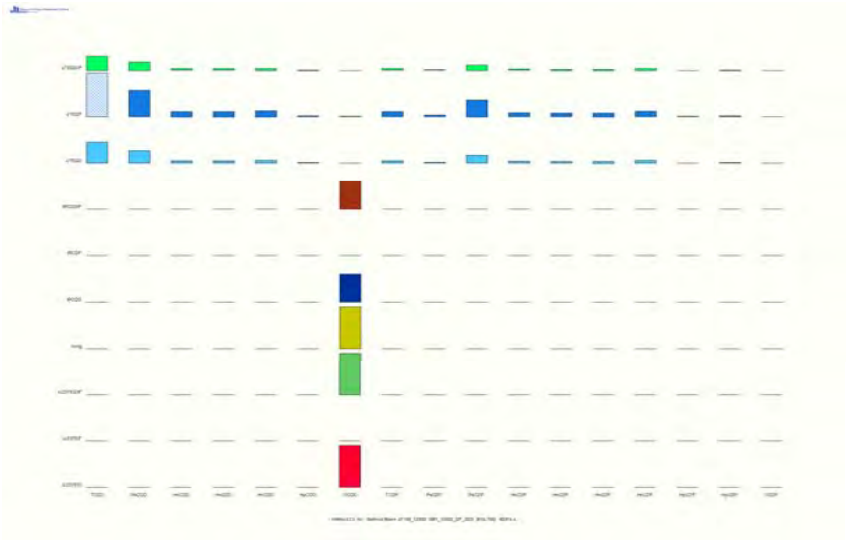

Totals
Project ID: CEC No. 142-644 Task 0001
A7185
Total PCDD/Fs (ND=0; EMPC=0)
Total PCDD/Fs (ND=0; EMPC=EMPC)
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)
pg
0
20
40
60
80
100
120
140
34.5
61.1
112
139
101
68.8
Method Blank A7185_12600
142644-01 Field Blank
142644-02 Run 1
142644-03 Run 2
142644-04 Run 3
Reagent Blank

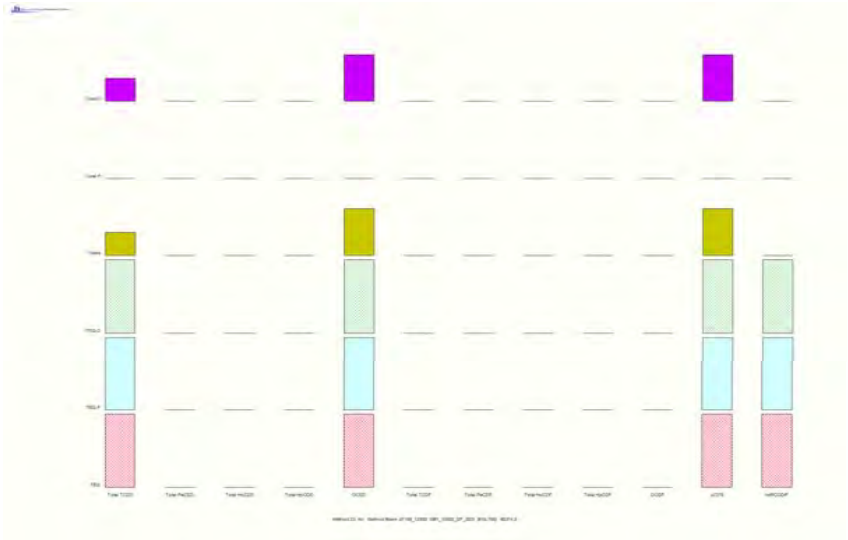


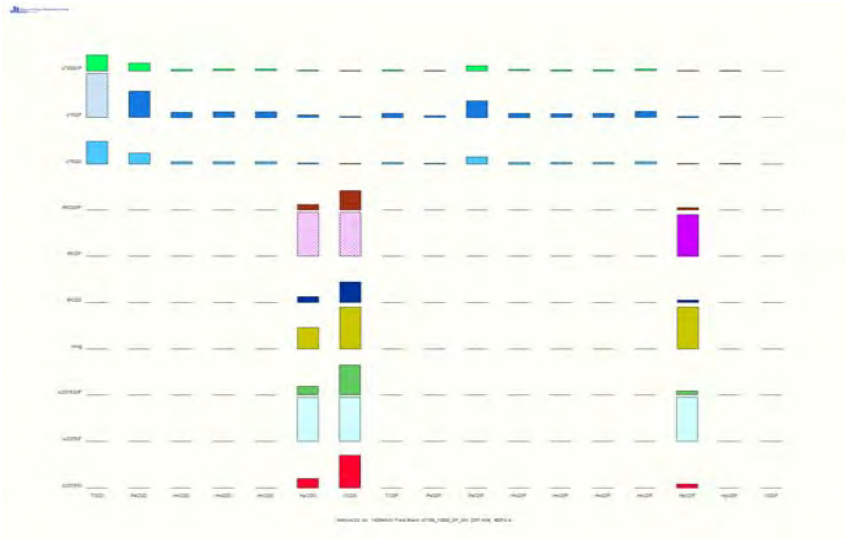
Method Specification Limits: Tetra-Hexa ES: 40-130%, Hepta-Octa ES: 25-130% (F = fail)

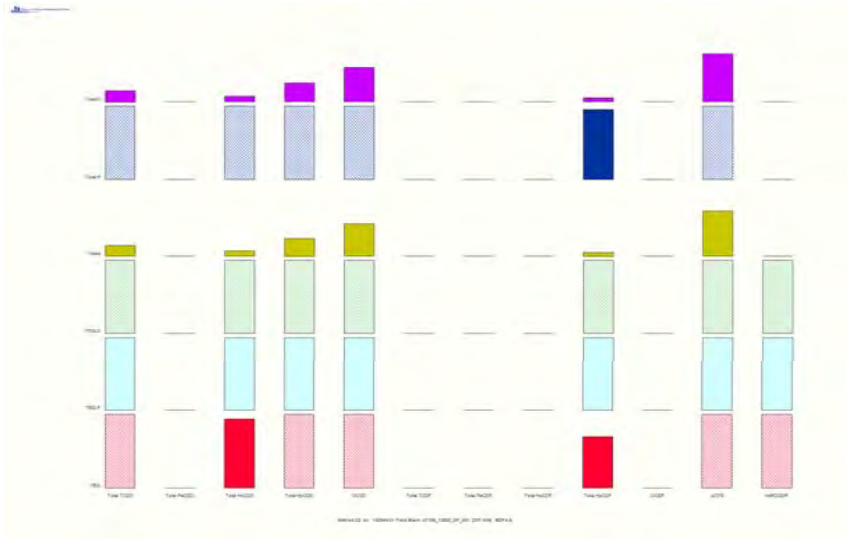


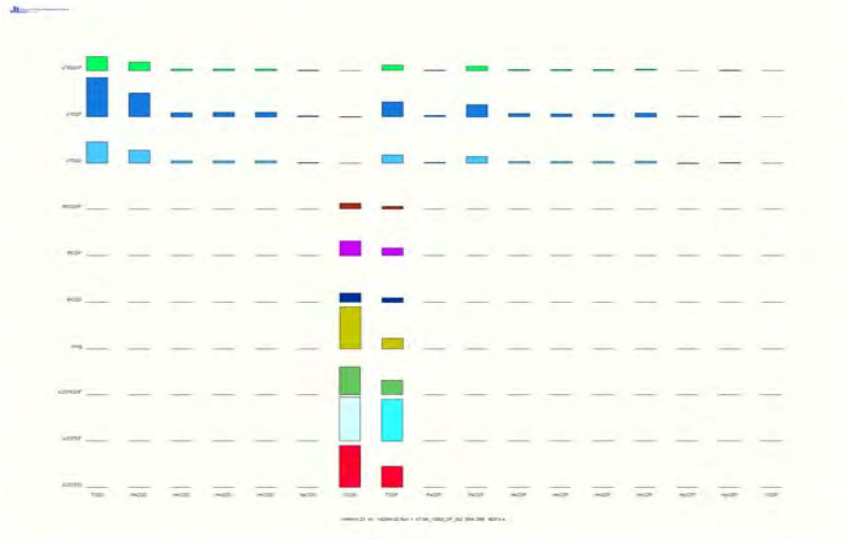
Method Specification Limits: Tetra-Octa SS: 70-130% (F = fail)

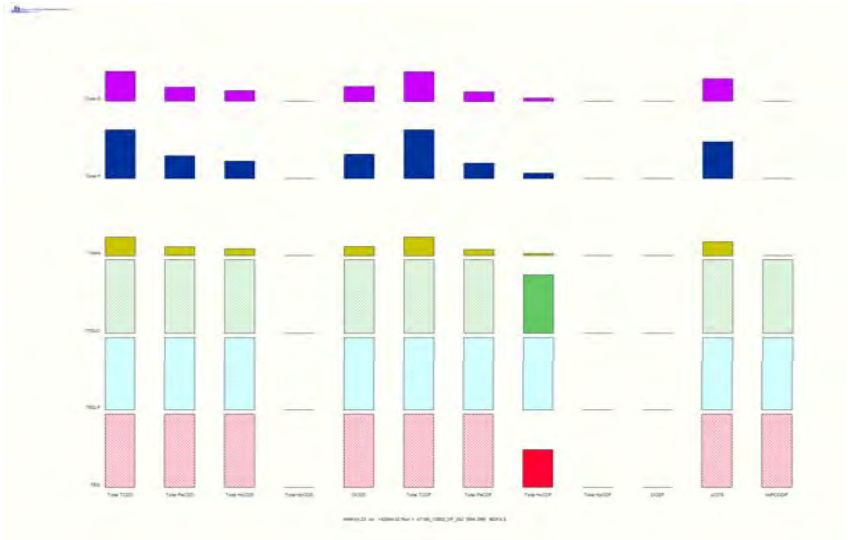


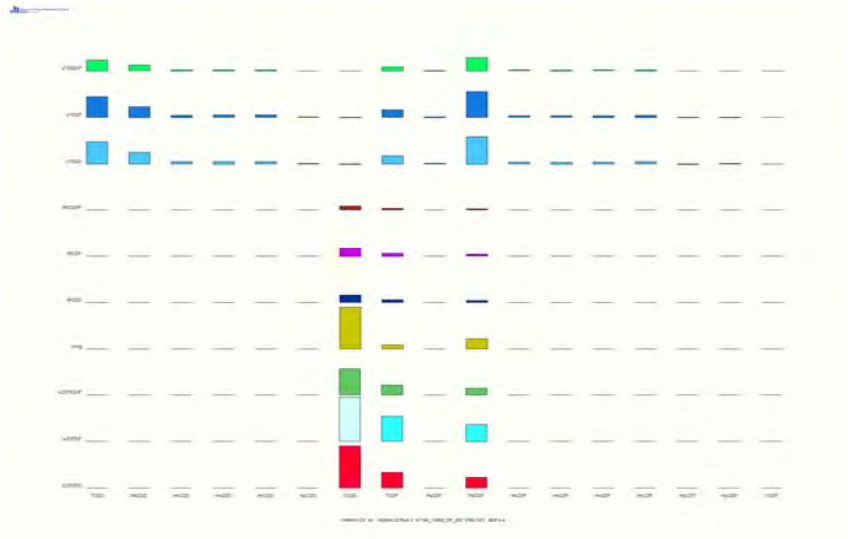


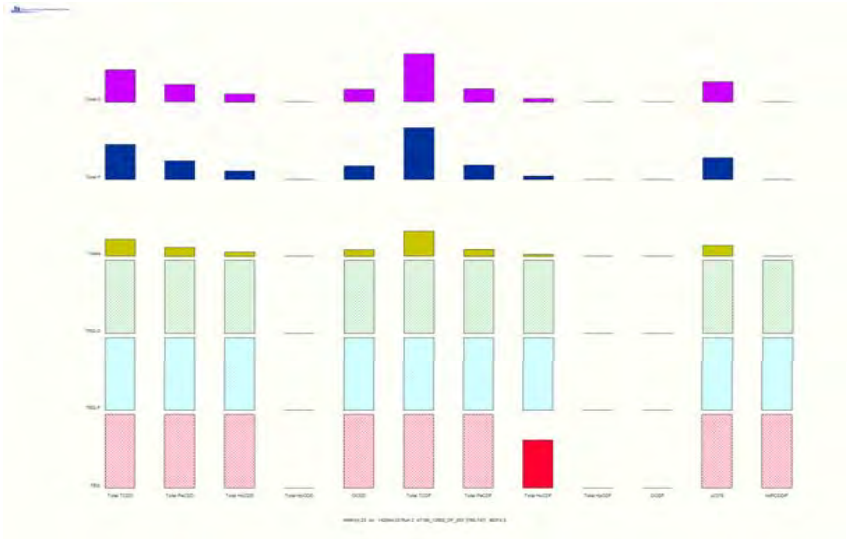


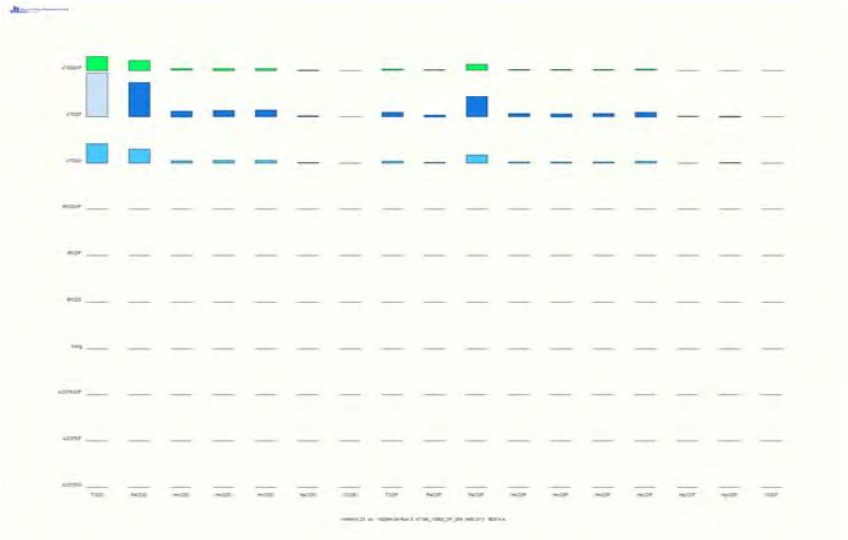


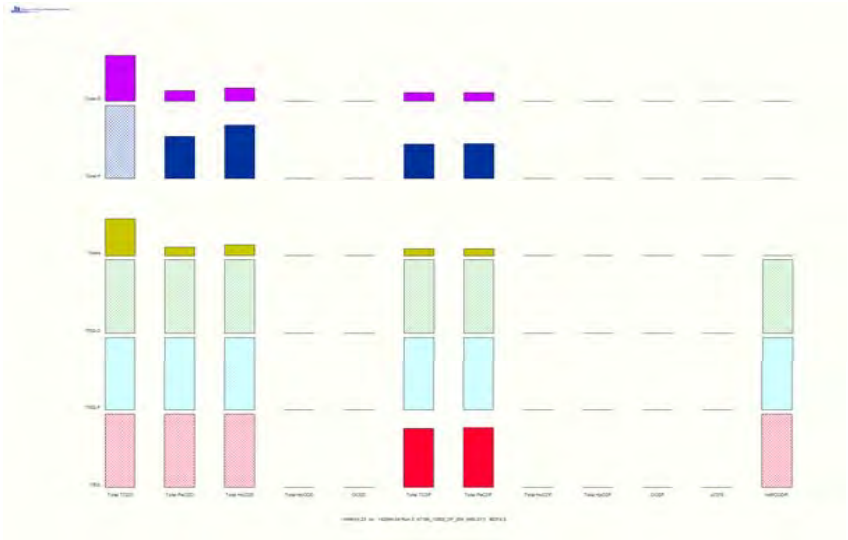


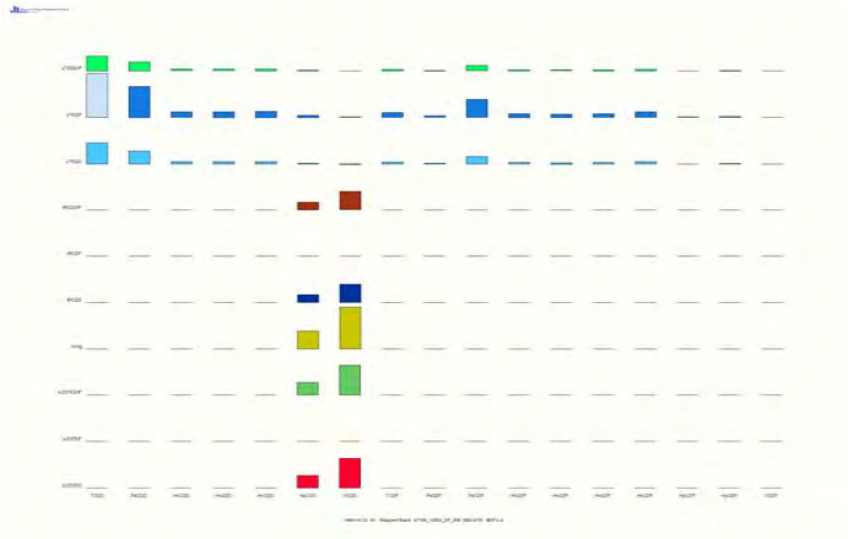


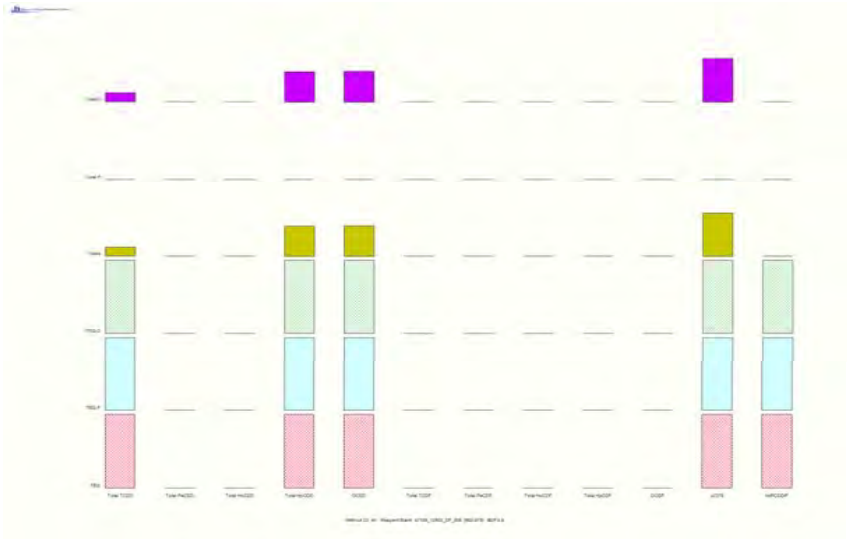












Sample ID: Method Blank A7185_12600 — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Civil & Environmental Consultants, Inc	Matrix:	Air	Lab Project ID:	A7185	Date Received:	n/a
Project ID:	CEC No. 142-644 Task 0001	Weight/Volume:	1	Lab Sample ID	MB1_12600_DF_SDS	Date Extracted:	06-Oct-2014
Date Collected:	n/a			QC Batch No:	12600	Date Analyzed:	09-Oct-2014
		Split:	2	Dilution:	-	Time Analyzed:	20:50:37

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	1.32			ES 2378-TCDD	92.4	
12378-PeCDD	ND	1.54			ES 12378-PeCDD	89.1	
123478-HxCDD	ND	1.55			ES 123478-HxCDD	91.2	
123678-HxCDD	ND	1.56			ES 123678-HxCDD	89.9	
123789-HxCDD	ND	1.76			ES 123789-HxCDD	90.8	
1234678-HpCDD	ND	2.52			ES 1234678-HpCDD	88.5	
OCDD	5.99			J	ES OCDD	79.1	
2378-TCDF	ND	1.53			ES 2378-TCDF	87.4	
12378-PeCDF	ND	0.923			ES 12378-PeCDF	95.5	
23478-PeCDF	ND	0.99			ES 23478-PeCDF	86.3	
123478-HxCDF	ND	1.14			ES 123478-HxCDF	86.9	
123678-HxCDF	ND	1.04			ES 123678-HxCDF	92.1	
234678-HxCDF	ND	1.1			ES 234678-HxCDF	91.5	
123789-HxCDF	ND	1.62			ES 123789-HxCDF	77	
1234678-HpCDF	ND	1.15			ES 1234678-HpCDF	98.3	
1234789-HpCDF	ND	2.2			ES 1234789-HpCDF	79.3	
OCDF	ND	3.65			ES OCDF	69.4	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	104	
Total TCDD	ND		2.95		SS 12347-PeCDD	103	
Total PeCDD	ND	1.54	ND		SS 12346-PeCDF	99	
Total HxCDD	ND	1.61	ND		SS 123469-HxCDF	96.5	
Total HpCDD	ND	2.52	ND		SS 1234689-HpCDF	82.9	
					AS 1368-TCDD	93	
Total TCDF	ND	1.53	ND		AS 1368-TCDF	93.5	
Total PeCDF	ND	0.953	ND				
Total HxCDF	ND	1.2	ND				
Total HpCDF	ND	1.57	ND				
Total PCDD/Fs	**5.99**		**8.95**				
ITEF TEQs							
TEQ: ND=0	0.00599		0.00599				
TEQ: ND=DL/2	1.92	1.91	1.92				
TEQ: ND=DL	3.83	3.83	3.83				

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Sample ID: 142644-01 Field Blank — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Civil & Environmental Consultants, Inc	Matrix:	Air	Lab Project ID:	A7185	Date Received:	02-Oct-2014
Project ID:	CEC No. 142-644 Task 0001	Weight/Volume:	1	Lab Sample ID	A7185_12600_DF_001	Date Extracted:	06-Oct-2014
Date Collected:	30-Sep-2014			QC Batch No:	12600	Date Analyzed:	09-Oct-2014
		Split:	2	Dilution:	-	Time Analyzed:	21:43:53

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	1.86			ES 2378-TCDD	91.2	
12378-PeCDD	ND	1.84			ES 12378-PeCDD	90.6	
123478-HxCDD	ND	1.89			ES 123478-HxCDD	82.3	
123678-HxCDD	ND	1.94			ES 123678-HxCDD	83.9	
123789-HxCDD	ND	2			ES 123789-HxCDD	82	
1234678-HpCDD	4.28			J	ES 1234678-HpCDD	83.1	
OCDD	15.3			J B	ES OCDD	74	
2378-TCDF	ND	1.45			ES 2378-TCDF	92.7	
12378-PeCDF	ND	1.08			ES 12378-PeCDF	95	
23478-PeCDF	ND	1.16			ES 23478-PeCDF	88.3	
123478-HxCDF	ND	1.48			ES 123478-HxCDF	82	
123678-HxCDF	ND	1.27			ES 123678-HxCDF	86.5	
234678-HxCDF	ND	1.38			ES 234678-HxCDF	87.3	
123789-HxCDF	ND	2.07			ES 123789-HxCDF	74.5	
1234678-HpCDF	EMPC		1.82	J	ES 1234678-HpCDF	93.7	
1234789-HpCDF	ND	3.02			ES 1234789-HpCDF	77	
OCDF	ND	5.6			ES OCDF	65.5	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	106	
Total TCDD	5.04		5.04		SS 12347-PeCDD	103	
Total PeCDD	ND	1.84	ND		SS 12346-PeCDF	101	
Total HxCDD	ND		2.44		SS 123469-HxCDF	97.8	
Total HpCDD	8.42		8.42		SS 1234689-HpCDF	84.1	
					AS 1368-TCDD	95.3	
Total TCDF	ND	1.45	ND		AS 1368-TCDF	94.9	
Total PeCDF	ND	1.12	ND				
Total HxCDF	ND	1.52	ND				
Total HpCDF	ND		1.82				
Total PCDD/Fs	**28.8**		**33**				
ITEF TEQs							
TEQ: ND=0	0.0581		0.0763				
TEQ: ND=DL/2	2.47	2.42	2.48				
TEQ: ND=DL	4.87	4.85	4.88				

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Sample ID: 142644-02 Run 1 — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Civil & Environmental Consultants, Inc	Matrix:	Air	Lab Project ID:	A7185	Date Received:	02-Oct-2014
Project ID:	CEC No. 142-644 Task 0001	Weight/Volume:	1	Lab Sample ID	A7185_12600_DF_002	Date Extracted:	06-Oct-2014
Date Collected:	30-Sep-2014			QC Batch No:	12600	Date Analyzed:	09-Oct-2014
		Split:	2	Dilution:	-	Time Analyzed:	22:37:08

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	2.46			ES 2378-TCDD	83.4	
12378-PeCDD	ND	2.98			ES 12378-PeCDD	83	
123478-HxCDD	ND	2.6			ES 123478-HxCDD	75.8	
123678-HxCDD	ND	2.7			ES 123678-HxCDD	75.4	
123789-HxCDD	ND	2.81			ES 123789-HxCDD	74.5	
1234678-HpCDD	ND	4.91			ES 1234678-HpCDD	75.5	
OCDD	9.17			J B	ES OCDD	68.7	
2378-TCDF	EMPC		4.63	J	ES 2378-TCDF	84.3	
12378-PeCDF	ND	1.48			ES 12378-PeCDF	85.2	
23478-PeCDF	ND	1.53			ES 23478-PeCDF	83.4	
123478-HxCDF	ND	1.94			ES 123478-HxCDF	75.7	
123678-HxCDF	ND	1.74			ES 123678-HxCDF	77.3	
234678-HxCDF	ND	1.76			ES 234678-HxCDF	80.2	
123789-HxCDF	ND	2.37			ES 123789-HxCDF	68.1	
1234678-HpCDF	ND	2.35			ES 1234678-HpCDF	76.9	
1234789-HpCDF	ND	3.85			ES 1234789-HpCDF	74.4	
OCDF	ND	7.93			ES OCDF	66.9	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	102	
Total TCDD	18.4		18.4		SS 12347-PeCDD	103	
Total PeCDD	4.84		8.62		SS 12346-PeCDF	102	
Total HxCDD	6.53		6.53		SS 123469-HxCDF	100	
Total HpCDD	ND	4.91	ND		SS 1234689-HpCDF	98.6	
					AS 1368-TCDD	94.8	
Total TCDF	8.22		18.3		AS 1368-TCDF	93.2	
Total PeCDF	3.22		5.83				
Total HxCDF	2.01		2.01				
Total HpCDF	ND	3.02	ND				
Total PCDD/Fs	**52.4**		**68.9**				
ITEF TEQs							
TEQ: ND=0	0.00917		0.472				
TEQ: ND=DL/2	3.38	3.38	3.72				
TEQ: ND=DL	6.76	6.76	6.97				

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Sample ID: 142644-03 Run 2 — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Civil & Environmental Consultants, Inc	Matrix:	Air	Lab Project ID:	A7185	Date Received:	02-Oct-2014
Project ID:	CEC No. 142-644 Task 0001	Weight/Volume:	1	Lab Sample ID	A7185_12600_DF_003	Date Extracted:	06-Oct-2014
Date Collected:	30-Sep-2014			QC Batch No:	12600	Date Analyzed:	09-Oct-2014
		Split:	2	Dilution:	-	Time Analyzed:	23:30:25

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	1.98			ES 2378-TCDD	79.7	
12378-PeCDD	ND	2.06			ES 12378-PeCDD	78.2	
123478-HxCDD	ND	2.13			ES 123478-HxCDD	71.2	
123678-HxCDD	ND	2.28			ES 123678-HxCDD	70.7	
123789-HxCDD	ND	2.24			ES 123789-HxCDD	68.9	
1234678-HpCDD	ND	3.45			ES 1234678-HpCDD	70.5	
OCDD	EMPC		9.73	J B	ES OCDD	60.8	
2378-TCDF	EMPC		3.59	J	ES 2378-TCDF	80.4	
12378-PeCDF	ND	1.3			ES 12378-PeCDF	81.3	
23478-PeCDF	2.44			J	ES 23478-PeCDF	78.5	
123478-HxCDF	ND	1.66			ES 123478-HxCDF	71.2	
123678-HxCDF	ND	1.56			ES 123678-HxCDF	72.7	
234678-HxCDF	ND	1.67			ES 234678-HxCDF	75.2	
123789-HxCDF	ND	2.15			ES 123789-HxCDF	66.9	
1234678-HpCDF	ND	2.01			ES 1234678-HpCDF	71.5	
1234789-HpCDF	ND	3.23			ES 1234789-HpCDF	69.5	
OCDF	ND	6.09			ES OCDF	62.1	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	119	
Total TCDD	25.1		25.1		SS 12347-PeCDD	120	
Total PeCDD	13.4		13.4		SS 12346-PeCDF	116	
Total HxCDD	6.22		6.22		SS 123469-HxCDF	116	
Total HpCDD	ND	3.45	ND		SS 1234689-HpCDF	116	
					AS 1368-TCDD	92.4	
Total TCDF	24.2		37.4		AS 1368-TCDF	92.6	
Total PeCDF	6.06		10.3				
Total HxCDF	2.65		2.65				
Total HpCDF	ND	2.56	ND				
Total PCDD/Fs	**77.6**		**105**				
ITEF TEQs							
TEQ: ND=0	1.22		1.59				
TEQ: ND=DL/2	3.58	2.71	3.85				
TEQ: ND=DL	5.94	5.41	6.12				

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Sample ID: 142644-04 Run 3 — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Civil & Environmental Consultants, Inc	Matrix:	Air	Lab Project ID:	A7185	Date Received:	02-Oct-2014
Project ID:	CEC No. 142-644 Task 0001	Weight/Volume:	1	Lab Sample ID	A7185_12600_DF_004	Date Extracted:	06-Oct-2014
Date Collected:	30-Sep-2014			QC Batch No:	12600	Date Analyzed:	10-Oct-2014
		Split:	2	Dilution:	-	Time Analyzed:	00:23:41

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	2.8			ES 2378-TCDD	91.1	
12378-PeCDD	ND	4.05			ES 12378-PeCDD	89.1	
123478-HxCDD	ND	3.34			ES 123478-HxCDD	79.8	
123678-HxCDD	ND	3.69			ES 123678-HxCDD	83.1	
123789-HxCDD	ND	3.94			ES 123789-HxCDD	81.9	
1234678-HpCDD	ND	5.48			ES 1234678-HpCDD	81.1	
OCDD	ND	9.23			ES OCDD	69.3	
2378-TCDF	ND	2.6			ES 2378-TCDF	94.2	
12378-PeCDF	ND	2.22			ES 12378-PeCDF	92	
23478-PeCDF	ND	2.39			ES 23478-PeCDF	90.2	
123478-HxCDF	ND	1.92			ES 123478-HxCDF	81.8	
123678-HxCDF	ND	1.78			ES 123678-HxCDF	83.9	
234678-HxCDF	ND	1.89			ES 234678-HxCDF	86.4	
123789-HxCDF	ND	2.69			ES 123789-HxCDF	73.3	
1234678-HpCDF	ND	2.7			ES 1234678-HpCDF	82.1	
1234789-HpCDF	ND	3.88			ES 1234789-HpCDF	79.4	
OCDF	ND	9.84			ES OCDF	68.6	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	102	
Total TCDD	19.1		19.1		SS 12347-PeCDD	105	
Total PeCDD	4.38		4.38		SS 12346-PeCDF	101	
Total HxCDD	5.53		5.53		SS 123469-HxCDF	98.9	
Total HpCDD	ND	5.48	ND		SS 1234689-HpCDF	96.6	
					AS 1368-TCDD	91.8	
Total TCDF	3.57		3.57		AS 1368-TCDF	91.7	
Total PeCDF	3.62		3.62				
Total HxCDF	ND	2.04	ND				
Total HpCDF	ND	3.23	ND				
Total PCDD/Fs	**36.2**		**36.2**				
ITEF TEQs							
TEQ: ND=0	0		0				
TEQ: ND=DL/2	4.23	4.23	4.23				
TEQ: ND=DL	8.46	8.46	8.46				

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Sample ID: Reagent Blank — Method 23

Client Data		Sample Data		Laboratory Data			
Name:	Civil & Environmental Consultants, Inc	Matrix:	Air	Lab Project ID:	A7185	Date Received:	02-Oct-2014
Project ID:	CEC No. 142-644 Task 0001	Weight/Volume:	1	Lab Sample ID	A7185_12600_DF_005	Date Extracted:	06-Oct-2014
Date Collected:	30-Sep-2014			QC Batch No:	12600	Date Analyzed:	10-Oct-2014
		Split:	2	Dilution:	-	Time Analyzed:	01:16:58

Analyte	Conc. (pg)	DL (pg)	EMPC (pg)	Qualifiers	Standard	ES Recoveries	Qualifiers
2378-TCDD	ND	2.36			ES 2378-TCDD	87.8	
12378-PeCDD	ND	2.87			ES 12378-PeCDD	86.2	
123478-HxCDD	ND	2.6			ES 123478-HxCDD	83.6	
123678-HxCDD	ND	2.65			ES 123678-HxCDD	81.8	
123789-HxCDD	ND	2.85			ES 123789-HxCDD	84.4	
1234678-HpCDD	5.26			J	ES 1234678-HpCDD	80.9	
OCDD	EMPC		12.5	J B	ES OCDD	59.7	
2378-TCDF	ND	2.17			ES 2378-TCDF	87.6	
12378-PeCDF	ND	1.46			ES 12378-PeCDF	90.2	
23478-PeCDF	ND	1.67			ES 23478-PeCDF	84.8	
123478-HxCDF	ND	1.72			ES 123478-HxCDF	81.6	
123678-HxCDF	ND	1.55			ES 123678-HxCDF	85.7	
234678-HxCDF	ND	1.7			ES 234678-HxCDF	85.4	
123789-HxCDF	ND	2.5			ES 123789-HxCDF	71.6	
1234678-HpCDF	ND	2.03			ES 1234678-HpCDF	86.6	
1234789-HpCDF	ND	3.77			ES 1234789-HpCDF	75.8	
OCDF	ND	8.53			ES OCDF	58.4	
Totals					**Standard**	**SS/AS Recoveries**	
					SS 37Cl-2378-TCDD	101	
Total TCDD	ND		3.65		SS 12347-PeCDD	105	
Total PeCDD	ND	2.87	ND		SS 12346-PeCDF	98.4	
Total HxCDD	ND	2.69	ND		SS 123469-HxCDF	95.4	
Total HpCDD	12.3		12.3		SS 1234689-HpCDF	84.7	
					AS 1368-TCDD	91.1	
Total TCDF	ND	2.17	ND		AS 1368-TCDF	88.5	
Total PeCDF	ND	1.56	ND				
Total HxCDF	ND	1.83	ND				
Total HpCDF	ND	2.77	ND				
Total PCDD/Fs	**12.3**		**28.4**				
ITEF TEQs							
TEQ: ND=0	0.0526		0.0651				
TEQ: ND=DL/2	3.32	3.29	3.33				
TEQ: ND=DL	6.6	6.58	6.6				

SGS
5500 Business Drive
Wilmington, NC 28405, USA
www.us.sgs.com
Tel: +1 910 794-1613; Toll-Free 866 846-8290

Sample Receipt Notification

5500 Business Drive
Wilmington, NC 28405 USA
Tel: 910 794-1613
Toll Free: 866 846-8290
Fax: 910 794-3919

Project Manager:	*Heather Distel*
Receipt Date & Time:	*02-Oct-14 at 16:16*
AP Project name:	*A7185*
Requested TAT:	*21 days*
Projected due date:	*24-Oct-14*
Matrix:	*Air - M23*
Phone#:	*910-794-1613*
Email Address:	*Heather.Distel@sgs.com*

Company Contact:	*Paul Jenkins*
Company:	*Civil & Environmental Consultants, Inc*
Project Name & Site:	*CEC No. 142-644 Task 0001*
Project PO#:	*NC14067*
QAAP/Contract #:	*N/A*
Requested Analysis:	*Method 23*
Phone#:	*980-237-0373*
Email Address:	*pjenkins@cecinc.com*

Received Temps

Client Smp ID	AP Smp ID	Components	Sampling Date	Sampling Time	XAD	Solvent Rinse(s)	Container #	Shipping #
142644-01 Field Blank	A7185_001	Filter #1, T2099-003, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
142644-02 Run 1	A7185_002	Filter #1, T2099-008, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
142644-03 Run 2	A7185_003	Filter #1, T2099-001, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
142644-04 Run 3	A7185_004	Filter #1, T2099-006, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
Reagent Blank	A7185_005	Filter #1, T2099-005, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,

Sample Seals Intact: No **Sample(s) Condition:** Intact

Notes/Comments:

Samples received intact

Any un-extracted sample will be stored for 90 days from reporting date. Additional storage fees may apply for any samples stored longer than 90 days.

Received by: Barbara Hager *Logged in by: Barbara Hager* *QC'ed by:* AK 3 Oct 14

All services are rendered in accordance with the applicable SGS General Conditions of Service accessible via: http://www.sgs.com/terms_and_conditions.htm

07185

SGS CHAIN OF CUSTODY | ULTRATRACE ANALYSIS IN AIR

PROJECT INFO:
PROJECT: CEC No. 142-644 Task 0001
P.O. #
QUOTE #:
SITE REF:
TURN AROUND TIME:
REPORT LEVEL: (see reverse)
☐ Standard ☐ Basic ☐ Other:
SPECIAL DELIVERABLES: ☐ State of Origin:
☐ EDD: ☐ Other:

SEND DOCUMENTATION / RESULTS TO:
COMPANY: CEC CONTACT: Paul Jenkins
ADDRESS: 1900 Center Park Dr. Suite A Charlotte, NC 28217
PHONE: 980.237.0373 Ext. 2807
EMAIL: Pjenkins@cecinc.com

INVOICE TO: (☐ CHECK IF SAME)
COMPANY: CONTACT:
ADDRESS:
PHONE: EMAIL:

SPECIAL INSTRUCTIONS / COMMENTS:
☐ Dioxin/Furan ☐ USVOST
☐ PCBs ☐ TRI-OCTA
☐ PAH ☑ M23
* ☑ Alt-052 ☐ M 0023A
TEFS: ☐ ITEFS ☐ MA-TEFS ☐ WHO-98 ☐ CT-TEFS ☐ WHO-05 ☐ _____

NOTES:
1. M23 represents one sample (FH/BH combined) while M0023A represents two samples (FH/BH separate). If 0023A option is selected, we will append FH and BH to the sample ID.No entries for the BH components = FH & BH are combined. An "X" in Lab QC slot = DO NOT ANALYZE.
2. For Method 23 FH & BH rinses are combined - No Condensates

LAB ID	SAMPLE ID / DESCRIPTION	DATE	TIME	FILTER	FIELD QC	LAB QC	XAD-2 RESIN	FIELD QC	LAB QC	FH AC./MC *	FIELD QC	LAB QC	FH TOLUENE	FIELD QC	LAB QC	BH AC./MC	FIELD QC	LAB QC	BH TOLUENE	FIELD QC	LAB QC	CONDENSATES	FIELD QC	LAB QC	REMARKS
	142644-01 Field Blank	9/30/14		X			X			X			X												See Alt-052
	142644-02 Run 1	9/30/14		X			X			X			X												See Alt-052
	142644-03 Run 2	9/30/14		X			X			X			X												See Alt-052
	142644-04 Run 3	9/30/14		X			X			X			X												See Alt-052
142644-05	BU REAGENT BLANK-Acetone	9/30/14								X			X	BU											
142644-06	Toluene Reagent Blank	9/30/14											X												
142644-07	Filter Blank	10/1/14		X																					
142644-08	XAD-2 Resin Trap Blank	10/1/14					X																		

COLLECTED/RELINQUISHED BY (1):	DATE:	TIME:	RECEIVED BY:
Ryan T. Haines	10/02/14	0845	Chris Hunter
RELINQUISHED BY (2):	DATE:	TIME:	RECEIVED BY:
			Shannon R Hudson

RECEIVED BY LABORATORY: Shannon R Hudson DATE: 2-Oct-14 TIME: 4:16PM
COC SEAL: ☐ INTACT ☐ BROKEN ☐ ABSENT
SAMPLE RECEIPT TEMP: °C 2° & 23-Solvents
CARRIER: Courier TRACKING #: _____
NOTES:

SGS NORTH AMERICA INC. | ULTRATRACE LABORATORY 5500 Business Drive Wilmington, NC 28405 910 350 1903 | 910 794 1613 www.sgs.com/ultratrace

Member of the SGS Group (SGS SA)

Type & Quantity of Sampling Modules

Qty. XAD Traps:	8
Resin Batch No.:	51724
Qty. PUF:	N/A
PUF Batch No.:	N/A
Filter Size:	82.6 mm
Qty. Filter:	10
Filter Batch #:	03012014
Qty. Petri Dishes:	8
# of BCS3 & MB:	1

Client Specific Instructions

USE CLIENT TRAPS
OK TO RENT TRAPS IF NEEDED

Other Requirements

# Rinse Jars:	N/A
# CarboPacs:	N/A

Spike Profile

Vol. PCDD/F : 40µL

Solution ID:	01172014D	Amount:	1.6-4 ng
Vial ID:	14-38-1	Expiration:	8/1/15

Vol. HR_PAH: 80 µL (40ng)

Solution ID:	N/A	Amount:	0.5 ng/µL
Vial ID:	N/A	Expiration:	N/A

Vol.HR_PCB: 40 µL (4ng)

Solution ID:	N/A	Amount:	0.1 ng/µL
Vial ID:	N/A	Expiration:	N/A

Sampling Module Request Form

Trap Order #: T2099

Following sample recovery, please return this form with the field samples to:

5500 Business Dr.
Wilmington, NC 28405
Ph.:910-794-1613
Fax.: 910-794-3919

Please be aware of your trap batch #
QC begins when we prep your traps.
The Method Blanks and BCS_3 are prepared simultaneously with the trap and are properly stored until the trap batch returns for analysis.

We recommend keeping trap batches together and if a set of traps is to be split into multiple projects, please let us know so we can prepare extra Method Blanks/BCS_3

Spike By: DA 9/22/14

Witness: RAN 9/22/14

Client Information

Company:	Civil & Environmental Consultants, Inc.
Contact:	Quentin Best
Email:	qbest@cecinc.com
Phone:	855-859-9932
Project Name:	
PO#:	NC14067
Order Date:	29-Aug-14
Arrival Date:	23-Sep-14

Ship To: Civil & Environmental Consultants, Inc.
Quentin Best
1900 Center Park Drive Suite A
Charlotte NC 28217
USA
qbest@cecinc.com
980-237-0373

All PROJECTS ARE SHIPPED PRIORITY OVERNIGHT VIA FEDEX

Analyses

PCDD/F

Additional Information

AP Rental Traps Qty.: 4 & CLEAN
Air Bill #: 9/22/14
1 ice # Containers: 6109 3067 4286
Ship Date: 22-Sept.-14

Trap Batch

T2099

Initial & Date below for each trap

Spiking Traps

only fill out applicable table

Solution ID: 011720140	
Spike Volume : 40uL	
TRAP ID	**PCDD/Fs**
BCS3	RAN
MB-000	RAN
001	RAN
002	RAN
003	RAN
004	RAN
005	RAN
006	RAN
007	RAN
008	RAN
009	
010	
011	
012	
013	
014	
015	

Solution ID:	
Spike Volume :	
TRAP ID	**HRPCBs**
BCS3	
MB-000	
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	

Solution ID:	
Spike Volume :	
TRAP ID	**HRPAHs**
BCS3	
MB-000	
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	

Solution ID:	
Spike Volume :	
TRAP ID	**PCDD/Fs(FS)**
BCS3	
MB-000	
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	

RAN
9/22/14

SGS ANALYTICAL PERSPECTIVES

Project Initiation Form

Project Number:	A7185	Initiation Date:	03-Oct-14
Client Name:	Civil & Environmental Consultants, Inc	Sample Matrix:	Air - M23
Analysis Method:	M23	TAT:	21 days
		Project Manager:	Heather

Special Instructions

n/a

Reporting Instructions

n/a

PM Initials: akornega Date: 03-Oct-2014

Prep Sheet

TRANSFER: [illegible] 10-9-14

RECEIVED: [illegible] 10/9/14

SGS

M23

AIR

Project # A7185 | Batch # 12600 | Extract Init/Date: MK 10/6/14 | ASECS Init/Date: [illegible] 10/8/14 | Transfer Init/Date: [illegible] 10-9-14

AP Sample ID	Client Sample ID	SDS #	RV & S.E. Initials	RV & S.E. #	Split (1/2) 1/4	ASECS #	(Td) 20.5
A7185_12600_001	142644-01 Field Blank	36	JB	3	ba	3	BF
A7185_12600_002	142644-02 Run 1	37	JB	4	ba	2	BF
A7185_12600_003	142644-03 Run 2	38	JB	2	ba	1	BF
A7185_12600_004	142644-04 Run 3	39	JB	3	ba	16	BF
A7185_12600_005	Reagent Blank	40	JB	4	ba	15	BF
BCS3_12600	0_12600_BCS3	—	—	—	—	—	40 10/6/14
MB1_12600	Method Blank	35	JB	2	ba	4	BF
			10/7/14		10/7/14		

Supply IDs

Toluene	DL140
CH_2CL_2	DL031
Sand	———
Florisil	10022014
Hexane	DL495
Silica	09112014
Acid Silica	09242014
Base Silica	08292014
HydroMatrix	———
Tetradecane	04112013
~~H_2SO_4~~ Na_2SO_4	09052014
~~K Silicate~~ $AgNO_3$	09232014

Special Instructions

n/a

T61

Cycle Time

Start 3:00 pm

Stop 9:00 Am

SGS

M23

AIR

Project # A7185 Batch # 12600

Inter-Department Communication Sheet

T2099_MB000
CIVIL & ENV. CONSULT.
PREP: 22 SEPT 2014
EXP: 06 OCT 2014
4 NG Sampling Standard PCDD/F
RAN

10/6/14

	XAD	FILTERS	RINSES	OTHER
A7185_12600_001	wh, D	wh, D	clear, clear, slight pm	wh, D
A7185_12600_002	wh, m, st, Bin & Top	wh, D	see 001	Wh, w
A7185_12600_003	See 002	wh, D	see 001	See 002
A7185_12600_004	See 002	wh, D	see 001	See 002
A7185_12600_005	wh, D	wh, D	clear, clear	wh, D

Special Instructions

n/a

M23 benchsheet

SGS | M23 | AIR

Project # A7185 Batch # 12600

SPIKE PROFILE PCDD/Fs

Analyte	Spike Compounds	Spiked Amount	Spiked Volume	Solution Conc.	Split Factor	Final Volume	Final Solvent
PCDD/F	SS	4 ng	40 uL	40 pg/uL	2	20 uL	Td
	ES	4 ng	400 uL	10 pg/uL	2	20 uL	Td
	AS	4 ng	400 uL	10 pg/uL	2	20 uL	Td
	JS	2 ng	200 uL	10 pg/uL	1	20 uL	Td
	Ax Batch CS3	0.4 ng	400 uL	1 pg/uL	2	40 uL	Td
	Td Batch CS3		40 uL			40 uL	Td
	Spiker Initials:	MK 10/6/14	MK 10/6/14	MK 10/6/14	tm 10/7/14	tm 10.9.14	

AP Sample ID	Client Sample ID	PCDD/F ES Amount: 400 pL Observer Initials	PCDD/F Ax-A Amount: 400 pL Observer Initials	PCDD/F Ax-B Amount: 40 pL Observer Initials	PCDD/F AS Amount: 40 uL Observer Initials	PCDD/F JS Amount: 200 uL Observer Initials	Amount: Observer Initials
A7185_12600_001	142644-01 Field Blank	MK	—	—	bdh	av	
A7185_12600_002	142644-02 Run 1	MK	—	—	bdh	av	
A7185_12600_003	142644-03 Run 2	MK	—	—	bdh	av	
A7185_12600_004	142644-04 Run 3	MK	—	—	bdh	av	
A7185_12600_005	Reagent Blank	MK	—	—	bdh	av	
BCS3_12600	0_12600_BCS3	MK	MK	MK	bdh	av	
MB1_12600	Method Blank	MK	—	—	bdh	av	
		10/6/14	10/6/14	10/6/14	10/7/14	10-9-14	

Standard Information

		ES	AX-A	Ax-B	AS	JS	
STD Type							
Spike ID		011720140	011720140	———	011720140Ad3	011720140Ad2	
SIL #		14-98-1	14-68-2	13-13-1	14-88-2	14-68-5	
Concentration		10	1	10	10	10	
Units		pg /µL	pg /µL	pg /µL	pg /µL	pg /µL	
Exp. Date		8/25/15	6/23/15	3/27/15	8-1-15	6-23-15	
Spike amount (µL)		400	400	40	400	200	

Sample Receipt Notification

5500 Business Drive
Wilmington, NC 28405 USA
Tel: 910 794-1613
Toll Free: 866 846-8290
Fax: 910 794-3919

Project Manager:	*Heather Distel*
Receipt Date & Time:	*02-Oct-14 at 16:16*
AP Project name:	*A7185*
Requested TAT:	*21 days*
Projected due date:	*24-Oct-14*
Matrix:	*Air - M23*
Phone#:	*910-794-1613*
Email Address:	*Heather.Distel@sgs.com*

Company Contact:	*Paul Jenkins*
Company:	*Civil & Environmental Consultants, Inc*
Project Name & Site:	*CEC No. 142-644 Task 0001*
Project PO#:	*NC14067*
QAAP/Contract #:	*N/A*
Requested Analysis:	*Method 23*
Phone#:	*980-237-0373*
Email Address:	*pjenkins@cecinc.com*

Received Temps

Client Smp ID	AP Smp ID	Components	Sampling Date	Sampling Time	XAD	Solvent Rinse(s)	Container #	Shipping #
142644-01 Field Blank	A7185_001	Filter #1, T2099-003, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
142644-02 Run 1	A7185_002	Filter #1, T2099-008, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
142644-03 Run 2	A7185_003	Filter #1, T2099-001, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
142644-04 Run 3	A7185_004	Filter #1, T2099-006, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,
Reagent Blank	A7185_005	Filter #1, T2099-005, Acetone, Toluene, XAD #1	30-Sep-14	00:00	2	23	1, 2	na,na,

Sample Seals Intact: No **Sample(s) Condition:** Intact

Notes/Comments:

Samples received intact

Any un-extracted sample will be stored for 90 days from reporting date. Additional storage fees may apply for any samples stored longer than 90 days.

Received by: Barbara Hager *Logged in by: Barbara Hager* *QC'ed by:* AK 3 Oct 14

All services are rendered in accordance with the applicable SGS General Conditions of Service accessible via: http://www.sgs.com/terms_and_conditions.htm

07185

SGS CHAIN OF CUSTODY | ULTRATRACE ANALYSIS IN AIR

PROJECT INFO:
PROJECT: CEC No. 142-644 Task 0001
P.O. #
QUOTE #:
SITE REF:
TURN AROUND TIME:
REPORT LEVEL: (see reverse)
☐ Standard ☐ Basic ☐ Other:
SPECIAL DELIVERABLES: ☐ State of Origin:
☐ EDD: ☐ Other:

SEND DOCUMENTATION / RESULTS TO:
COMPANY: CEC CONTACT: Paul Jenkins
ADDRESS: 1900 Center Park Dr. Suite A Charlotte, NC 28217
PHONE: 980.237.0373 Ext. 2807
EMAIL: Pjenkins@cecinc.com

INVOICE TO: (☐ CHECK IF SAME)
COMPANY: CONTACT:
ADDRESS:
PHONE: EMAIL:

SPECIAL INSTRUCTIONS / COMMENTS:
☐ Dioxin/Furan ☐ USVOST
☐ PCBs ☐ TRI-OCTA
☐ PAH ☑ M23
* ☑ Alt-052 ☐ M 0023A
TEFS: ☐ ITEFS ☐ MA-TEFS ☐ WHO-98 ☐ CT-TEFS ☐ WHO-05 ☐ _____

NOTES:
1. M23 represents one sample (FH/BH combined) while M0023A represents two samples (FH/BH separate). If 0023A option is selected, we will append FH and BH to the sample ID.No entries for the BH components = FH & BH are combined. An "X" in Lab QC slot = DO NOT ANALYZE.
2. For Method 23 FH & BH rinses are combined - No Condensates

LAB ID	SAMPLE ID / DESCRIPTION	DATE	TIME	FILTER	FIELD QC	LAB QC	XAD-2 RESIN	FIELD QC	LAB QC	FH AC. *	FIELD QC	LAB QC	FH TOLUENE	FIELD QC	LAB QC	BH AC./MC	FIELD QC	LAB QC	BH TOLUENE	FIELD QC	LAB QC	CONDENSATES	FIELD QC	LAB QC	REMARKS
	142644-01 Field Blank	9/30/14		X			X			X			X												See Alt-052
	142644-02 Run 1	9/30/14		X			X			X			X												See Alt-052
	142644-03 Run 2	9/30/14		X			X			X			X												See Alt-052
	142644-04 Run 3	9/30/14		X			X			X			X												See Alt-052
142644-05	BU REAGENT BLANK - Acetone	9/30/14								X			X	BU											
142644-06	Toluene Reagent Blank	9/30/14											X												
142644-07	Filter Blank	10/1/14		X																					
142644-08	XAD-2 Resin Trap Blank	10/1/14					X																		

COLLECTED/RELINQUISHED BY (1):	DATE:	TIME:	RECEIVED BY:	RECEIVED BY LABORATORY:	DATE:	TIME:
Bryan T. Haines	10/02/14	0845	Chris Hunter	Shannon Hudson	2 Oct-14	4:16 PM
RELINQUISHED BY (2):	DATE:	TIME:	RECEIVED BY:	COC SEAL: ☐ INTACT ☐ BROKEN ☑ ABSENT		
			Shannon R Hudson	SAMPLE RECEIPT TEMP: °C 2° & 23-Solvents		
				CARRIER: Courier	TRACKING #: _____	
				NOTES:		

SGS NORTH AMERICA INC. | ULTRATRACE LABORATORY 5500 Business Drive Wilmington, NC 28405 910 350 1903 | 910 794 1613 www.sgs.com/ultratrace

CLIENT SAMPLE ID	142644-01 Field Blank	142644-02- Run 1	142644-03- Run2	142644-04 Run 3
LAB SAMPLE #	97185 -001	97185 - 002	97185 -003	97185 -004
DATE SAMPLED	30-Sept-14	30-Sept-14	30-Sept-14	30-Sept-14
OBSERVATIONS				
COMPONENTS	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**
FILTER	1	1	1	1
XAD	1	1	1	1
TRAP PREP#	T2099- 003	T2099- 008	T2099- 001	T2099- 006
ACETONE / ~~CH_2Cl_2~~ FH/BH RINSE	1	1	1	1
TOLUENE FH/BH RINSE	1	1	1	1
OTHER (IMPING ERS, ETC…)				
TRAP SOURCE	☐ AP ☑ CLIENT	~~☑~~ AP ☐ CLIENT	~~☑~~ AP ☐ CLIENT	~~☑~~ AP ☐ CLIENT

CLIENT SAMPLE ID	Reagent Blank			
LAB SAMPLE #	97185 -005			
DATE SAMPLED	30-Sept-14			
OBSERVATIONS				
COMPONENTS	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**
FILTER	1			
XAD	1			
TRAP PREP#	T2099- 005			
ACETONE / CH_2Cl_2 FH/BH RINSE	1			
TOLUENE FH/BH RINSE	1			
OTHER (IMPINGERS, ETC…)				
TRAP SOURCE	☐ AP ☑ CLIENT	☐ AP ☐ CLIENT	☐ AP ☐ CLIENT	☐ AP ☐ CLIENT

UNUSED TRAPS: 3 unused

METHOD 23
PCDD / PCDFs

Type & Quantity of Sampling Modules

Qty. XAD Traps:	8
Resin Batch No.:	51724
Qty. PUF:	N/A
PUF Batch No.:	N/A
Filter Size:	82.6 mm
Qty. Filter:	10
Filter Batch #:	08012014
Qty. Petri Dishes:	8
# of BCS3 & MB:	1

Client Specific Instructions

USE CLIENT TRAPS
OK TO RENT TRAPS IF NEEDED

Other Requirements

# Rinse Jars:	N/A
# CarboPacs:	N/A

Spike Profile

Vol. PCDD/F : 40µL

Solution ID:	01172014D	Amount:	1.6-4 ng
Vial ID:	14-38-1	Expiration:	8/1/15

Vol. HR_PAH: 80 µL (40ng)

Solution ID:	N/A	Amount:	0.5 ng/µL
Vial ID:	N/A	Expiration:	N/A

Vol.HR_PCB: 40 µL (4ng)

Solution ID:	N/A	Amount:	0.1 ng/µL
Vial ID:	N/A	Expiration:	N/A

SGS

Sampling Module Request Form

Trap Order #: T2099

Following sample recovery, please return this form with the field samples to:

5500 Business Dr.
Wilmington, NC 28405
Ph.:910-794-1613
Fax.: 910-794-3919

Please be aware of your trap batch #
QC begins when we prep your traps.
The Method Blanks and BCS_3 are prepared simultaneously with the trap and are properly stored until the trap batch returns for analysis.

We recommend keeping trap batches together and if a set of traps is to be split into multiple projects, please let us know so we can prepare extra Method Blanks/BCS_3

Spike By: DA 9/22/14

Witness: RAN 9/22/14

Client Information

Company:	Civil & Environmental Consultants, Inc.
Contact:	Quentin Best
Email:	qbest@cecinc.com
Phone:	855-859-9932
Project Name:	
PO#:	NC14067
Order Date:	29-Aug-14
Arrival Date:	23-Sep-14

Ship To: Civil & Environmental Consultants, Inc.
Quentin Best
1900 Center Park Drive Suite A
Charlotte NC 28217
USA
qbest@cecinc.com
980-237-0373

All PROJECTS ARE SHIPPED PRIORITY OVERNIGHT VIA FEDEX

Analyses

PCDD/F

Additional Information

AP Rental Traps Qty.: 4 & 4 C.E RAN 9/22/14
Air Bill #:
1 E # Containers: 6109 3067 4286
Ship Date: 22-Sept.-14

Trap Batch

T2099

Initial & Date below for each trap

Spiking Traps

only fill out applicable table

Solution ID: 011720140	
Spike Volume : 40uL	
TRAP ID	**PCDD/Fs**
BCS3	RAN
MB-000	RAN
001	RAN
002	RAN
003	RAN
004	RAN
005	RAN
006	RAN
007	RAN
008	RAN
009	
010	
011	
012	
013	
014	
015	

Solution ID:	
Spike Volume :	
TRAP ID	**HRPCBs**
BCS3	
MB-000	
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	

Solution ID:	
Spike Volume :	
TRAP ID	**HRPAHs**
BCS3	
MB-000	
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	

Solution ID:	
Spike Volume :	
TRAP ID	**PCDD/Fs(FS)**
BCS3	
MB-000	
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	
011	
012	
013	
014	
015	

RAN
9/22/14

SGS

ANALYTICAL PERSPECTIVES

SGS Environmental Services — Run Log **Project: A7185_12600_DF**

Instrument: MM1 (AutoSpec-Ultima) MS Experiment: df_cl4-8 GC Program: zb5-ms_60m

#	Datafile	Vial#	Lab ID	Wt/Vol	Client/Sample ID	Analyst(s)	Checkcode	Acq Date	Acq Time
2	141009P02	15	BCS3_12600_DF_PA	1.00	BCS3_12600_DF_PA	ACC	029-563	09-Oct-2014	19:04:05
3	141009P03	2	SBS_141009_DF_PA	1.00	SIL 12-70-1	ACC	743-599	09-Oct-2014	19:57:21
4	141009P04	16	MB1_12600_DF_SDS	1.00	Method Blank	ACC	616-785	09-Oct-2014	20:50:37
5	141009P05	17	A7185_12600_DF_001	1.00	142644-01 Field Blank	ACC	297-434	09-Oct-2014	21:43:53
6	141009P06	18	A7185_12600_DF_002	1.00	142644-02 Run 1	ACC	694-399	09-Oct-2014	22:37:08
7	141009P07	19	A7185_12600_DF_003	1.00	142644-03 Run 2	ACC	765-747	09-Oct-2014	23:30:25
8	141009P08	20	A7185_12600_DF_004	1.00	142644-04 Run 3	ACC	455-311	10-Oct-2014	00:23:41
9	141009P09	21	A7185_12600_DF_005	1.00	Reagent Blank	ACC	552-578	10-Oct-2014	01:16:58
10	141009P10	2	SBS_141009_DF_PB	1.00	SIL 12-70-1	ACC	307-281	10-Oct-2014	02:10:13
11	141009P11	15	BCS3_12600_DF_PB	1.00	BCS3_12600_DF_PB	ACC	214-053	10-Oct-2014	03:03:30

REVIEWED
By Amber Kornegay at 9:54 am, Oct 13, 2014

REVIEWED
By Andrew Chu at 1:35 pm, Oct 12, 2014

Project file: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF.utp_prj, saved 12-Oct-2014 13:35
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689

Printed: 12-Oct-2014 13:35

Lab ID: MB1_12600_DF_SDS **Acq'd:** 09 Oct 2014 20:50 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: Method Blank A7185_12600 **UTP:** 12-Oct-2014 13:18:24 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 616-785-GWX

Datafile: 141009P04 **Report:** 12 Oct 2014 13:20 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
2378-TCDD	NotFnd		1.0008	-		-	-	-	1.16	-	2140	1.32
12378-PeCDD	NotFnd		1.0005	-		-	-	-	0.99	-	2193	1.54
123478-HxCDD	NotFnd		1.0003	-		-	-	-	1.06	-	2072	1.55
123678-HxCDD	NotFnd		1.0035	-		-	-	-	1.09	-	2072	1.56
123789-HxCDD	NotFnd		1.0116	-		-	-	-	0.93	-	2072	1.76
1234678-HpCDD	NotFnd		1.0005	-		-	-	-	1.02	-	1882	2.52
OCDD	45.91		1.0005	1.0004	-0.3	4.86E+04	0.89	Y	1.07	5.99	1681	3.97
2378-TCDF	NotFnd		1.0008	-		-	-	-	0.99	-	2805	1.53
12378-PeCDF	NotFnd		1.0005	-		-	-	-	1.00	-	2157	0.923
23478-PeCDF	NotFnd		1.0005	-		-	-	-	1.02	-	2157	0.99
123478-HxCDF	NotFnd		1.0004	-		-	-	-	1.18	-	1950	1.14
123678-HxCDF	NotFnd		1.0004	-		-	-	-	1.11	-	1950	1.04
234678-HxCDF	NotFnd		1.0004	-		-	-	-	1.14	-	1950	1.1
123789-HxCDF	NotFnd		1.0003	-		-	-	-	1.08	-	1950	1.62
1234678-HpCDF	NotFnd		1.0004	-		-	-	-	1.38	-	1500	1.15
1234789-HpCDF	NotFnd		1.0004	-		-	-	-	1.28	-	1500	2.2
OCDF	NotFnd		1.0004	-		-	-	-	1.04	-	1596	3.65

Name	Act RT	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
ES 2378-TCDD	27.06	1.0257	1.0258	+0.2	6.07E+07	0.77	Y	1.12	92.4
ES 12378-PeCDD	32.64	1.2368	1.2371	+0.5	5.50E+07	1.59	Y	1.05	89.1
ES 123478-HxCDD	36.58	0.9917	0.9918	+0.2	4.77E+07	1.27	Y	1.08	91.2
ES 123678-HxCDD	36.69	0.9948	0.9948	0	4.59E+07	1.24	Y	1.06	89.9
ES 123789-HxCDD	36.99	1.0029	1.0028	-0.2	5.48E+07	1.24	Y	1.25	90.8
ES 1234678-HpCDD	40.81	1.1065	1.1064	-0.2	4.11E+07	1.11	Y	0.96	88.5
ES OCDD	45.89	1.2447	1.2443	-0.9	6.04E+07	0.88	Y	0.79	79.1
ES 2378-TCDF	26.13	1.0578	1.0579	+0.1	8.67E+07	0.75	Y	1.04	87.4
ES 12378-PeCDF	31.14	1.2599	1.2606	+1.0	8.92E+07	1.49	Y	0.98	95.5
ES 23478-PeCDF	32.28	1.3061	1.3067	+0.9	7.48E+07	1.47	Y	0.91	86.3
ES 123478-HxCDF	35.61	0.9653	0.9654	+0.2	5.17E+07	0.52	Y	1.23	86.9
ES 123678-HxCDF	35.75	0.9692	0.9692	0	6.61E+07	0.53	Y	1.49	92.1
ES 234678-HxCDF	36.40	0.9868	0.9869	+0.2	5.99E+07	0.52	Y	1.36	91.5
ES 123789-HxCDF	37.37	1.0132	1.0132	0	4.96E+07	0.52	Y	1.33	77
ES 1234678-HpCDF	39.25	1.0642	1.0641	-0.2	4.54E+07	0.47	Y	0.96	98.3
ES 1234789-HpCDF	41.59	1.1278	1.1277	-0.2	3.22E+07	0.46	Y	0.84	79.3
ES OCDF	46.23	1.2538	1.2533	-1.1	6.31E+07	0.89	Y	0.94	69.4

Lab ID: MB1_12600_DF_SDS **Acq'd:** 09 Oct 2014 20:50 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: Method Blank A7185_12600 **UTP:** 12-Oct-2014 13:18:24 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 616-785-GWX

Datafile: 141009P04 **Report:** 12 Oct 2014 13:20 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
JS 1234-TCDD	26.38		-	-	-	5.88E+07	0.78	Y	-	-
JS 1234-TCDF	24.70		-	-	-	9.53E+07	0.75	Y	-	-
JS 123467-HxCDD	36.88		-	-	-	2.42E+07	1.23	Y	-	-
CS 37Cl-2378-TCDD	27.09		1.0266	1.0267	+0.2	2.74E+07	n/a	-	1.21	96.5
CS 12347-PeCDD	32.13		1.2174	1.2176	+0.3	4.95E+07	1.61	Y	0.91	92.1
CS 12346-PeCDF	30.60		1.2380	1.2387	+1.0	7.56E+07	1.48	Y	0.84	94.6
CS 123469-HxCDF	36.06		0.9775	0.9776	+0.2	5.27E+07	0.52	Y	1.23	88.9
CS 1234689-HpCDF	39.90		1.0818	1.0817	-0.2	3.24E+07	0.46	Y	0.82	81.5
SS 37Cl-2378-TCDD	27.09		1.0266	1.0267	+0.2	2.74E+07	n/a	-	1.08	104
SS 12347-PeCDD	32.13		1.2174	1.2176	+0.3	4.95E+07	1.61	Y	0.87	103
SS 12346-PeCDF	30.60		1.2380	1.2387	+1.0	7.56E+07	1.48	Y	0.86	99
SS 123469-HxCDF	36.06		0.9775	0.9776	+0.2	5.27E+07	0.52	Y	0.83	96.5
SS 1234689-HpCDF	39.90		1.0818	1.0817	-0.2	3.24E+07	0.46	Y	0.86	82.9
AS 1368-TCDD	23.14		0.8774	0.8770	-0.6	5.92E+07	0.79	Y	1.08	93
AS 1368-TCDF	20.96		0.8487	0.8483	-0.6	1.04E+08	0.75	Y	1.16	93.5

Totals	Conc	EMPC
Total TCDD	0	2.95
Total PeCDD	0	0
Total HxCDD	0	0
Total HpCDD	0	0
Total Tetra-Octa Dioxins	5.99	8.95
Total TCDF	0	0
Total PeCDF	0	0
Total HxCDF	0	0
Total HpCDF	0	0
Total Tetra-Octa Furans	0	0
Total Tetra-Octa Dioxins & Furans	5.99	8.95

Lab ID: MB1_12600_DF_SDS **Acq'd: 09 Oct 2014 20:50 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: Method Blank A7185_12600 **UTP: 12-Oct-2014 13:18:24 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 616-785-GWX**

Datafile: 141009P04 **Report: 12 Oct 2014 13:20 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1368-TCDD	23.17		0.8565	0.8560	-0.8	5.18E+04	1.01	N	1.16	2.95	2140	1.32
1379-TCDD	NotFnd		0.8710						1.16		2140	1.32
1369-TCDD	NotFnd		0.8881						1.16		2140	1.32
1469-TCDD	NotFnd		0.9195						1.16		2140	1.32
1247/1246/1248/1249-TCDD	NotFnd		0.9287						1.16		2140	1.32
1378-TCDD	NotFnd		0.9363						1.16		2140	1.32
1268-TCDD	NotFnd		0.9442						1.16		2140	1.32
1478-TCDD	NotFnd		0.9538						1.16		2140	1.32
1279-TCDD	NotFnd		0.9605						1.16		2140	1.32
1234/1269-TCDD	NotFnd		0.9746						1.16		2140	1.32
1236-TCDD	NotFnd		0.9797						1.16		2140	1.32
1237/1238-TCDD	NotFnd		0.9896						1.16		2140	1.32
1239-TCDD	NotFnd		0.9950						1.16		2140	1.32
2378-TCDD	**NotFnd**		**1.0008**						**1.16**		**2140**	**1.32**
1278-TCDD	NotFnd		1.0137						1.16		2140	1.32
1267-TCDD	NotFnd		1.0187						1.16		2140	1.32
1289-TCDD	NotFnd		1.0388						1.16		2140	1.32
12479/12468-PeCDD	NotFnd		0.9217						0.99		2193	1.54
12469-PeCDD	NotFnd		0.9383						0.99		2193	1.54
12368-PeCDD	NotFnd		0.9559						0.99		2193	1.54
12478-PeCDD	NotFnd		0.9618						0.99		2193	1.54
12379-PeCDD	NotFnd		0.9650						0.99		2193	1.54
12369/12467/12489-PeCDD	NotFnd		0.9732						0.99		2193	1.54
12346/12347-PeCDD	NotFnd		0.9849						0.99		2193	1.54
12378-PeCDD	**NotFnd**		**1.0005**						**0.99**		**2193**	**1.54**
12367-PeCDD	NotFnd		1.0034						0.99		2193	1.54
12389-PeCDD	NotFnd		1.0143						0.99		2193	1.54
124679/124689-HxCDD	NotFnd		0.9537						1.03		2072	1.61
123468-HxCDD	NotFnd		0.9718						1.03		2072	1.61
123679/123689-HxCDD	NotFnd		0.9797						1.03		2072	1.61
123469-HxCDD	NotFnd		0.9834						1.03		2072	1.61
123478-HxCDD	**NotFnd**		**1.0003**						**1.06**		**2072**	**1.55**
123678-HxCDD	**NotFnd**		**1.0035**						**1.09**		**2072**	**1.56**
123467-HxCDD	NotFnd		1.0087						1.03		2072	1.61
123789-HxCDD	**NotFnd**		**1.0116**						**0.93**		**2072**	**1.76**

Lab ID: MB1_12600_DF_SDS **Acq'd:** 09 Oct 2014 20:50 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: Method Blank A7185_12600 **UTP:** 12-Oct-2014 13:18:24 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 616-785-GWX

Datafile: 141009P04 **Report:** 12 Oct 2014 13:20 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1234679-HpCDD	NotFnd		0.9725						1.02		1882	2.52
1234678-HpCDD	**NotFnd**		**1.0005**						**1.02**		**1882**	**2.52**
OCDD	**45.91**		**1.0005**	**1.0004**	**-0.3**	**4.86E+04**	**0.89**	**Y**	**1.07**	**5.99**	**1681**	**3.97**
OCDD-a	NotFnd		1.0003						0.07		1944	71.9
1368-TCDF	NotFnd		0.8033						0.99		2805	1.53
1468-TCDF	NotFnd		0.8244						0.99		2805	1.53
2468-TCDF	NotFnd		0.8485						0.99		2805	1.53
1346/1246-TCDF	NotFnd		0.8652						0.99		2805	1.53
1347/1378/1247-TCDF	NotFnd		0.8706						0.99		2805	1.53
1348-TCDF	NotFnd		0.8816						0.99		2805	1.53
1248/1367/1379-TCDF	NotFnd		0.8870						0.99		2805	1.53
1268-TCDF	NotFnd		0.9030						0.99		2805	1.53
1467-TCDF	NotFnd		0.9085						0.99		2805	1.53
1478-TCDF	NotFnd		0.9154						0.99		2805	1.53
1369/1237-TCDF	NotFnd		0.9307						0.99		2805	1.53
2467-TCDF	NotFnd		0.9360						0.99		2805	1.53
2368-TCDF	NotFnd		0.9421						0.99		2805	1.53
1238/1234/1678/1469/1236-TCDF	NotFnd		0.9466						0.99		2805	1.53
1278-TCDF	NotFnd		0.9648						0.99		2805	1.53
1349-TCDF	NotFnd		0.9692						0.99		2805	1.53
1267-TCDF	NotFnd		0.9759						0.99		2805	1.53
2346/1249-TCDF	NotFnd		0.9839						0.99		2805	1.53
2347/1279-TCDF	NotFnd		0.9920						0.99		2805	1.53
2348-TCDF	NotFnd		0.9965						0.99		2805	1.53
2378-TCDF	**NotFnd**		**1.0008**						**0.99**		**2805**	**1.53**
2367/3467-TCDF	NotFnd		1.0157						0.99		2805	1.53
1269-TCDF	NotFnd		1.0255						0.99		2805	1.53
1239-TCDF	NotFnd		1.0365						0.99		2805	1.53
1289-TCDF	NotFnd		1.0818						0.99		2805	1.53
13468/12468-PeCDF	NotFnd		0.9073						1.01		2983	1.32
13678/13467/12467-PeCDF	NotFnd		0.9585						1.01		2157	0.953
12368/13478/12478-PeCDF	NotFnd		0.9637						1.01		2157	0.953
14678-PeCDF	NotFnd		0.9670						1.01		2157	0.953
13479-PeCDF	NotFnd		0.9702						1.01		2157	0.953
13469/12479-PeCDF	NotFnd		0.9783						1.01		2157	0.953
12346-PeCDF	NotFnd		0.9829						1.01		2157	0.953

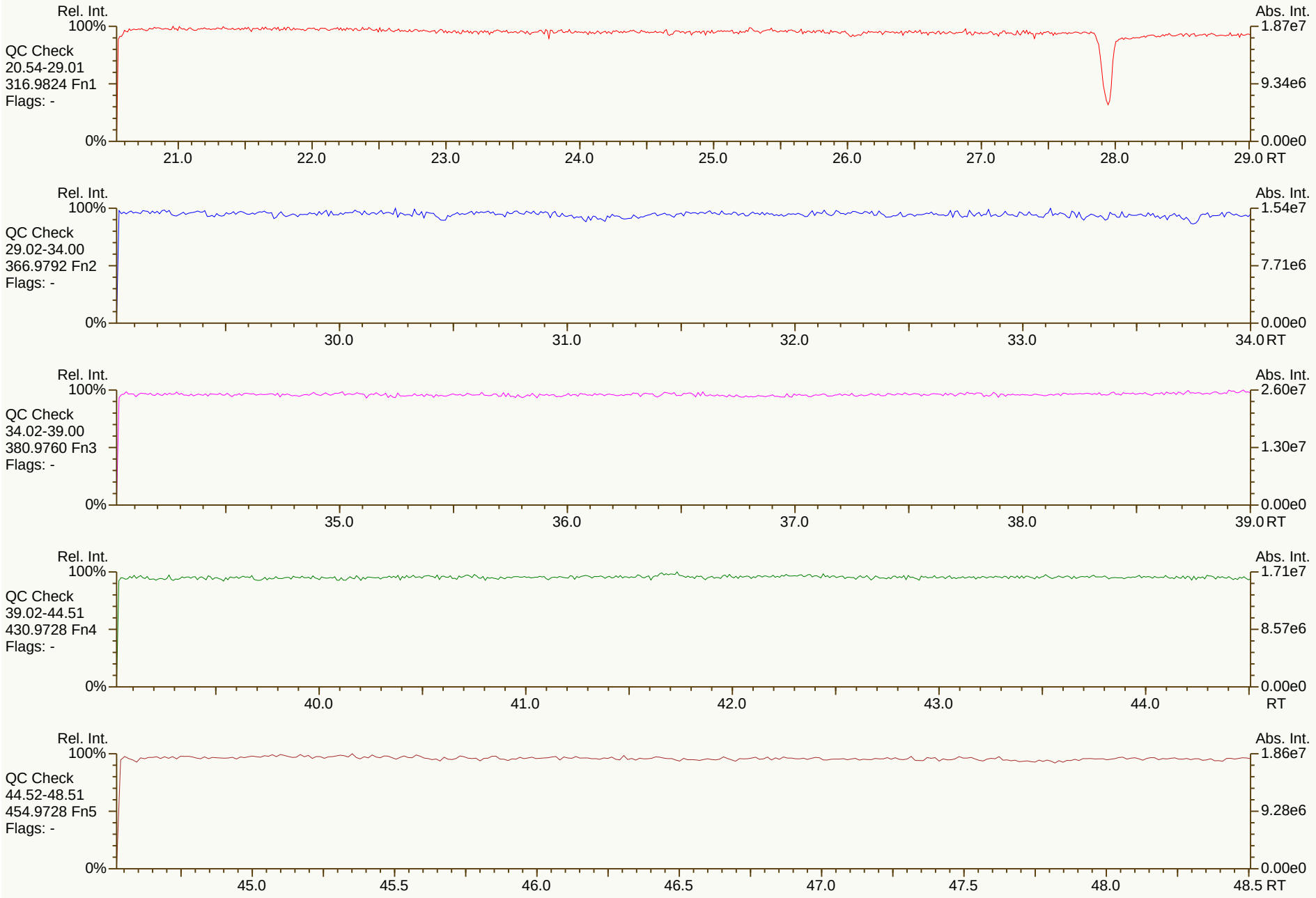
Lab ID: MB1_12600_DF_SDS **Acq'd:** 09 Oct 2014 20:50 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: Method Blank A7185_12600 **UTP:** 12-Oct-2014 13:18:24 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 616-785-GWX

Datafile: 141009P04 **Report:** 12 Oct 2014 13:20 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

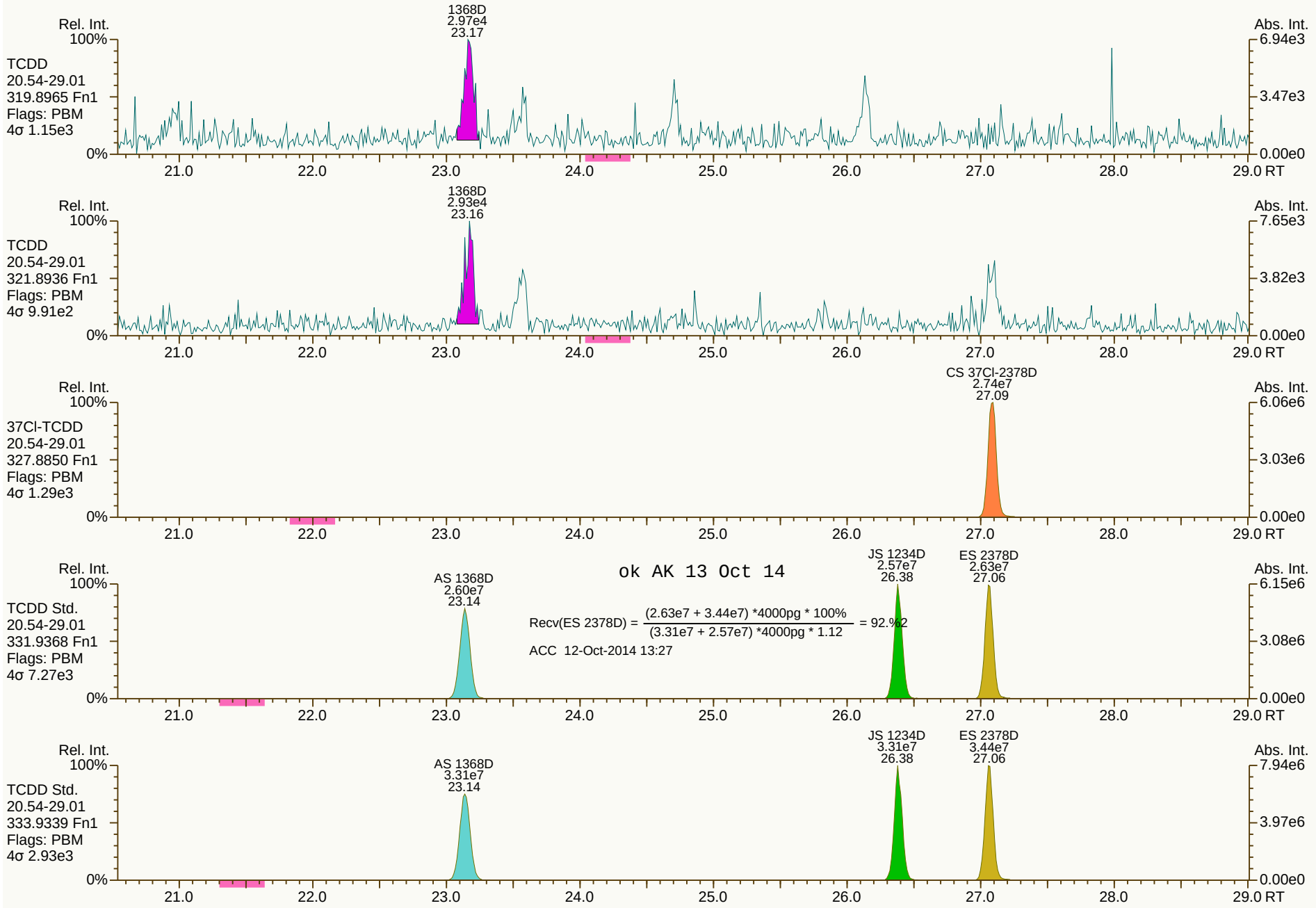
Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
23468/12469-PeCDF	NotFnd		0.9857						1.01		2157	0.953
12347-PeCDF	NotFnd		0.9883						1.01		2157	0.953
12348-PeCDF	NotFnd		0.9936						1.01		2157	0.953
12378-PeCDF	**NotFnd**		**1.0005**						**1.00**		**2157**	**0.923**
12678/12367-PeCDF	NotFnd		1.0095						1.01		2157	0.953
12379-PeCDF	NotFnd		1.0151						1.01		2157	0.953
12679-PeCDF	NotFnd		0.9925						1.01		2157	0.953
23467/12369-PeCDF	NotFnd		0.9966						1.01		2157	0.953
23478-PeCDF	**NotFnd**		**1.0005**						**1.02**		**2157**	**0.99**
23478/12489-PeCDF	NotFnd		0.0000						1.02			
12489-PeCDF	NotFnd		1.0053						1.01		2157	0.953
12349-PeCDF	NotFnd		1.0109						1.01		2157	0.953
12389-PeCDF	NotFnd		1.0347						1.01		2157	0.953
123468-HxCDF	NotFnd		0.9611						1.12		1950	1.2
124678/134678-HxCDF	NotFnd		0.9668						1.12		1950	1.2
134679-HxCDF	NotFnd		0.9734						1.12		1950	1.2
124679-HxCDF	NotFnd		0.9788						1.12		1950	1.2
124689-HxCDF	NotFnd		0.9851						1.12		1950	1.2
123467-HxCDF	NotFnd		0.9971						1.12		1950	1.2
123478-HxCDF	**NotFnd**		**1.0004**						**1.18**		**1950**	**1.14**
123678-HxCDF	**NotFnd**		**1.0004**						**1.11**		**1950**	**1.04**
123479-HxCDF	NotFnd		1.0048						1.12		1950	1.2
123469-HxCDF	NotFnd		1.0089						1.12		1950	1.2
123679-HxCDF	NotFnd		0.9943						1.12		1950	1.2
234678-HxCDF	**NotFnd**		**1.0004**						**1.14**		**1950**	**1.1**
234678/123689-HxCDF	NotFnd		0.0000						1.14			
123689-HxCDF	NotFnd		1.0068						1.12		1950	1.2
123789-HxCDF	**NotFnd**		**1.0003**						**1.08**		**1950**	**1.62**
123789/123489-HxCDF	NotFnd		0.0000						1.08			
123489-HxCDF	NotFnd		1.0017						1.12		1950	1.2
1234678-HpCDF	**NotFnd**		**1.0004**						**1.38**		**1500**	**1.15**
1234679-HpCDF	NotFnd		1.0111						1.33		1500	1.57
1234689-HpCDF	NotFnd		1.0170						1.33		1500	1.57
1234789-HpCDF	**NotFnd**		**1.0004**						**1.28**		**1500**	**2.2**
OCDF	**NotFnd**		**1.0004**						**1.04**		**1596**	**3.65**
OCDF-a	NotFnd		1.0003						0.06		2358	90.5

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 0762, 8046, 4746 scc: 616-785 *PKD: 12-Oct-2014 13:06 Printed: 12-Oct-2014 13:29 Page 2 of 12*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



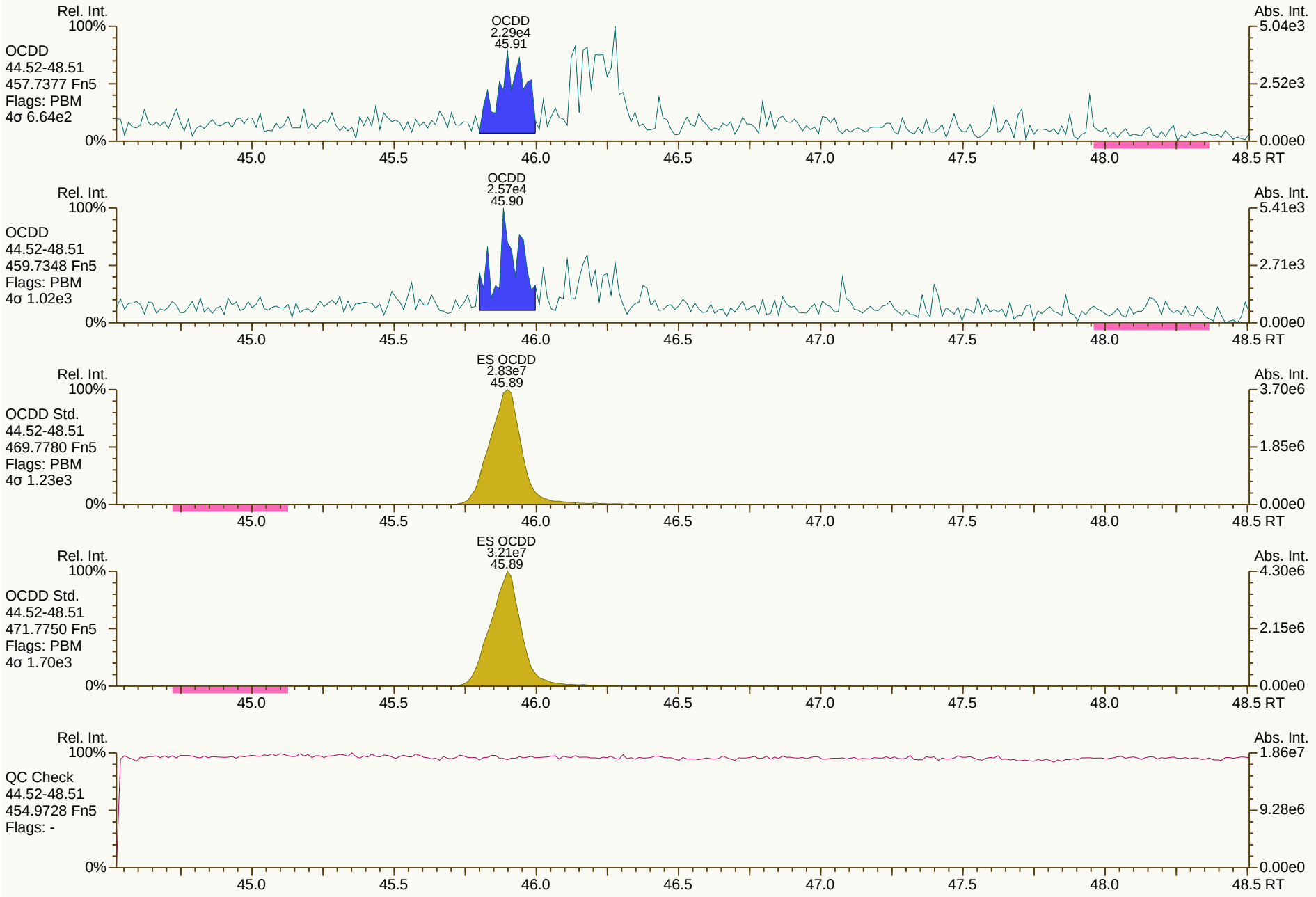
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 4488, 1508 scc: 616-785 *PKD: 12-Oct-2014 13:06 Printed: 12-Oct-2014 13:29 Page 4 of 12*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 7272, 2023 scc: 616-785 *PKD: 12-Oct-2014 13:06 Printed: 12-Oct-2014 13:29 Page 6 of 12*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



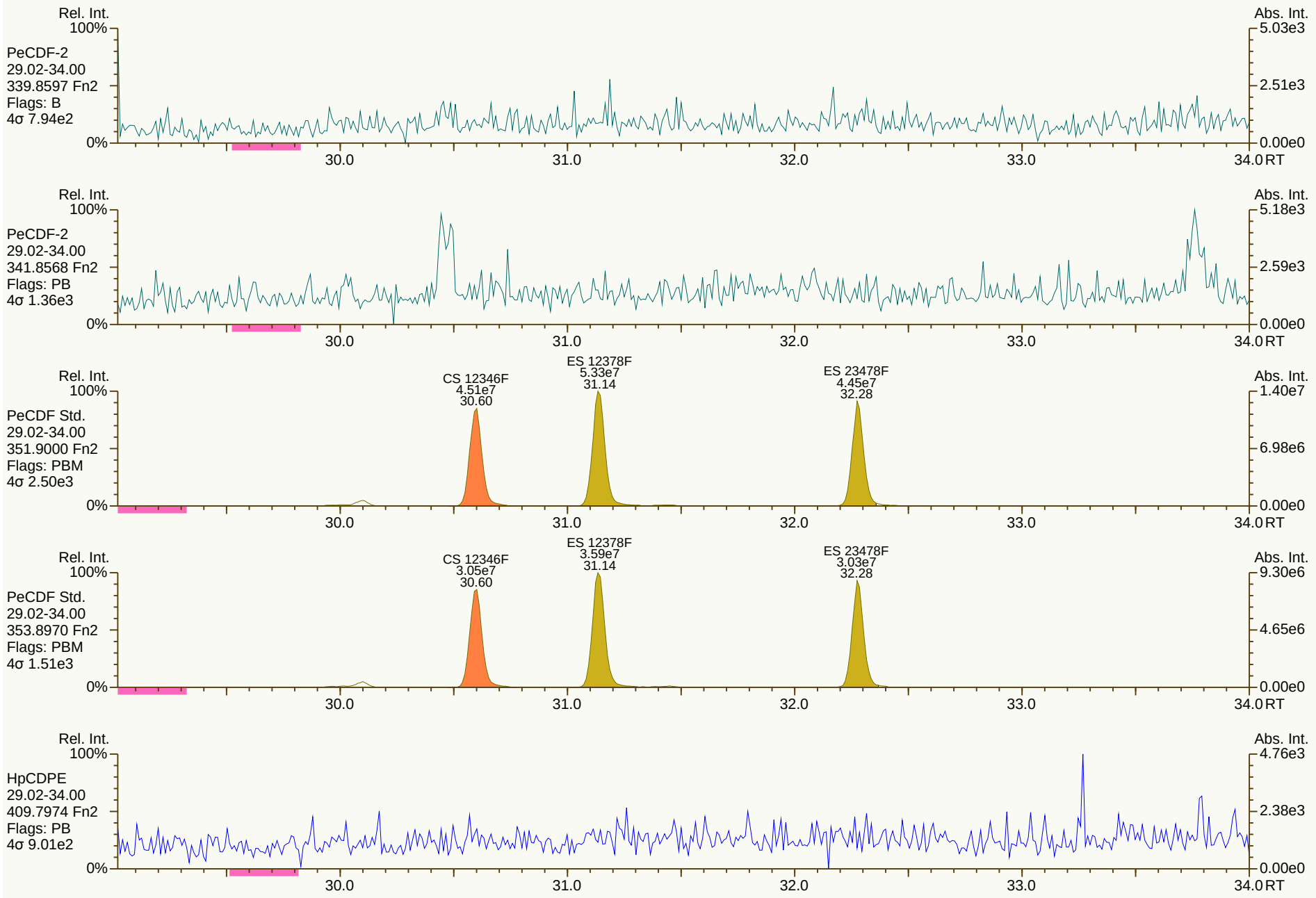
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 7118, 3992, 7440 scc: 616-785 *PKD: 12-Oct-2014 13:06 Printed: 12-Oct-2014 13:29 Page 7 of 12*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



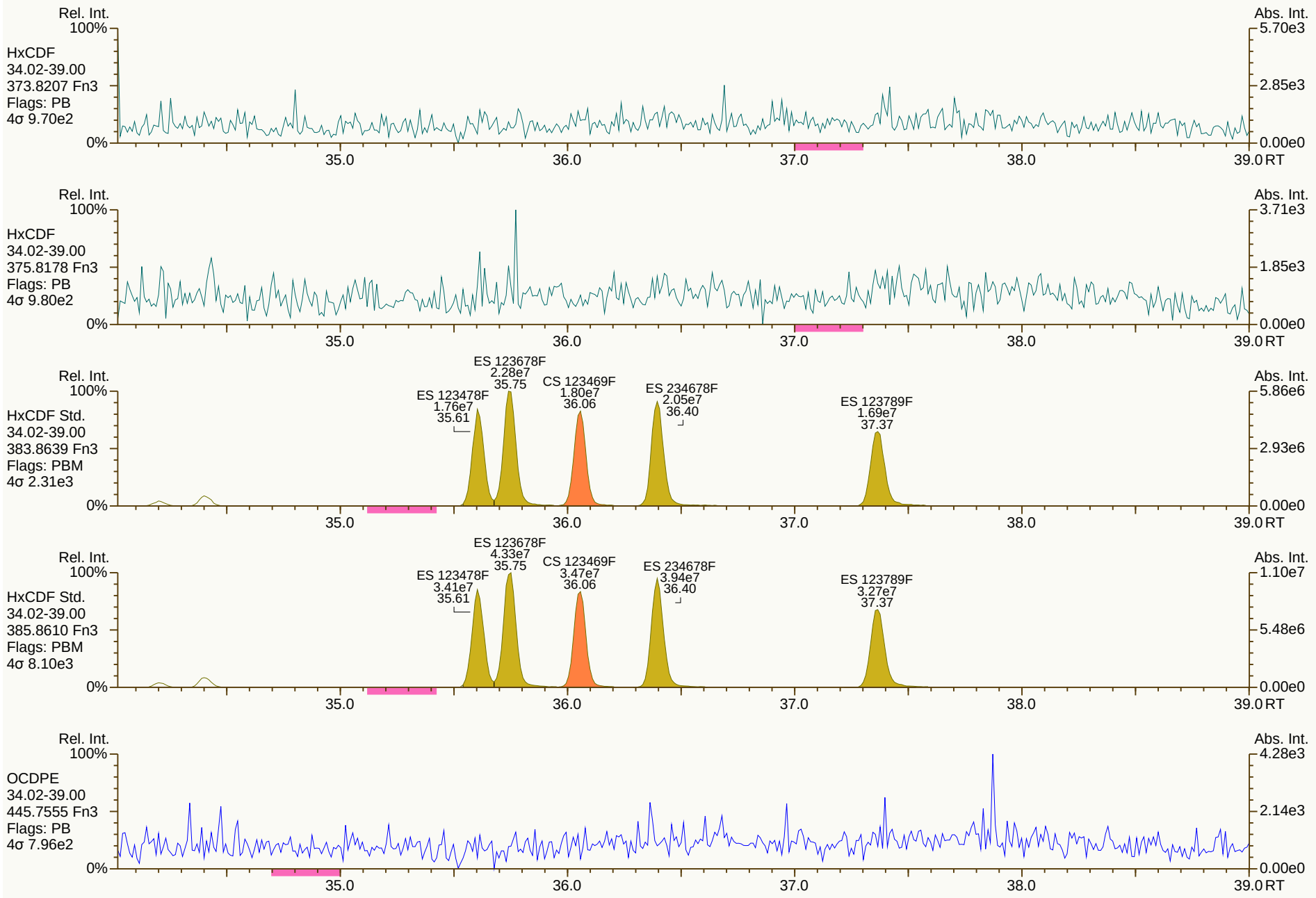
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SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



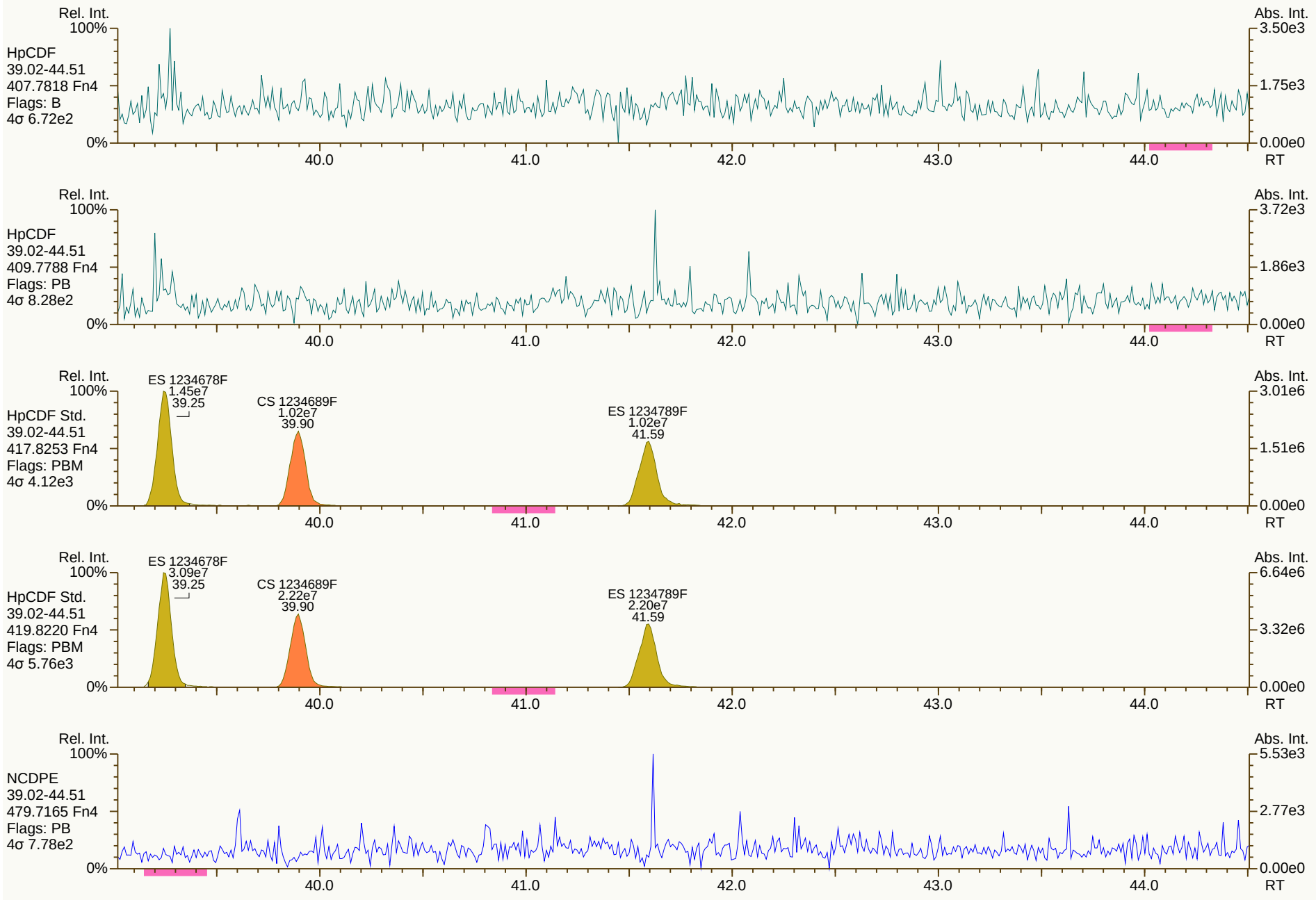
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 4919, 0074, 0308 scc: 616-785 *PKD: 12-Oct-2014 13:06 Printed: 12-Oct-2014 13:29 Page 9 of 12*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



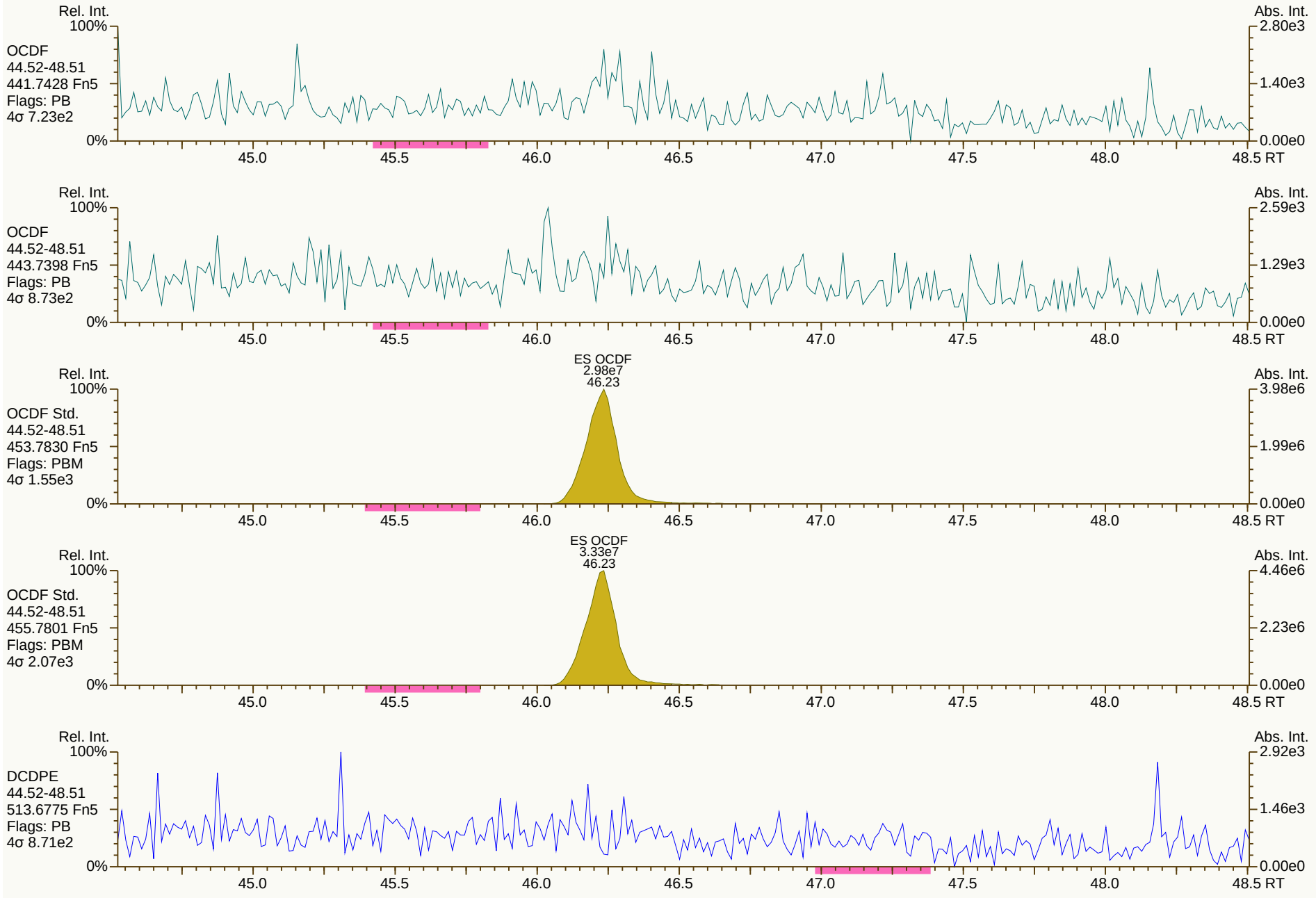
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 5138, 0898, 1407 scc: 616-785 *PKD: 12-Oct-2014 13:06 Printed: 12-Oct-2014 13:29 Page 10 of 12*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 7477, 3015, 0113 scc: 616-785 *PKD: 12-Oct-2014 13:06 Printed: 12-Oct-2014 13:29 Page 11 of 12*

SGS ID: MB1_12600_DF_SDS **Sample ID: Method Blank** **Acq: 09-Oct-2014 20:50:37**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 16** **User: ACC Datafile: 141009P04**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\MB1_12600_DF_SDS.utp_res, saved 12-Oct-2014 13:27 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 9250, 2002, 7570 scc: 616-785 *Revised: 12-Oct-2014 08:06 (ACC) Printed: 12-Oct-2014 13:29 Page 12 of 12*

Lab ID: A7185_12600_DF_001 **Acq'd: 09 Oct 2014 21:43 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-01 Field Blank **UTP: 12-Oct-2014 13:21:07 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 297-434-YRK**

Datafile: 141009P05 **Report: 12 Oct 2014 13:23 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
2378-TCDD	NotFnd		1.0008	-		-	-	-	1.16	-	2456	1.86
12378-PeCDD	NotFnd		1.0005	-		-	-	-	0.99	-	2282	1.84
123478-HxCDD	NotFnd		1.0003	-		-	-	-	1.06	-	2103	1.89
123678-HxCDD	NotFnd		1.0035	-		-	-	-	1.09	-	2103	1.94
123789-HxCDD	NotFnd		1.0116	-		-	-	-	0.93	-	2103	2
1234678-HpCDD	40.83		1.0005	1.0005	0	3.88E+04	1.13	Y	1.02	4.28	1645	2.47
OCDD	45.90		1.0005	1.0002	-0.8	1.07E+05	0.86	Y	1.07	15.3	1972	5.27
2378-TCDF	NotFnd		1.0008	-		-	-	-	0.99	-	2406	1.45
12378-PeCDF	NotFnd		1.0005	-		-	-	-	1.00	-	2151	1.08
23478-PeCDF	NotFnd		1.0005	-		-	-	-	1.02	-	2151	1.16
123478-HxCDF	NotFnd		1.0004	-		-	-	-	1.18	-	2184	1.48
123678-HxCDF	NotFnd		1.0004	-		-	-	-	1.11	-	2184	1.27
234678-HxCDF	NotFnd		1.0004	-		-	-	-	1.14	-	2184	1.38
123789-HxCDF	NotFnd		1.0003	-		-	-	-	1.08	-	2184	2.07
1234678-HpCDF	39.26		1.0004	1.0003	-0.2	2.51E+04	1.52	N	1.38	1.82	1789	1.68
1234789-HpCDF	NotFnd		1.0004	-		-	-	-	1.28	-	1789	3.02
OCDF	NotFnd		1.0004	-		-	-	-	1.04	-	2006	5.6

Name	Act RT	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
ES 2378-TCDD	27.07	1.0257	1.0258	+0.2	5.20E+07	0.81	Y	1.12	91.2
ES 12378-PeCDD	32.64	1.2368	1.2370	+0.3	4.85E+07	1.58	Y	1.05	90.6
ES 123478-HxCDD	36.58	0.9917	0.9917	0	3.98E+07	1.29	Y	1.08	82.3
ES 123678-HxCDD	36.69	0.9948	0.9947	-0.2	3.96E+07	1.28	Y	1.06	83.9
ES 123789-HxCDD	36.99	1.0029	1.0028	-0.2	4.57E+07	1.25	Y	1.25	82
ES 1234678-HpCDD	40.81	1.1065	1.1063	-0.4	3.56E+07	1.11	Y	0.96	83.1
ES OCDD	45.89	1.2447	1.2441	-1.3	5.22E+07	0.90	Y	0.79	74
ES 2378-TCDF	26.14	1.0578	1.0579	+0.1	7.99E+07	0.76	Y	1.04	92.7
ES 12378-PeCDF	31.14	1.2599	1.2603	+0.6	7.70E+07	1.49	Y	0.98	95
ES 23478-PeCDF	32.28	1.3061	1.3064	+0.4	6.65E+07	1.48	Y	0.91	88.3
ES 123478-HxCDF	35.61	0.9653	0.9653	0	4.51E+07	0.52	Y	1.23	82
ES 123678-HxCDF	35.75	0.9692	0.9692	0	5.73E+07	0.53	Y	1.49	86.5
ES 234678-HxCDF	36.40	0.9868	0.9868	0	5.28E+07	0.52	Y	1.36	87.3
ES 123789-HxCDF	37.37	1.0132	1.0131	-0.2	4.43E+07	0.52	Y	1.33	74.5
ES 1234678-HpCDF	39.25	1.0642	1.0641	-0.2	4.00E+07	0.46	Y	0.96	93.7
ES 1234789-HpCDF	41.59	1.1278	1.1276	-0.4	2.89E+07	0.45	Y	0.84	77
ES OCDF	46.23	1.2538	1.2533	-1.1	5.50E+07	0.92	Y	0.94	65.5

Lab ID: A7185_12600_DF_001 **Acq'd:** 09 Oct 2014 21:43 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-01 Field Blank **UTP:** 12-Oct-2014 13:21:07 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 297-434-YRK

Datafile: 141009P05 **Report:** 12 Oct 2014 13:23 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
JS 1234-TCDD	26.39		-	-	-	5.10E+07	0.79	Y	-	-
JS 1234-TCDF	24.71		-	-	-	8.27E+07	0.77	Y	-	-
JS 123467-HxCDD	36.89		-	-	-	2.23E+07	1.24	Y	-	-
CS 37Cl-2378-TCDD	27.09		1.0266	1.0267	+0.2	2.39E+07	n/a	-	1.21	97
CS 12347-PeCDD	32.13		1.2174	1.2176	+0.3	4.36E+07	1.57	Y	0.91	93.5
CS 12346-PeCDF	30.60		1.2380	1.2384	+0.6	6.64E+07	1.47	Y	0.84	95.7
CS 123469-HxCDF	36.06		0.9775	0.9775	0	4.63E+07	0.52	Y	1.23	84.5
CS 1234689-HpCDF	39.90		1.0818	1.0816	-0.4	2.89E+07	0.45	Y	0.82	78.8
SS 37Cl-2378-TCDD	27.09		1.0266	1.0267	+0.2	2.39E+07	n/a	-	1.08	106
SS 12347-PeCDD	32.13		1.2174	1.2176	+0.3	4.36E+07	1.57	Y	0.87	103
SS 12346-PeCDF	30.60		1.2380	1.2384	+0.6	6.64E+07	1.47	Y	0.86	101
SS 123469-HxCDF	36.06		0.9775	0.9775	0	4.63E+07	0.52	Y	0.83	97.8
SS 1234689-HpCDF	39.90		1.0818	1.0816	-0.4	2.89E+07	0.45	Y	0.86	84.1
AS 1368-TCDD	23.15		0.8774	0.8772	-0.3	5.27E+07	0.80	Y	1.08	95.3
AS 1368-TCDF	20.96		0.8487	0.8484	-0.4	9.14E+07	0.76	Y	1.16	94.9

Totals	Conc	EMPC
Total TCDD	5.04	5.04
Total PeCDD	0	0
Total HxCDD	0	2.44
Total HpCDD	8.42	8.42
Total Tetra-Octa Dioxins	28.8	31.2
Total TCDF	0	0
Total PeCDF	0	0
Total HxCDF	0	0
Total HpCDF	0	1.82
Total Tetra-Octa Furans	0	1.82
Total Tetra-Octa Dioxins & Furans	28.8	33

Lab ID: A7185_12600_DF_001 **Acq'd: 09 Oct 2014 21:43 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-01 Field Blank **UTP: 12-Oct-2014 13:21:07 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 297-434-YRK**

Datafile: 141009P05 **Report: 12 Oct 2014 13:23 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1368-TCDD	23.17		0.8565	0.8561	-0.6	7.58E+04	0.81	Y	1.16	5.04	2456	1.86
1379-TCDD	NotFnd		0.8710						1.16		2456	1.86
1369-TCDD	NotFnd		0.8881						1.16		2456	1.86
1469-TCDD	NotFnd		0.9195						1.16		2456	1.86
1247/1246/1248/1249-TCDD	NotFnd		0.9287						1.16		2456	1.86
1378-TCDD	NotFnd		0.9363						1.16		2456	1.86
1268-TCDD	NotFnd		0.9442						1.16		2456	1.86
1478-TCDD	NotFnd		0.9538						1.16		2456	1.86
1279-TCDD	NotFnd		0.9605						1.16		2456	1.86
1234/1269-TCDD	NotFnd		0.9746						1.16		2456	1.86
1236-TCDD	NotFnd		0.9797						1.16		2456	1.86
1237/1238-TCDD	NotFnd		0.9896						1.16		2456	1.86
1239-TCDD	NotFnd		0.9950						1.16		2456	1.86
2378-TCDD	**NotFnd**		**1.0008**						**1.16**		**2456**	**1.86**
1278-TCDD	NotFnd		1.0137						1.16		2456	1.86
1267-TCDD	NotFnd		1.0187						1.16		2456	1.86
1289-TCDD	NotFnd		1.0388						1.16		2456	1.86
12479/12468-PeCDD	NotFnd		0.9217						0.99		2282	1.84
12469-PeCDD	NotFnd		0.9383						0.99		2282	1.84
12368-PeCDD	NotFnd		0.9559						0.99		2282	1.84
12478-PeCDD	NotFnd		0.9618						0.99		2282	1.84
12379-PeCDD	NotFnd		0.9650						0.99		2282	1.84
12369/12467/12489-PeCDD	NotFnd		0.9732						0.99		2282	1.84
12346/12347-PeCDD	NotFnd		0.9849						0.99		2282	1.84
12378-PeCDD	**NotFnd**		**1.0005**						**0.99**		**2282**	**1.84**
12367-PeCDD	NotFnd		1.0034						0.99		2282	1.84
12389-PeCDD	NotFnd		1.0143						0.99		2282	1.84
124679/124689-HxCDD	NotFnd		0.9537						1.03		2103	1.94
123468-HxCDD	35.56		0.9718	0.9721	+0.7	2.61E+04	1.97	N	1.03	2.44	2103	1.94
123679/123689-HxCDD	NotFnd		0.9797						1.03		2103	1.94
123469-HxCDD	NotFnd		0.9834						1.03		2103	1.94
123478-HxCDD	**NotFnd**		**1.0003**						**1.06**		**2103**	**1.89**
123678-HxCDD	**NotFnd**		**1.0035**						**1.09**		**2103**	**1.94**
123467-HxCDD	NotFnd		1.0087						1.03		2103	1.94
123789-HxCDD	**NotFnd**		**1.0116**						**0.93**		**2103**	**2**

Lab ID: A7185_12600_DF_001 **Acq'd:** 09 Oct 2014 21:43 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-01 Field Blank **UTP:** 12-Oct-2014 13:21:07 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 297-434-YRK

Datafile: 141009P05 **Report:** 12 Oct 2014 13:23 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1234679-HpCDD	39.69		0.9725	0.9725	0	3.74E+04	0.93	Y	1.02	4.13	1645	2.47
1234678-HpCDD	**40.83**		**1.0005**	**1.0005**	**0**	**3.88E+04**	**1.13**	**Y**	**1.02**	**4.28**	**1645**	**2.47**
OCDD	**45.90**		**1.0005**	**1.0002**	**-0.8**	**1.07E+05**	**0.86**	**Y**	**1.07**	**15.3**	**1972**	**5.27**
OCDD-a	NotFnd		1.0003						0.07		2021	84.5
1368-TCDF	NotFnd		0.8033						0.99		2406	1.45
1468-TCDF	NotFnd		0.8244						0.99		2406	1.45
2468-TCDF	NotFnd		0.8485						0.99		2406	1.45
1346/1246-TCDF	NotFnd		0.8652						0.99		2406	1.45
1347/1378/1247-TCDF	NotFnd		0.8706						0.99		2406	1.45
1348-TCDF	NotFnd		0.8816						0.99		2406	1.45
1248/1367/1379-TCDF	NotFnd		0.8870						0.99		2406	1.45
1268-TCDF	NotFnd		0.9030						0.99		2406	1.45
1467-TCDF	NotFnd		0.9085						0.99		2406	1.45
1478-TCDF	NotFnd		0.9154						0.99		2406	1.45
1369/1237-TCDF	NotFnd		0.9307						0.99		2406	1.45
2467-TCDF	NotFnd		0.9360						0.99		2406	1.45
2368-TCDF	NotFnd		0.9421						0.99		2406	1.45
1238/1234/1678/1469/1236-TCDF	NotFnd		0.9466						0.99		2406	1.45
1278-TCDF	NotFnd		0.9648						0.99		2406	1.45
1349-TCDF	NotFnd		0.9692						0.99		2406	1.45
1267-TCDF	NotFnd		0.9759						0.99		2406	1.45
2346/1249-TCDF	NotFnd		0.9839						0.99		2406	1.45
2347/1279-TCDF	NotFnd		0.9920						0.99		2406	1.45
2348-TCDF	NotFnd		0.9965						0.99		2406	1.45
2378-TCDF	**NotFnd**		**1.0008**						**0.99**		**2406**	**1.45**
2367/3467-TCDF	NotFnd		1.0157						0.99		2406	1.45
1269-TCDF	NotFnd		1.0255						0.99		2406	1.45
1239-TCDF	NotFnd		1.0365						0.99		2406	1.45
1289-TCDF	NotFnd		1.0818						0.99		2406	1.45
13468/12468-PeCDF	NotFnd		0.9073						1.01		2913	1.51
13678/13467/12467-PeCDF	NotFnd		0.9585						1.01		2151	1.12
12368/13478/12478-PeCDF	NotFnd		0.9637						1.01		2151	1.12
14678-PeCDF	NotFnd		0.9670						1.01		2151	1.12
13479-PeCDF	NotFnd		0.9702						1.01		2151	1.12
13469/12479-PeCDF	NotFnd		0.9783						1.01		2151	1.12
12346-PeCDF	NotFnd		0.9829						1.01		2151	1.12

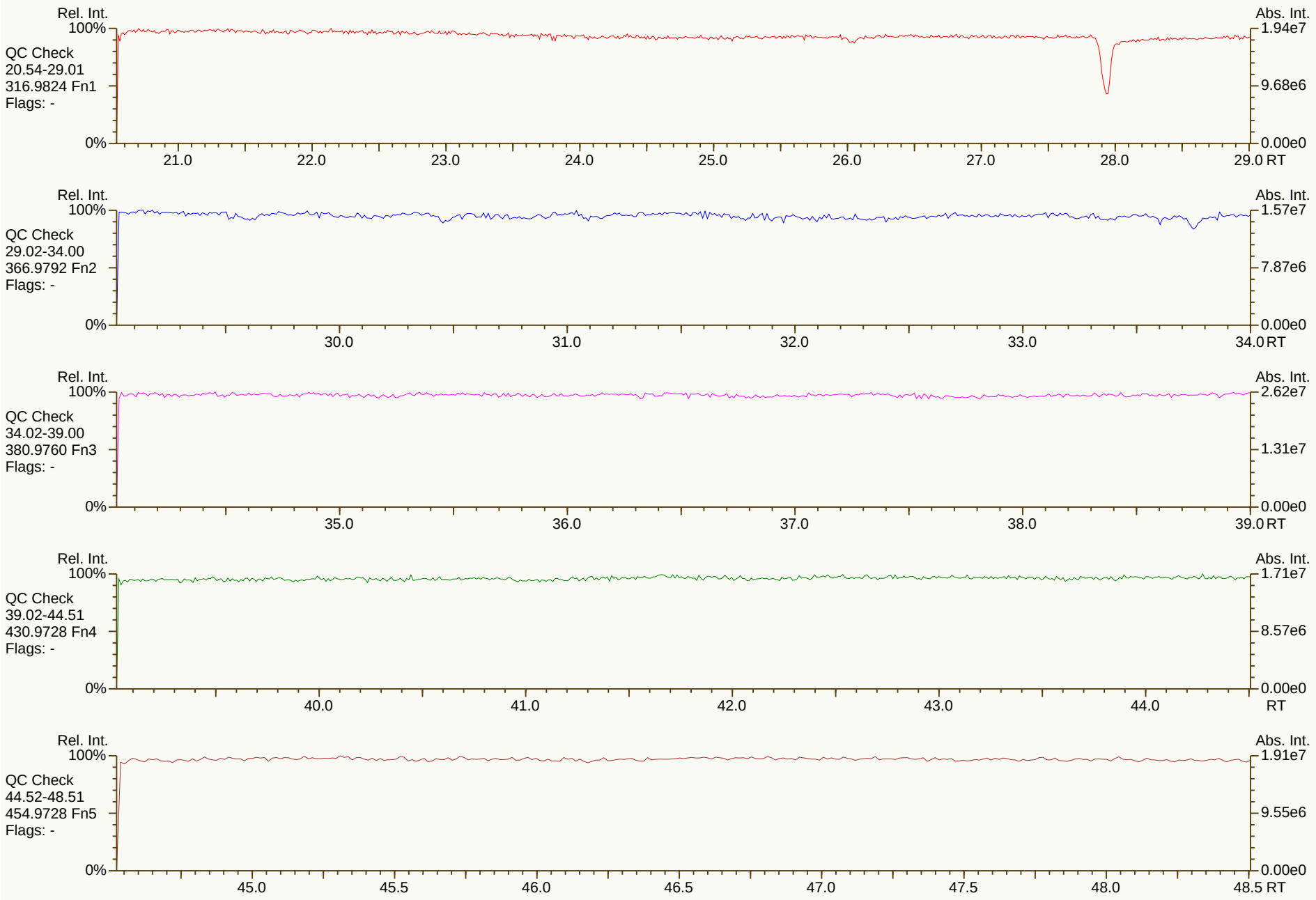
Lab ID: A7185_12600_DF_001 **Acq'd:** 09 Oct 2014 21:43 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-01 Field Blank **UTP:** 12-Oct-2014 13:21:07 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 297-434-YRK

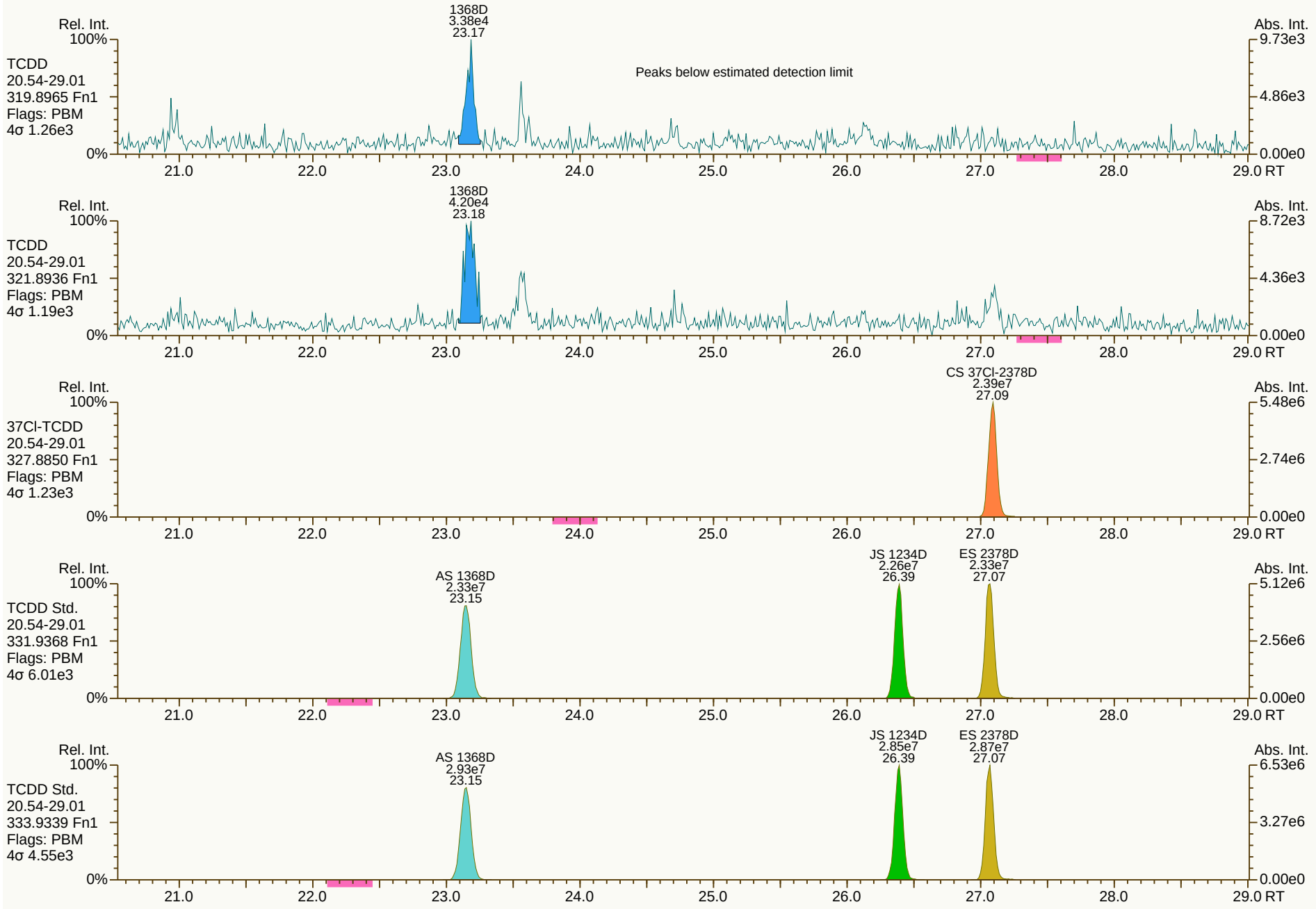
Datafile: 141009P05 **Report:** 12 Oct 2014 13:23 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
23468/12469-PeCDF	NotFnd		0.9857						1.01		2151	1.12
12347-PeCDF	NotFnd		0.9883						1.01		2151	1.12
12348-PeCDF	NotFnd		0.9936						1.01		2151	1.12
12378-PeCDF	**NotFnd**		**1.0005**						**1.00**		**2151**	**1.08**
12678/12367-PeCDF	NotFnd		1.0095						1.01		2151	1.12
12379-PeCDF	NotFnd		1.0151						1.01		2151	1.12
12679-PeCDF	NotFnd		0.9925						1.01		2151	1.12
23467/12369-PeCDF	NotFnd		0.9966						1.01		2151	1.12
23478-PeCDF	**NotFnd**		**1.0005**						**1.02**		**2151**	**1.16**
23478/12489-PeCDF	NotFnd		0.0000						1.02			
12489-PeCDF	NotFnd		1.0053						1.01		2151	1.12
12349-PeCDF	NotFnd		1.0109						1.01		2151	1.12
12389-PeCDF	NotFnd		1.0347						1.01		2151	1.12
123468-HxCDF	NotFnd		0.9611						1.12		2184	1.52
124678/134678-HxCDF	NotFnd		0.9668						1.12		2184	1.52
134679-HxCDF	NotFnd		0.9734						1.12		2184	1.52
124679-HxCDF	NotFnd		0.9788						1.12		2184	1.52
124689-HxCDF	NotFnd		0.9851						1.12		2184	1.52
123467-HxCDF	NotFnd		0.9971						1.12		2184	1.52
123478-HxCDF	**NotFnd**		**1.0004**						**1.18**		**2184**	**1.48**
123678-HxCDF	**NotFnd**		**1.0004**						**1.11**		**2184**	**1.27**
123479-HxCDF	NotFnd		1.0048						1.12		2184	1.52
123469-HxCDF	NotFnd		1.0089						1.12		2184	1.52
123679-HxCDF	NotFnd		0.9943						1.12		2184	1.52
234678-HxCDF	**NotFnd**		**1.0004**						**1.14**		**2184**	**1.38**
234678/123689-HxCDF	NotFnd		0.0000						1.14			
123689-HxCDF	NotFnd		1.0068						1.12		2184	1.52
123789-HxCDF	**NotFnd**		**1.0003**						**1.08**		**2184**	**2.07**
123789/123489-HxCDF	NotFnd		0.0000						1.08			
123489-HxCDF	NotFnd		1.0017						1.12		2184	1.52
1234678-HpCDF	**39.26**		**1.0004**	**1.0003**	**-0.2**	**2.51E+04**	**1.52**	**N**	**1.38**	**1.82**	**1789**	**1.68**
1234679-HpCDF	NotFnd		1.0111						1.33		1789	2.23
1234689-HpCDF	NotFnd		1.0170						1.33		1789	2.23
1234789-HpCDF	**NotFnd**		**1.0004**						**1.28**		**1789**	**3.02**
OCDF	**NotFnd**		**1.0004**						**1.04**		**2006**	**5.6**
OCDF-a	NotFnd		1.0003						0.06		2099	98.4

SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



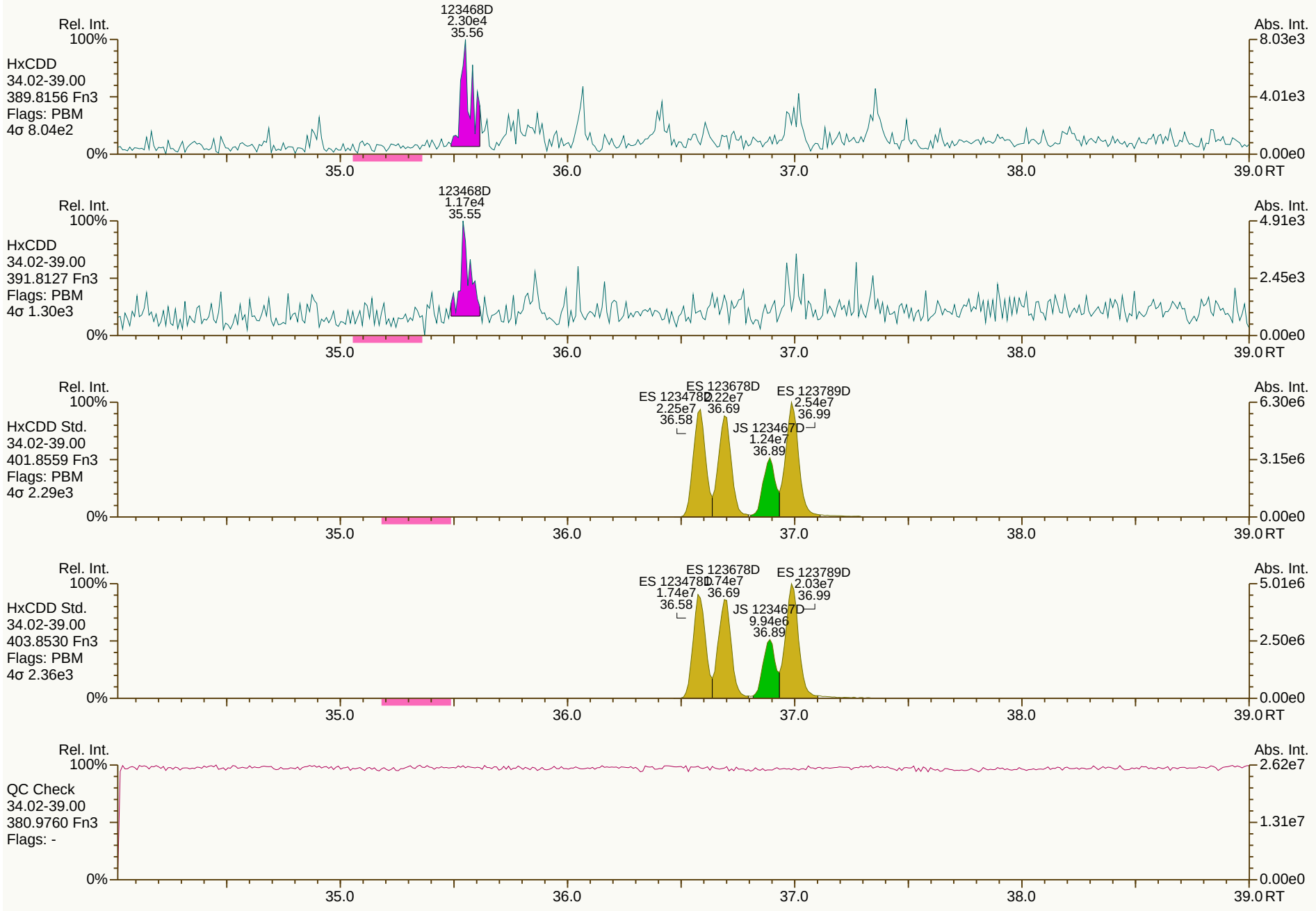
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 4008, 3198, 6849 scc: 297-434 *Revised: 12-Oct-2014 13:20 (ACC) Printed: 12-Oct-2014 13:29 Page 2 of 12*

SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_001.utp_res, saved 12-Oct-2014 13:21 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



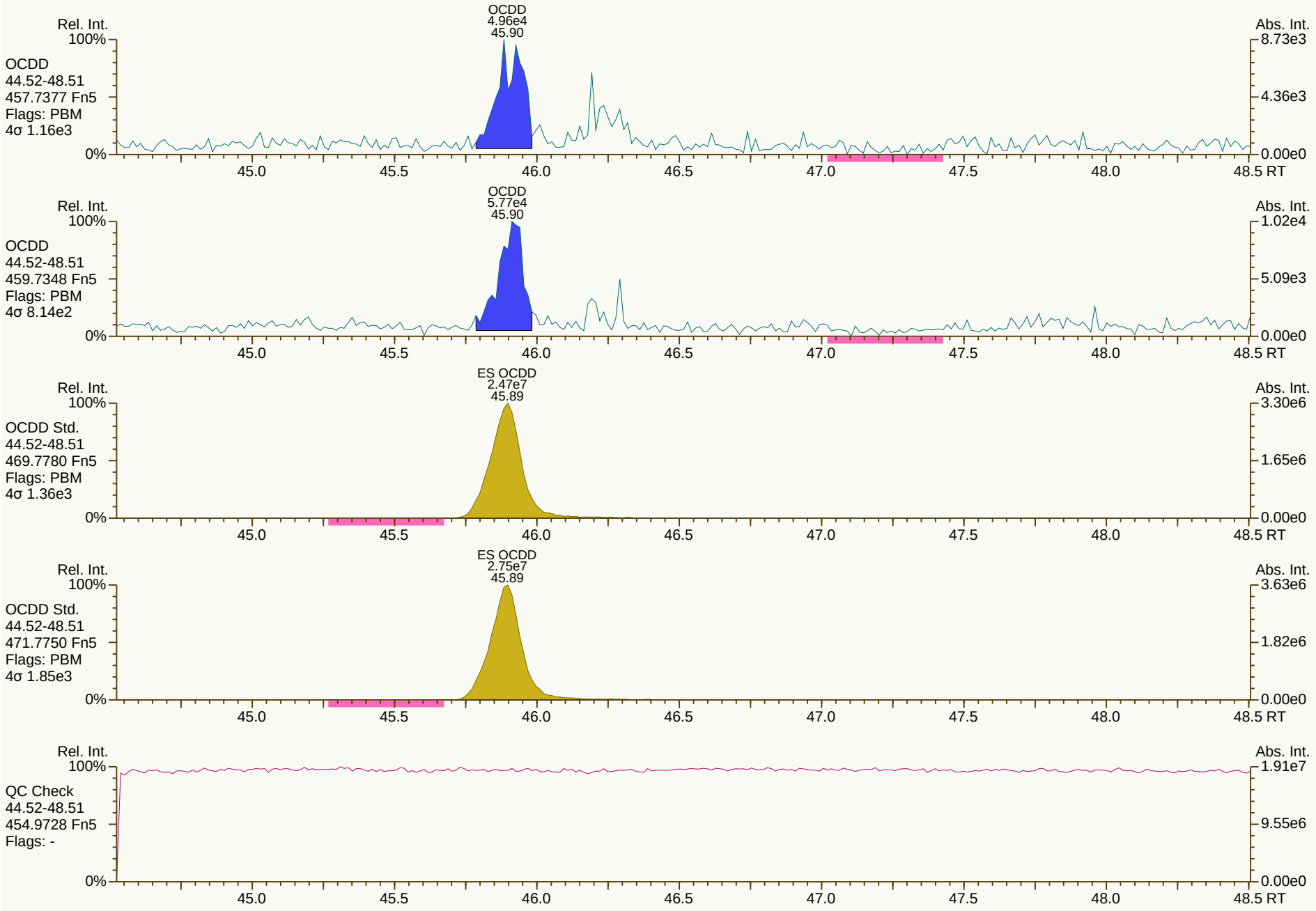
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SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



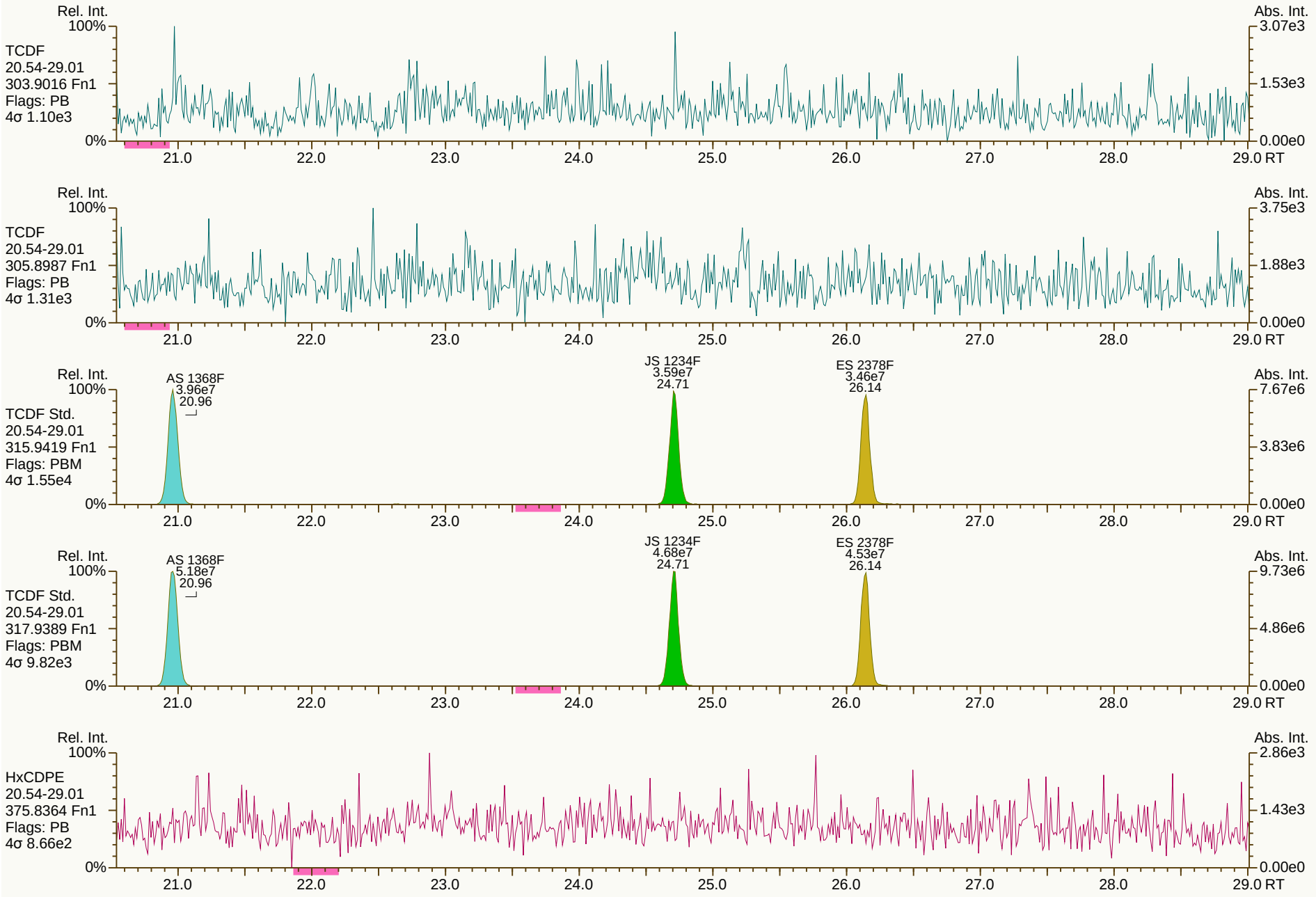
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SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_001.utp_res, saved 12-Oct-2014 13:21 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



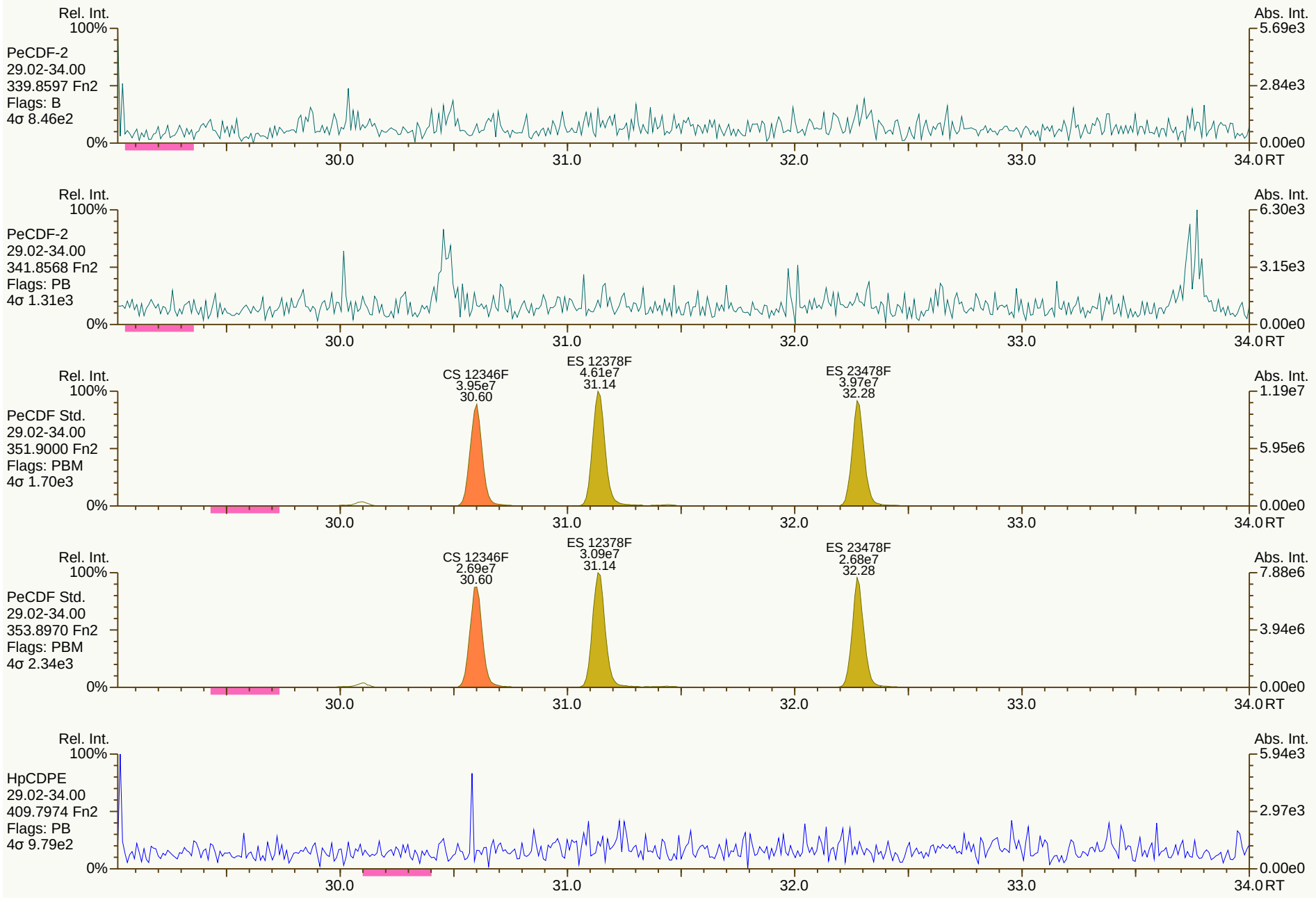
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SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



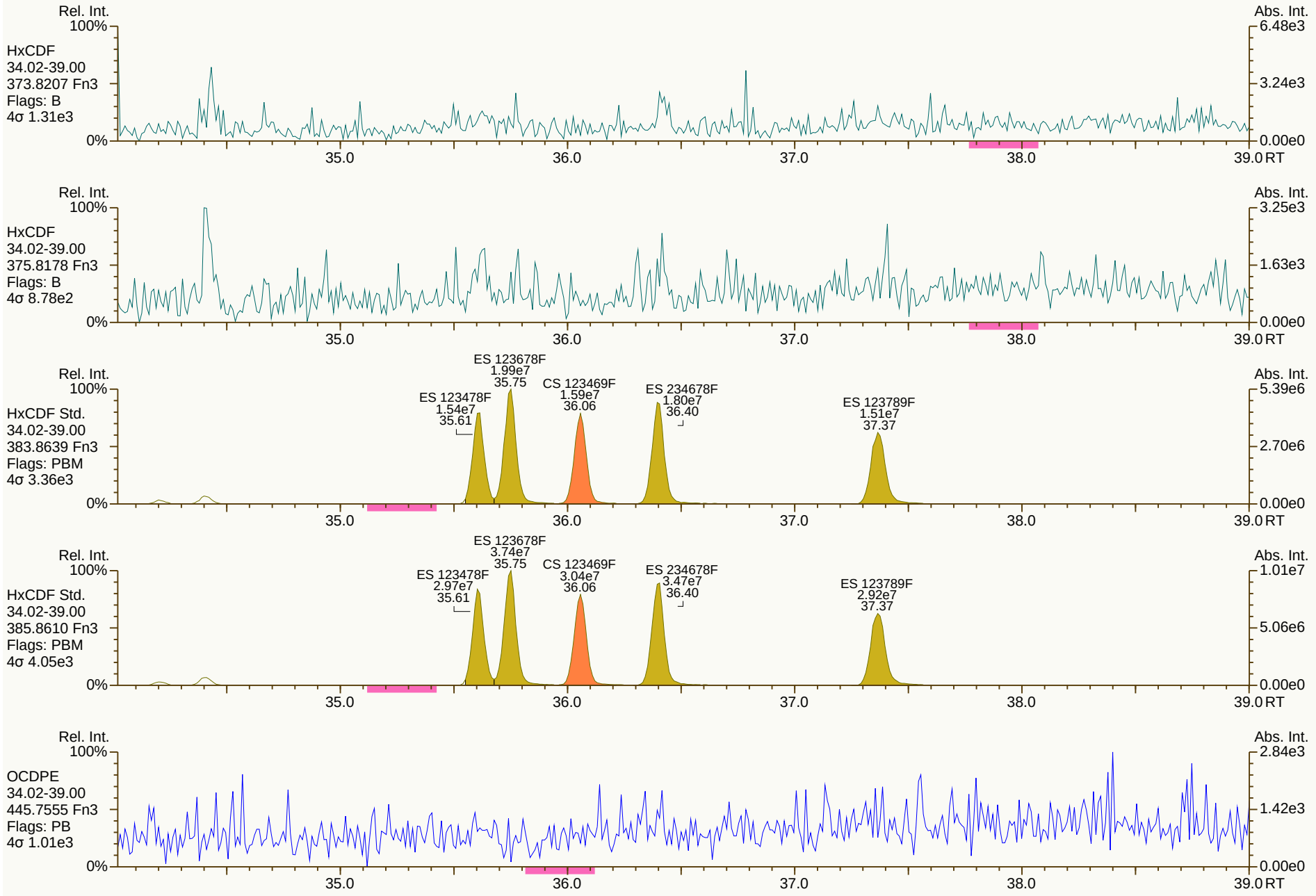
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SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



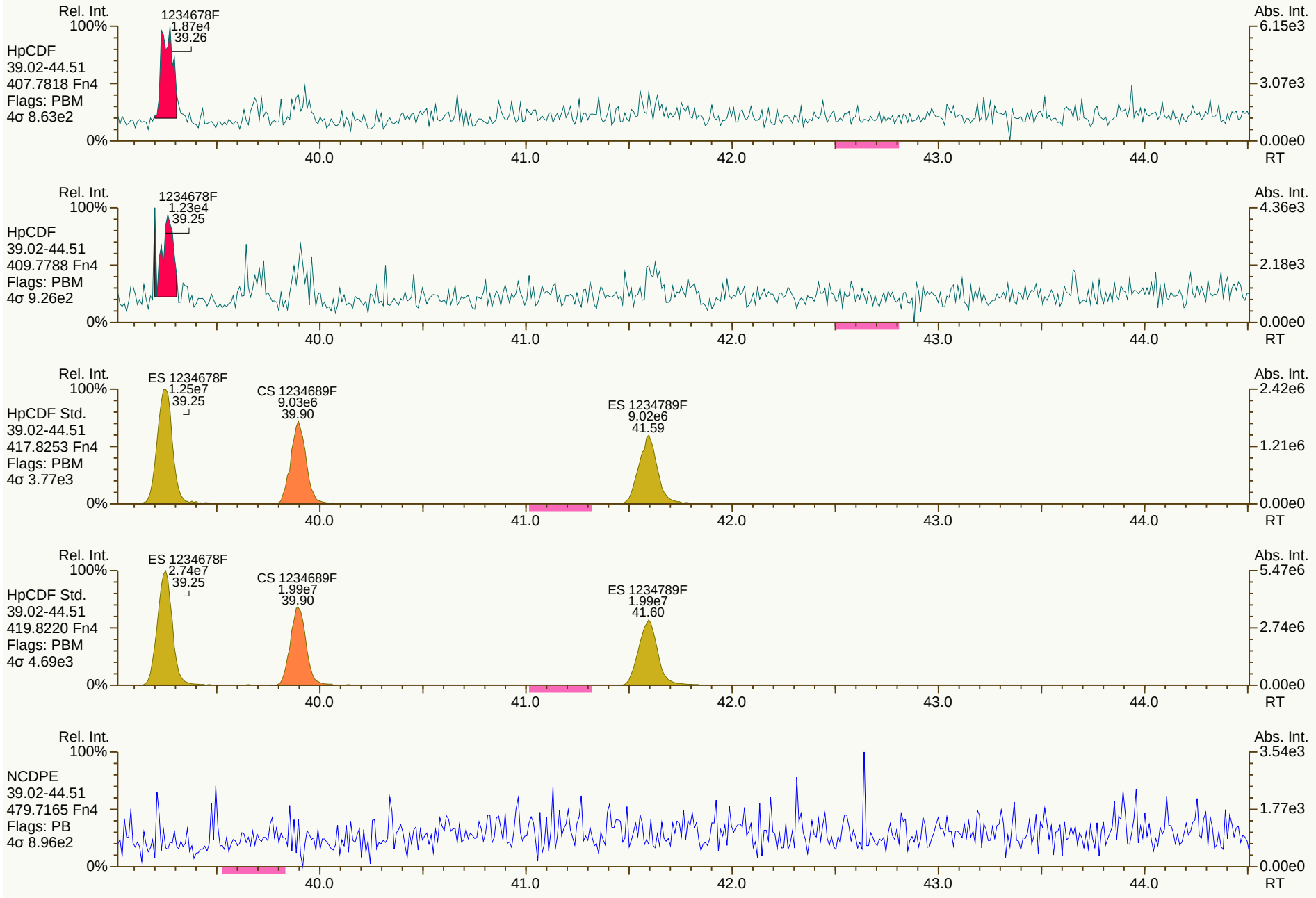
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SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



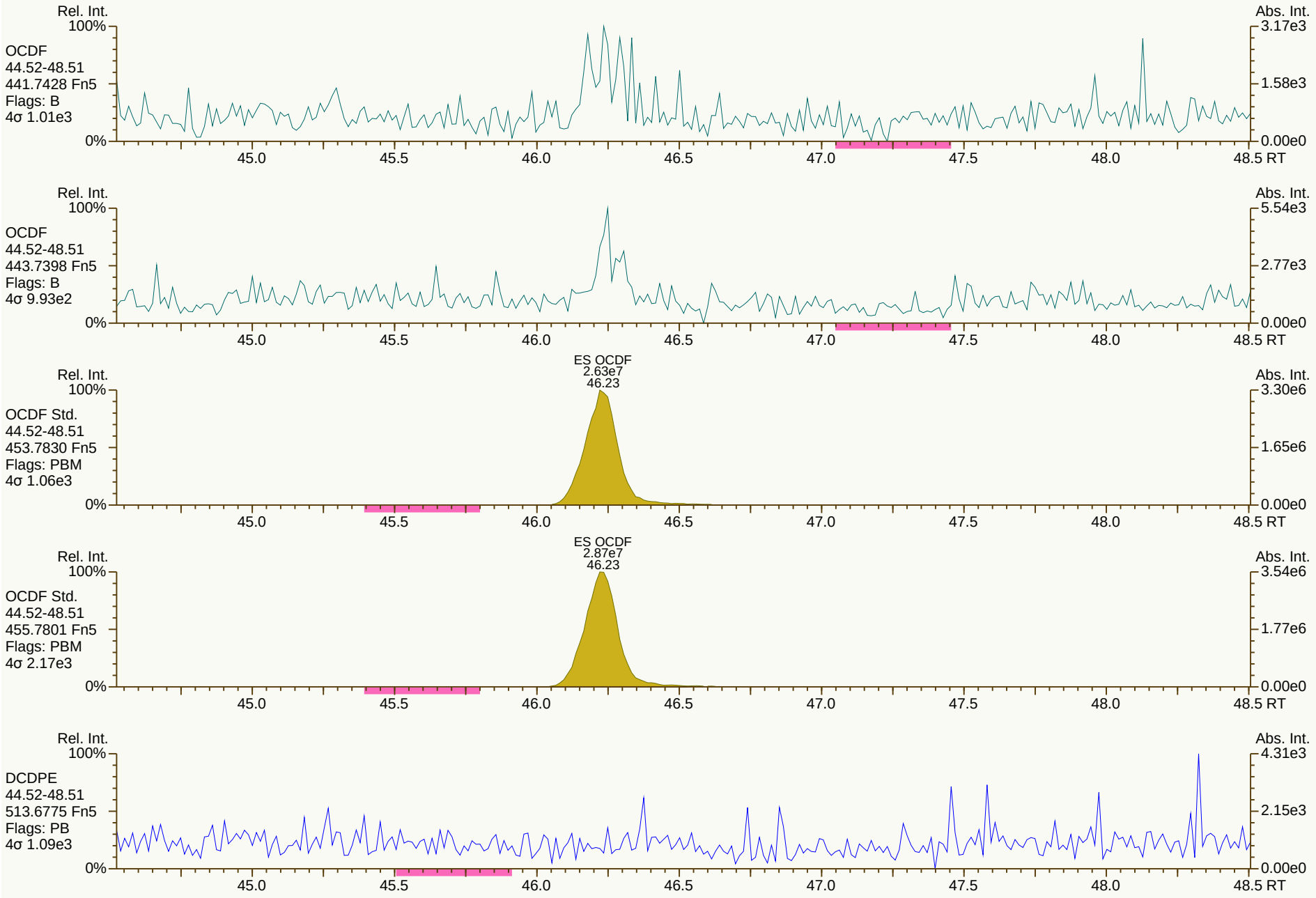
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SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_001.utp_res, saved 12-Oct-2014 13:21 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_001 **Sample ID: 142644-01 Field Blank** **Acq: 09-Oct-2014 21:43:53**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 17** **User: ACC Datafile: 141009P05**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_001.utp_res, saved 12-Oct-2014 13:21 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 2408, 3308, 8299 scc: 297-434 *Revised: 12-Oct-2014 13:08 (ACC) Printed: 12-Oct-2014 13:29 Page 12 of 12*

Lab ID: A7185_12600_DF_002 **Acq'd:** 09 Oct 2014 22:37 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-02 Run 1 **UTP:** 12-Oct-2014 13:18:25 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 694-399-CLF

Datafile: 141009P06 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
2378-TCDD	NotFnd		1.0008	-		-	-	-	1.16	-	2658	2.46
12378-PeCDD	NotFnd		1.0005	-		-	-	-	0.99	-	3108	2.98
123478-HxCDD	NotFnd		1.0003	-		-	-	-	1.06	-	2274	2.6
123678-HxCDD	NotFnd		1.0035	-		-	-	-	1.09	-	2274	2.7
123789-HxCDD	NotFnd		1.0116	-		-	-	-	0.93	-	2274	2.81
1234678-HpCDD	NotFnd		1.0005	-		-	-	-	1.02	-	2416	4.91
OCDD	45.89		1.0005	1.0001	-1.1	5.15E+04	0.99	Y	1.07	9.17	2099	7.76
2378-TCDF	26.15		1.0008	1.0008	0	6.98E+04	0.96	N	0.99	4.63	3100	2.51
12378-PeCDF	NotFnd		1.0005	-		-	-	-	1.00	-	2275	1.48
23478-PeCDF	NotFnd		1.0005	-		-	-	-	1.02	-	2275	1.53
123478-HxCDF	NotFnd		1.0004	-		-	-	-	1.18	-	2139	1.94
123678-HxCDF	NotFnd		1.0004	-		-	-	-	1.11	-	2139	1.74
234678-HxCDF	NotFnd		1.0004	-		-	-	-	1.14	-	2139	1.76
123789-HxCDF	NotFnd		1.0003	-		-	-	-	1.08	-	2139	2.37
1234678-HpCDF	NotFnd		1.0004	-		-	-	-	1.38	-	1879	2.35
1234789-HpCDF	NotFnd		1.0004	-		-	-	-	1.28	-	1879	3.85
OCDF	NotFnd		1.0004	-		-	-	-	1.04	-	2595	7.93

Name	Act RT	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
ES 2378-TCDD	27.06	1.0257	1.0258	+0.2	4.06E+07	0.80	Y	1.12	83.4
ES 12378-PeCDD	32.63	1.2368	1.2370	+0.3	3.79E+07	1.57	Y	1.05	83
ES 123478-HxCDD	36.57	0.9917	0.9917	0	3.16E+07	1.25	Y	1.08	75.8
ES 123678-HxCDD	36.68	0.9948	0.9947	-0.2	3.07E+07	1.22	Y	1.06	75.4
ES 123789-HxCDD	36.98	1.0029	1.0028	-0.2	3.58E+07	1.24	Y	1.25	74.5
ES 1234678-HpCDD	40.80	1.1065	1.1063	-0.4	2.79E+07	1.09	Y	0.96	75.5
ES OCDD	45.88	1.2447	1.2442	-1.1	4.18E+07	0.89	Y	0.79	68.7
ES 2378-TCDF	26.13	1.0578	1.0580	+0.3	6.11E+07	0.74	Y	1.04	84.3
ES 12378-PeCDF	31.13	1.2599	1.2603	+0.6	5.81E+07	1.51	Y	0.98	85.2
ES 23478-PeCDF	32.27	1.3061	1.3066	+0.7	5.29E+07	1.49	Y	0.91	83.4
ES 123478-HxCDF	35.60	0.9653	0.9653	0	3.59E+07	0.53	Y	1.23	75.7
ES 123678-HxCDF	35.74	0.9692	0.9691	-0.2	4.42E+07	0.53	Y	1.49	77.3
ES 234678-HxCDF	36.39	0.9868	0.9868	0	4.19E+07	0.52	Y	1.36	80.2
ES 123789-HxCDF	37.36	1.0132	1.0130	-0.4	3.50E+07	0.51	Y	1.33	68.1
ES 1234678-HpCDF	39.24	1.0642	1.0640	-0.4	2.83E+07	0.45	Y	0.96	76.9
ES 1234789-HpCDF	41.58	1.1278	1.1276	-0.4	2.41E+07	0.47	Y	0.84	74.4
ES OCDF	46.22	1.2538	1.2533	-1.1	4.85E+07	0.88	Y	0.94	66.9

Lab ID: A7185_12600_DF_002 **Acq'd:** 09 Oct 2014 22:37 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-02 Run 1 **UTP:** 12-Oct-2014 13:18:25 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 694-399-CLF

Datafile: 141009P06 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
JS 1234-TCDD	26.38		-	-	-	4.35E+07	0.78	Y	-	-
JS 1234-TCDF	24.70		-	-	-	6.97E+07	0.75	Y	-	-
JS 123467-HxCDD	36.88		-	-	-	1.92E+07	1.22	Y	-	-
CS 37Cl-2378-TCDD	27.08		1.0266	1.0267	+0.2	1.78E+07	n/a	-	1.21	85
CS 12347-PeCDD	32.12		1.2174	1.2177	+0.5	3.40E+07	1.57	Y	0.91	85.4
CS 12346-PeCDF	30.59		1.2380	1.2384	+0.6	5.06E+07	1.50	Y	0.84	86.6
CS 123469-HxCDF	36.05		0.9775	0.9775	0	3.67E+07	0.51	Y	1.23	77.6
CS 1234689-HpCDF	39.89		1.0818	1.0816	-0.4	2.40E+07	0.46	Y	0.82	75.8
SS 37Cl-2378-TCDD	27.08		1.0266	1.0267	+0.2	1.78E+07	n/a	-	1.08	102
SS 12347-PeCDD	32.12		1.2174	1.2177	+0.5	3.40E+07	1.57	Y	0.87	103
SS 12346-PeCDF	30.59		1.2380	1.2384	+0.6	5.06E+07	1.50	Y	0.86	102
SS 123469-HxCDF	36.05		0.9775	0.9775	0	3.67E+07	0.51	Y	0.83	100
SS 1234689-HpCDF	39.89		1.0818	1.0816	-0.4	2.40E+07	0.46	Y	0.86	98.6
AS 1368-TCDD	23.14		0.8774	0.8771	-0.5	4.47E+07	0.79	Y	1.08	94.8
AS 1368-TCDF	20.95		0.8487	0.8482	-0.7	7.56E+07	0.76	Y	1.16	93.2

Totals	Conc	EMPC
Total TCDD	18.4	18.4
Total PeCDD	4.84	8.62
Total HxCDD	6.53	6.53
Total HpCDD	0	0
Total Tetra-Octa Dioxins	38.9	42.7
Total TCDF	8.22	18.3
Total PeCDF	3.22	5.83
Total HxCDF	2.01	2.01
Total HpCDF	0	0
Total Tetra-Octa Furans	13.5	26.2
Total Tetra-Octa Dioxins & Furans	52.4	68.9

Lab ID: A7185_12600_DF_002 **Acq'd: 09 Oct 2014 22:37 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-02 Run 1 **UTP: 12-Oct-2014 13:18:25 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 694-399-CLF**

Datafile: 141009P06 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1368-TCDD	23.17		0.8565	0.8562	-0.5	1.53E+05	0.70	Y	1.16	13	2658	2.46
1379-TCDD	23.57		0.8710	0.8709	-0.2	6.28E+04	0.88	Y	1.16	5.36	2658	2.46
1369-TCDD	NotFnd		0.8881						1.16		2658	2.46
1469-TCDD	NotFnd		0.9195						1.16		2658	2.46
1247/1246/1248/1249-TCDD	NotFnd		0.9287						1.16		2658	2.46
1378-TCDD	NotFnd		0.9363						1.16		2658	2.46
1268-TCDD	NotFnd		0.9442						1.16		2658	2.46
1478-TCDD	NotFnd		0.9538						1.16		2658	2.46
1279-TCDD	NotFnd		0.9605						1.16		2658	2.46
1234/1269-TCDD	NotFnd		0.9746						1.16		2658	2.46
1236-TCDD	NotFnd		0.9797						1.16		2658	2.46
1237/1238-TCDD	NotFnd		0.9896						1.16		2658	2.46
1239-TCDD	NotFnd		0.9950						1.16		2658	2.46
2378-TCDD	**NotFnd**		**1.0008**						**1.16**		**2658**	**2.46**
1278-TCDD	NotFnd		1.0137						1.16		2658	2.46
1267-TCDD	NotFnd		1.0187						1.16		2658	2.46
1289-TCDD	NotFnd		1.0388						1.16		2658	2.46
12479/12468-PeCDD	30.07		0.9217	0.9216	-0.2	4.53E+04	1.58	Y	0.99	4.84	3108	2.98
12469-PeCDD	NotFnd		0.9383						0.99		3108	2.98
12368-PeCDD	31.19		0.9559	0.9558	-0.2	3.54E+04	1.23	N	0.99	3.78	3108	2.98
12478-PeCDD	NotFnd		0.9618						0.99		3108	2.98
12379-PeCDD	NotFnd		0.9650						0.99		3108	2.98
12369/12467/12489-PeCDD	NotFnd		0.9732						0.99		3108	2.98
12346/12347-PeCDD	NotFnd		0.9849						0.99		3108	2.98
12378-PeCDD	**NotFnd**		**1.0005**						**0.99**		**3108**	**2.98**
12367-PeCDD	NotFnd		1.0034						0.99		3108	2.98
12389-PeCDD	NotFnd		1.0143						0.99		3108	2.98
124679/124689-HxCDD	NotFnd		0.9537						1.03		2274	2.69
123468-HxCDD	35.55		0.9718	0.9720	+0.4	5.48E+04	1.08	Y	1.03	6.53	2274	2.69
123679/123689-HxCDD	NotFnd		0.9797						1.03		2274	2.69
123469-HxCDD	NotFnd		0.9834						1.03		2274	2.69
123478-HxCDD	**NotFnd**		**1.0003**						**1.06**		**2274**	**2.6**
123678-HxCDD	**NotFnd**		**1.0035**						**1.09**		**2274**	**2.7**
123467-HxCDD	NotFnd		1.0087						1.03		2274	2.69
123789-HxCDD	**NotFnd**		**1.0116**						**0.93**		**2274**	**2.81**

Lab ID: A7185_12600_DF_002 **Acq'd: 09 Oct 2014 22:37 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-02 Run 1 **UTP: 12-Oct-2014 13:18:25 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 694-399-CLF**

Datafile: 141009P06 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1234679-HpCDD	NotFnd		0.9725						1.02		2416	4.91
1234678-HpCDD	**NotFnd**		**1.0005**						**1.02**		**2416**	**4.91**
OCDD	**45.89**		**1.0005**	**1.0001**	**-1.1**	**5.15E+04**	**0.99**	**Y**	**1.07**	**9.17**	**2099**	**7.76**
OCDD-a	NotFnd		1.0003						0.07		1985	115
1368-TCDF	NotFnd		0.8033						0.99		3100	2.51
1468-TCDF	NotFnd		0.8244						0.99		3100	2.51
2468-TCDF	NotFnd		0.8485						0.99		3100	2.51
1346/1246-TCDF	NotFnd		0.8652						0.99		3100	2.51
1347/1378/1247-TCDF	22.74		0.8706	0.8701	-0.8	7.46E+04	0.78	Y	0.99	4.95	3100	2.51
1348-TCDF	NotFnd		0.8816						0.99		3100	2.51
1248/1367/1379-TCDF	NotFnd		0.8870						0.99		3100	2.51
1268-TCDF	NotFnd		0.9030						0.99		3100	2.51
1467-TCDF	NotFnd		0.9085						0.99		3100	2.51
1478-TCDF	NotFnd		0.9154						0.99		3100	2.51
1369/1237-TCDF	NotFnd		0.9307						0.99		3100	2.51
2467-TCDF	NotFnd		0.9360						0.99		3100	2.51
2368-TCDF	NotFnd		0.9421						0.99		3100	2.51
1238/1234/1678/1469/1236-TCDF	NotFnd		0.9466						0.99		3100	2.51
1278-TCDF	25.21		0.9648	0.9646	-0.3	8.23E+04	0.65	N	0.99	5.47	3100	2.51
1349-TCDF	NotFnd		0.9692						0.99		3100	2.51
1267-TCDF	NotFnd		0.9759						0.99		3100	2.51
2346/1249-TCDF	NotFnd		0.9839						0.99		3100	2.51
2347/1279-TCDF	NotFnd		0.9920						0.99		3100	2.51
2348-TCDF	NotFnd		0.9965						0.99		3100	2.51
2378-TCDF	**26.15**		**1.0008**	**1.0008**	**0**	**6.98E+04**	**0.96**	**N**	**0.99**	**4.63**	**3100**	**2.51**
2367/3467-TCDF	26.54		1.0157	1.0157	0	4.93E+04	0.79	Y	0.99	3.27	3100	2.51
1269-TCDF	NotFnd		1.0255						0.99		3100	2.51
1239-TCDF	NotFnd		1.0365						0.99		3100	2.51
1289-TCDF	NotFnd		1.0818						0.99		3100	2.51
13468/12468-PeCDF	NotFnd		0.9073						1.01		3376	2.23
13678/13467/12467-PeCDF	29.84		0.9585	0.9585	0	3.65E+04	1.28	N	1.01	2.61	2275	1.5
12368/13478/12478-PeCDF	30.02		0.9637	0.9642	+0.9	4.50E+04	1.41	Y	1.01	3.22	2275	1.5
14678-PeCDF	NotFnd		0.9670						1.01		2275	1.5
13479-PeCDF	NotFnd		0.9702						1.01		2275	1.5
13469/12479-PeCDF	NotFnd		0.9783						1.01		2275	1.5
12346-PeCDF	NotFnd		0.9829						1.01		2275	1.5

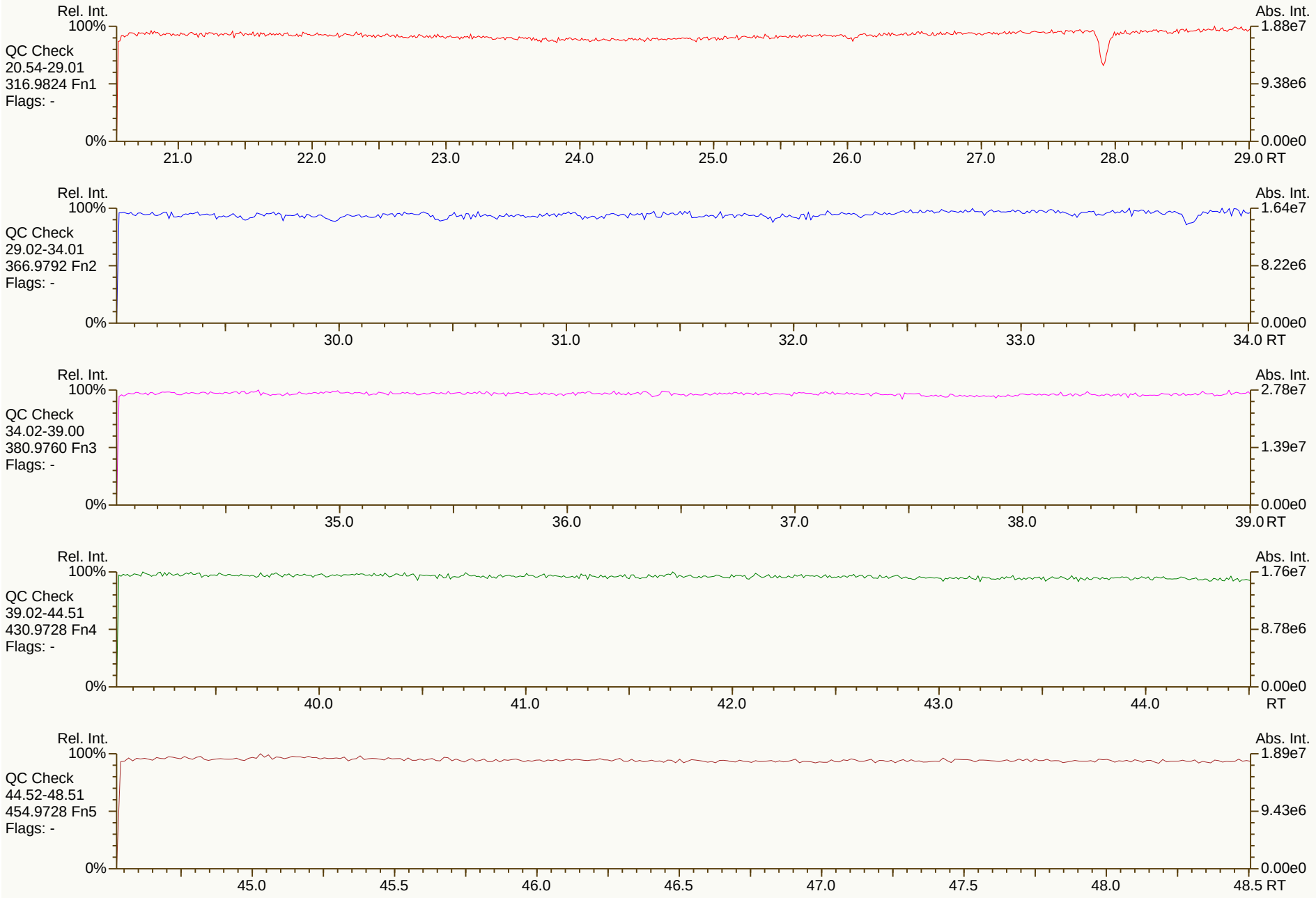
Lab ID: A7185_12600_DF_002 **Acq'd:** 09 Oct 2014 22:37 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-02 Run 1 **UTP:** 12-Oct-2014 13:18:25 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 694-399-CLF

Datafile: 141009P06 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
23468/12469-PeCDF	NotFnd		0.9857						1.01		2275	1.5
12347-PeCDF	NotFnd		0.9883						1.01		2275	1.5
12348-PeCDF	NotFnd		0.9936						1.01		2275	1.5
12378-PeCDF	**NotFnd**		**1.0005**						**1.00**		**2275**	**1.48**
12678/12367-PeCDF	NotFnd		1.0095						1.01		2275	1.5
12379-PeCDF	NotFnd		1.0151						1.01		2275	1.5
12679-PeCDF	NotFnd		0.9925						1.01		2275	1.5
23467/12369-PeCDF	NotFnd		0.9966						1.01		2275	1.5
23478-PeCDF	**NotFnd**		**1.0005**						**1.02**		**2275**	**1.53**
23478/12489-PeCDF	NotFnd		0.0000						1.02			
12489-PeCDF	NotFnd		1.0053						1.01		2275	1.5
12349-PeCDF	NotFnd		1.0109						1.01		2275	1.5
12389-PeCDF	NotFnd		1.0347						1.01		2275	1.5
123468-HxCDF	NotFnd		0.9611						1.12		2139	1.93
124678/134678-HxCDF	34.41		0.9668	0.9666	-0.4	2.21E+04	1.34	Y	1.12	2.01	2139	1.93
134679-HxCDF	NotFnd		0.9734						1.12		2139	1.93
124679-HxCDF	NotFnd		0.9788						1.12		2139	1.93
124689-HxCDF	NotFnd		0.9851						1.12		2139	1.93
123467-HxCDF	NotFnd		0.9971						1.12		2139	1.93
123478-HxCDF	**NotFnd**		**1.0004**						**1.18**		**2139**	**1.94**
123678-HxCDF	**NotFnd**		**1.0004**						**1.11**		**2139**	**1.74**
123479-HxCDF	NotFnd		1.0048						1.12		2139	1.93
123469-HxCDF	NotFnd		1.0089						1.12		2139	1.93
123679-HxCDF	NotFnd		0.9943						1.12		2139	1.93
234678-HxCDF	**NotFnd**		**1.0004**						**1.14**		**2139**	**1.76**
234678/123689-HxCDF	NotFnd		0.0000						1.14			
123689-HxCDF	NotFnd		1.0068						1.12		2139	1.93
123789-HxCDF	**NotFnd**		**1.0003**						**1.08**		**2139**	**2.37**
123789/123489-HxCDF	NotFnd		0.0000						1.08			
123489-HxCDF	NotFnd		1.0017						1.12		2139	1.93
1234678-HpCDF	**NotFnd**		**1.0004**						**1.38**		**1879**	**2.35**
1234679-HpCDF	NotFnd		1.0111						1.33		1879	3.02
1234689-HpCDF	NotFnd		1.0170						1.33		1879	3.02
1234789-HpCDF	**NotFnd**		**1.0004**						**1.28**		**1879**	**3.85**
OCDF	**NotFnd**		**1.0004**						**1.04**		**2595**	**7.93**
OCDF-a	NotFnd		1.0003						0.06		2612	134

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



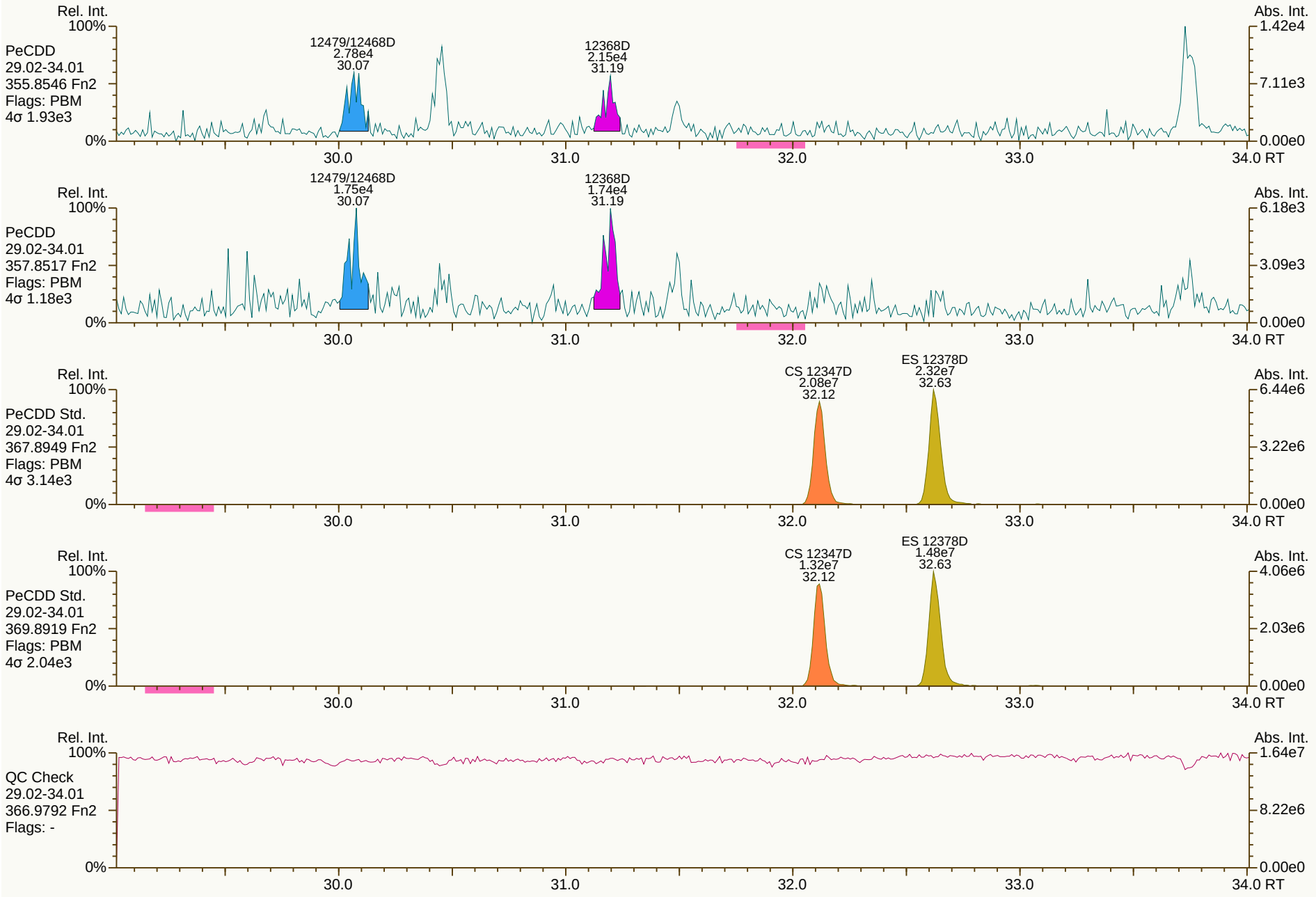
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



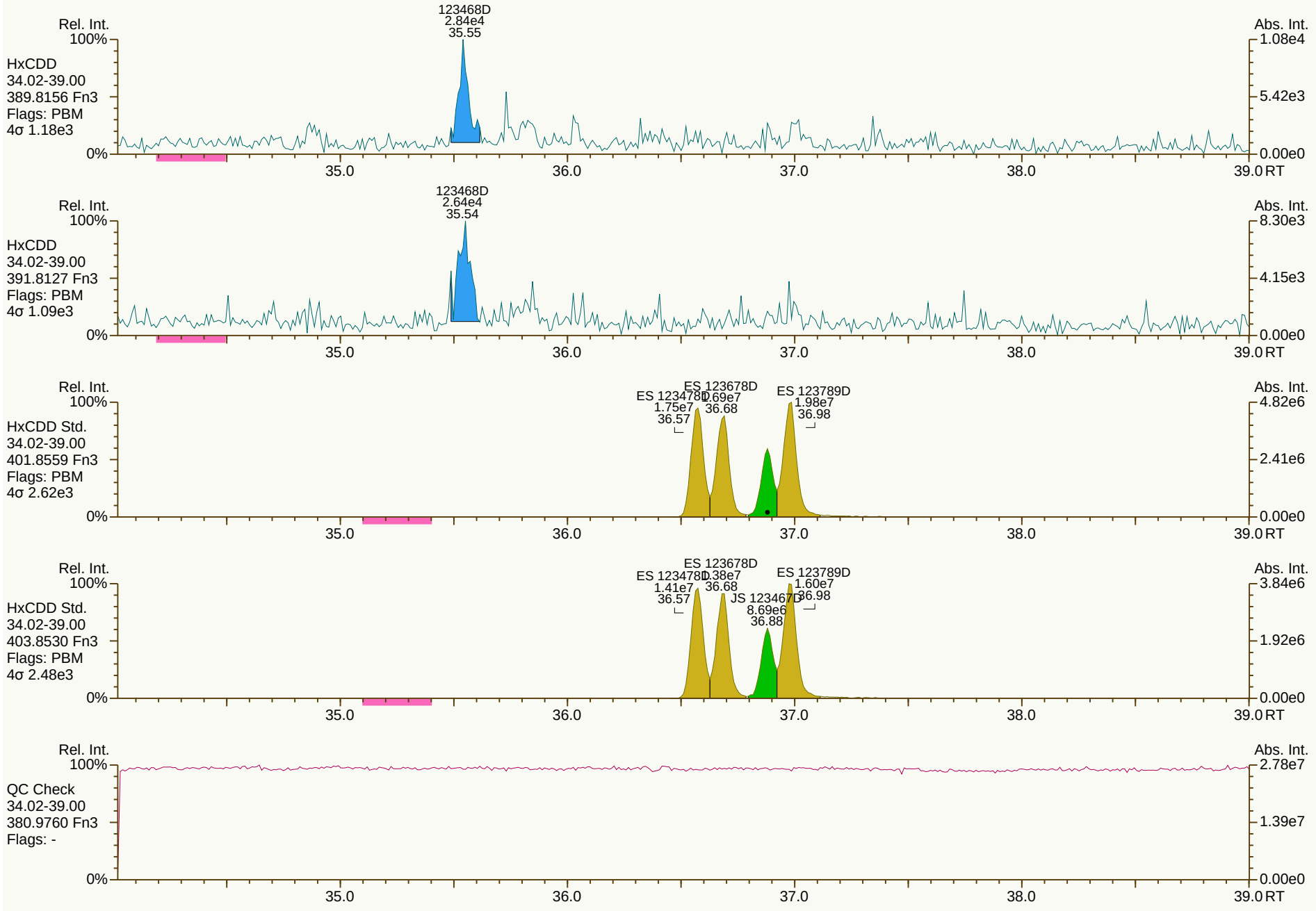
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SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 5116, 2655 scc: 694-399 *PKD: 12-Oct-2014 13:10 Printed: 12-Oct-2014 13:29 Page 6 of 12*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

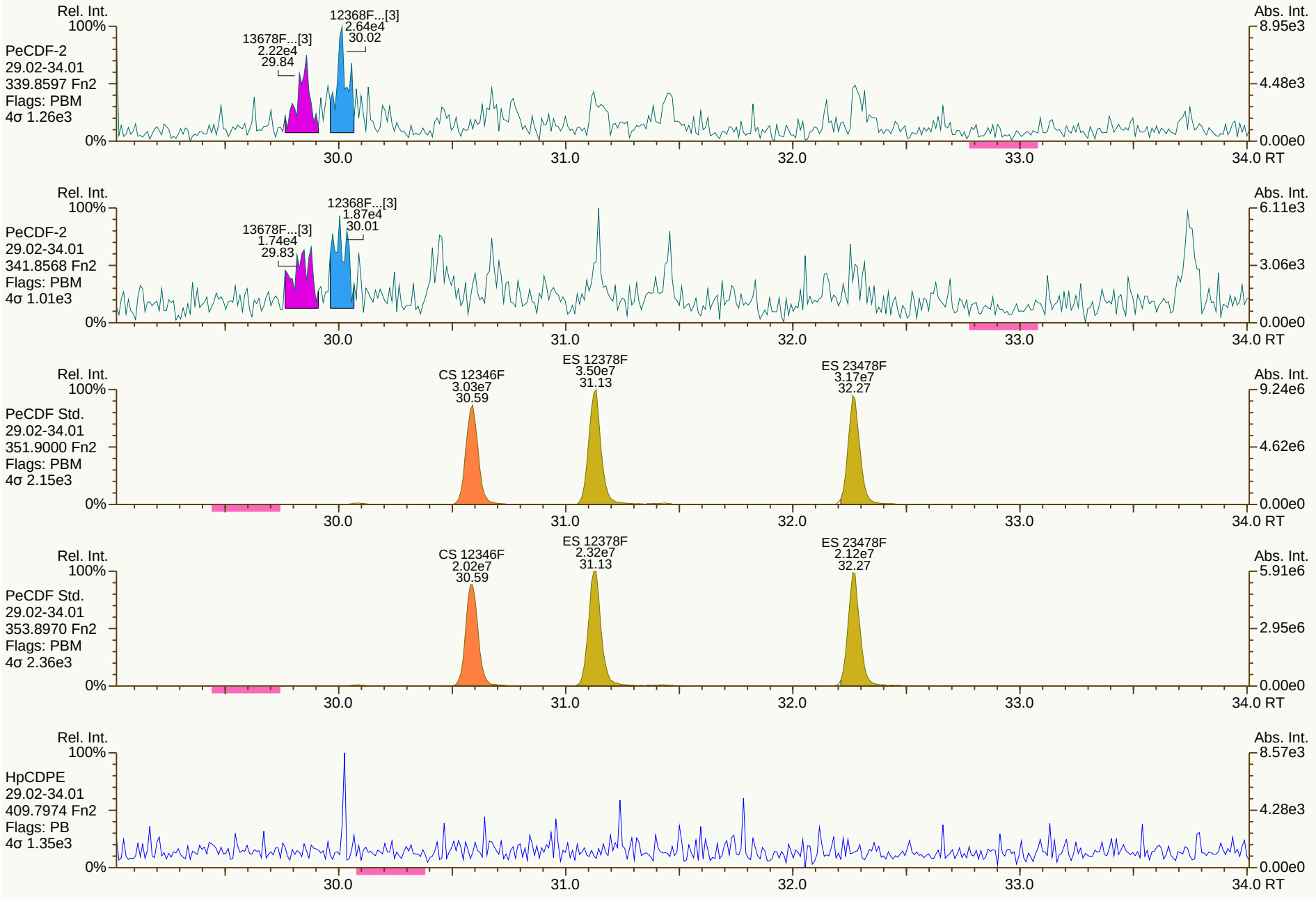
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 4598, 7607, 1835 scc: 694-399 *PKD: 12-Oct-2014 13:10 Printed: 12-Oct-2014 13:30 Page 7 of 12*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



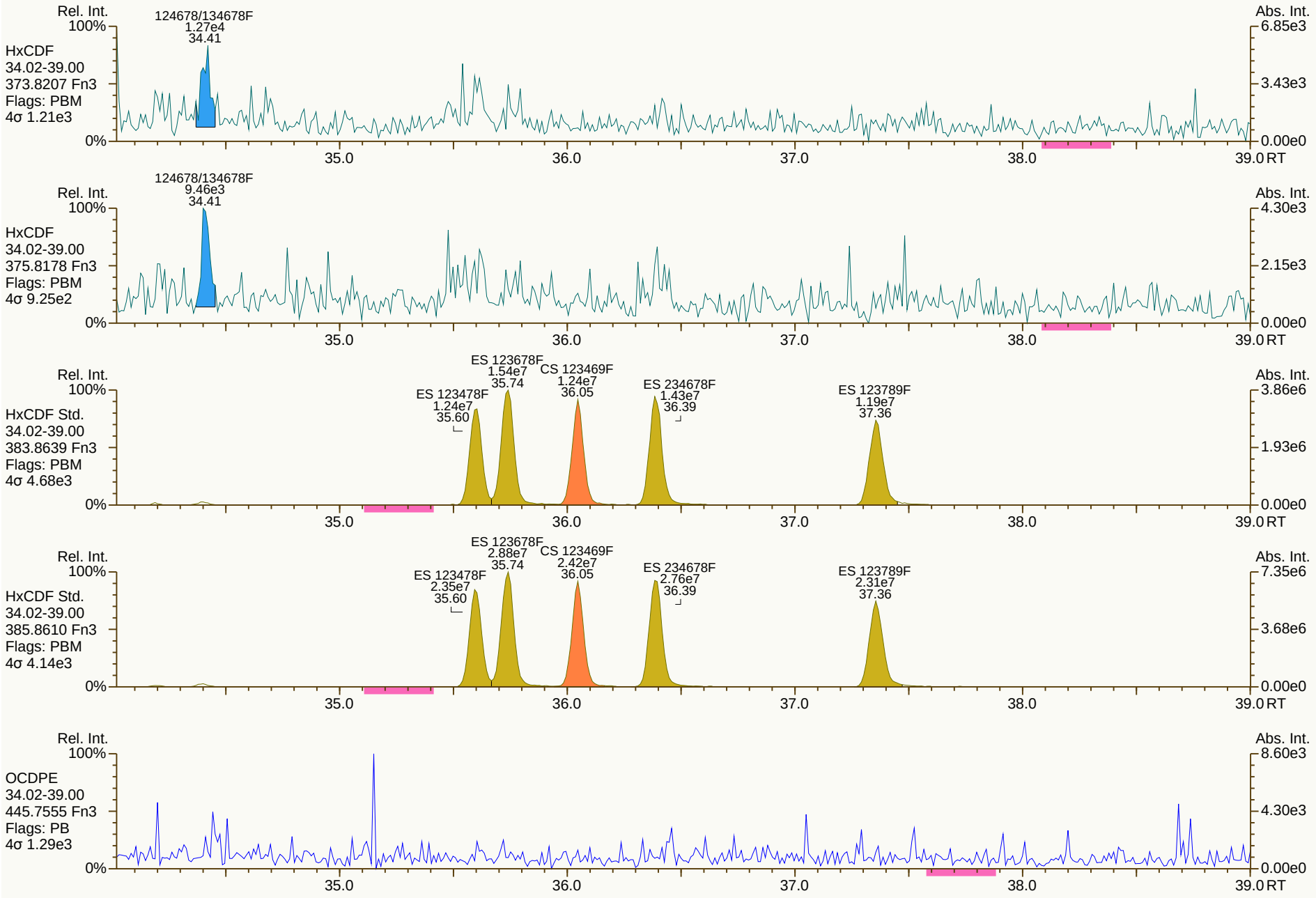
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SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



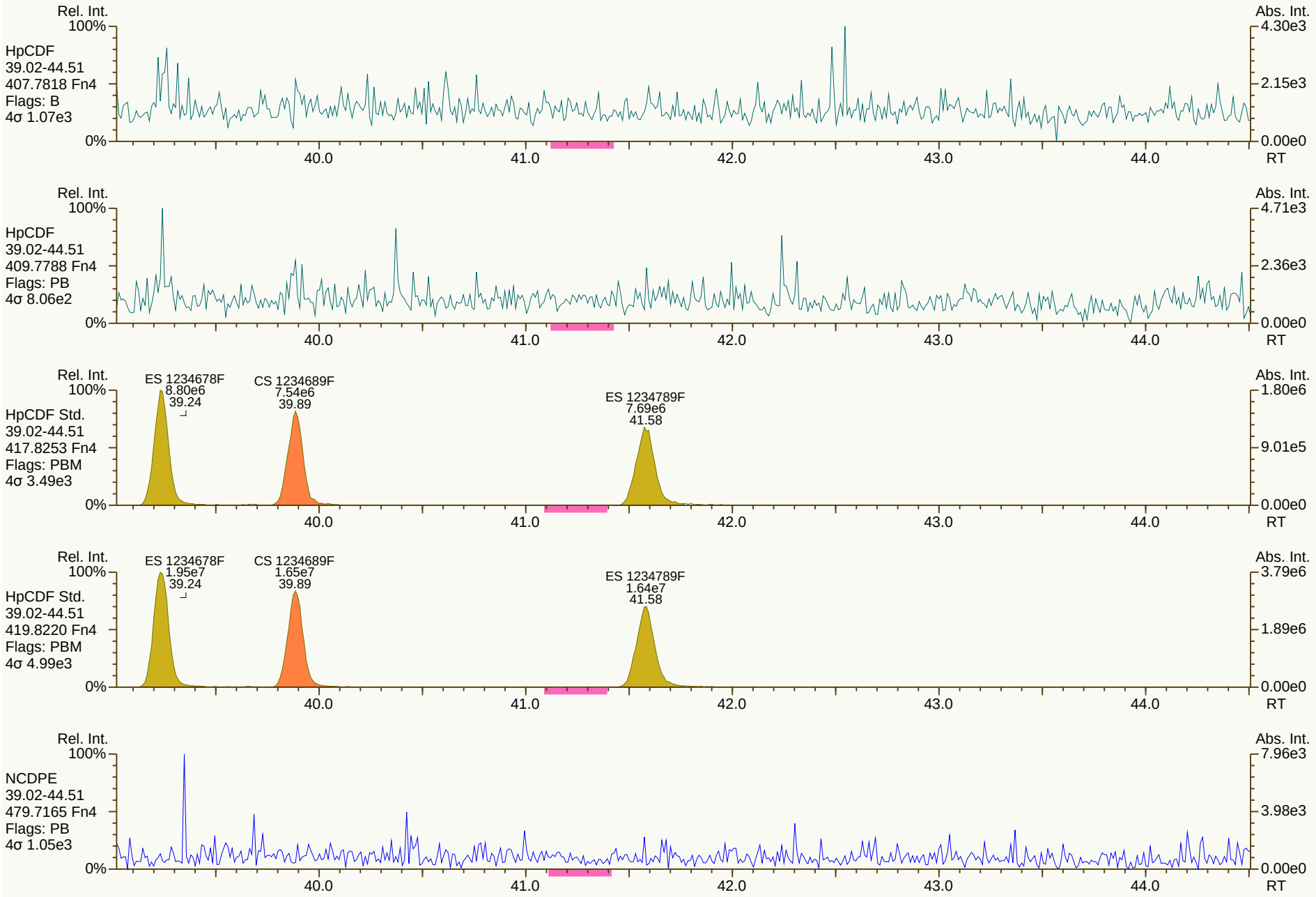
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 6959, 2513, 0058 scc: 694-399 *PKD: 12-Oct-2014 13:10 Printed: 12-Oct-2014 13:30 Page 9 of 12*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

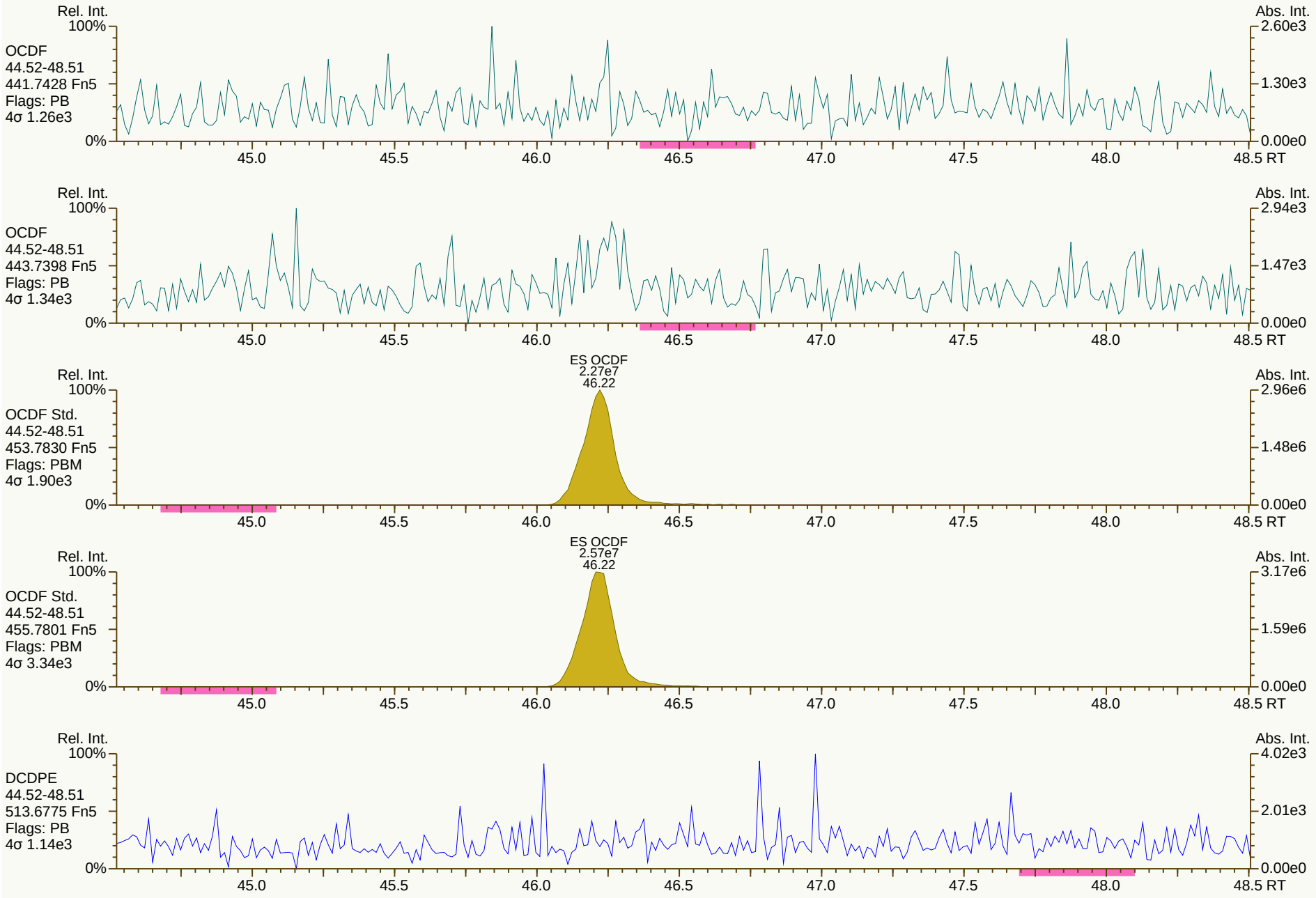
SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 0017, 4213, 8289 scc: 694-399 *PKD: 12-Oct-2014 13:10 Printed: 12-Oct-2014 13:30 Page 11 of 12*

SGS ID: A7185_12600_DF_002 **Sample ID: 142644-02 Run 1** **Acq: 09-Oct-2014 22:37:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 18** **User: ACC Datafile: 141009P06**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_002.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 2196, 0083, 9831 scc: 694-399 *Revised: 12-Oct-2014 08:08 (ACC) Printed: 12-Oct-2014 13:30 Page 12 of 12*

Lab ID: A7185_12600_DF_003 **Acq'd:** 09 Oct 2014 23:30 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-03 Run 2 **UTP:** 12-Oct-2014 13:22:23 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 765-747-WYN

Datafile: 141009P07 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
2378-TCDD	NotFnd		1.0008	-		-	-	-	1.16	-	2744	1.98
12378-PeCDD	NotFnd		1.0005	-		-	-	-	0.99	-	2709	2.06
123478-HxCDD	NotFnd		1.0003	-		-	-	-	1.06	-	2501	2.13
123678-HxCDD	NotFnd		1.0035	-		-	-	-	1.09	-	2501	2.28
123789-HxCDD	NotFnd		1.0116	-		-	-	-	0.93	-	2501	2.24
1234678-HpCDD	NotFnd		1.0005	-		-	-	-	1.02	-	2278	3.45
OCDD	45.91		1.0005	1.0003	-0.6	6.82E+04	0.74	N	1.07	9.73	2249	6.06
2378-TCDF	26.16		1.0008	1.0007	-0.2	7.20E+04	0.65	N	0.99	3.59	3353	1.88
12378-PeCDF	NotFnd		1.0005	-		-	-	-	1.00	-	2720	1.3
23478-PeCDF	32.30		1.0005	1.0006	+0.2	4.30E+04	1.59	Y	1.02	2.44	2720	1.38
123478-HxCDF	NotFnd		1.0004	-		-	-	-	1.18	-	2614	1.66
123678-HxCDF	NotFnd		1.0004	-		-	-	-	1.11	-	2614	1.56
234678-HxCDF	NotFnd		1.0004	-		-	-	-	1.14	-	2614	1.67
123789-HxCDF	NotFnd		1.0003	-		-	-	-	1.08	-	2614	2.15
1234678-HpCDF	NotFnd		1.0004	-		-	-	-	1.38	-	2101	2.01
1234789-HpCDF	NotFnd		1.0004	-		-	-	-	1.28	-	2101	3.23
OCDF	NotFnd		1.0004	-		-	-	-	1.04	-	2634	6.09

Name	Act RT	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
ES 2378-TCDD	27.07	1.0257	1.0257	0	5.40E+07	0.78	Y	1.12	79.7
ES 12378-PeCDD	32.64	1.2368	1.2369	+0.2	4.97E+07	1.55	Y	1.05	78.2
ES 123478-HxCDD	36.58	0.9917	0.9917	0	4.19E+07	1.25	Y	1.08	71.2
ES 123678-HxCDD	36.69	0.9948	0.9948	0	4.05E+07	1.25	Y	1.06	70.7
ES 123789-HxCDD	36.99	1.0029	1.0027	-0.4	4.67E+07	1.26	Y	1.25	68.9
ES 1234678-HpCDD	40.81	1.1065	1.1063	-0.4	3.68E+07	1.13	Y	0.96	70.5
ES OCDD	45.89	1.2447	1.2442	-1.1	5.22E+07	0.89	Y	0.79	60.8
ES 2378-TCDF	26.14	1.0578	1.0579	+0.1	8.13E+07	0.76	Y	1.04	80.4
ES 12378-PeCDF	31.14	1.2599	1.2602	+0.4	7.74E+07	1.47	Y	0.98	81.3
ES 23478-PeCDF	32.28	1.3061	1.3063	+0.3	6.94E+07	1.48	Y	0.91	78.5
ES 123478-HxCDF	35.61	0.9653	0.9653	0	4.77E+07	0.51	Y	1.23	71.2
ES 123678-HxCDF	35.75	0.9692	0.9691	-0.2	5.86E+07	0.53	Y	1.49	72.7
ES 234678-HxCDF	36.40	0.9868	0.9868	0	5.53E+07	0.53	Y	1.36	75.2
ES 123789-HxCDF	37.37	1.0132	1.0131	-0.2	4.84E+07	0.52	Y	1.33	66.9
ES 1234678-HpCDF	39.25	1.0642	1.0640	-0.4	3.71E+07	0.45	Y	0.96	71.5
ES 1234789-HpCDF	41.60	1.1278	1.1277	-0.2	3.17E+07	0.46	Y	0.84	69.5
ES OCDF	46.23	1.2538	1.2533	-1.1	6.35E+07	0.89	Y	0.94	62.1

Lab ID: A7185_12600_DF_003 **Acq'd:** 09 Oct 2014 23:30 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-03 Run 2 **UTP:** 12-Oct-2014 13:22:23 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 765-747-WYN

Datafile: 141009P07 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
JS 1234-TCDD	26.39		-	-	-	6.07E+07	0.79	Y	-	-
JS 1234-TCDF	24.71		-	-	-	9.71E+07	0.76	Y	-	-
JS 123467-HxCDD	36.89		-	-	-	2.71E+07	1.25	Y	-	-
CS 37Cl-2378-TCDD	27.09		1.0266	1.0266	0	2.78E+07	n/a	-	1.21	95.1
CS 12347-PeCDD	32.13		1.2174	1.2175	+0.2	5.21E+07	1.59	Y	0.91	94.1
CS 12346-PeCDF	30.60		1.2380	1.2383	+0.4	7.67E+07	1.48	Y	0.84	94.1
CS 123469-HxCDF	36.06		0.9775	0.9775	0	5.60E+07	0.53	Y	1.23	84.1
CS 1234689-HpCDF	39.90		1.0818	1.0816	-0.4	3.70E+07	0.46	Y	0.82	82.9
SS 37Cl-2378-TCDD	27.09		1.0266	1.0266	0	2.78E+07	n/a	-	1.08	119
SS 12347-PeCDD	32.13		1.2174	1.2175	+0.2	5.21E+07	1.59	Y	0.87	120
SS 12346-PeCDF	30.60		1.2380	1.2383	+0.4	7.67E+07	1.48	Y	0.86	116
SS 123469-HxCDF	36.06		0.9775	0.9775	0	5.60E+07	0.53	Y	0.83	116
SS 1234689-HpCDF	39.90		1.0818	1.0816	-0.4	3.70E+07	0.46	Y	0.86	116
AS 1368-TCDD	23.14		0.8774	0.8771	-0.5	6.06E+07	0.78	Y	1.08	92.4
AS 1368-TCDF	20.96		0.8487	0.8481	-0.9	1.05E+08	0.74	Y	1.16	92.6

Totals	Conc	EMPC
Total TCDD	25.1	25.1
Total PeCDD	13.4	13.4
Total HxCDD	6.22	6.22
Total HpCDD	0	0
Total Tetra-Octa Dioxins	44.7	54.4
Total TCDF	24.2	37.4
Total PeCDF	6.06	10.3
Total HxCDF	2.65	2.65
Total HpCDF	0	0
Total Tetra-Octa Furans	32.9	50.3
Total Tetra-Octa Dioxins & Furans	77.6	105

Lab ID: A7185_12600_DF_003 **Acq'd: 09 Oct 2014 23:30 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-03 Run 2 **UTP: 12-Oct-2014 13:22:23 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 765-747-WYN**

Datafile: 141009P07 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1368-TCDD	23.18		0.8565	0.8563	-0.3	2.38E+05	0.76	Y	1.16	15.2	2744	1.98
1379-TCDD	23.56		0.8710	0.8706	-0.6	1.08E+05	0.87	Y	1.16	6.91	2744	1.98
1369-TCDD	NotFnd		0.8881						1.16		2744	1.98
1469-TCDD	NotFnd		0.9195						1.16		2744	1.98
1247/1246/1248/1249-TCDD	NotFnd		0.9287						1.16		2744	1.98
1378-TCDD	NotFnd		0.9363						1.16		2744	1.98
1268-TCDD	NotFnd		0.9442						1.16		2744	1.98
1478-TCDD	NotFnd		0.9538						1.16		2744	1.98
1279-TCDD	NotFnd		0.9605						1.16		2744	1.98
1234/1269-TCDD	NotFnd		0.9746						1.16		2744	1.98
1236-TCDD	NotFnd		0.9797						1.16		2744	1.98
1237/1238-TCDD	26.78		0.9896	0.9893	-0.5	4.54E+04	0.83	Y	1.16	2.91	2744	1.98
1239-TCDD	NotFnd		0.9950						1.16		2744	1.98
2378-TCDD	**NotFnd**		**1.0008**						**1.16**		**2744**	**1.98**
1278-TCDD	NotFnd		1.0137						1.16		2744	1.98
1267-TCDD	NotFnd		1.0187						1.16		2744	1.98
1289-TCDD	NotFnd		1.0388						1.16		2744	1.98
12479/12468-PeCDD	30.08		0.9217	0.9216	-0.2	7.00E+04	1.72	Y	0.99	5.7	2709	2.06
12469-PeCDD	NotFnd		0.9383						0.99		2709	2.06
12368-PeCDD	31.20		0.9559	0.9561	+0.4	6.31E+04	1.48	Y	0.99	5.14	2709	2.06
12478-PeCDD	NotFnd		0.9618						0.99		2709	2.06
12379-PeCDD	31.50		0.9650	0.9652	+0.4	3.14E+04	1.73	Y	0.99	2.56	2709	2.06
12369/12467/12489-PeCDD	NotFnd		0.9732						0.99		2709	2.06
12346/12347-PeCDD	NotFnd		0.9849						0.99		2709	2.06
12378-PeCDD	**NotFnd**		**1.0005**						**0.99**		**2709**	**2.06**
12367-PeCDD	NotFnd		1.0034						0.99		2709	2.06
12389-PeCDD	NotFnd		1.0143						0.99		2709	2.06
124679/124689-HxCDD	NotFnd		0.9537						1.03		2501	2.21
123468-HxCDD	35.55		0.9718	0.9717	-0.2	6.87E+04	1.37	Y	1.03	6.22	2501	2.21
123679/123689-HxCDD	NotFnd		0.9797						1.03		2501	2.21
123469-HxCDD	NotFnd		0.9834						1.03		2501	2.21
123478-HxCDD	**NotFnd**		**1.0003**						**1.06**		**2501**	**2.13**
123678-HxCDD	**NotFnd**		**1.0035**						**1.09**		**2501**	**2.28**
123467-HxCDD	NotFnd		1.0087						1.03		2501	2.21
123789-HxCDD	**NotFnd**		**1.0116**						**0.93**		**2501**	**2.24**

Lab ID: A7185_12600_DF_003 **Acq'd: 09 Oct 2014 23:30 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-03 Run 2 **UTP: 12-Oct-2014 13:22:23 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 765-747-WYN**

Datafile: 141009P07 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1234679-HpCDD	NotFnd		0.9725						1.02		2278	3.45
1234678-HpCDD	**NotFnd**		**1.0005**						**1.02**		**2278**	**3.45**
OCDD	**45.91**		**1.0005**	**1.0003**	**-0.6**	**6.82E+04**	**0.74**	**N**	**1.07**	**9.73**	**2249**	**6.06**
OCDD-a	NotFnd		1.0003						0.07		2597	110
1368-TCDF	20.98		0.8033	0.8028	-0.8	5.53E+04	0.76	Y	0.99	2.76	3353	1.88
1468-TCDF	NotFnd		0.8244						0.99		3353	1.88
2468-TCDF	22.18		0.8485	0.8483	-0.3	5.61E+04	0.89	N	0.99	2.8	3353	1.88
1346/1246-TCDF	NotFnd		0.8652						0.99		3353	1.88
1347/1378/1247-TCDF	22.74		0.8706	0.8700	-0.9	1.14E+05	0.71	Y	0.99	5.71	3353	1.88
1348-TCDF	NotFnd		0.8816						0.99		3353	1.88
1248/1367/1379-TCDF	23.16		0.8870	0.8859	-1.7	8.62E+04	0.75	Y	0.99	4.3	3353	1.88
1268-TCDF	NotFnd		0.9030						0.99		3353	1.88
1467-TCDF	NotFnd		0.9085						0.99		3353	1.88
1478-TCDF	23.92		0.9154	0.9151	-0.5	4.42E+04	0.82	Y	0.99	2.21	3353	1.88
1369/1237-TCDF	NotFnd		0.9307						0.99		3353	1.88
2467-TCDF	24.46		0.9360	0.9358	-0.3	4.37E+04	0.66	Y	0.99	2.18	3353	1.88
2368-TCDF	24.62		0.9421	0.9420	-0.2	5.60E+04	0.71	Y	0.99	2.79	3353	1.88
1238/1234/1678/1469/1236-TCDF	24.73		0.9466	0.9461	-0.8	6.92E+04	0.62	N	0.99	3.46	3353	1.88
1278-TCDF	25.22		0.9648	0.9647	-0.2	8.50E+04	0.68	Y	0.99	4.24	3353	1.88
1349-TCDF	NotFnd		0.9692						0.99		3353	1.88
1267-TCDF	NotFnd		0.9759						0.99		3353	1.88
2346/1249-TCDF	NotFnd		0.9839						0.99		3353	1.88
2347/1279-TCDF	NotFnd		0.9920						0.99		3353	1.88
2348-TCDF	NotFnd		0.9965						0.99		3353	1.88
2378-TCDF	**26.16**		**1.0008**	**1.0007**	**-0.2**	**7.20E+04**	**0.65**	**N**	**0.99**	**3.59**	**3353**	**1.88**
2367/3467-TCDF	26.55		1.0157	1.0157	0	6.66E+04	0.50	N	0.99	3.32	3353	1.88
1269-TCDF	NotFnd		1.0255						0.99		3353	1.88
1239-TCDF	NotFnd		1.0365						0.99		3353	1.88
1289-TCDF	NotFnd		1.0818						0.99		3353	1.88
13468/12468-PeCDF	NotFnd		0.9073						1.01		3897	1.91
13678/13467/12467-PeCDF	29.86		0.9585	0.9588	+0.6	6.69E+04	1.34	Y	1.01	3.62	2720	1.34
12368/13478/12478-PeCDF	30.01		0.9637	0.9637	0	7.90E+04	1.11	N	1.01	4.27	2720	1.34
14678-PeCDF	NotFnd		0.9670						1.01		2720	1.34
13479-PeCDF	NotFnd		0.9702						1.01		2720	1.34
13469/12479-PeCDF	NotFnd		0.9783						1.01		2720	1.34
12346-PeCDF	NotFnd		0.9829						1.01		2720	1.34

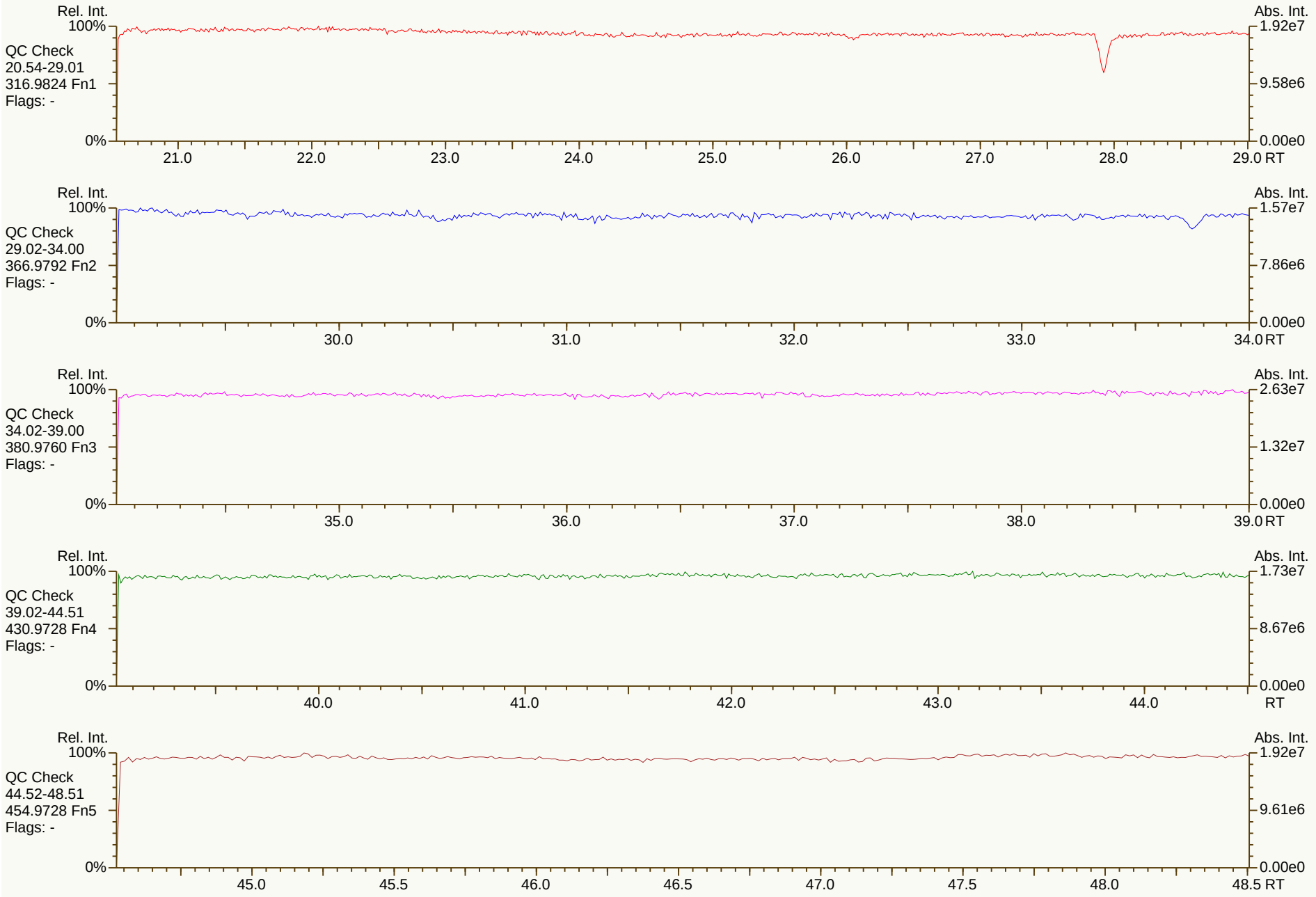
Lab ID: A7185_12600_DF_003 **Acq'd: 09 Oct 2014 23:30 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-03 Run 2 **UTP: 12-Oct-2014 13:22:23 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 765-747-WYN**

Datafile: 141009P07 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

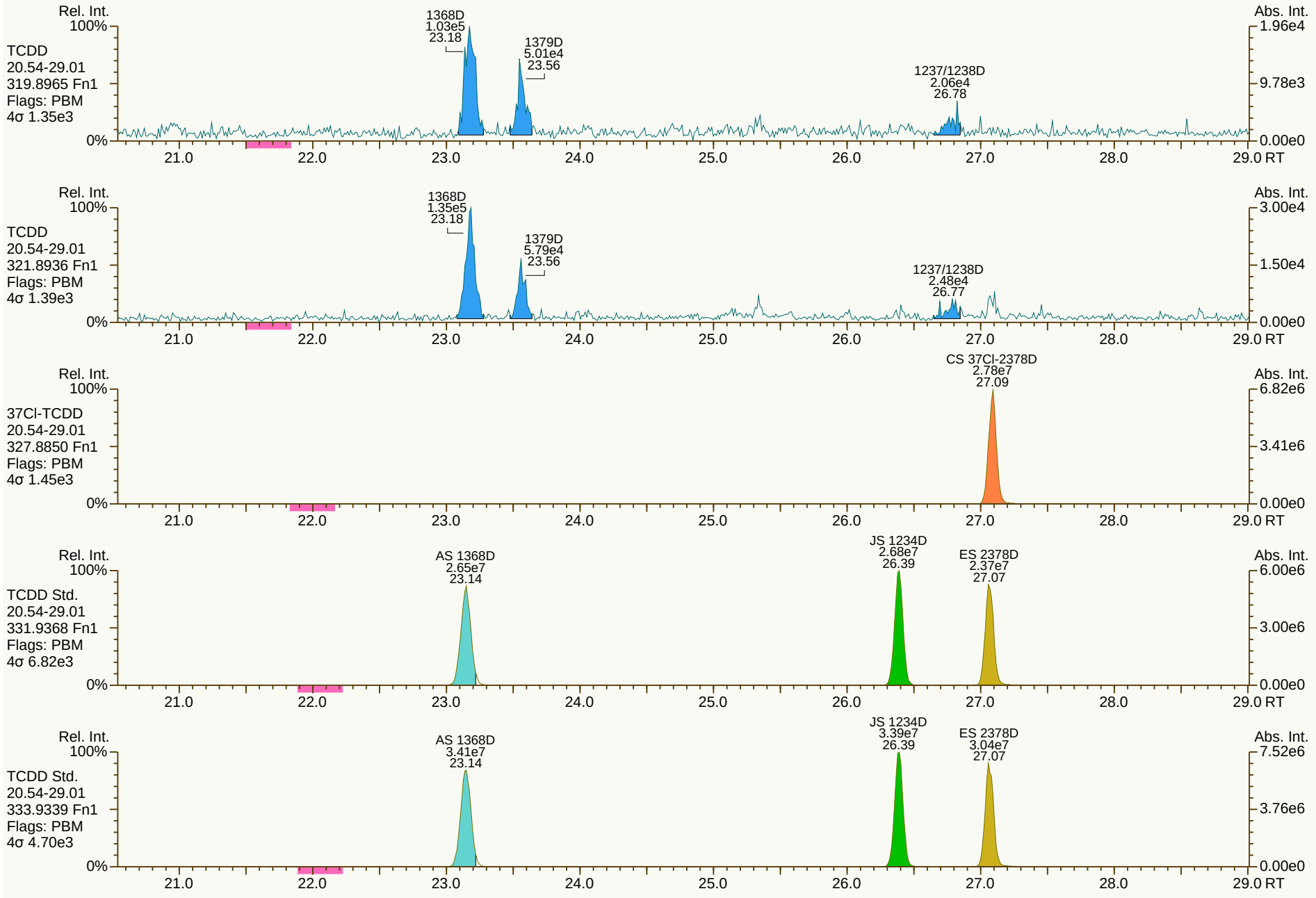
Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
23468/12469-PeCDF	NotFnd		0.9857						1.01		2720	1.34
12347-PeCDF	NotFnd		0.9883						1.01		2720	1.34
12348-PeCDF	NotFnd		0.9936						1.01		2720	1.34
12378-PeCDF	**NotFnd**		**1.0005**						**1.00**		**2720**	**1.3**
12678/12367-PeCDF	NotFnd		1.0095						1.01		2720	1.34
12379-PeCDF	NotFnd		1.0151						1.01		2720	1.34
12679-PeCDF	NotFnd		0.9925						1.01		2720	1.34
23467/12369-PeCDF	NotFnd		0.9966						1.01		2720	1.34
23478-PeCDF	**32.30**		**1.0005**	**1.0006**	**+0.2**	**4.30E+04**	**1.59**	**Y**	**1.02**	**2.44**	**2720**	**1.38**
23478/12489-PeCDF	NotFnd		0.0000						1.02			
12489-PeCDF	NotFnd		1.0053						1.01		2720	1.34
12349-PeCDF	NotFnd		1.0109						1.01		2720	1.34
12389-PeCDF	NotFnd		1.0347						1.01		2720	1.34
123468-HxCDF	NotFnd		0.9611						1.12		2614	1.74
124678/134678-HxCDF	34.42		0.9668	0.9668	0	3.91E+04	1.42	Y	1.12	2.65	2614	1.74
134679-HxCDF	NotFnd		0.9734						1.12		2614	1.74
124679-HxCDF	NotFnd		0.9788						1.12		2614	1.74
124689-HxCDF	NotFnd		0.9851						1.12		2614	1.74
123467-HxCDF	NotFnd		0.9971						1.12		2614	1.74
123478-HxCDF	**NotFnd**		**1.0004**						**1.18**		**2614**	**1.66**
123678-HxCDF	**NotFnd**		**1.0004**						**1.11**		**2614**	**1.56**
123479-HxCDF	NotFnd		1.0048						1.12		2614	1.74
123469-HxCDF	NotFnd		1.0089						1.12		2614	1.74
123679-HxCDF	NotFnd		0.9943						1.12		2614	1.74
234678-HxCDF	**NotFnd**		**1.0004**						**1.14**		**2614**	**1.67**
234678/123689-HxCDF	NotFnd		0.0000						1.14			
123689-HxCDF	NotFnd		1.0068						1.12		2614	1.74
123789-HxCDF	**NotFnd**		**1.0003**						**1.08**		**2614**	**2.15**
123789/123489-HxCDF	NotFnd		0.0000						1.08			
123489-HxCDF	NotFnd		1.0017						1.12		2614	1.74
1234678-HpCDF	**NotFnd**		**1.0004**						**1.38**		**2101**	**2.01**
1234679-HpCDF	NotFnd		1.0111						1.33		2101	2.56
1234689-HpCDF	NotFnd		1.0170						1.33		2101	2.56
1234789-HpCDF	**NotFnd**		**1.0004**						**1.28**		**2101**	**3.23**
OCDF	**NotFnd**		**1.0004**						**1.04**		**2634**	**6.09**
OCDF-a	NotFnd		1.0003						0.06		2780	108

SGS ID: A7185_12600_DF_003 | **Sample ID: 142644-03 Run 2** | **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 | **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** | **User: ACC Datafile: 141009P07**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



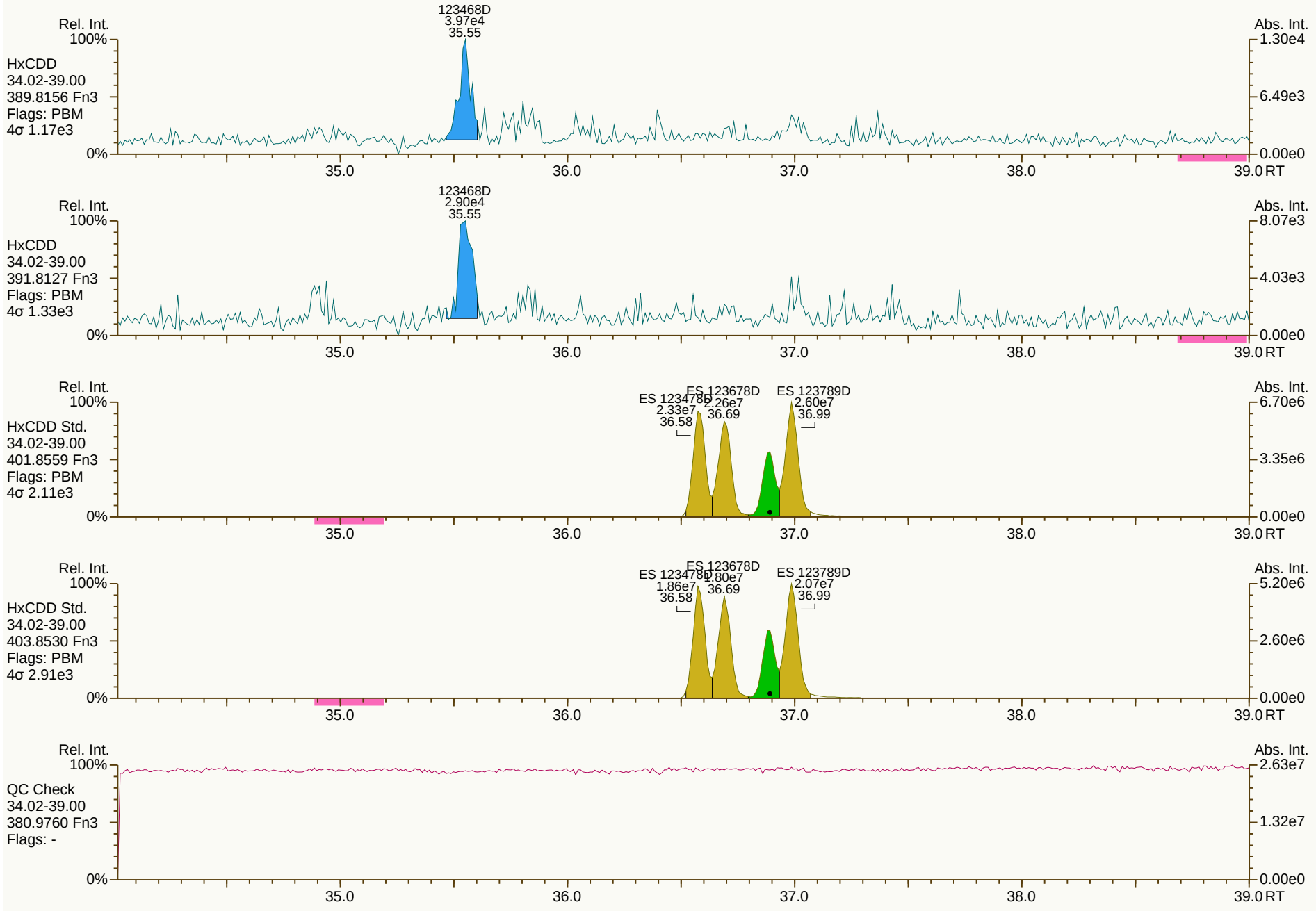
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SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 0430, 3729 scc: 765-747 *PKD: 12-Oct-2014 13:13 Printed: 12-Oct-2014 13:30 Page 4 of 12*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**

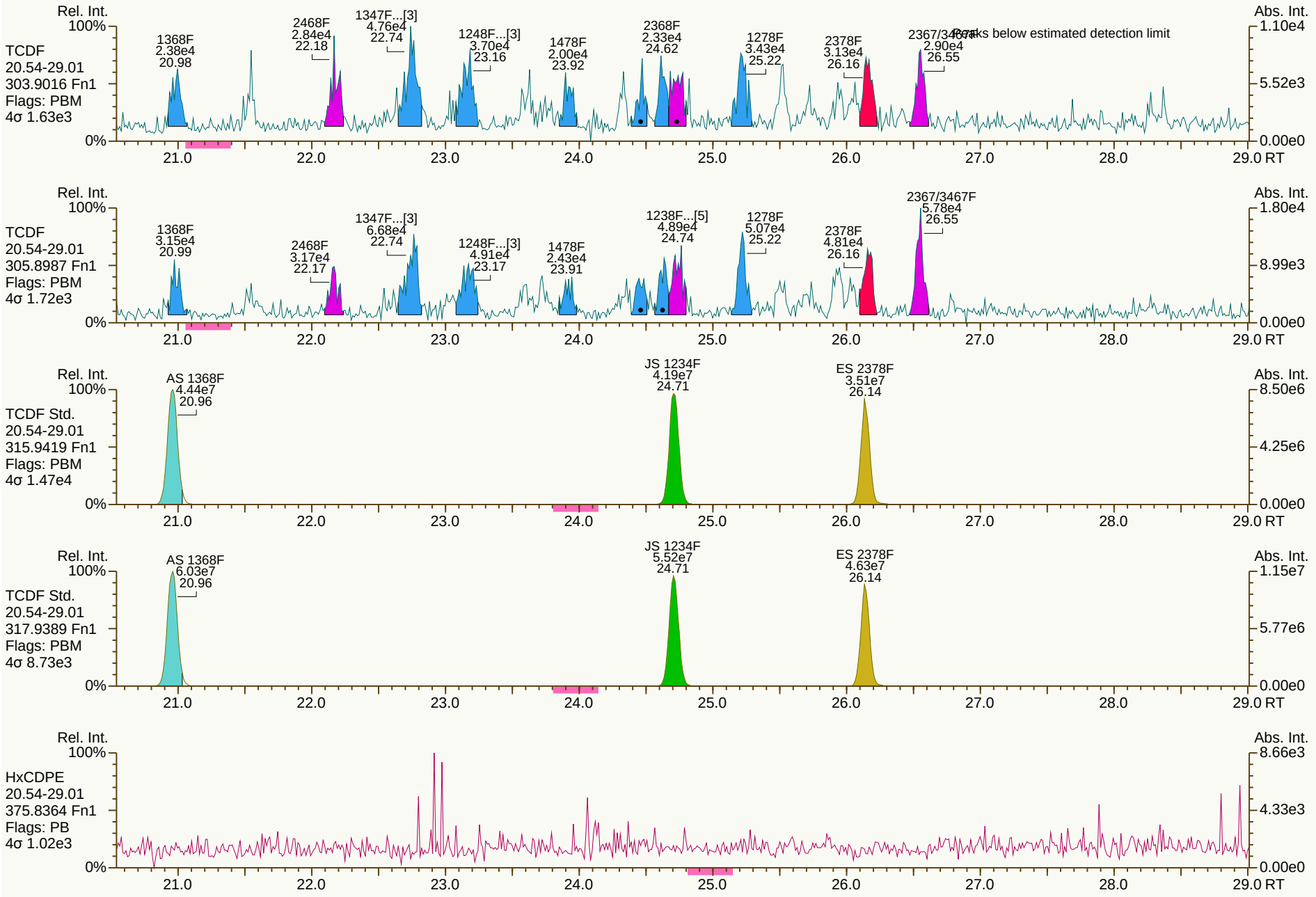


SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



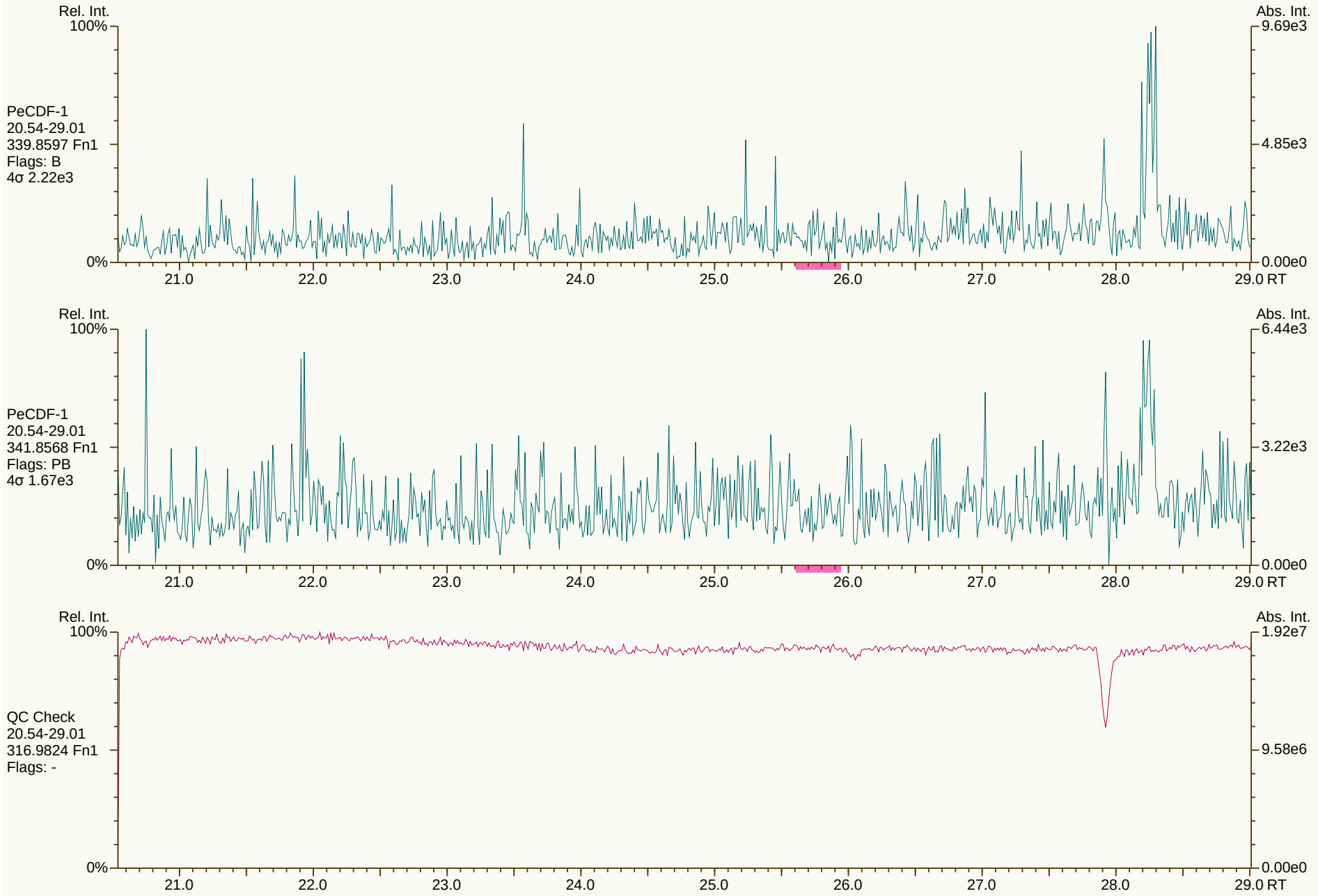
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



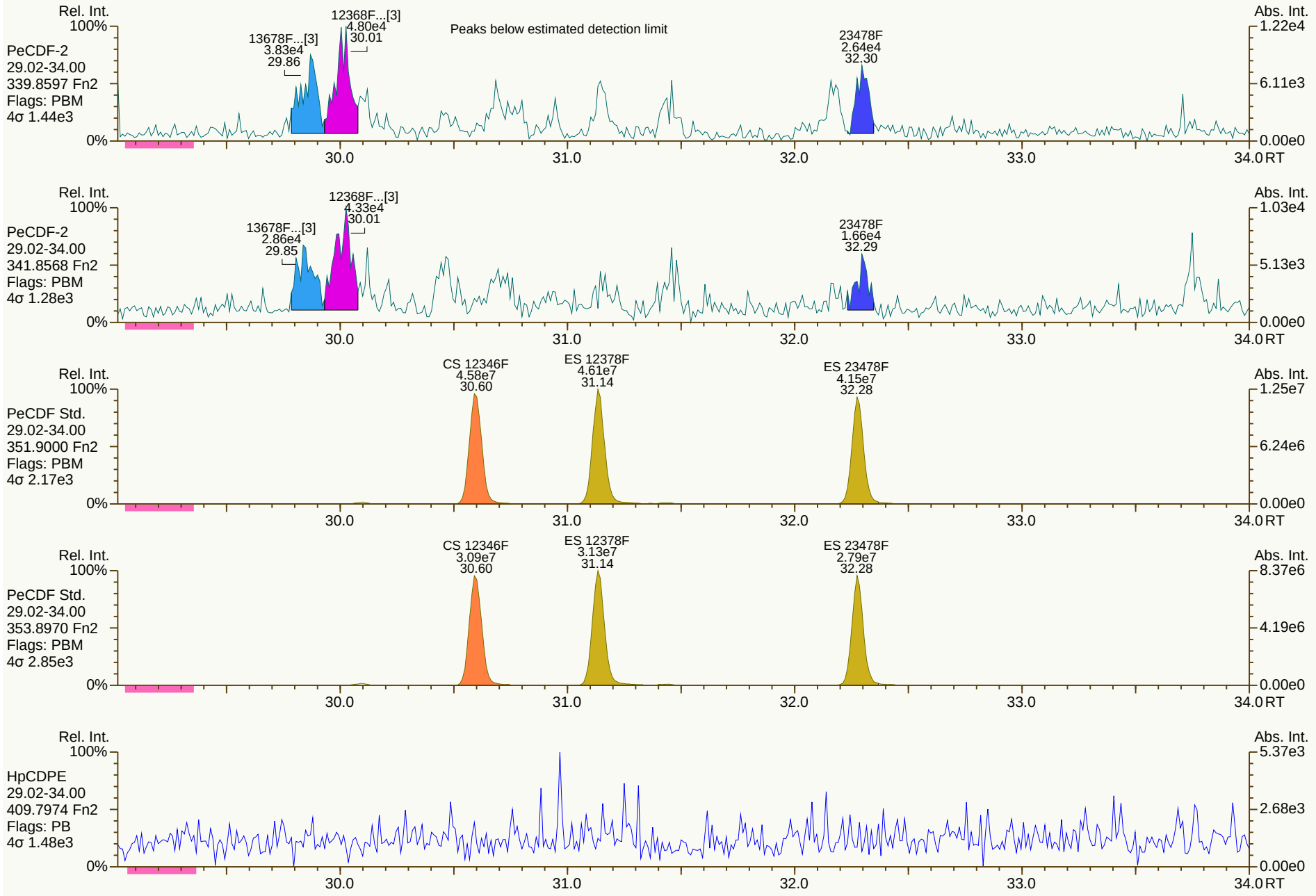
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



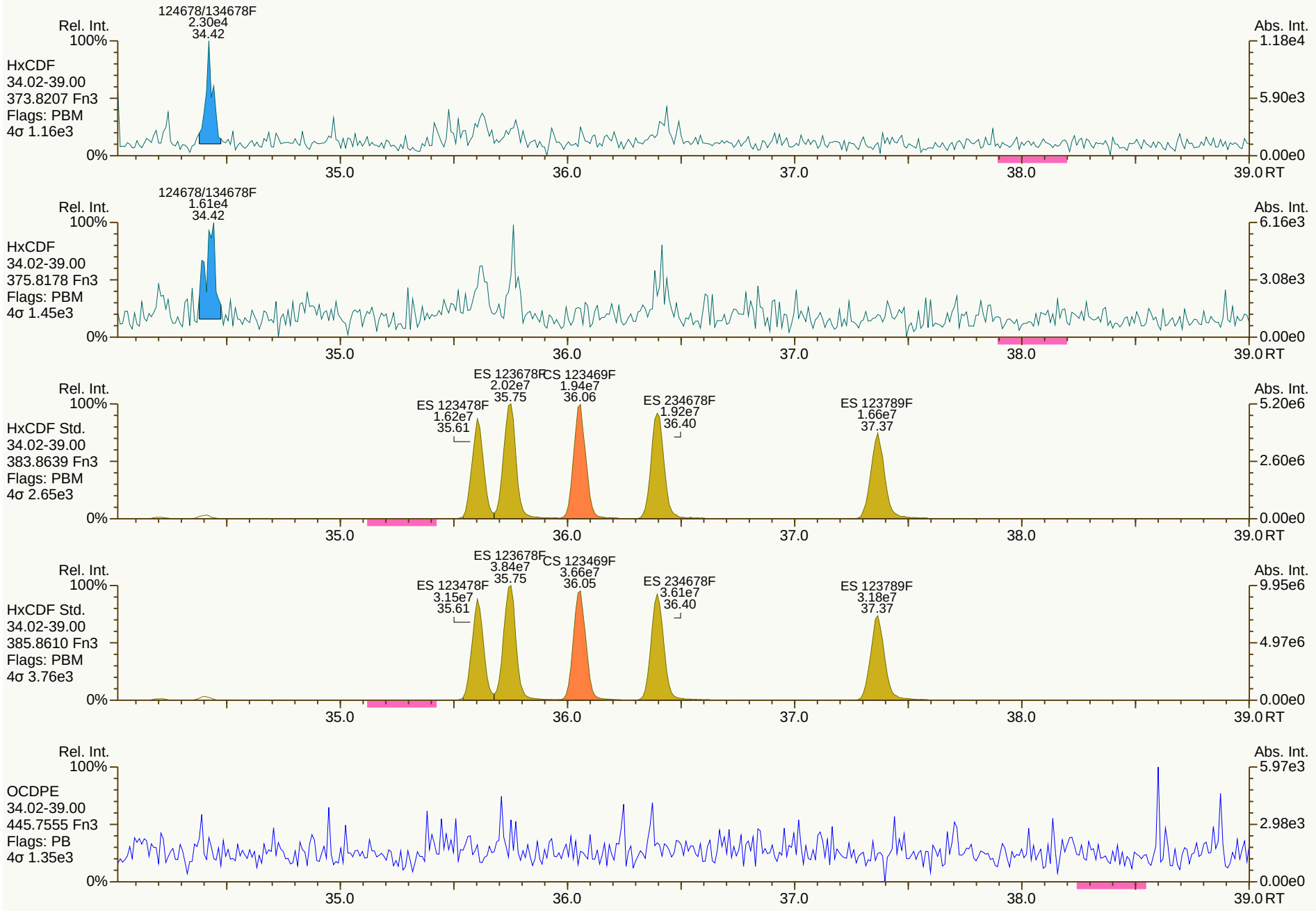
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



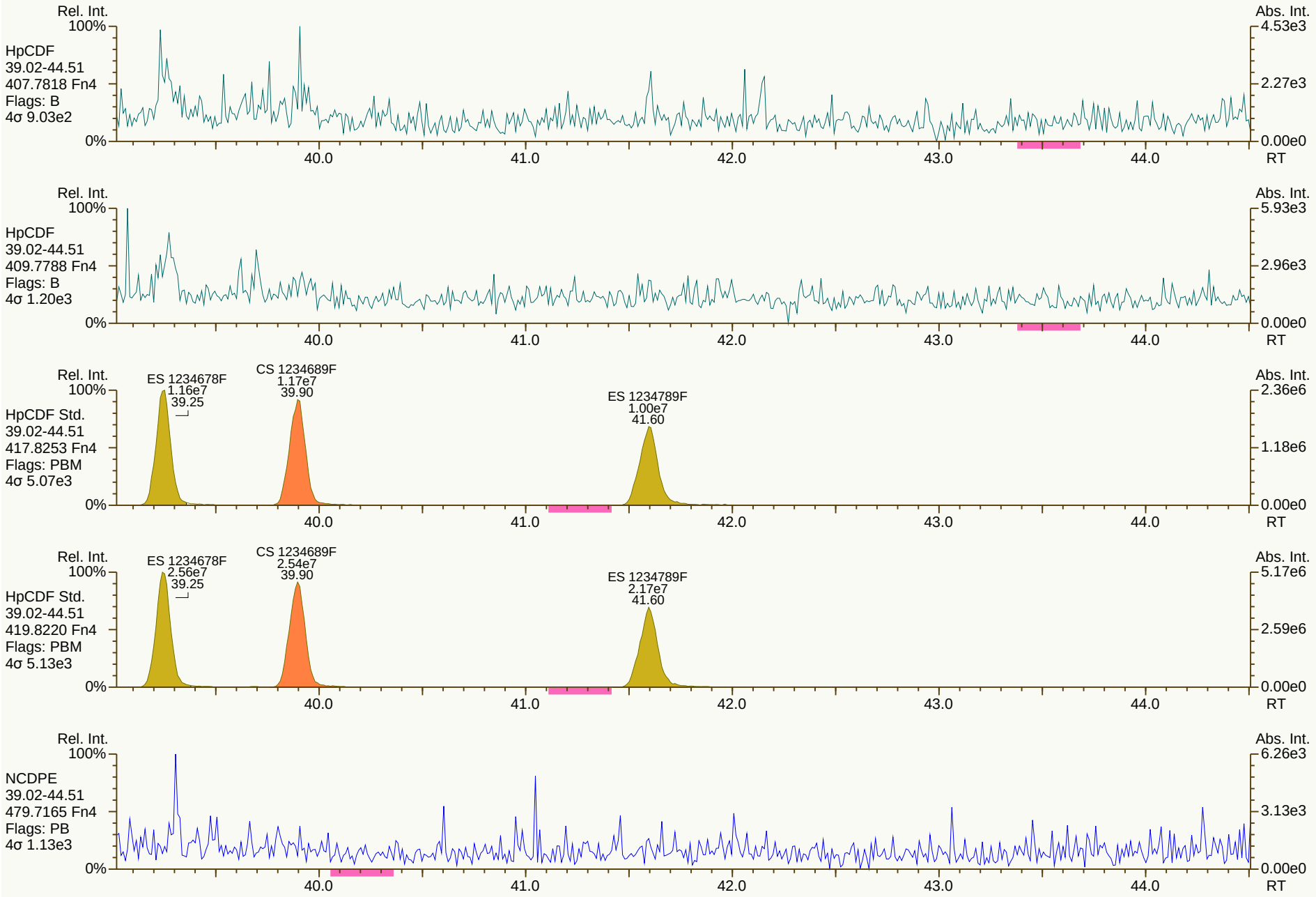
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



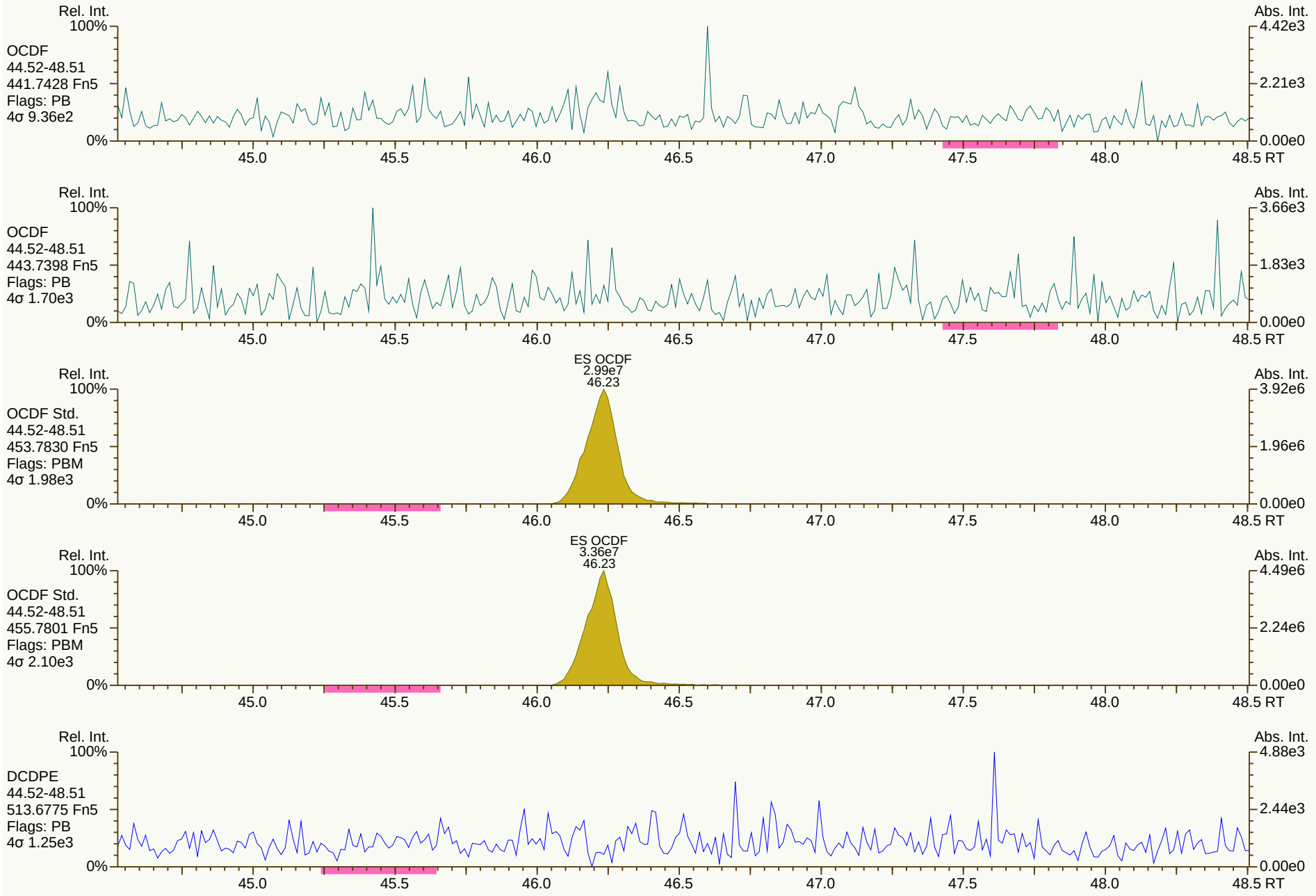
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_003 **Sample ID: 142644-03 Run 2** **Acq: 09-Oct-2014 23:30:25**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 19** **User: ACC Datafile: 141009P07**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_003.utp_res, saved 12-Oct-2014 13:22 (ACC) *Peak annotation: Areas, Centroids*

Lab ID: A7185_12600_DF_004 **Acq'd:** 10 Oct 2014 00:23 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-04 Run 3 **UTP:** 12-Oct-2014 13:23:18 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 455-311-TXS

Datafile: 141009P08 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
2378-TCDD	NotFnd		1.0008	-		-	-	-	1.16	-	2629	2.8
12378-PeCDD	NotFnd		1.0005	-		-	-	-	0.99	-	3697	4.05
123478-HxCDD	NotFnd		1.0003	-		-	-	-	1.06	-	2681	3.34
123678-HxCDD	NotFnd		1.0035	-		-	-	-	1.09	-	2681	3.69
123789-HxCDD	NotFnd		1.0116	-		-	-	-	0.93	-	2681	3.94
1234678-HpCDD	NotFnd		1.0005	-		-	-	-	1.02	-	2450	5.48
OCDD	NotFnd		1.0005	-		-	-	-	1.07	-	2269	9.23
2378-TCDF	NotFnd		1.0008	-		-	-	-	0.99	-	3080	2.6
12378-PeCDF	NotFnd		1.0005	-		-	-	-	1.00	-	3034	2.22
23478-PeCDF	NotFnd		1.0005	-		-	-	-	1.02	-	3034	2.39
123478-HxCDF	NotFnd		1.0004	-		-	-	-	1.18	-	2009	1.92
123678-HxCDF	NotFnd		1.0004	-		-	-	-	1.11	-	2009	1.78
234678-HxCDF	NotFnd		1.0004	-		-	-	-	1.14	-	2009	1.89
123789-HxCDF	NotFnd		1.0003	-		-	-	-	1.08	-	2009	2.69
1234678-HpCDF	NotFnd		1.0004	-		-	-	-	1.38	-	1804	2.7
1234789-HpCDF	NotFnd		1.0004	-		-	-	-	1.28	-	1804	3.88
OCDF	NotFnd		1.0004	-		-	-	-	1.04	-	2646	9.84

Name	Act RT	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
ES 2378-TCDD	27.06	1.0257	1.0258	+0.2	3.70E+07	0.79	Y	1.12	91.1
ES 12378-PeCDD	32.63	1.2368	1.2370	+0.3	3.40E+07	1.55	Y	1.05	89.1
ES 123478-HxCDD	36.58	0.9917	0.9918	+0.2	2.81E+07	1.23	Y	1.08	79.8
ES 123678-HxCDD	36.69	0.9948	0.9948	0	2.86E+07	1.26	Y	1.06	83.1
ES 123789-HxCDD	36.99	1.0029	1.0029	0	3.32E+07	1.28	Y	1.25	81.9
ES 1234678-HpCDD	40.80	1.1065	1.1064	-0.2	2.53E+07	1.09	Y	0.96	81.1
ES OCDD	45.89	1.2447	1.2443	-0.9	3.56E+07	0.92	Y	0.79	69.3
ES 2378-TCDF	26.14	1.0578	1.0578	0	5.81E+07	0.78	Y	1.04	94.2
ES 12378-PeCDF	31.13	1.2599	1.2601	+0.3	5.35E+07	1.47	Y	0.98	92
ES 23478-PeCDF	32.28	1.3061	1.3063	+0.3	4.86E+07	1.47	Y	0.91	90.2
ES 123478-HxCDF	35.60	0.9653	0.9653	0	3.28E+07	0.52	Y	1.23	81.8
ES 123678-HxCDF	35.74	0.9692	0.9692	0	4.05E+07	0.52	Y	1.49	83.9
ES 234678-HxCDF	36.40	0.9868	0.9869	+0.2	3.80E+07	0.53	Y	1.36	86.4
ES 123789-HxCDF	37.36	1.0132	1.0131	-0.2	3.18E+07	0.52	Y	1.33	73.3
ES 1234678-HpCDF	39.24	1.0642	1.0641	-0.2	2.55E+07	0.45	Y	0.96	82.1
ES 1234789-HpCDF	41.59	1.1278	1.1277	-0.2	2.17E+07	0.47	Y	0.84	79.4
ES OCDF	46.22	1.2538	1.2534	-0.9	4.20E+07	0.90	Y	0.94	68.6

Lab ID: A7185_12600_DF_004 **Acq'd:** 10 Oct 2014 00:23 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-04 Run 3 **UTP:** 12-Oct-2014 13:23:18 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 455-311-TXS

Datafile: 141009P08 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
JS 1234-TCDD	26.38		-	-	-	3.63E+07	0.79	Y	-	-
JS 1234-TCDF	24.71		-	-	-	5.93E+07	0.75	Y	-	-
JS 123467-HxCDD	36.88		-	-	-	1.63E+07	1.28	Y	-	-
CS 37Cl-2378-TCDD	27.09		1.0266	1.0267	+0.2	1.63E+07	n/a	-	1.21	93
CS 12347-PeCDD	32.12		1.2174	1.2176	+0.3	3.12E+07	1.60	Y	0.91	93.9
CS 12346-PeCDF	30.59		1.2380	1.2382	+0.3	4.61E+07	1.51	Y	0.84	92.7
CS 123469-HxCDF	36.05		0.9775	0.9775	0	3.31E+07	0.53	Y	1.23	82.9
CS 1234689-HpCDF	39.89		1.0818	1.0816	-0.4	2.12E+07	0.46	Y	0.82	79.3
SS 37Cl-2378-TCDD	27.09		1.0266	1.0267	+0.2	1.63E+07	n/a	-	1.08	102
SS 12347-PeCDD	32.12		1.2174	1.2176	+0.3	3.12E+07	1.60	Y	0.87	105
SS 12346-PeCDF	30.59		1.2380	1.2382	+0.3	4.61E+07	1.51	Y	0.86	101
SS 123469-HxCDF	36.05		0.9775	0.9775	0	3.31E+07	0.53	Y	0.83	98.9
SS 1234689-HpCDF	39.89		1.0818	1.0816	-0.4	2.12E+07	0.46	Y	0.86	96.6
AS 1368-TCDD	23.14		0.8774	0.8772	-0.3	3.61E+07	0.80	Y	1.08	91.8
AS 1368-TCDF	20.96		0.8487	0.8482	-0.7	6.33E+07	0.76	Y	1.16	91.7

Totals	Conc	EMPC
Total TCDD	19.1	19.1
Total PeCDD	4.38	4.38
Total HxCDD	5.53	5.53
Total HpCDD	0	0
Total Tetra-Octa Dioxins	29	29
Total TCDF	3.57	3.57
Total PeCDF	3.62	3.62
Total HxCDF	0	0
Total HpCDF	0	0
Total Tetra-Octa Furans	7.19	7.19
Total Tetra-Octa Dioxins & Furans	36.2	36.2

Lab ID: A7185_12600_DF_004 **Acq'd: 10 Oct 2014 00:23 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-04 Run 3 **UTP: 12-Oct-2014 13:23:18 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 455-311-TXS**

Datafile: 141009P08 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1368-TCDD	23.17		0.8565	0.8563	-0.3	1.45E+05	0.70	Y	1.16	13.6	2629	2.8
1379-TCDD	23.58		0.8710	0.8712	+0.3	5.88E+04	0.73	Y	1.16	5.5	2629	2.8
1369-TCDD	NotFnd		0.8881						1.16		2629	2.8
1469-TCDD	NotFnd		0.9195						1.16		2629	2.8
1247/1246/1248/1249-TCDD	NotFnd		0.9287						1.16		2629	2.8
1378-TCDD	NotFnd		0.9363						1.16		2629	2.8
1268-TCDD	NotFnd		0.9442						1.16		2629	2.8
1478-TCDD	NotFnd		0.9538						1.16		2629	2.8
1279-TCDD	NotFnd		0.9605						1.16		2629	2.8
1234/1269-TCDD	NotFnd		0.9746						1.16		2629	2.8
1236-TCDD	NotFnd		0.9797						1.16		2629	2.8
1237/1238-TCDD	NotFnd		0.9896						1.16		2629	2.8
1239-TCDD	NotFnd		0.9950						1.16		2629	2.8
2378-TCDD	**NotFnd**		**1.0008**						**1.16**		**2629**	**2.8**
1278-TCDD	NotFnd		1.0137						1.16		2629	2.8
1267-TCDD	NotFnd		1.0187						1.16		2629	2.8
1289-TCDD	NotFnd		1.0388						1.16		2629	2.8
12479/12468-PeCDD	NotFnd		0.9217						0.99		3697	4.05
12469-PeCDD	NotFnd		0.9383						0.99		3697	4.05
12368-PeCDD	31.19		0.9559	0.9557	-0.4	3.67E+04	1.69	Y	0.99	4.38	3697	4.05
12478-PeCDD	NotFnd		0.9618						0.99		3697	4.05
12379-PeCDD	NotFnd		0.9650						0.99		3697	4.05
12369/12467/12489-PeCDD	NotFnd		0.9732						0.99		3697	4.05
12346/12347-PeCDD	NotFnd		0.9849						0.99		3697	4.05
12378-PeCDD	**NotFnd**		**1.0005**						**0.99**		**3697**	**4.05**
12367-PeCDD	NotFnd		1.0034						0.99		3697	4.05
12389-PeCDD	NotFnd		1.0143						0.99		3697	4.05
124679/124689-HxCDD	NotFnd		0.9537						1.03		2681	3.64
123468-HxCDD	35.55		0.9718	0.9719	+0.2	4.26E+04	1.32	Y	1.03	5.53	2681	3.64
123679/123689-HxCDD	NotFnd		0.9797						1.03		2681	3.64
123469-HxCDD	NotFnd		0.9834						1.03		2681	3.64
123478-HxCDD	**NotFnd**		**1.0003**						**1.06**		**2681**	**3.34**
123678-HxCDD	**NotFnd**		**1.0035**						**1.09**		**2681**	**3.69**
123467-HxCDD	NotFnd		1.0087						1.03		2681	3.64
123789-HxCDD	**NotFnd**		**1.0116**						**0.93**		**2681**	**3.94**

Lab ID: A7185_12600_DF_004 **Acq'd: 10 Oct 2014 00:23 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: 142644-04 Run 3 **UTP: 12-Oct-2014 13:23:18 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 455-311-TXS**

Datafile: 141009P08 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1234679-HpCDD	NotFnd		0.9725						1.02		2450	5.48
1234678-HpCDD	**NotFnd**		**1.0005**						**1.02**		**2450**	**5.48**
OCDD	**NotFnd**		**1.0005**						**1.07**		**2269**	**9.23**
OCDD-a	NotFnd		1.0003						0.07		2326	148
1368-TCDF	NotFnd		0.8033						0.99		3080	2.6
1468-TCDF	NotFnd		0.8244						0.99		3080	2.6
2468-TCDF	NotFnd		0.8485						0.99		3080	2.6
1346/1246-TCDF	NotFnd		0.8652						0.99		3080	2.6
1347/1378/1247-TCDF	22.77		0.8706	0.8711	+0.8	5.11E+04	0.80	Y	0.99	3.57	3080	2.6
1348-TCDF	NotFnd		0.8816						0.99		3080	2.6
1248/1367/1379-TCDF	NotFnd		0.8870						0.99		3080	2.6
1268-TCDF	NotFnd		0.9030						0.99		3080	2.6
1467-TCDF	NotFnd		0.9085						0.99		3080	2.6
1478-TCDF	NotFnd		0.9154						0.99		3080	2.6
1369/1237-TCDF	NotFnd		0.9307						0.99		3080	2.6
2467-TCDF	NotFnd		0.9360						0.99		3080	2.6
2368-TCDF	NotFnd		0.9421						0.99		3080	2.6
1238/1234/1678/1469/1236-TCDF	NotFnd		0.9466						0.99		3080	2.6
1278-TCDF	NotFnd		0.9648						0.99		3080	2.6
1349-TCDF	NotFnd		0.9692						0.99		3080	2.6
1267-TCDF	NotFnd		0.9759						0.99		3080	2.6
2346/1249-TCDF	NotFnd		0.9839						0.99		3080	2.6
2347/1279-TCDF	NotFnd		0.9920						0.99		3080	2.6
2348-TCDF	NotFnd		0.9965						0.99		3080	2.6
2378-TCDF	**NotFnd**		**1.0008**						**0.99**		**3080**	**2.6**
2367/3467-TCDF	NotFnd		1.0157						0.99		3080	2.6
1269-TCDF	NotFnd		1.0255						0.99		3080	2.6
1239-TCDF	NotFnd		1.0365						0.99		3080	2.6
1289-TCDF	NotFnd		1.0818						0.99		3080	2.6
13468/12468-PeCDF	NotFnd		0.9073						1.01		3353	2.54
13678/13467/12467-PeCDF	NotFnd		0.9585						1.01		3034	2.3
12368/13478/12478-PeCDF	30.00		0.9637	0.9636	-0.2	4.66E+04	1.55	Y	1.01	3.62	3034	2.3
14678-PeCDF	NotFnd		0.9670						1.01		3034	2.3
13479-PeCDF	NotFnd		0.9702						1.01		3034	2.3
13469/12479-PeCDF	NotFnd		0.9783						1.01		3034	2.3
12346-PeCDF	NotFnd		0.9829						1.01		3034	2.3

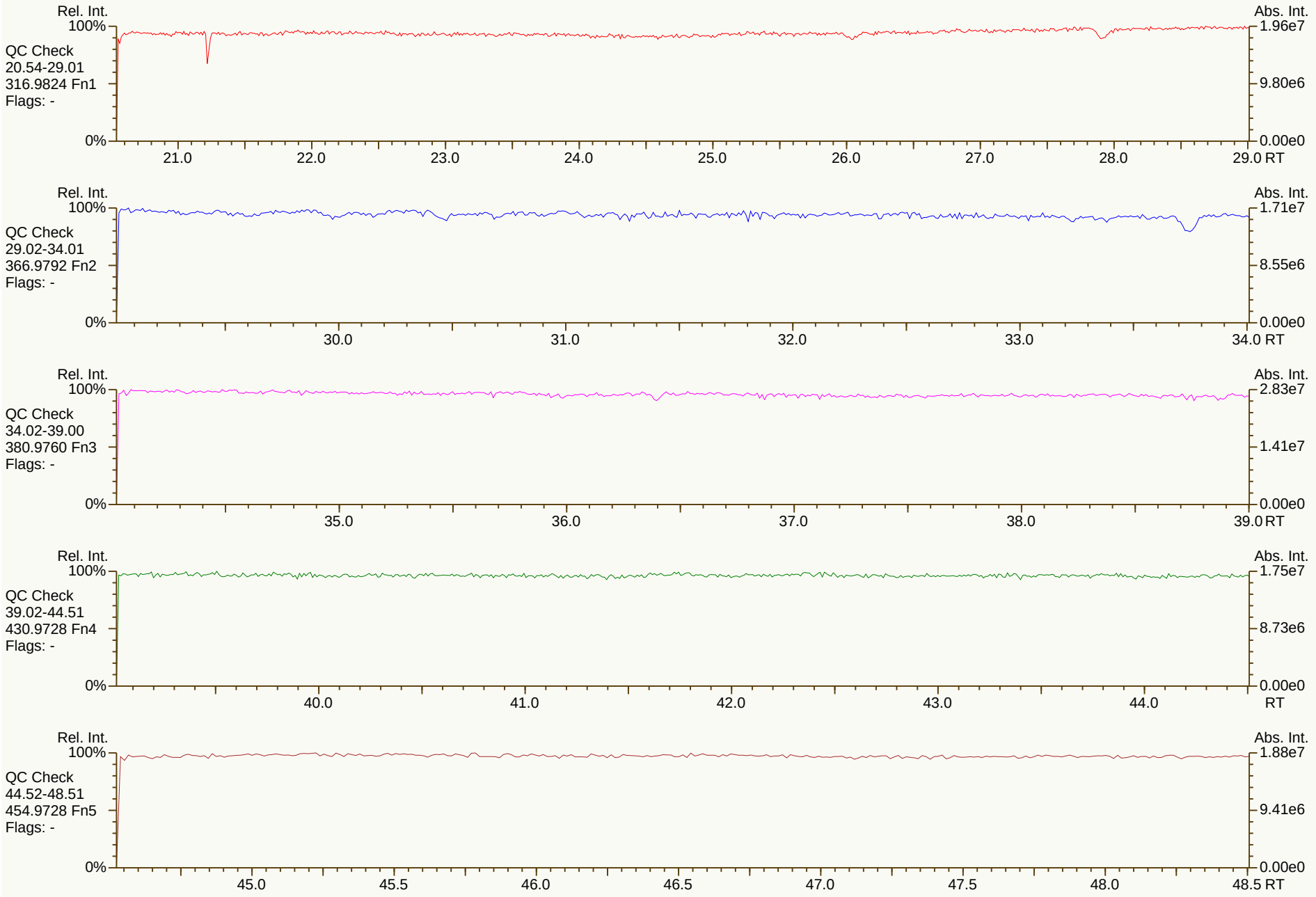
Lab ID: A7185_12600_DF_004 **Acq'd:** 10 Oct 2014 00:23 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: 142644-04 Run 3 **UTP:** 12-Oct-2014 13:23:18 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 455-311-TXS

Datafile: 141009P08 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

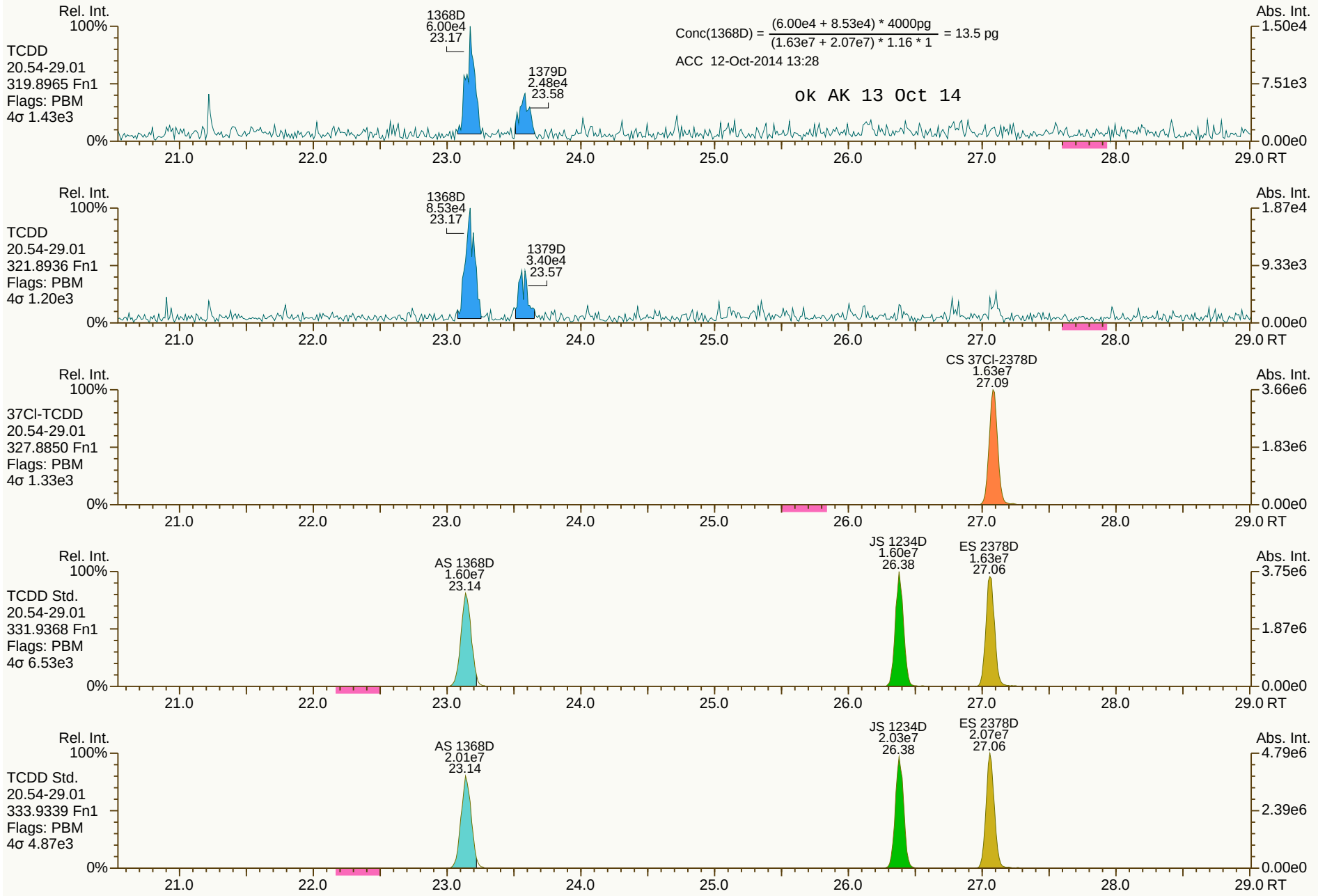
Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
23468/12469-PeCDF	NotFnd		0.9857						1.01		3034	2.3
12347-PeCDF	NotFnd		0.9883						1.01		3034	2.3
12348-PeCDF	NotFnd		0.9936						1.01		3034	2.3
12378-PeCDF	**NotFnd**		**1.0005**						**1.00**		**3034**	**2.22**
12678/12367-PeCDF	NotFnd		1.0095						1.01		3034	2.3
12379-PeCDF	NotFnd		1.0151						1.01		3034	2.3
12679-PeCDF	NotFnd		0.9925						1.01		3034	2.3
23467/12369-PeCDF	NotFnd		0.9966						1.01		3034	2.3
23478-PeCDF	**NotFnd**		**1.0005**						**1.02**		**3034**	**2.39**
23478/12489-PeCDF	NotFnd		0.0000						1.02			
12489-PeCDF	NotFnd		1.0053						1.01		3034	2.3
12349-PeCDF	NotFnd		1.0109						1.01		3034	2.3
12389-PeCDF	NotFnd		1.0347						1.01		3034	2.3
123468-HxCDF	NotFnd		0.9611						1.12		2009	2.04
124678/134678-HxCDF	NotFnd		0.9668						1.12		2009	2.04
134679-HxCDF	NotFnd		0.9734						1.12		2009	2.04
124679-HxCDF	NotFnd		0.9788						1.12		2009	2.04
124689-HxCDF	NotFnd		0.9851						1.12		2009	2.04
123467-HxCDF	NotFnd		0.9971						1.12		2009	2.04
123478-HxCDF	**NotFnd**		**1.0004**						**1.18**		**2009**	**1.92**
123678-HxCDF	**NotFnd**		**1.0004**						**1.11**		**2009**	**1.78**
123479-HxCDF	NotFnd		1.0048						1.12		2009	2.04
123469-HxCDF	NotFnd		1.0089						1.12		2009	2.04
123679-HxCDF	NotFnd		0.9943						1.12		2009	2.04
234678-HxCDF	**NotFnd**		**1.0004**						**1.14**		**2009**	**1.89**
234678/123689-HxCDF	NotFnd		0.0000						1.14			
123689-HxCDF	NotFnd		1.0068						1.12		2009	2.04
123789-HxCDF	**NotFnd**		**1.0003**						**1.08**		**2009**	**2.69**
123789/123489-HxCDF	NotFnd		0.0000						1.08			
123489-HxCDF	NotFnd		1.0017						1.12		2009	2.04
1234678-HpCDF	**NotFnd**		**1.0004**						**1.38**		**1804**	**2.7**
1234679-HpCDF	NotFnd		1.0111						1.33		1804	3.23
1234689-HpCDF	NotFnd		1.0170						1.33		1804	3.23
1234789-HpCDF	**NotFnd**		**1.0004**						**1.28**		**1804**	**3.88**
OCDF	**NotFnd**		**1.0004**						**1.04**		**2646**	**9.84**
OCDF-a	NotFnd		1.0003						0.06		2721	170

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



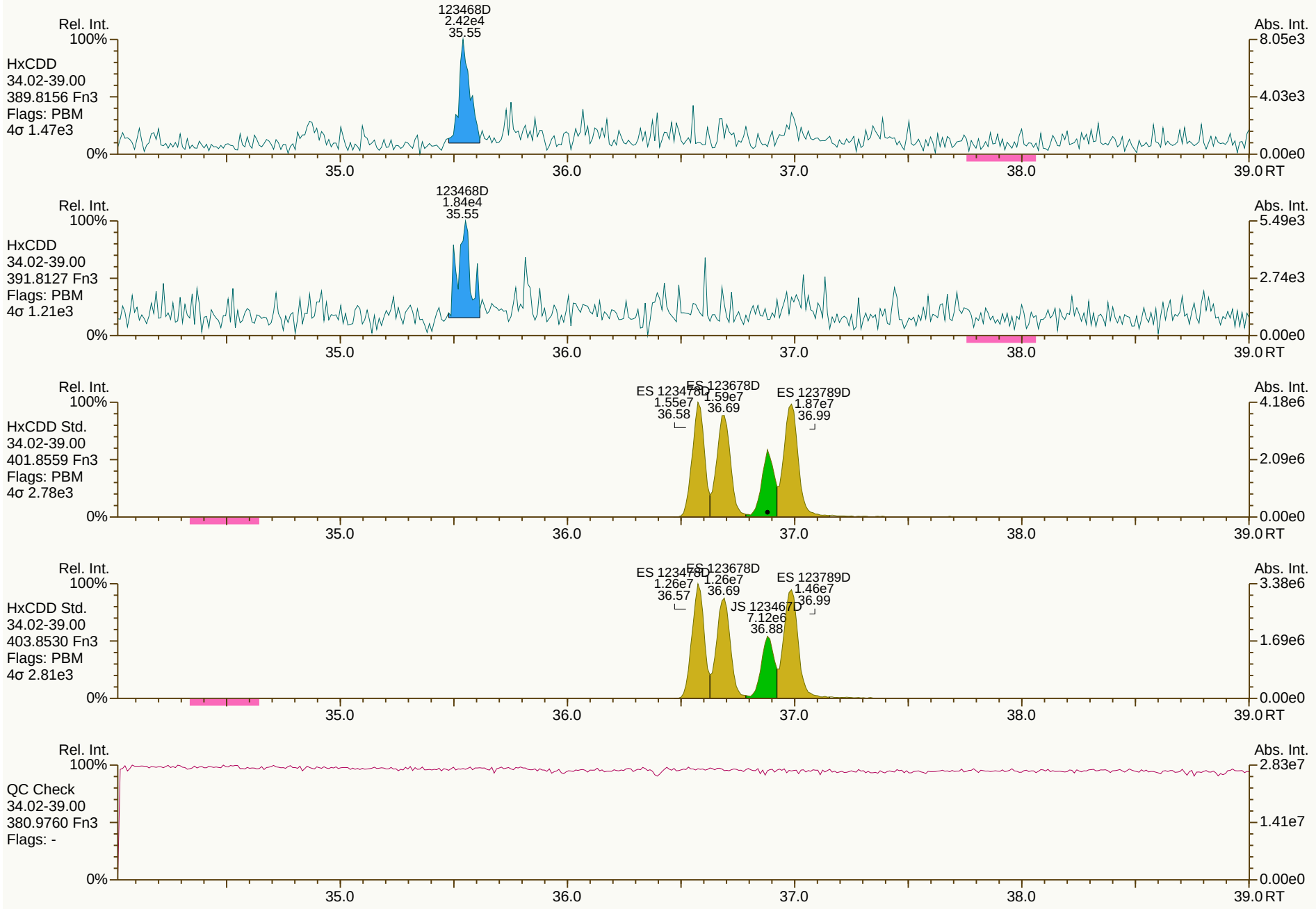
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 7325, 7093, 5856 scc: 455-311 *PKD: 12-Oct-2014 13:15 Printed: 12-Oct-2014 13:30 Page 2 of 12*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC)
Peak annotation: Areas, Centroids
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 9946, 8136 scc: 455-311
PKD: 12-Oct-2014 13:15 Printed: 12-Oct-2014 13:30 Page 4 of 12

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



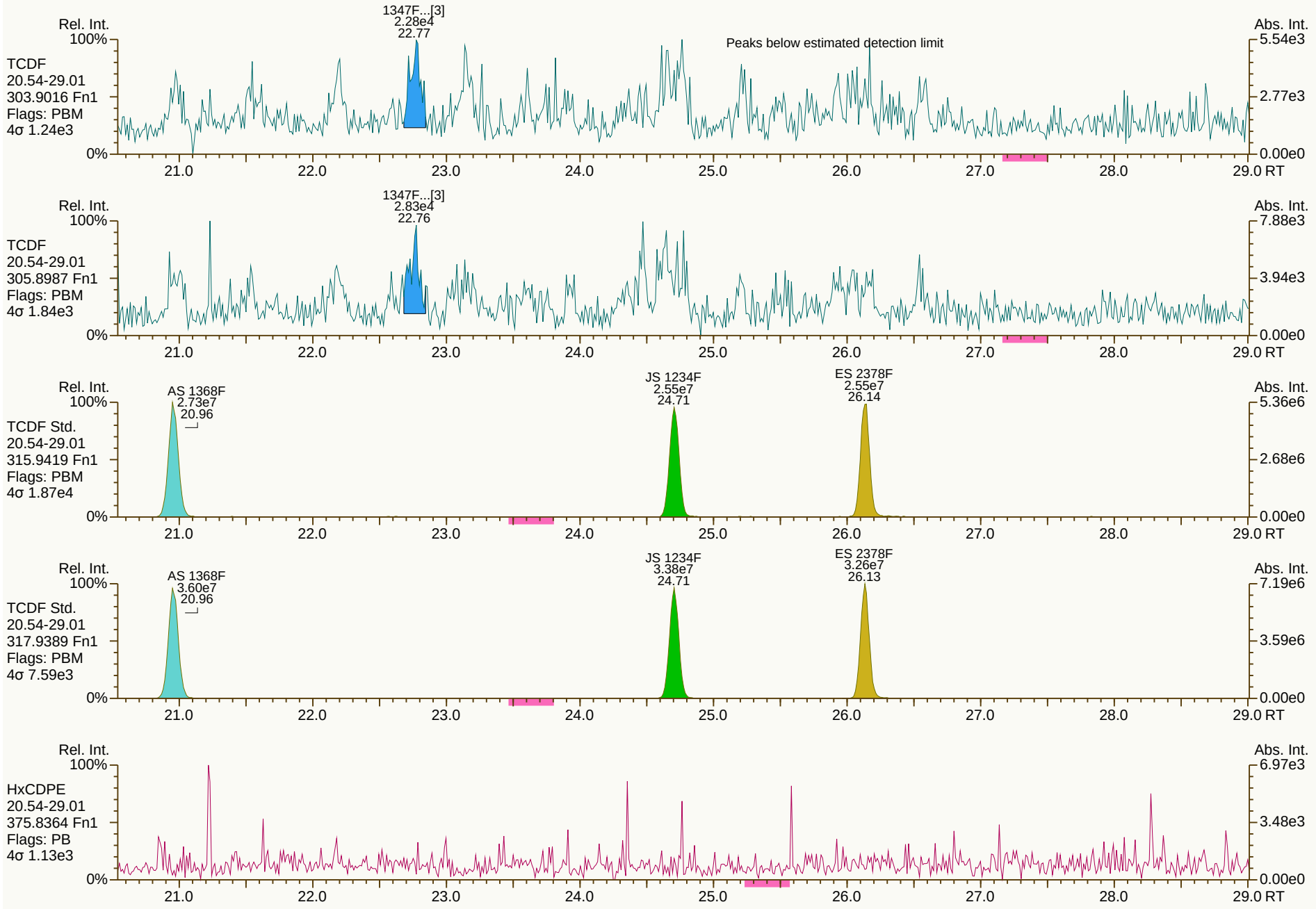
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SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



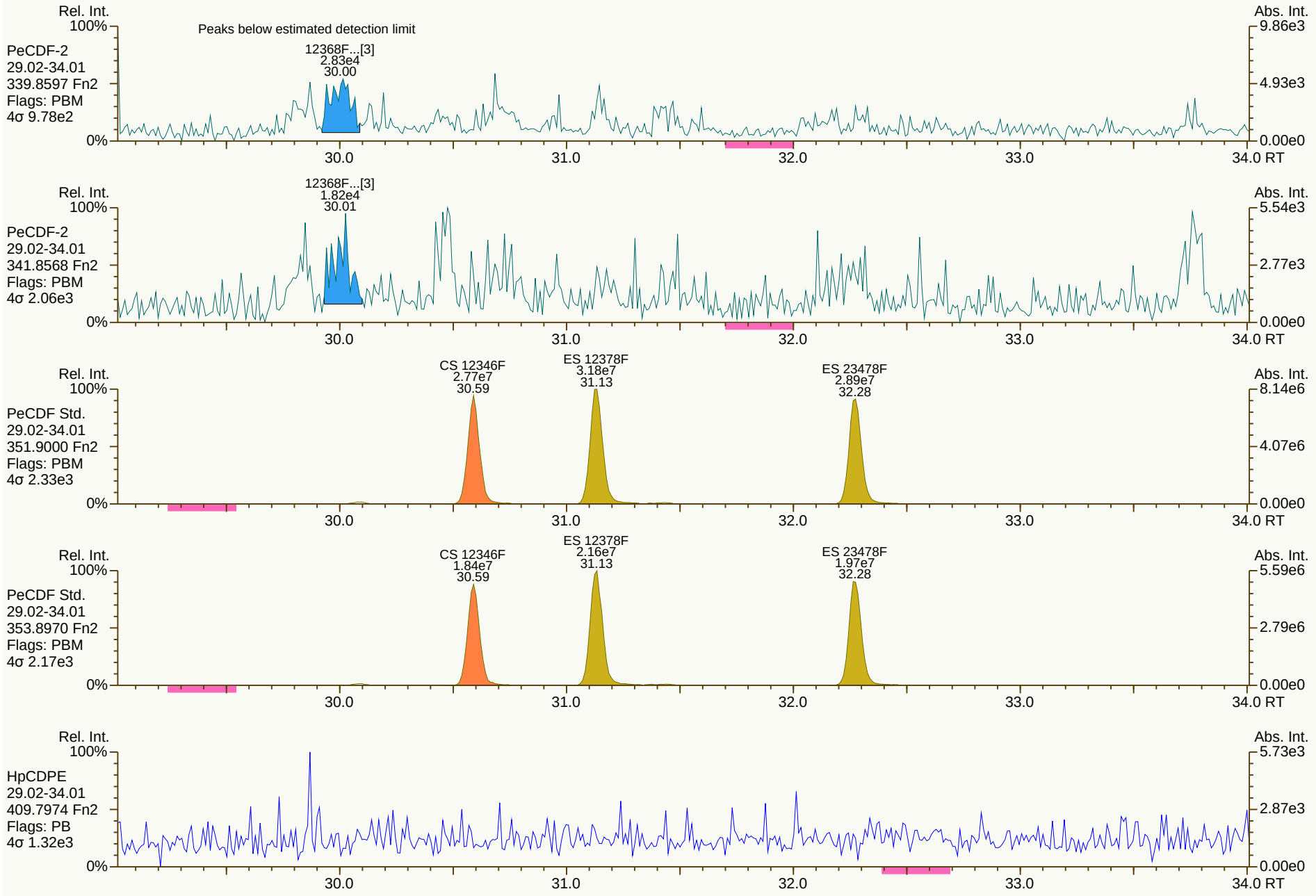
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 1662, 3940, 4051 scc: 455-311 *Revised: 12-Oct-2014 13:22 (ACC) Printed: 12-Oct-2014 13:30 Page 7 of 12*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



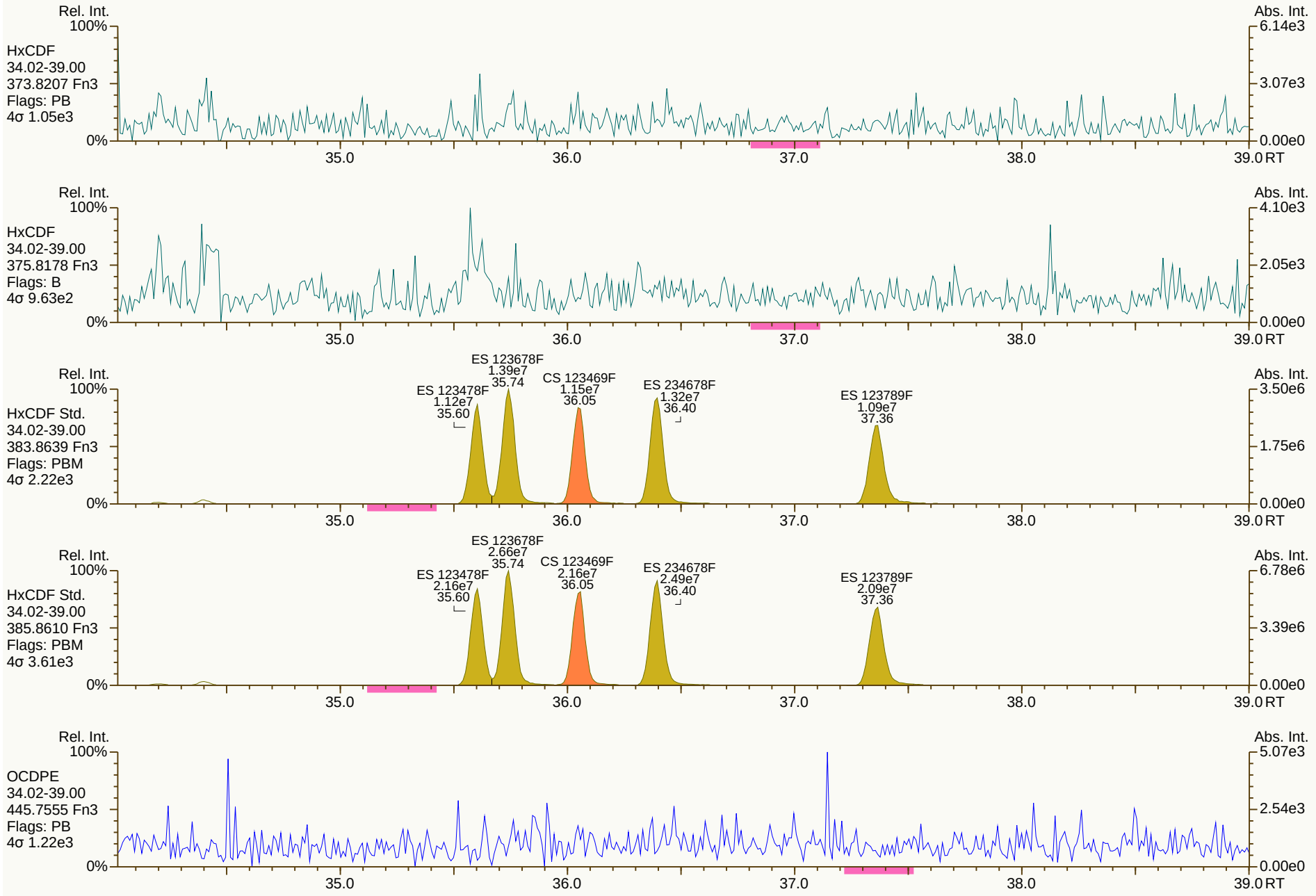
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SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



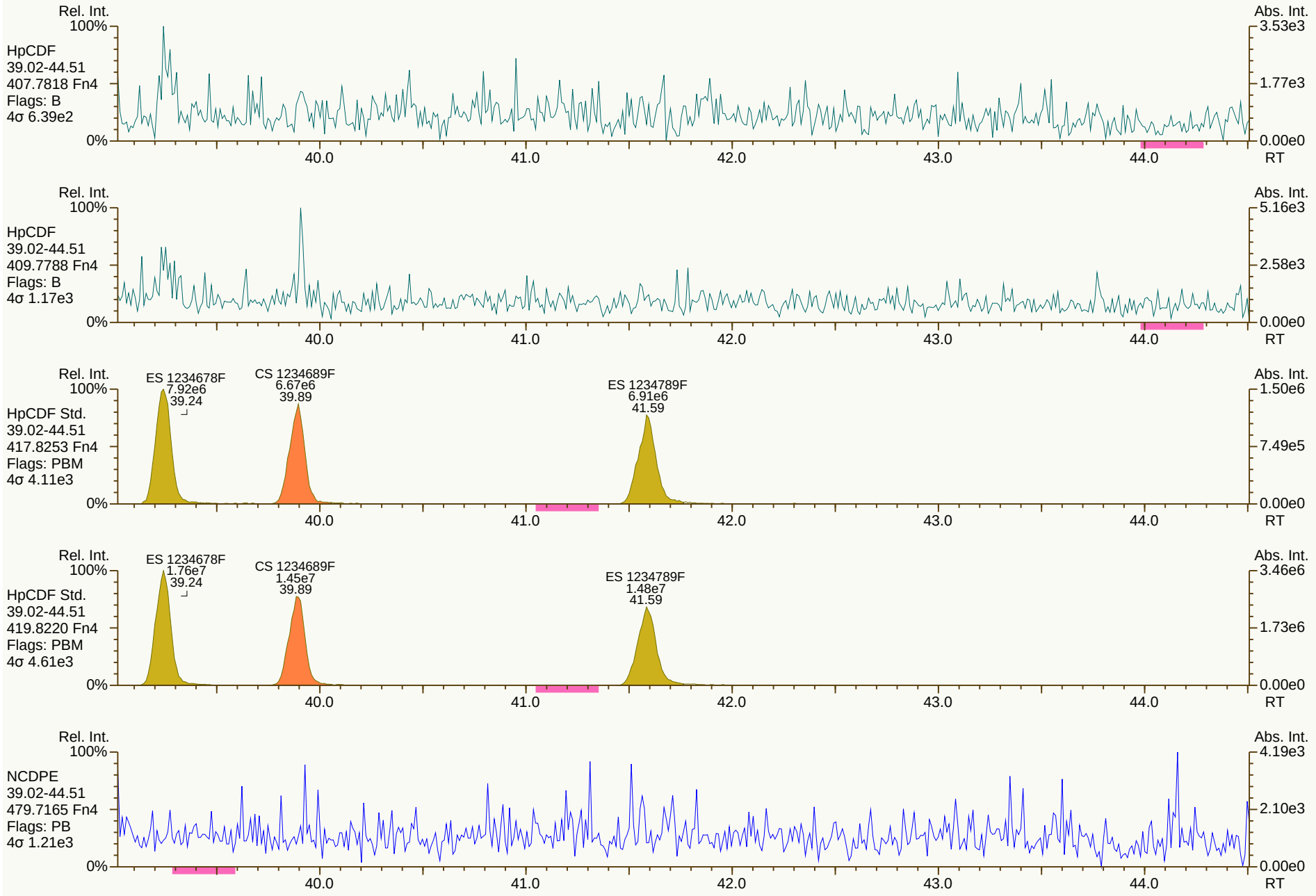
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 6423, 1558, 5041 scc: 455-311 *Revised: 12-Oct-2014 13:23 (ACC) Printed: 12-Oct-2014 13:30 Page 9 of 12*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



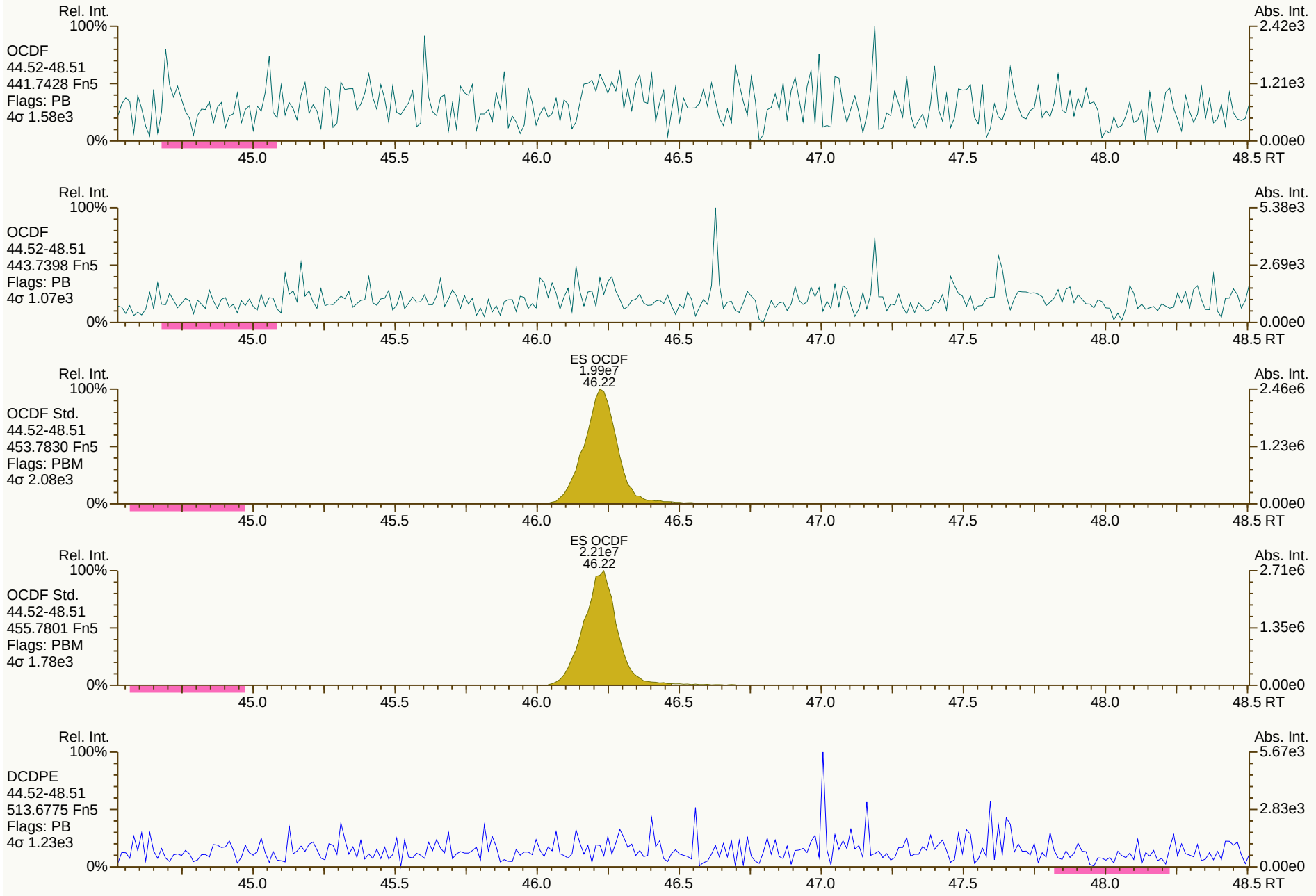
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_004 **Sample ID: 142644-04 Run 3** **Acq: 10-Oct-2014 00:23:41**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 20** **User: ACC Datafile: 141009P08**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_004.utp_res, saved 12-Oct-2014 13:28 (ACC) *Peak annotation: Areas, Centroids*

Lab ID: A7185_12600_DF_005 **Acq'd:** 10 Oct 2014 01:16 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: Reagent Blank **UTP:** 12-Oct-2014 13:18:28 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 552-578-HLD

Datafile: 141009P09 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
2378-TCDD	NotFnd		1.0008	-		-	-	-	1.16	-	2481	2.36
12378-PeCDD	NotFnd		1.0005	-		-	-	-	0.99	-	2865	2.87
123478-HxCDD	NotFnd		1.0003	-		-	-	-	1.06	-	2231	2.6
123678-HxCDD	NotFnd		1.0035	-		-	-	-	1.09	-	2231	2.65
123789-HxCDD	NotFnd		1.0116	-		-	-	-	0.93	-	2231	2.85
1234678-HpCDD	40.82		1.0005	1.0003	-0.5	3.72E+04	1.16	Y	1.02	5.26	1656	3.46
OCDD	45.90		1.0005	1.0002	-0.8	5.68E+04	1.06	N	1.07	12.5	1694	7.21
2378-TCDF	NotFnd		1.0008	-		-	-	-	0.99	-	2871	2.17
12378-PeCDF	NotFnd		1.0005	-		-	-	-	1.00	-	2369	1.46
23478-PeCDF	NotFnd		1.0005	-		-	-	-	1.02	-	2369	1.67
123478-HxCDF	NotFnd		1.0004	-		-	-	-	1.18	-	1949	1.72
123678-HxCDF	NotFnd		1.0004	-		-	-	-	1.11	-	1949	1.55
234678-HxCDF	NotFnd		1.0004	-		-	-	-	1.14	-	1949	1.7
123789-HxCDF	NotFnd		1.0003	-		-	-	-	1.08	-	1949	2.5
1234678-HpCDF	NotFnd		1.0004	-		-	-	-	1.38	-	1657	2.03
1234789-HpCDF	NotFnd		1.0004	-		-	-	-	1.28	-	1657	3.77
OCDF	NotFnd		1.0004	-		-	-	-	1.04	-	2073	8.53

Name	Act RT	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
ES 2378-TCDD	27.07	1.0257	1.0257	0	4.15E+07	0.79	Y	1.12	87.8
ES 12378-PeCDD	32.64	1.2368	1.2369	+0.2	3.82E+07	1.57	Y	1.05	86.2
ES 123478-HxCDD	36.58	0.9917	0.9918	+0.2	3.25E+07	1.30	Y	1.08	83.6
ES 123678-HxCDD	36.69	0.9948	0.9948	0	3.10E+07	1.27	Y	1.06	81.8
ES 123789-HxCDD	36.99	1.0029	1.0029	0	3.78E+07	1.23	Y	1.25	84.4
ES 1234678-HpCDD	40.81	1.1065	1.1064	-0.2	2.79E+07	1.11	Y	0.96	80.9
ES OCDD	45.90	1.2447	1.2444	-0.7	3.39E+07	0.88	Y	0.79	59.7
ES 2378-TCDF	26.14	1.0578	1.0578	0	6.27E+07	0.78	Y	1.04	87.6
ES 12378-PeCDF	31.14	1.2599	1.2601	+0.3	6.08E+07	1.48	Y	0.98	90.2
ES 23478-PeCDF	32.28	1.3061	1.3063	+0.3	5.31E+07	1.47	Y	0.91	84.8
ES 123478-HxCDF	35.61	0.9653	0.9654	+0.2	3.61E+07	0.53	Y	1.23	81.6
ES 123678-HxCDF	35.75	0.9692	0.9692	0	4.56E+07	0.53	Y	1.49	85.7
ES 234678-HxCDF	36.40	0.9868	0.9869	+0.2	4.15E+07	0.51	Y	1.36	85.4
ES 123789-HxCDF	37.37	1.0132	1.0132	0	3.42E+07	0.52	Y	1.33	71.6
ES 1234678-HpCDF	39.25	1.0642	1.0642	0	2.97E+07	0.46	Y	0.96	86.6
ES 1234789-HpCDF	41.59	1.1278	1.1277	-0.2	2.28E+07	0.47	Y	0.84	75.8
ES OCDF	46.23	1.2538	1.2535	-0.7	3.94E+07	0.90	Y	0.94	58.4

Lab ID: A7185_12600_DF_005 **Acq'd:** 10 Oct 2014 01:16 ACC **Wt/Vol:** 1 **Cal:** BCS3_12600_DF_PAB

Client ID: Reagent Blank **UTP:** 12-Oct-2014 13:18:28 ACC **J-level:** 10 pg **Split:** 2 **Checkcode:** 552-578-HLD

Datafile: 141009P09 **Report:** 12 Oct 2014 13:24 AC **Stds (pg):** JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Rec. %
JS 1234-TCDD	26.39		-	-	-	4.23E+07	0.78	Y	-	-
JS 1234-TCDF	24.71		-	-	-	6.88E+07	0.76	Y	-	-
JS 123467-HxCDD	36.88		-	-	-	1.79E+07	1.26	Y	-	-
CS 37Cl-2378-TCDD	27.09		1.0266	1.0266	0	1.80E+07	n/a	-	1.21	88.4
CS 12347-PeCDD	32.13		1.2174	1.2175	+0.2	3.49E+07	1.62	Y	0.91	90.5
CS 12346-PeCDF	30.60		1.2380	1.2382	+0.3	5.12E+07	1.47	Y	0.84	88.7
CS 123469-HxCDF	36.06		0.9775	0.9776	+0.2	3.60E+07	0.51	Y	1.23	81.8
CS 1234689-HpCDF	39.90		1.0818	1.0817	-0.2	2.16E+07	0.46	Y	0.82	73.3
SS 37Cl-2378-TCDD	27.09		1.0266	1.0266	0	1.80E+07	n/a	-	1.08	101
SS 12347-PeCDD	32.13		1.2174	1.2175	+0.2	3.49E+07	1.62	Y	0.87	105
SS 12346-PeCDF	30.60		1.2380	1.2382	+0.3	5.12E+07	1.47	Y	0.86	98.4
SS 123469-HxCDF	36.06		0.9775	0.9776	+0.2	3.60E+07	0.51	Y	0.83	95.4
SS 1234689-HpCDF	39.90		1.0818	1.0817	-0.2	2.16E+07	0.46	Y	0.86	84.7
AS 1368-TCDD	23.15		0.8774	0.8772	-0.3	4.17E+07	0.78	Y	1.08	91.1
AS 1368-TCDF	20.96		0.8487	0.8482	-0.7	7.09E+07	0.75	Y	1.16	88.5

Totals	Conc	EMPC
Total TCDD	0	3.65
Total PeCDD	0	0
Total HxCDD	0	0
Total HpCDD	12.3	12.3
Total Tetra-Octa Dioxins	12.3	28.4
Total TCDF	0	0
Total PeCDF	0	0
Total HxCDF	0	0
Total HpCDF	0	0
Total Tetra-Octa Furans	0	0
Total Tetra-Octa Dioxins & Furans	12.3	28.4

Lab ID: A7185_12600_DF_005 **Acq'd: 10 Oct 2014 01:16 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: Reagent Blank **UTP: 12-Oct-2014 13:18:28 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 552-578-HLD**

Datafile: 141009P09 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1368-TCDD	23.18		0.8565	0.8565	0	4.38E+04	1.26	N	1.16	3.65	2481	2.36
1379-TCDD	NotFnd		0.8710						1.16		2481	2.36
1369-TCDD	NotFnd		0.8881						1.16		2481	2.36
1469-TCDD	NotFnd		0.9195						1.16		2481	2.36
1247/1246/1248/1249-TCDD	NotFnd		0.9287						1.16		2481	2.36
1378-TCDD	NotFnd		0.9363						1.16		2481	2.36
1268-TCDD	NotFnd		0.9442						1.16		2481	2.36
1478-TCDD	NotFnd		0.9538						1.16		2481	2.36
1279-TCDD	NotFnd		0.9605						1.16		2481	2.36
1234/1269-TCDD	NotFnd		0.9746						1.16		2481	2.36
1236-TCDD	NotFnd		0.9797						1.16		2481	2.36
1237/1238-TCDD	NotFnd		0.9896						1.16		2481	2.36
1239-TCDD	NotFnd		0.9950						1.16		2481	2.36
2378-TCDD	**NotFnd**		**1.0008**						**1.16**		**2481**	**2.36**
1278-TCDD	NotFnd		1.0137						1.16		2481	2.36
1267-TCDD	NotFnd		1.0187						1.16		2481	2.36
1289-TCDD	NotFnd		1.0388						1.16		2481	2.36
12479/12468-PeCDD	NotFnd		0.9217						0.99		2865	2.87
12469-PeCDD	NotFnd		0.9383						0.99		2865	2.87
12368-PeCDD	NotFnd		0.9559						0.99		2865	2.87
12478-PeCDD	NotFnd		0.9618						0.99		2865	2.87
12379-PeCDD	NotFnd		0.9650						0.99		2865	2.87
12369/12467/12489-PeCDD	NotFnd		0.9732						0.99		2865	2.87
12346/12347-PeCDD	NotFnd		0.9849						0.99		2865	2.87
12378-PeCDD	**NotFnd**		**1.0005**						**0.99**		**2865**	**2.87**
12367-PeCDD	NotFnd		1.0034						0.99		2865	2.87
12389-PeCDD	NotFnd		1.0143						0.99		2865	2.87
124679/124689-HxCDD	NotFnd		0.9537						1.03		2231	2.69
123468-HxCDD	NotFnd		0.9718						1.03		2231	2.69
123679/123689-HxCDD	NotFnd		0.9797						1.03		2231	2.69
123469-HxCDD	NotFnd		0.9834						1.03		2231	2.69
123478-HxCDD	**NotFnd**		**1.0003**						**1.06**		**2231**	**2.6**
123678-HxCDD	**NotFnd**		**1.0035**						**1.09**		**2231**	**2.65**
123467-HxCDD	NotFnd		1.0087						1.03		2231	2.69
123789-HxCDD	**NotFnd**		**1.0116**						**0.93**		**2231**	**2.85**

Lab ID: A7185_12600_DF_005 **Acq'd: 10 Oct 2014 01:16 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: Reagent Blank **UTP: 12-Oct-2014 13:18:28 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 552-578-HLD**

Datafile: 141009P09 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
1234679-HpCDD	39.68		0.9725	0.9724	-0.2	4.96E+04	0.89	Y	1.02	7	1656	3.46
1234678-HpCDD	**40.82**		**1.0005**	**1.0003**	**-0.5**	**3.72E+04**	**1.16**	**Y**	**1.02**	**5.26**	**1656**	**3.46**
OCDD	**45.90**		**1.0005**	**1.0002**	**-0.8**	**5.68E+04**	**1.06**	**N**	**1.07**	**12.5**	**1694**	**7.21**
OCDD-a	NotFnd		1.0003						0.07		2113	141
1368-TCDF	NotFnd		0.8033						0.99		2871	2.17
1468-TCDF	NotFnd		0.8244						0.99		2871	2.17
2468-TCDF	NotFnd		0.8485						0.99		2871	2.17
1346/1246-TCDF	NotFnd		0.8652						0.99		2871	2.17
1347/1378/1247-TCDF	NotFnd		0.8706						0.99		2871	2.17
1348-TCDF	NotFnd		0.8816						0.99		2871	2.17
1248/1367/1379-TCDF	NotFnd		0.8870						0.99		2871	2.17
1268-TCDF	NotFnd		0.9030						0.99		2871	2.17
1467-TCDF	NotFnd		0.9085						0.99		2871	2.17
1478-TCDF	NotFnd		0.9154						0.99		2871	2.17
1369/1237-TCDF	NotFnd		0.9307						0.99		2871	2.17
2467-TCDF	NotFnd		0.9360						0.99		2871	2.17
2368-TCDF	NotFnd		0.9421						0.99		2871	2.17
1238/1234/1678/1469/1236-TCDF	NotFnd		0.9466						0.99		2871	2.17
1278-TCDF	NotFnd		0.9648						0.99		2871	2.17
1349-TCDF	NotFnd		0.9692						0.99		2871	2.17
1267-TCDF	NotFnd		0.9759						0.99		2871	2.17
2346/1249-TCDF	NotFnd		0.9839						0.99		2871	2.17
2347/1279-TCDF	NotFnd		0.9920						0.99		2871	2.17
2348-TCDF	NotFnd		0.9965						0.99		2871	2.17
2378-TCDF	**NotFnd**		**1.0008**						**0.99**		**2871**	**2.17**
2367/3467-TCDF	NotFnd		1.0157						0.99		2871	2.17
1269-TCDF	NotFnd		1.0255						0.99		2871	2.17
1239-TCDF	NotFnd		1.0365						0.99		2871	2.17
1289-TCDF	NotFnd		1.0818						0.99		2871	2.17
13468/12468-PeCDF	NotFnd		0.9073						1.01		3382	2.22
13678/13467/12467-PeCDF	NotFnd		0.9585						1.01		2369	1.56
12368/13478/12478-PeCDF	NotFnd		0.9637						1.01		2369	1.56
14678-PeCDF	NotFnd		0.9670						1.01		2369	1.56
13479-PeCDF	NotFnd		0.9702						1.01		2369	1.56
13469/12479-PeCDF	NotFnd		0.9783						1.01		2369	1.56
12346-PeCDF	NotFnd		0.9829						1.01		2369	1.56

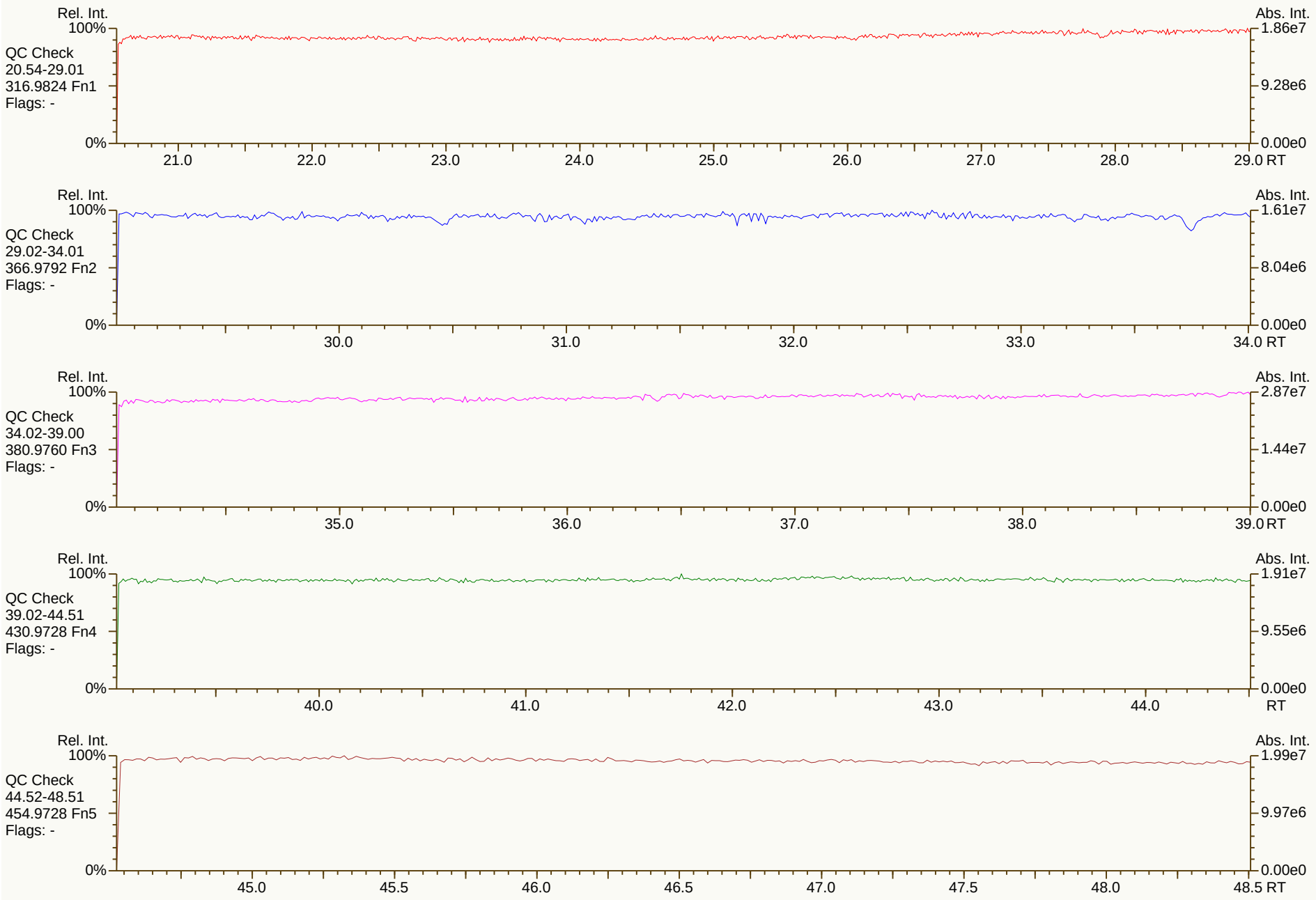
Lab ID: A7185_12600_DF_005 **Acq'd: 10 Oct 2014 01:16 ACC** **Wt/Vol: 1** **Cal: BCS3_12600_DF_PAB**

Client ID: Reagent Blank **UTP: 12-Oct-2014 13:18:28 ACC** **J-level: 10 pg** **Split: 2** **Checkcode: 552-578-HLD**

Datafile: 141009P09 **Report: 12 Oct 2014 13:24 AC** **Stds (pg): JS: 2000 ES: 4000 CS/SS: 4000, 1600 (37Cl)**

Name	Act RT	QC	Pred. RRT	Act. RRT	ΔSecs	Response	Ra	OK	RRF	Conc.	Noise	DL
23468/12469-PeCDF	NotFnd		0.9857						1.01		2369	1.56
12347-PeCDF	NotFnd		0.9883						1.01		2369	1.56
12348-PeCDF	NotFnd		0.9936						1.01		2369	1.56
12378-PeCDF	**NotFnd**		**1.0005**						**1.00**		**2369**	**1.46**
12678/12367-PeCDF	NotFnd		1.0095						1.01		2369	1.56
12379-PeCDF	NotFnd		1.0151						1.01		2369	1.56
12679-PeCDF	NotFnd		0.9925						1.01		2369	1.56
23467/12369-PeCDF	NotFnd		0.9966						1.01		2369	1.56
23478-PeCDF	**NotFnd**		**1.0005**						**1.02**		**2369**	**1.67**
23478/12489-PeCDF	NotFnd		0.0000						1.02			
12489-PeCDF	NotFnd		1.0053						1.01		2369	1.56
12349-PeCDF	NotFnd		1.0109						1.01		2369	1.56
12389-PeCDF	NotFnd		1.0347						1.01		2369	1.56
123468-HxCDF	NotFnd		0.9611						1.12		1949	1.83
124678/134678-HxCDF	NotFnd		0.9668						1.12		1949	1.83
134679-HxCDF	NotFnd		0.9734						1.12		1949	1.83
124679-HxCDF	NotFnd		0.9788						1.12		1949	1.83
124689-HxCDF	NotFnd		0.9851						1.12		1949	1.83
123467-HxCDF	NotFnd		0.9971						1.12		1949	1.83
123478-HxCDF	**NotFnd**		**1.0004**						**1.18**		**1949**	**1.72**
123678-HxCDF	**NotFnd**		**1.0004**						**1.11**		**1949**	**1.55**
123479-HxCDF	NotFnd		1.0048						1.12		1949	1.83
123469-HxCDF	NotFnd		1.0089						1.12		1949	1.83
123679-HxCDF	NotFnd		0.9943						1.12		1949	1.83
234678-HxCDF	**NotFnd**		**1.0004**						**1.14**		**1949**	**1.7**
234678/123689-HxCDF	NotFnd		0.0000						1.14			
123689-HxCDF	NotFnd		1.0068						1.12		1949	1.83
123789-HxCDF	**NotFnd**		**1.0003**						**1.08**		**1949**	**2.5**
123789/123489-HxCDF	NotFnd		0.0000						1.08			
123489-HxCDF	NotFnd		1.0017						1.12		1949	1.83
1234678-HpCDF	**NotFnd**		**1.0004**						**1.38**		**1657**	**2.03**
1234679-HpCDF	NotFnd		1.0111						1.33		1657	2.77
1234689-HpCDF	NotFnd		1.0170						1.33		1657	2.77
1234789-HpCDF	**NotFnd**		**1.0004**						**1.28**		**1657**	**3.77**
OCDF	**NotFnd**		**1.0004**						**1.04**		**2073**	**8.53**
OCDF-a	NotFnd		1.0003						0.06		1813	125

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



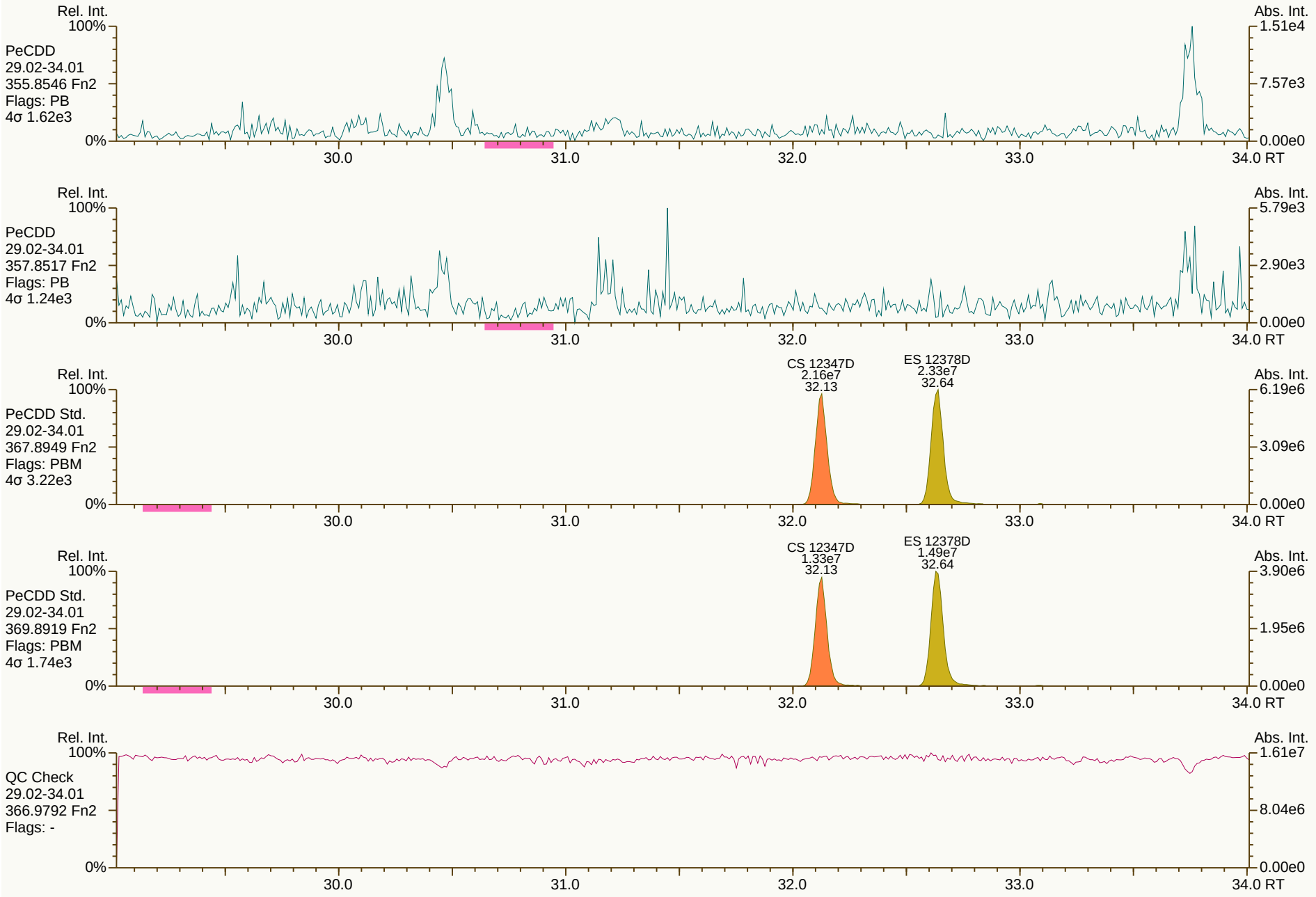
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



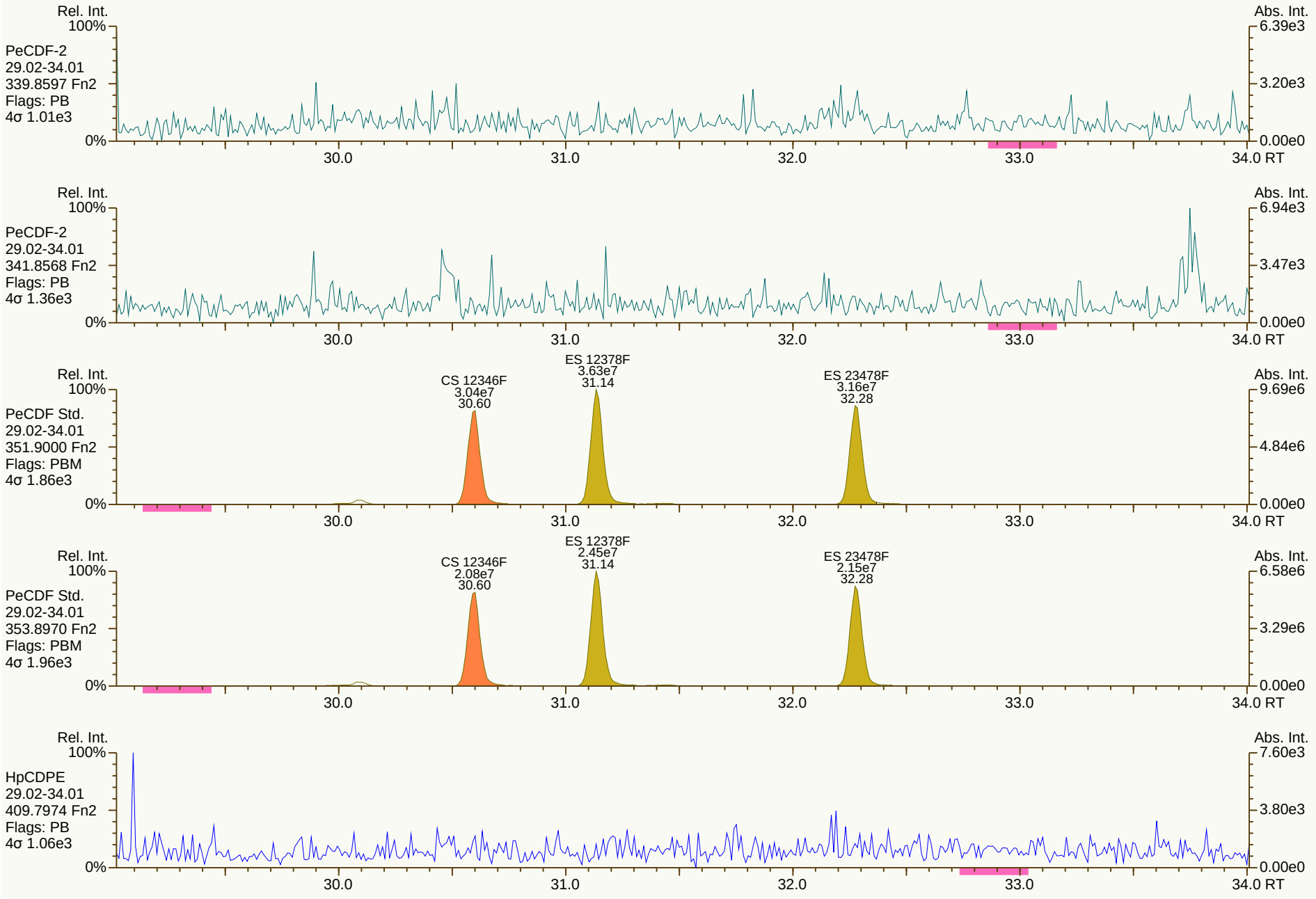
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 6569, 1679, 1008 scc: 552-578 *PKD: 12-Oct-2014 13:16 Printed: 12-Oct-2014 13:30 Page 7 of 12*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



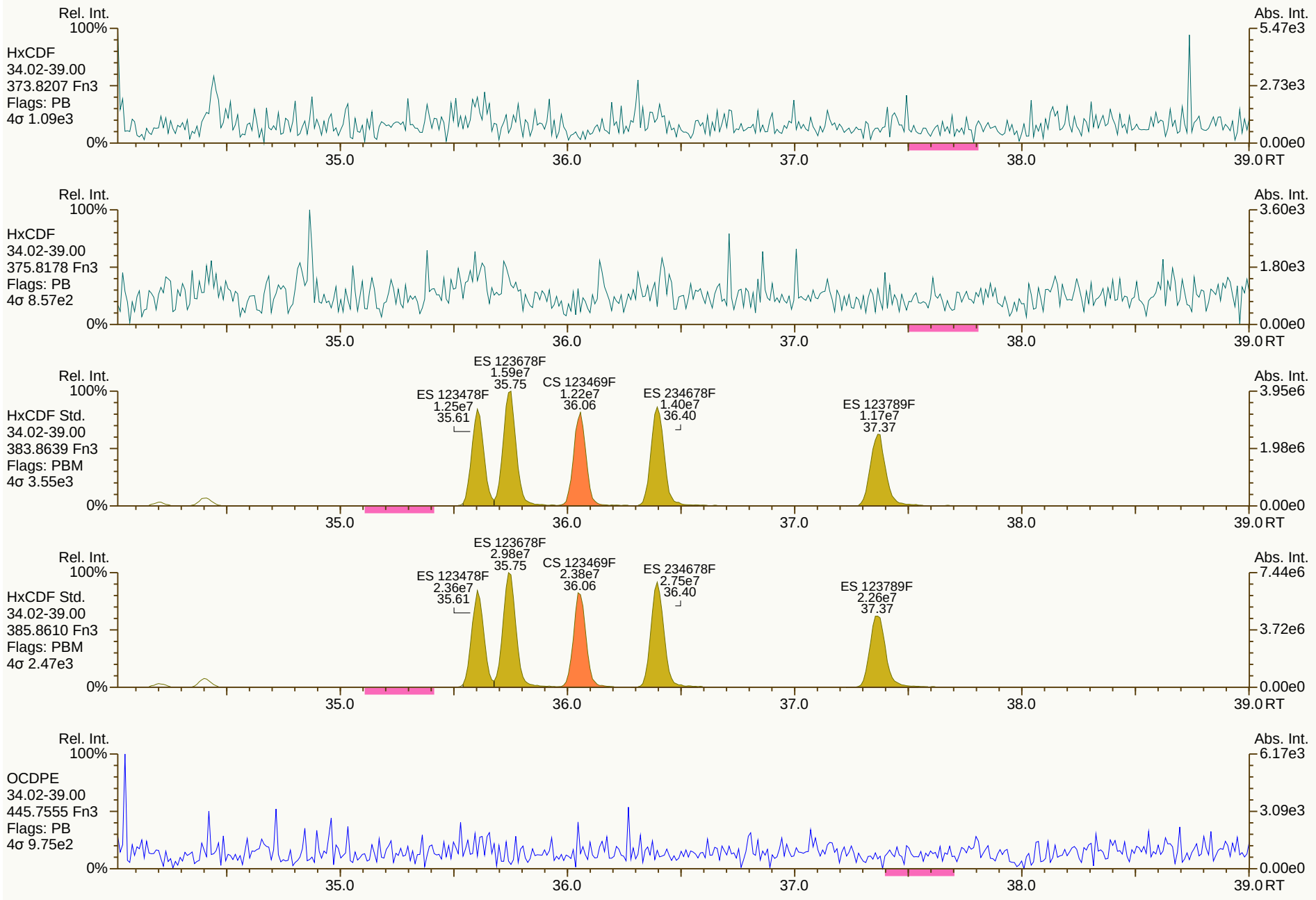
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



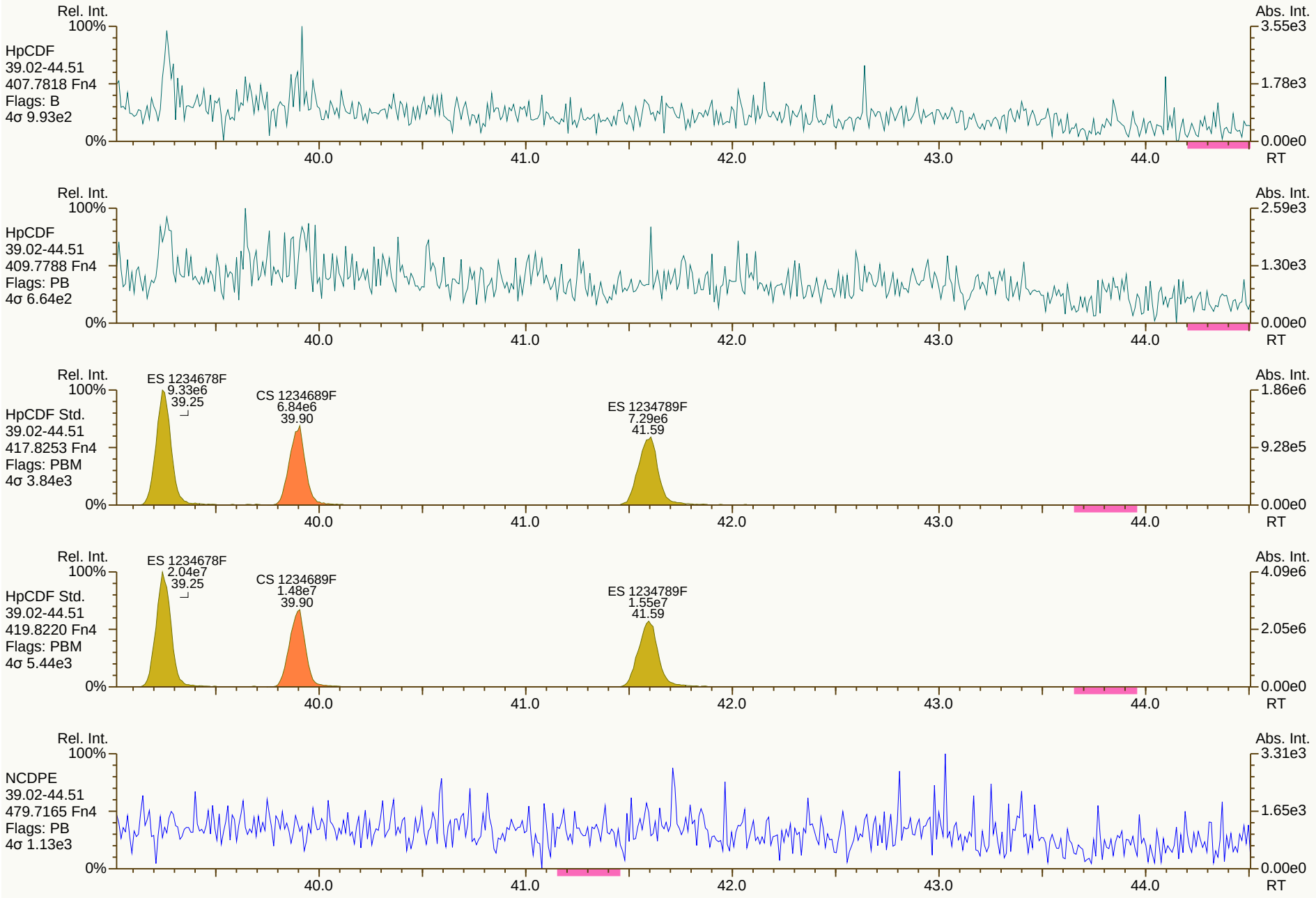
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



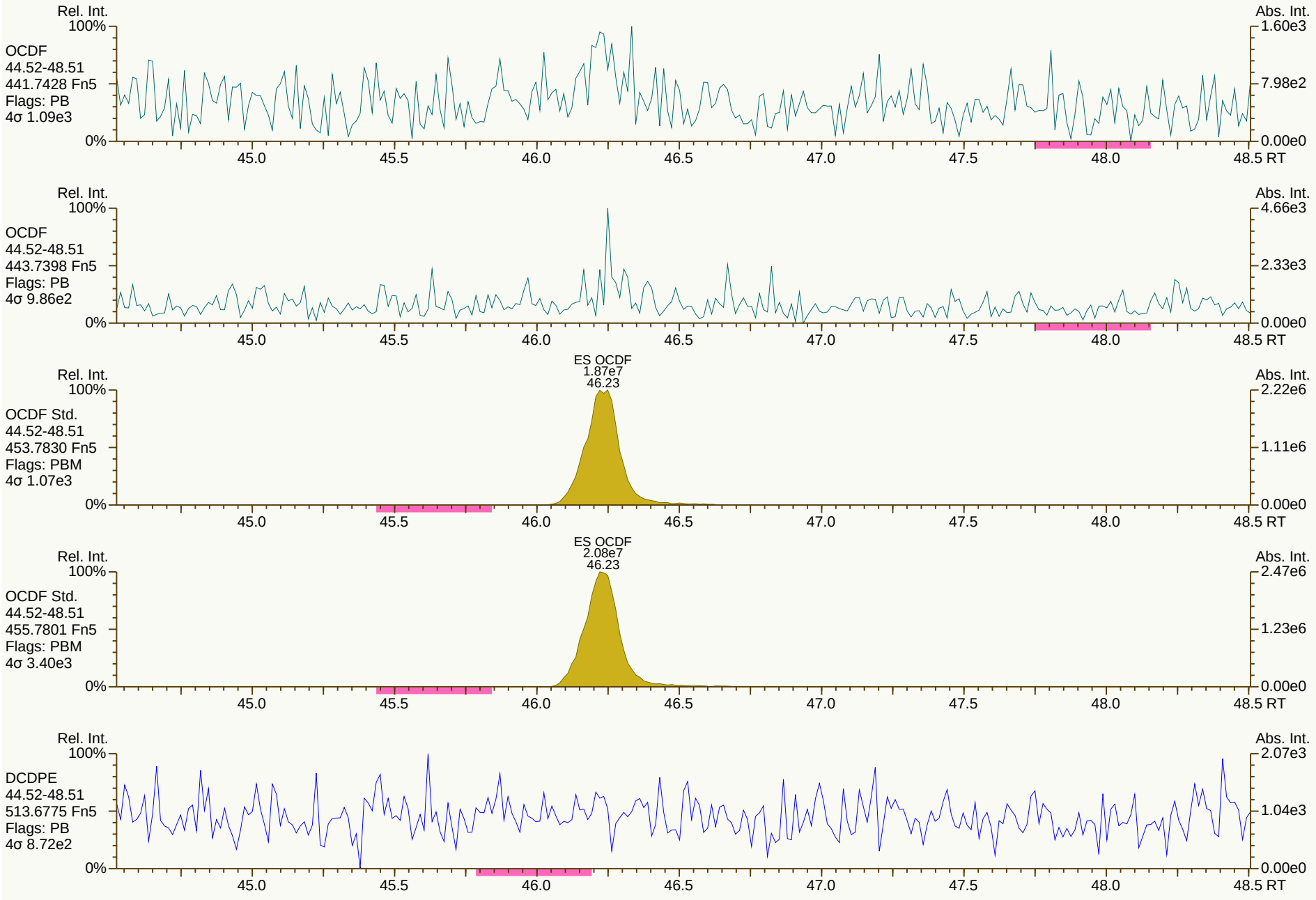
Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS ID: A7185_12600_DF_005 **Sample ID: Reagent Blank** **Acq: 10-Oct-2014 01:16:58**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 21** **User: ACC Datafile: 141009P09**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF_005.utp_res, saved 12-Oct-2014 13:18 (ACC) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 3577, 9250, 4908 scc: 552-578 *Revised: 12-Oct-2014 08:09 (ACC) Printed: 12-Oct-2014 13:30 Page 12 of 12*

SGS Environmental Services — Run Log **Project: A7185_12600_DF**

Instrument: MM1 (AutoSpec-Ultima) MS Experiment: df_cl4-8 GC Program: zb5-ms_60m

#	Datafile	Vial#	Lab ID	Wt/Vol	Client/Sample ID	Analyst(s)	Checkcode	Acq Date	Acq Time
2	141009P02	15	BCS3_12600_DF_PA	1.00	BCS3_12600_DF_PA	ACC	029-563	09-Oct-2014	19:04:05
3	141009P03	2	SBS_141009_DF_PA	1.00	SIL 12-70-1	ACC	743-599	09-Oct-2014	19:57:21
4	141009P04	16	MB1_12600_DF_SDS	1.00	Method Blank	ACC	616-785	09-Oct-2014	20:50:37
5	141009P05	17	A7185_12600_DF_001	1.00	142644-01 Field Blank	ACC	297-434	09-Oct-2014	21:43:53
6	141009P06	18	A7185_12600_DF_002	1.00	142644-02 Run 1	ACC	694-399	09-Oct-2014	22:37:08
7	141009P07	19	A7185_12600_DF_003	1.00	142644-03 Run 2	ACC	765-747	09-Oct-2014	23:30:25
8	141009P08	20	A7185_12600_DF_004	1.00	142644-04 Run 3	ACC	455-311	10-Oct-2014	00:23:41
9	141009P09	21	A7185_12600_DF_005	1.00	Reagent Blank	ACC	552-578	10-Oct-2014	01:16:58
10	141009P10	2	SBS_141009_DF_PB	1.00	SIL 12-70-1	ACC	307-281	10-Oct-2014	02:10:13
11	141009P11	15	BCS3_12600_DF_PB	1.00	BCS3_12600_DF_PB	ACC	214-053	10-Oct-2014	03:03:30

REVIEWED
By Amber Kornegay at 9:40 am, Oct 13, 2014

REVIEWED
By Andrew Chu at 1:35 pm, Oct 12, 2014

Project file: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\A7185_12600_DF.utp_prj, saved 12-Oct-2014 13:35
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689

Printed: 12-Oct-2014 13:35

Dioxin/Furan BCS3 Summary SGS **Report Created: 12-Oct-2014 13:19 AC**

	BCS3_12600_DF_PA 09-OCT-2014 19:04 141009P02			BCS3_12600_DF_PB 10-OCT-2014 03:03 141009P11			BCS3_12600_DF_PAB ICAL: MM1_DF_01172014_18SEP2014						
Name	**RT**	**Response**	**Ra**	**RT**	**Response**	**Ra**	**ICAL**	**RRF(A)**	**RRF(B)**	**AB Avg**	**A-I**	**B-I**	**AB RPD**
2378-TCDD	27.07	8.16E+06	0.77 Y	27.09	8.14E+06	0.80 Y	1.18	1.16	1.15	1.16	-2%	-2%	1%
12378-PeCDD	32.64	3.26E+07	1.67 Y	32.65	3.27E+07	1.64 Y	0.99	0.98	0.99	0.99	-1%	0%	1%
123478-HxCDD	36.58	3.02E+07	1.23 Y	36.59	3.04E+07	1.22 Y	1.02	1.07	1.05	1.06	5%	2%	3%
123678-HxCDD	36.69	3.04E+07	1.20 Y	36.71	3.07E+07	1.21 Y	1.05	1.07	1.12	1.09	2%	6%	4%
123789-HxCDD	36.99	3.04E+07	1.20 Y	37.00	3.08E+07	1.22 Y	0.96	0.92	0.94	0.93	-4%	-2%	2%
1234678-HpCDD	40.81	2.57E+07	1.05 Y	40.82	2.58E+07	1.04 Y	0.99	1.01	1.02	1.02	2%	3%	1%
OCDD	45.90	4.50E+07	0.89 Y	45.92	4.46E+07	0.89 Y	1.06	1.08	1.07	1.07	2%	2%	1%
2378-TCDF	26.15	1.07E+07	0.73 Y	26.16	9.99E+06	0.70 Y	0.97	1.01	0.96	0.99	4%	-1%	5%
12378-PeCDF	31.14	4.93E+07	1.50 Y	31.15	4.96E+07	1.52 Y	0.98	1.00	1.00	1.00	2%	2%	0%
23478-PeCDF	32.28	4.64E+07	1.51 Y	32.30	4.66E+07	1.54 Y	0.96	1.02	1.01	1.02	6%	6%	0%
123478-HxCDF	35.61	3.83E+07	1.22 Y	35.62	3.84E+07	1.20 Y	1.17	1.18	1.17	1.18	1%	0%	1%
123678-HxCDF	35.75	4.33E+07	1.21 Y	35.76	4.35E+07	1.22 Y	1.09	1.10	1.11	1.11	1%	2%	1%
234678-HxCDF	36.40	4.09E+07	1.22 Y	36.41	4.05E+07	1.20 Y	1.09	1.14	1.14	1.14	4%	4%	0%
123789-HxCDF	37.37	3.76E+07	1.21 Y	37.38	3.82E+07	1.22 Y	1.09	1.07	1.09	1.08	-2%	-1%	2%
1234678-HpCDF	39.25	3.48E+07	1.00 Y	39.26	3.50E+07	0.99 Y	1.29	1.38	1.39	1.38	7%	8%	1%
1234789-HpCDF	41.59	2.84E+07	0.98 Y	41.61	2.82E+07	1.00 Y	1.22	1.29	1.27	1.28	5%	4%	1%
OCDF	46.24	5.14E+07	0.87 Y	46.25	5.17E+07	0.88 Y	1.00	1.03	1.05	1.04	3%	4%	2%
ES 2378-TCDD	27.05	7.03E+07	0.79 Y	27.06	7.07E+07	0.78 Y	1.08	1.11	1.12	1.12	3%	4%	1%
ES 12378-PeCDD	32.62	6.63E+07	1.57 Y	32.64	6.60E+07	1.57 Y	1.01	1.05	1.05	1.05	4%	4%	0%
ES 123478-HxCDD	36.56	5.63E+07	1.28 Y	36.58	5.81E+07	1.27 Y	1.04	1.05	1.12	1.08	1%	8%	7%
ES 123678-HxCDD	36.68	5.67E+07	1.27 Y	36.69	5.49E+07	1.25 Y	1.01	1.05	1.06	1.06	5%	5%	1%
ES 123789-HxCDD	36.97	6.61E+07	1.26 Y	36.99	6.58E+07	1.28 Y	1.17	1.23	1.27	1.25	5%	9%	3%
ES 1234678-HpCDD	40.79	5.08E+07	1.08 Y	40.80	5.07E+07	1.10 Y	0.86	0.94	0.98	0.96	9%	13%	4%
ES OCDD	45.88	8.36E+07	0.89 Y	45.89	8.34E+07	0.91 Y	0.65	0.78	0.81	0.79	19%	23%	4%
ES 2378-TCDF	26.12	1.06E+08	0.75 Y	26.14	1.04E+08	0.76 Y	1.03	1.04	1.04	1.04	2%	1%	1%
ES 12378-PeCDF	31.13	9.86E+07	1.47 Y	31.14	9.89E+07	1.49 Y	0.94	0.97	0.99	0.98	4%	5%	2%
ES 23478-PeCDF	32.27	9.13E+07	1.47 Y	32.28	9.20E+07	1.49 Y	0.91	0.90	0.92	0.91	-1%	1%	2%
ES 123478-HxCDF	35.59	6.48E+07	0.52 Y	35.60	6.54E+07	0.53 Y	1.24	1.20	1.26	1.23	-3%	2%	5%
ES 123678-HxCDF	35.73	7.86E+07	0.51 Y	35.75	7.82E+07	0.52 Y	1.44	1.46	1.51	1.49	1%	5%	3%
ES 234678-HxCDF	36.38	7.18E+07	0.53 Y	36.40	7.13E+07	0.53 Y	1.30	1.33	1.38	1.36	2%	6%	3%
ES 123789-HxCDF	37.35	7.05E+07	0.53 Y	37.37	7.04E+07	0.52 Y	1.20	1.31	1.36	1.33	9%	13%	4%
ES 1234678-HpCDF	39.23	5.06E+07	0.45 Y	39.25	5.04E+07	0.46 Y	0.90	0.94	0.97	0.96	4%	8%	3%
ES 1234789-HpCDF	41.58	4.43E+07	0.45 Y	41.59	4.45E+07	0.46 Y	0.75	0.82	0.86	0.84	9%	14%	4%
ES OCDF	46.21	9.98E+07	0.91 Y	46.23	9.90E+07	0.90 Y	0.83	0.93	0.96	0.94	12%	16%	3%

Dioxin/Furan BCS3 Summary SGS **Report Created: 12-Oct-2014 13:19 AC**

	BCS3_12600_DF_PA 09-OCT-2014 19:04 141009P02				BCS3_12600_DF_PB 10-OCT-2014 03:03 141009P11			BCS3_12600_DF_PAB ICAL: MM1_DF_01172014_18SEP2014						
Name	**RT**	**Response**	**Ra**		**RT**	**Response**	**Ra**	**ICAL**	**RRF(A)**	**RRF(B)**	**AB Avg**	**A-I**	**B-I**	**AB RPD**
JS 1234-TCDD	26.37	3.16E+07	0.79 Y		26.38	3.15E+07	0.78 Y	-						
JS 1234-TCDF	24.69	5.07E+07	0.76 Y		24.71	5.01E+07	0.77 Y	-						
JS 123467-HxCDD	36.87	1.35E+07	1.31 Y		36.88	1.29E+07	1.29 Y	-						
CS 37Cl-2378-TCDD	27.07	3.06E+07	-		27.09	3.02E+07	-	1.28	1.21	1.20	1.21	-6%	-7%	1%
CS 12347-PeCDD	32.11	5.76E+07	1.58 Y		32.13	5.76E+07	1.61 Y	0.96	0.91	0.91	0.91	-5%	-5%	0%
CS 12346-PeCDF	30.58	8.44E+07	1.48 Y		30.60	8.46E+07	1.47 Y	0.91	0.83	0.84	0.84	-9%	-8%	1%
CS 123469-HxCDF	36.04	6.47E+07	0.52 Y		36.05	6.50E+07	0.52 Y	1.33	1.20	1.25	1.23	-9%	-5%	4%
CS 1234689-HpCDF	39.88	4.32E+07	0.46 Y		39.89	4.37E+07	0.46 Y	0.82	0.80	0.84	0.82	-2%	3%	5%
SS 37Cl-2378-TCDD	27.07	3.06E+07	-		27.09	3.02E+07	-	1.19	1.09	1.07	1.08	-9%	-11%	2%
SS 12347-PeCDD	32.11	5.76E+07	1.58 Y		32.13	5.76E+07	1.61 Y	0.95	0.87	0.87	0.87	-9%	-8%	0%
SS 12346-PeCDF	30.58	8.44E+07	1.48 Y		30.60	8.46E+07	1.47 Y	0.98	0.86	0.86	0.86	-12%	-12%	0%
SS 123469-HxCDF	36.04	6.47E+07	0.52 Y		36.05	6.50E+07	0.52 Y	0.92	0.82	0.83	0.83	-11%	-10%	1%
SS 1234689-HpCDF	39.88	4.32E+07	0.46 Y		39.89	4.37E+07	0.46 Y	0.91	0.85	0.87	0.86	-6%	-4%	1%
AS 1368-TCDD	23.13	6.88E+07	0.78 Y		23.14	6.78E+07	0.77 Y	1.08	1.09	1.08	1.08	1%	-1%	1%
AS 1368-TCDF	20.94	1.18E+08	0.76 Y		20.95	1.16E+08	0.76 Y	1.18	1.17	1.16	1.16	-1%	-2%	0%
FS 1278-TCDD	NotFnd	-	-	**	27.40	1.13E+05	0.81 Y	1.28		0.00			-100%	
FS 12478-PeCDD	NotFnd	-	-		NotFnd	-	-	1.18						
FS 123468-HxCDD	NotFnd	-	-		NotFnd	-	-	1.35		**N/A				
FS 1234679-HpCDD	NotFnd	-	-		NotFnd	-	-	1.27		AK 13 Oct 14				
TS 1378-TCDD	NotFnd	-	-		NotFnd	-	-	1.22						
OCDD-a	45.90	2.87E+06	2.52 Y		45.91	2.86E+06	2.50 Y	0.07	0.07	0.07	0.07	2%	1%	0%
OCDF-a	46.23	3.12E+06	2.39 Y		46.24	3.03E+06	2.43 Y	0.06	0.06	0.06	0.06	4%	1%	2%
Total TCDD	-	-	-		-	-	-	1.18	1.16	1.15	1.16	-2%	-2%	1%
Total PeCDD	-	-	-		-	-	-	0.99	0.98	0.99	0.99	-1%	0%	1%
Total HxCDD	-	-	-		-	-	-	1.01	1.02	1.03	1.03	1%	2%	1%
Total HpCDD	-	-	-		-	-	-	0.99	1.01	1.02	1.02	2%	3%	1%
Total TCDF	-	-	-		-	-	-	0.97	1.01	0.96	0.99	4%	-1%	5%
Total PeCDF	-	-	-		-	-	-	0.97	1.01	1.01	1.01	4%	4%	0%
Total HxCDF	-	-	-		-	-	-	1.11	1.12	1.13	1.12	1%	2%	0%
Total HpCDF	-	-	-		-	-	-	1.26	1.33	1.33	1.33	6%	6%	0%

PCDD/PCDF RT Window & Isomer Specificity Standards

SGS

	BCS3_12600_DF_PA 09-OCT-2014 19:04 141009P02	BCS3_12600_DF_PB 10-OCT-2014 03:03 141009P11

BCS3_12600_DF_PAB
ICAL: MM1_DF_01172014_18SEP2014

Name	RT	
Window Defining Standards Results		
First Eluting Isomer		
1368-TCDD	23.16	23.17
12479/12468-PeCDD	30.07	30.08
124679/124689-HxCDD	34.87	34.88
1234679-HpCDD	39.67	39.68
1368-TCDF	20.96	20.98
13468/12468-PeCDF	28.22	28.23
123468-HxCDF	34.21	34.22
1234678-HpCDF	39.25	39.26
Last Eluting Isomer		
1289-TCDD	28.10	28.11
12389-PeCDD	33.09	33.11
123789-HxCDD	36.99	37.00
1234678-HpCDD	40.81	40.82
1289-TCDF	28.27	28.28
12389-PeCDF	33.38	33.40
123789-HxCDF	37.37	37.38
1234789-HpCDF	41.59	41.61
Isomer Specificity Test Standard Results		
1239-TCDD	26.92	26.93
2378-TCDD	27.07	27.09
2348-TCDF	26.03	26.05
2378-TCDF	26.15	26.16

METHOD 23 **PCDD/F CALIBRATION VERIFICATION** **FORM 4A**

Lab Name: SGS Environmental Services

Initial Calibration: ICAL: MM1_DF_01172014_18SEP2014

Instrument ID: MM1 GC Column ID: ZB-5ms

VER Data Filename: 141009P02 Analysis Date: 09-OCT-2014 19:04:05

NATIVE ANALYTES	M/Z's FORMING RATIO	ION ABUND. RATIO	QC LIMITS			OK	CONC. FOUND	RANGE (ng/mL)			OK
2,3,7,8-TCDD	M/M+2	0.77	0.65	-	0.89	Y	9.84	8	-	12	Y
1,2,3,7,8-PeCDD	M+2/M+4	1.67	1.32	-	1.78	Y	49.6	40	-	60	Y
1,2,3,4,7,8-HxCDD	M+2/M+4	1.23	1.05	-	1.43	Y	52.5	40	-	60	Y
1,2,3,6,7,8-HxCDD	M+2/M+4	1.20	1.05	-	1.43	Y	51.1	40	-	60	Y
1,2,3,7,8,9-HxCDD	M+2/M+4	1.20	1.05	-	1.43	Y	48.1	40	-	60	Y
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	0.88	-	1.20	Y	51	40	-	60	Y
OCDD	M+2/M+4	0.89	0.76	-	1.02	Y	102	80	-	120	Y
2,3,7,8-TCDF	M/M+2	0.73	0.65	-	0.89	Y	10.4	8	-	12	Y
1,2,3,7,8-PeCDF	M+2/M+4	1.50	1.32	-	1.78	Y	50.9	40	-	60	Y
2,3,4,7,8-PeCDF	M+2/M+4	1.51	1.32	-	1.78	Y	53.1	40	-	60	Y
1,2,3,4,7,8-HxCDF	M+2/M+4	1.22	1.05	-	1.43	Y	50.5	40	-	60	Y
1,2,3,6,7,8-HxCDF	M+2/M+4	1.21	1.05	-	1.43	Y	50.7	40	-	60	Y
2,3,4,6,7,8-HxCDF	M+2/M+4	1.22	1.05	-	1.43	Y	52.1	40	-	60	Y
1,2,3,7,8,9-HxCDF	M+2/M+4	1.21	1.05	-	1.43	Y	48.9	40	-	60	Y
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.00	0.88	-	1.20	Y	53.4	40	-	60	Y
1,2,3,4,7,8,9-HpCDF	M+2/M+4	0.98	0.88	-	1.20	Y	52.5	40	-	60	Y
OCDF	M+2/M+4	0.87	0.76	-	1.02	Y	103	80	-	120	Y

Processed: 12 Oct 2014 13:19 Analyst: AC

METHOD 23 **PCDD/F CALIBRATION VERIFICATION** **FORM 4B**

Lab Name: SGS Environmental Services

Initial Calibration: ICAL: MM1_DF_01172014_18SEP2014

Instrument ID: MM1 GC Column ID: ZB-5ms

VER Data Filename: 141009P02 Analysis Date: 09-OCT-2014 19:04:05

LABELED ANALYTES	M/Z's FORMING RATIO	ION ABUND. RATIO	QC LIMITS			OK	CONC. FOUND	RANGE (ng/mL)			OK
13C-2,3,7,8-TCDD	M/M+2	0.79	0.65	-	0.89	Y	103	70	-	130	Y
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.57	1.32	-	1.78	Y	104	70	-	130	Y
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.28	1.05	-	1.43	Y	101	70	-	130	Y
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.27	1.05	-	1.43	Y	105	70	-	130	Y
13C-1,2,3,7,8,9-HxCDD	M+2/M+4	1.26	1.05	-	1.43	Y	105	70	-	130	Y
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.08	0.88	-	1.20	Y	109	70	-	130	Y
13C-OCDD	M+2/M+4	0.89	0.76	-	1.02	Y	238	140	-	260	Y
13C-2,3,7,8-TCDF	M/M+2	0.75	0.65	-	0.89	Y	102	70	-	130	Y
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.47	1.32	-	1.78	Y	104	70	-	130	Y
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.47	1.32	-	1.78	Y	99.4	70	-	130	Y
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.52	0.43	-	0.59	Y	97.1	70	-	130	Y
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.51	0.43	-	0.59	Y	101	70	-	130	Y
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.53	0.43	-	0.59	Y	102	70	-	130	Y
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.53	0.43	-	0.59	Y	109	70	-	130	Y
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.45	0.37	-	0.51	Y	104	70	-	130	Y
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.45	0.37	-	0.51	Y	109	70	-	130	Y
13C-OCDF	M+2/M+4	0.91	0.76	-	1.02	Y	224	140	-	260	Y
SURROGATE STANDARDS											
37Cl-2,3,7,8-TCDD	n/a						36.5	28	-	52	Y
13C-1,2,3,4,7-PeCDD	M+2/M+4	1.58	1.32	-	1.78	Y	91.4	70	-	130	Y
13C-1,2,3,4,6-PeCDF	M+2/M+4	1.48	1.32	-	1.78	Y	87.7	70	-	130	Y
13C-1,2,3,4,6,9-HxCDF	M/M+2	0.52	0.43	-	0.59	Y	89.4	70	-	130	Y
13C-1,2,3,4,6,8,9-HpCDF	M/M+2	0.46	0.37	-	0.51	Y	94.3	70	-	130	Y

Processed: 12 Oct 2014 13:19 Analyst: AC

METHOD 23 **PCDD/F CALIBRATION VERIFICATION** **FORM 4A**

Lab Name: SGS Environmental Services

Initial Calibration: ICAL: MM1_DF_01172014_18SEP2014

Instrument ID: MM1 GC Column ID: ZB-5ms

VER Data Filename: 141009P11 Analysis Date: 10-OCT-2014 03:03:30

NATIVE ANALYTES	M/Z's FORMING RATIO	ION ABUND. RATIO	QC LIMITS			OK	CONC. FOUND	RANGE (ng/mL)			OK
2,3,7,8-TCDD	M/M+2	0.80	0.65	-	0.89	Y	9.76	8	-	12	Y
1,2,3,7,8-PeCDD	M+2/M+4	1.64	1.32	-	1.78	Y	50	40	-	60	Y
1,2,3,4,7,8-HxCDD	M+2/M+4	1.22	1.05	-	1.43	Y	51.1	40	-	60	Y
1,2,3,6,7,8-HxCDD	M+2/M+4	1.21	1.05	-	1.43	Y	53.2	40	-	60	Y
1,2,3,7,8,9-HxCDD	M+2/M+4	1.22	1.05	-	1.43	Y	49	40	-	60	Y
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.04	0.88	-	1.20	Y	51.4	40	-	60	Y
OCDD	M+2/M+4	0.89	0.76	-	1.02	Y	102	80	-	120	Y
2,3,7,8-TCDF	M/M+2	0.70	0.65	-	0.89	Y	9.86	8	-	12	Y
1,2,3,7,8-PeCDF	M+2/M+4	1.52	1.32	-	1.78	Y	51	40	-	60	Y
2,3,4,7,8-PeCDF	M+2/M+4	1.54	1.32	-	1.78	Y	52.9	40	-	60	Y
1,2,3,4,7,8-HxCDF	M+2/M+4	1.20	1.05	-	1.43	Y	50.2	40	-	60	Y
1,2,3,6,7,8-HxCDF	M+2/M+4	1.22	1.05	-	1.43	Y	51.2	40	-	60	Y
2,3,4,6,7,8-HxCDF	M+2/M+4	1.20	1.05	-	1.43	Y	51.9	40	-	60	Y
1,2,3,7,8,9-HxCDF	M+2/M+4	1.22	1.05	-	1.43	Y	49.7	40	-	60	Y
1,2,3,4,6,7,8-HpCDF	M+2/M+4	0.99	0.88	-	1.20	Y	54	40	-	60	Y
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.00	0.88	-	1.20	Y	51.8	40	-	60	Y
OCDF	M+2/M+4	0.88	0.76	-	1.02	Y	104	80	-	120	Y

Processed: 12 Oct 2014 13:19 Analyst: AC

METHOD 23 **PCDD/F CALIBRATION VERIFICATION** **FORM 4B**

Lab Name: SGS Environmental Services

Initial Calibration: ICAL: MM1_DF_01172014_18SEP2014

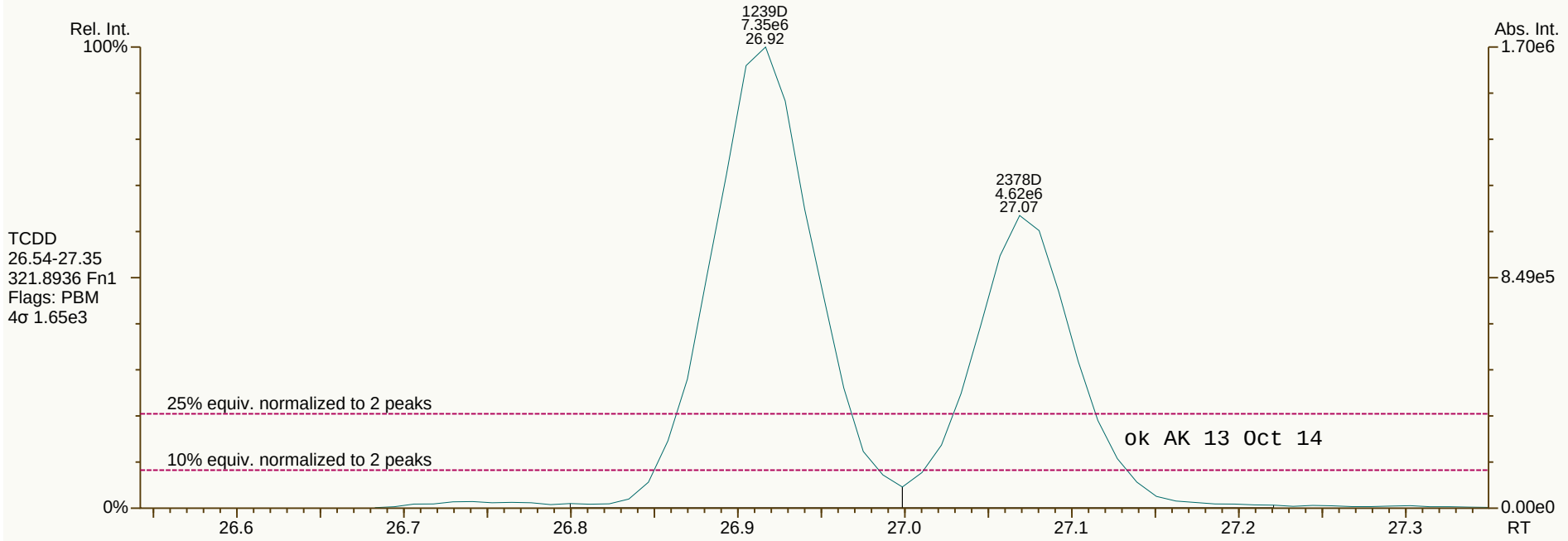
Instrument ID: MM1 GC Column ID: ZB-5ms

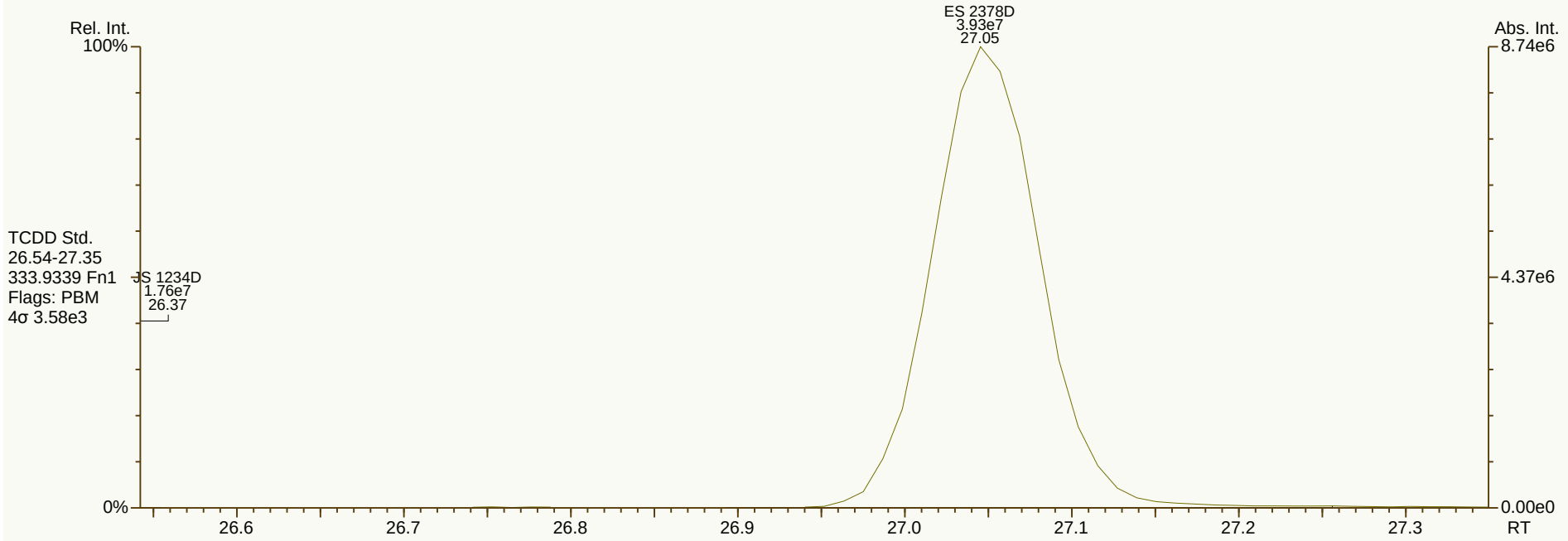
VER Data Filename: 141009P11 Analysis Date: 10-OCT-2014 03:03:30

LABELED ANALYTES	M/Z's FORMING RATIO	ION ABUND. RATIO	QC LIMITS			OK	CONC. FOUND	RANGE (ng/mL)			OK
13C-2,3,7,8-TCDD	M/M+2	0.78	0.65	-	0.89	Y	104	70	-	130	Y
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.57	1.32	-	1.78	Y	104	70	-	130	Y
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.27	1.05	-	1.43	Y	108	70	-	130	Y
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.25	1.05	-	1.43	Y	105	70	-	130	Y
13C-1,2,3,7,8,9-HxCDD	M+2/M+4	1.28	1.05	-	1.43	Y	109	70	-	130	Y
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.10	0.88	-	1.20	Y	113	70	-	130	Y
13C-OCDD	M+2/M+4	0.91	0.76	-	1.02	Y	247	140	-	260	Y
13C-2,3,7,8-TCDF	M/M+2	0.76	0.65	-	0.89	Y	101	70	-	130	Y
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.49	1.32	-	1.78	Y	105	70	-	130	Y
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.49	1.32	-	1.78	Y	101	70	-	130	Y
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.53	0.43	-	0.59	Y	102	70	-	130	Y
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.52	0.43	-	0.59	Y	105	70	-	130	Y
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.53	0.43	-	0.59	Y	106	70	-	130	Y
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.52	0.43	-	0.59	Y	113	70	-	130	Y
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.46	0.37	-	0.51	Y	108	70	-	130	Y
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.46	0.37	-	0.51	Y	114	70	-	130	Y
13C-OCDF	M+2/M+4	0.90	0.76	-	1.02	Y	231	140	-	260	Y
SURROGATE STANDARDS											
37Cl-2,3,7,8-TCDD	n/a						35.8	28	-	52	Y
13C-1,2,3,4,7-PeCDD	M+2/M+4	1.61	1.32	-	1.78	Y	91.8	70	-	130	Y
13C-1,2,3,4,6-PeCDF	M+2/M+4	1.47	1.32	-	1.78	Y	87.6	70	-	130	Y
13C-1,2,3,4,6,9-HxCDF	M/M+2	0.52	0.43	-	0.59	Y	90.4	70	-	130	Y
13C-1,2,3,4,6,8,9-HpCDF	M/M+2	0.46	0.37	-	0.51	Y	95.5	70	-	130	Y

Processed: 12 Oct 2014 13:19 Analyst: AC

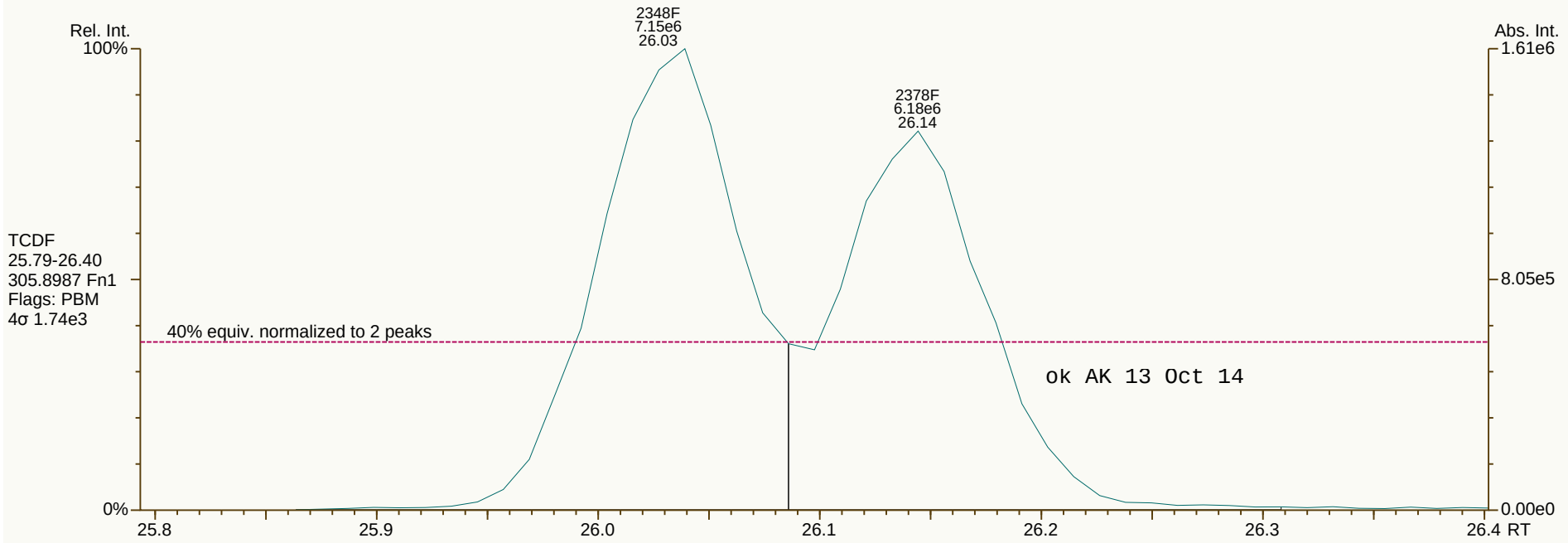
SGS ID: BCS3_12600_DF_PA
Sample ID: BCS3_12600_DF_PA
Acq: 09-Oct-2014 19:04:05
Instr: [ILM] AutoSpec-Ultima MM1
VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15
User: ACC Datafile: 141009P02

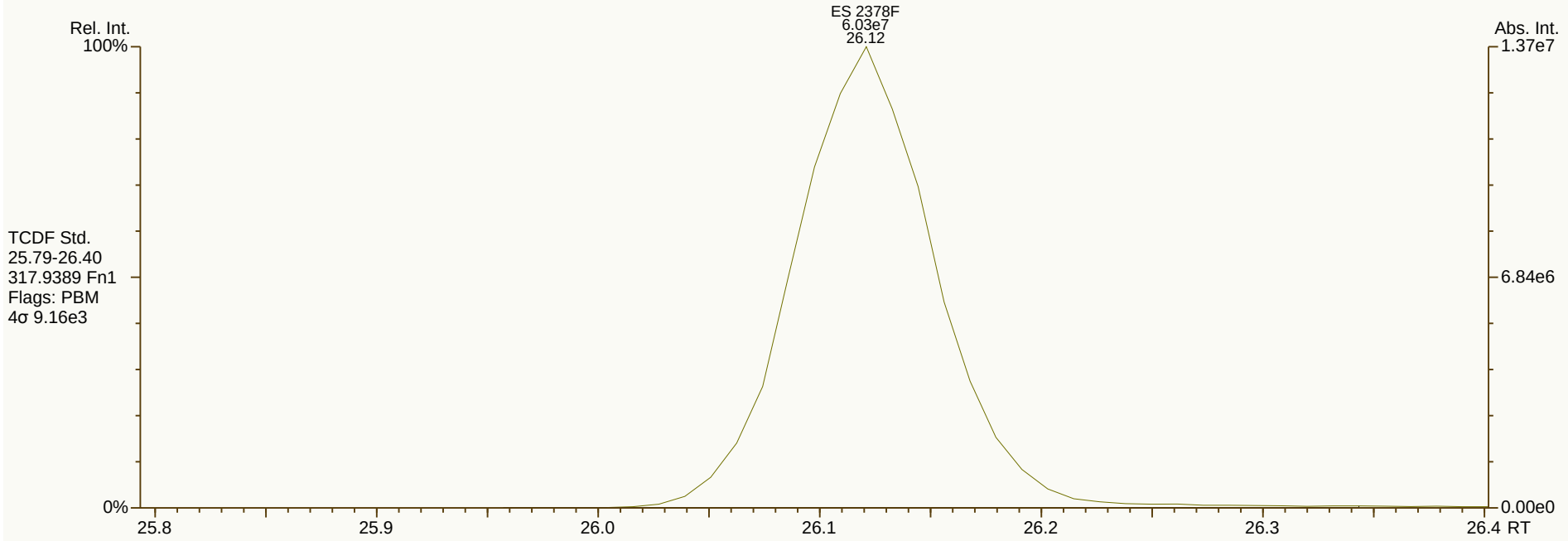




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Peak annotation: Areas, Centroids
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689
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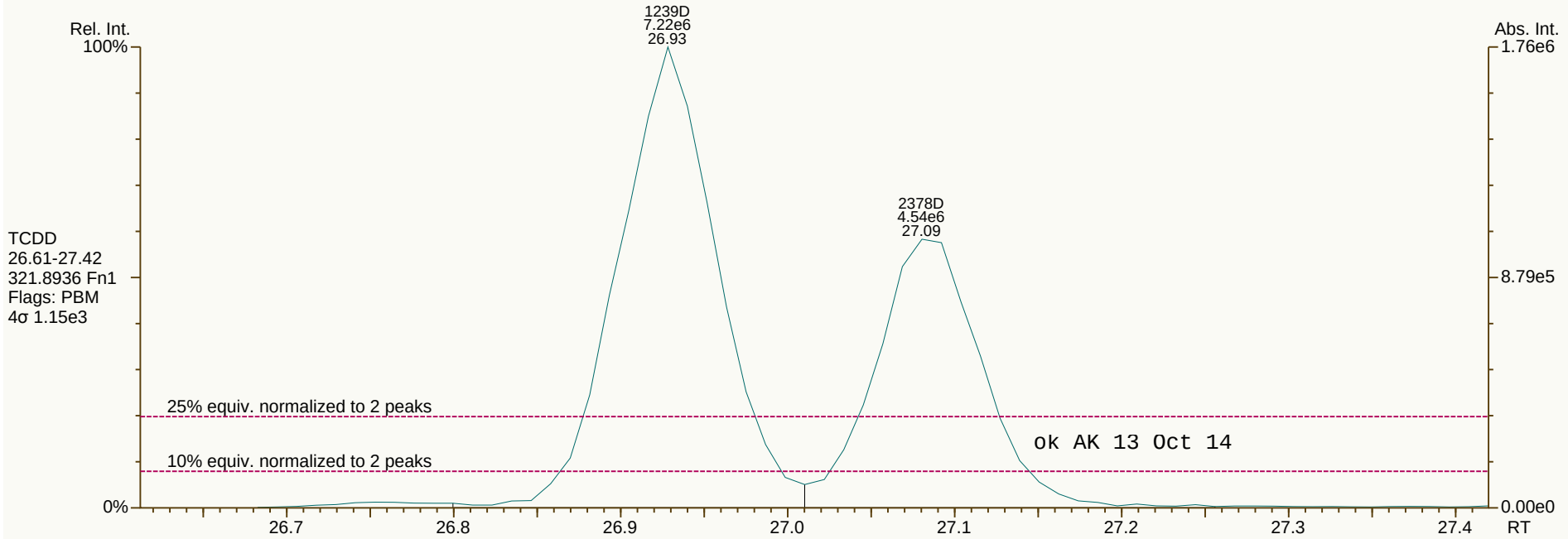
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VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15
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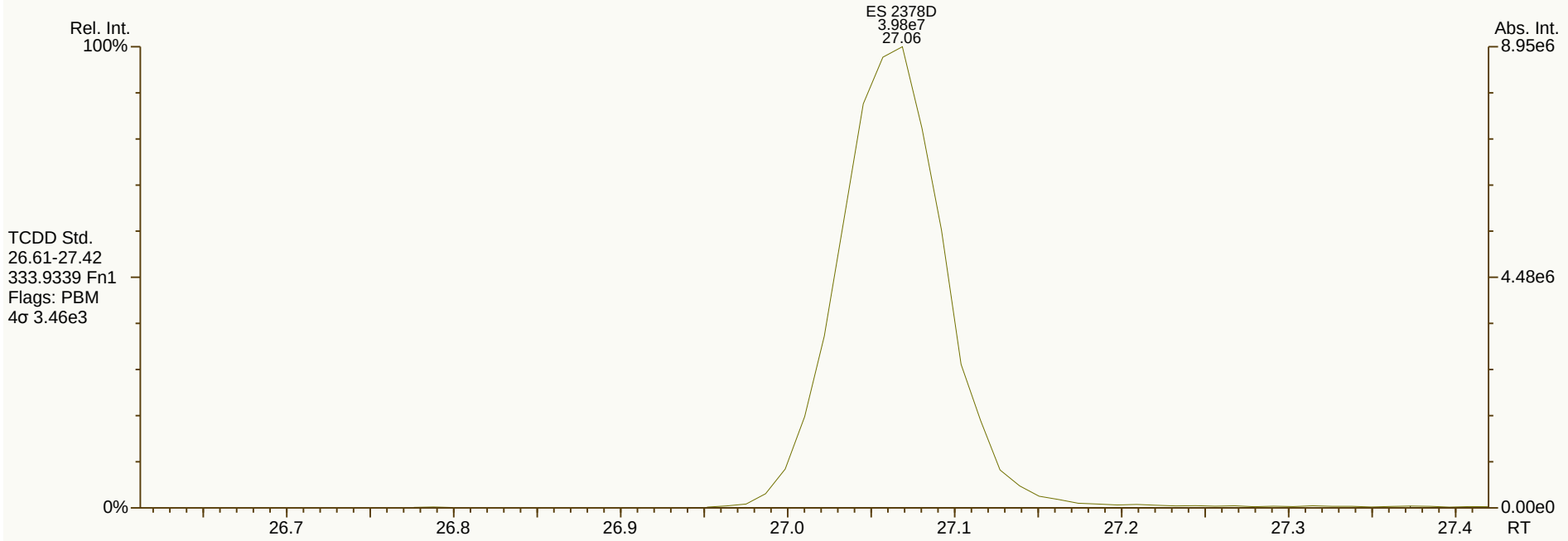




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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689
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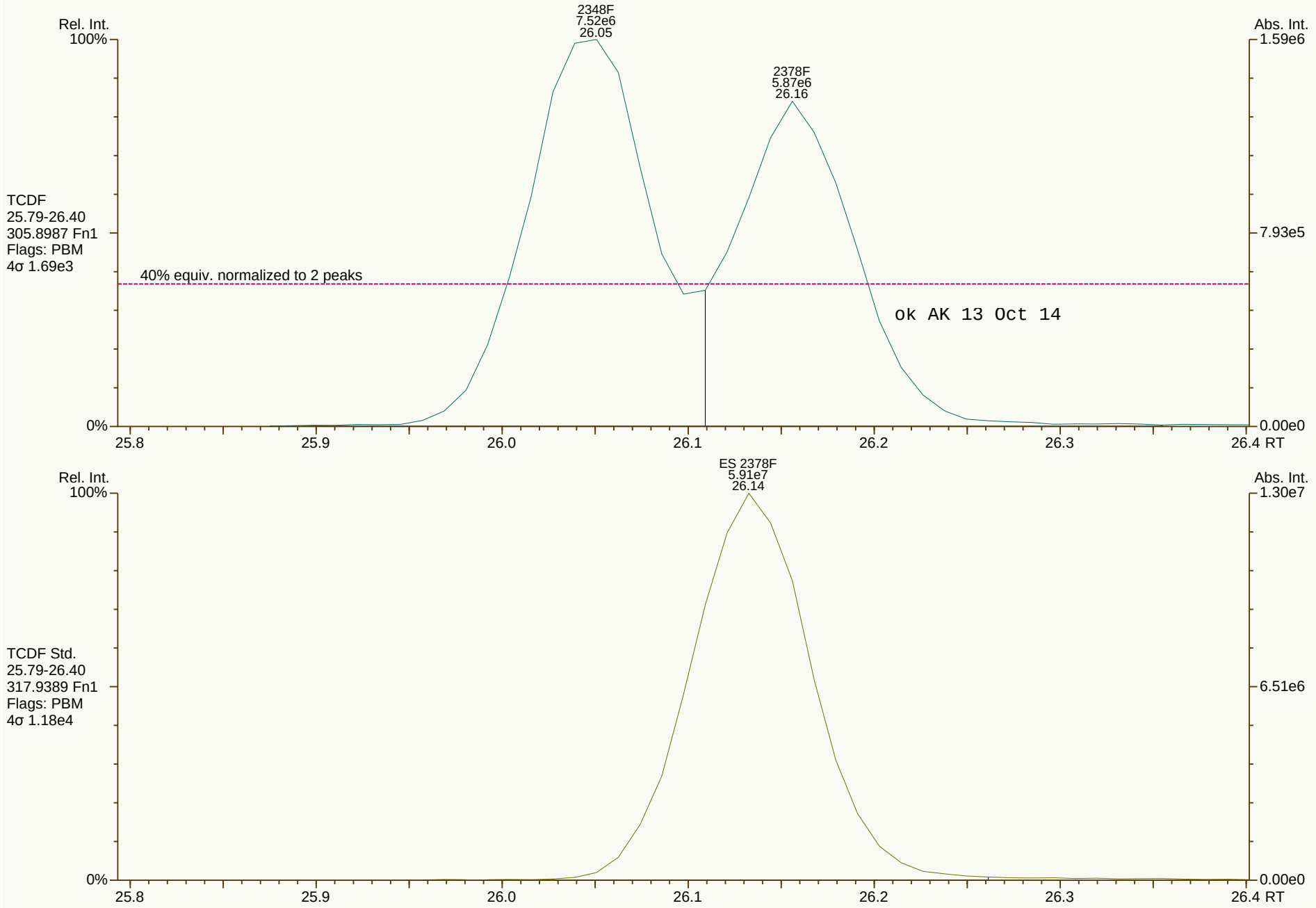
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Acq: 10-Oct-2014 03:03:30
Instr: [ILM] AutoSpec-Ultima MM1
VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15
User: ACC Datafile: 141009P11





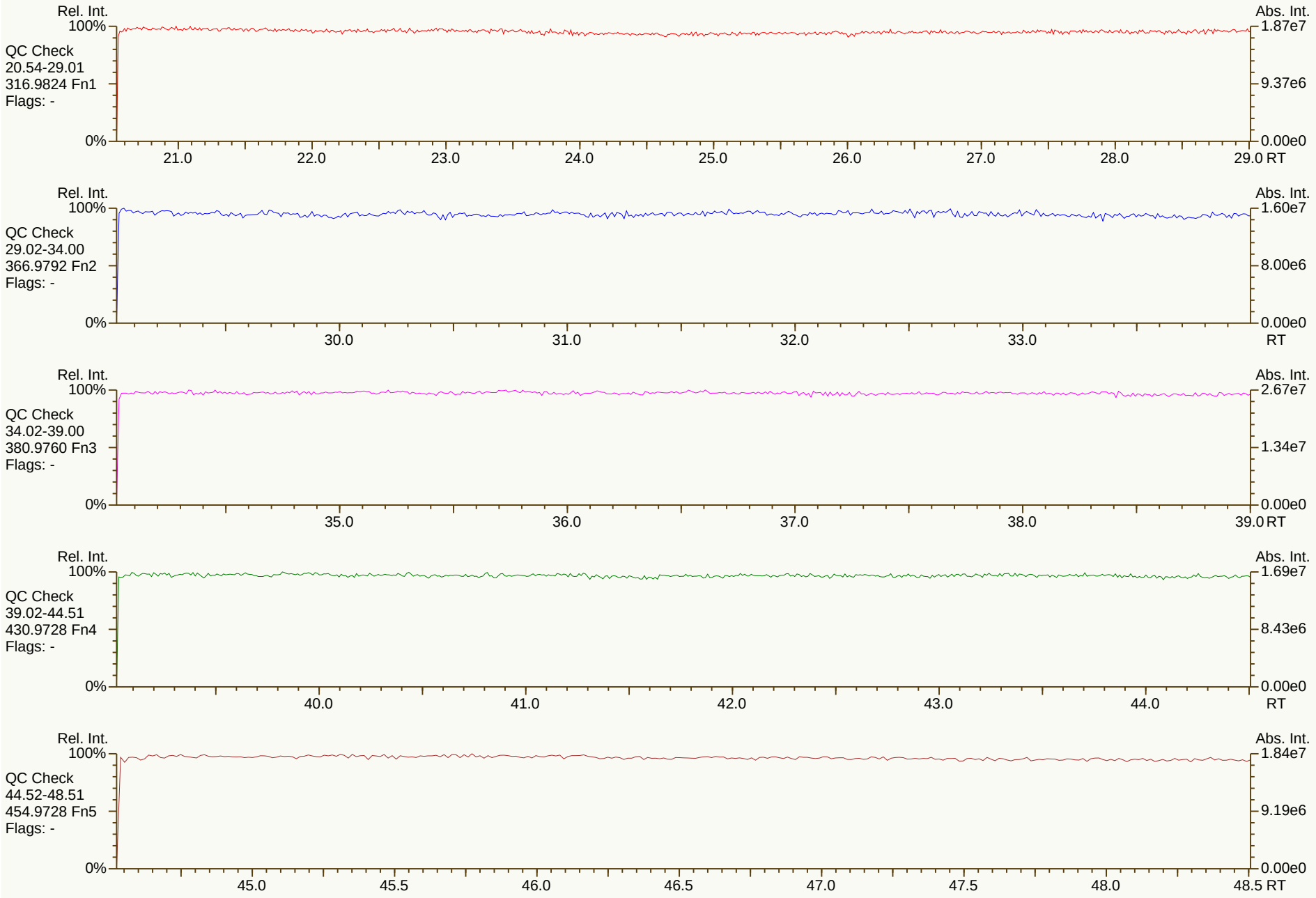
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689
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SGS ID: BCS3_12600_DF_PB
Sample ID: BCS3_12600_DF_PB
Acq: 10-Oct-2014 03:03:30
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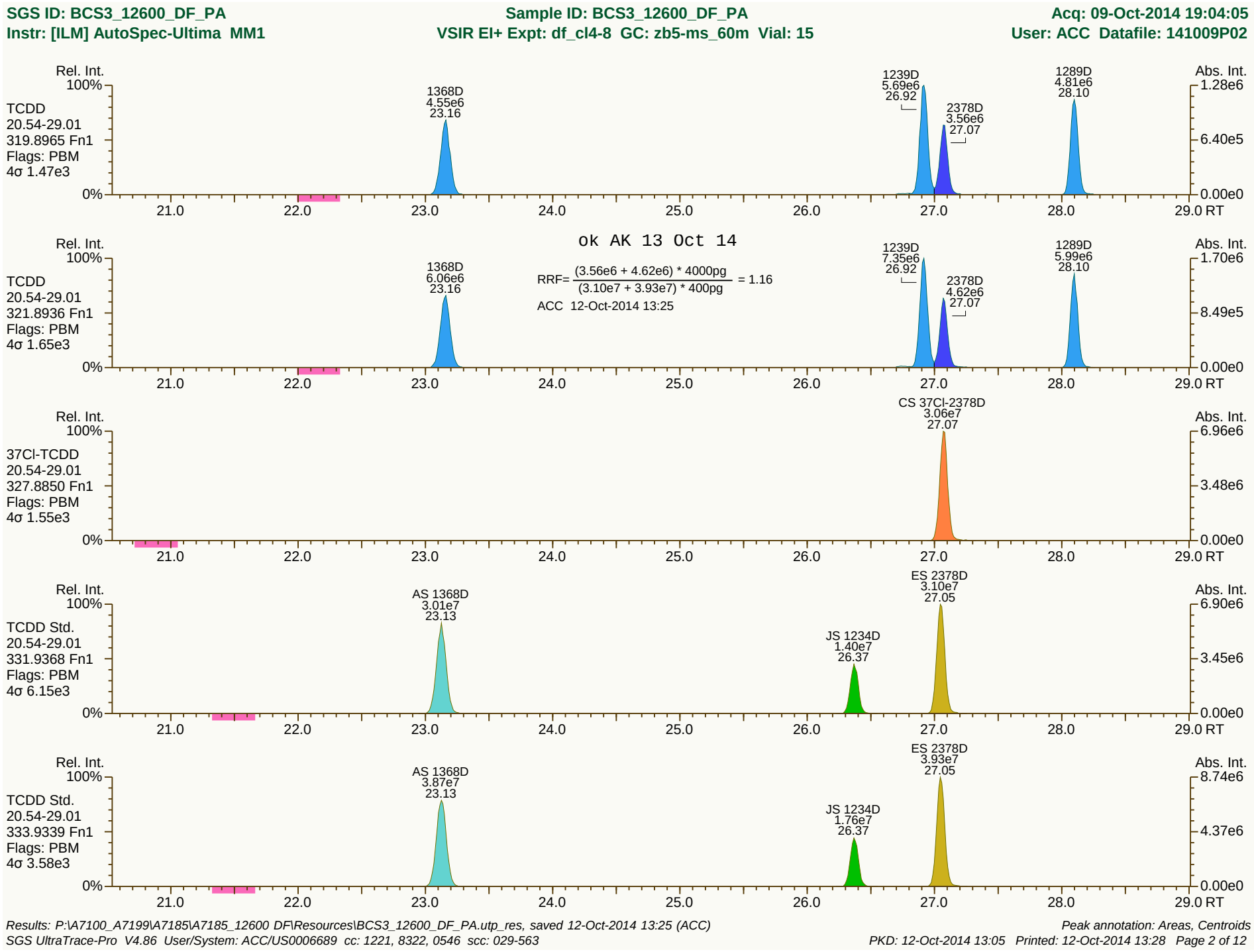


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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689
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SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\BCS3_12600_DF_PA.utp_res, saved 12-Oct-2014 13:25 (ACC) *Peak annotation: Areas, Centroids*



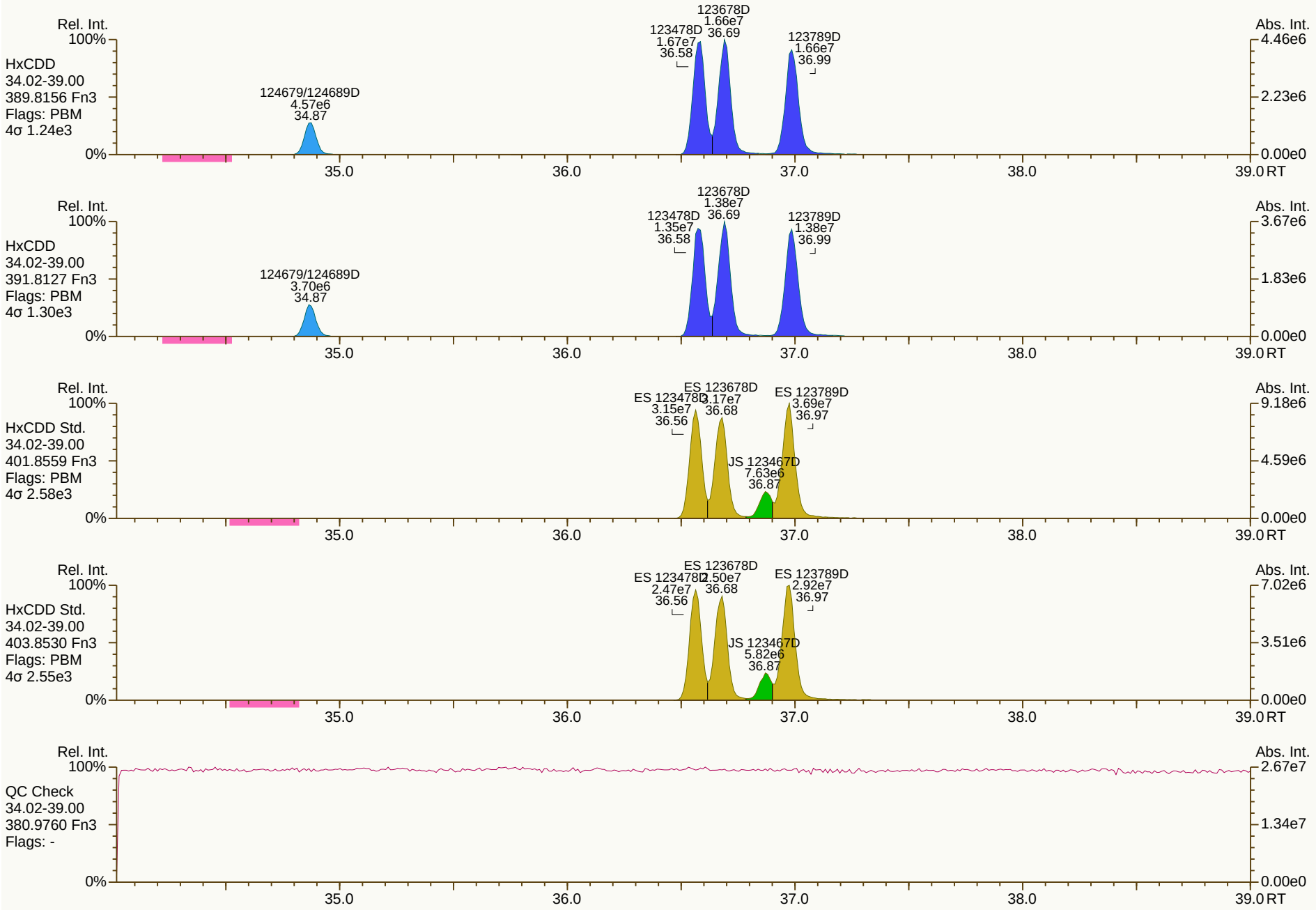
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Peak annotation: Areas, Centroids
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 1221, 8322, 0546 scc: 029-563
PKD: 12-Oct-2014 13:05 Printed: 12-Oct-2014 13:28 Page 2 of 12

SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\BCS3_12600_DF_PA.utp_res, saved 12-Oct-2014 13:25 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 2755, 2671 scc: 029-563 *Revised: 12-Oct-2014 13:05 (ACC) Printed: 12-Oct-2014 13:28 Page 3 of 12*

SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



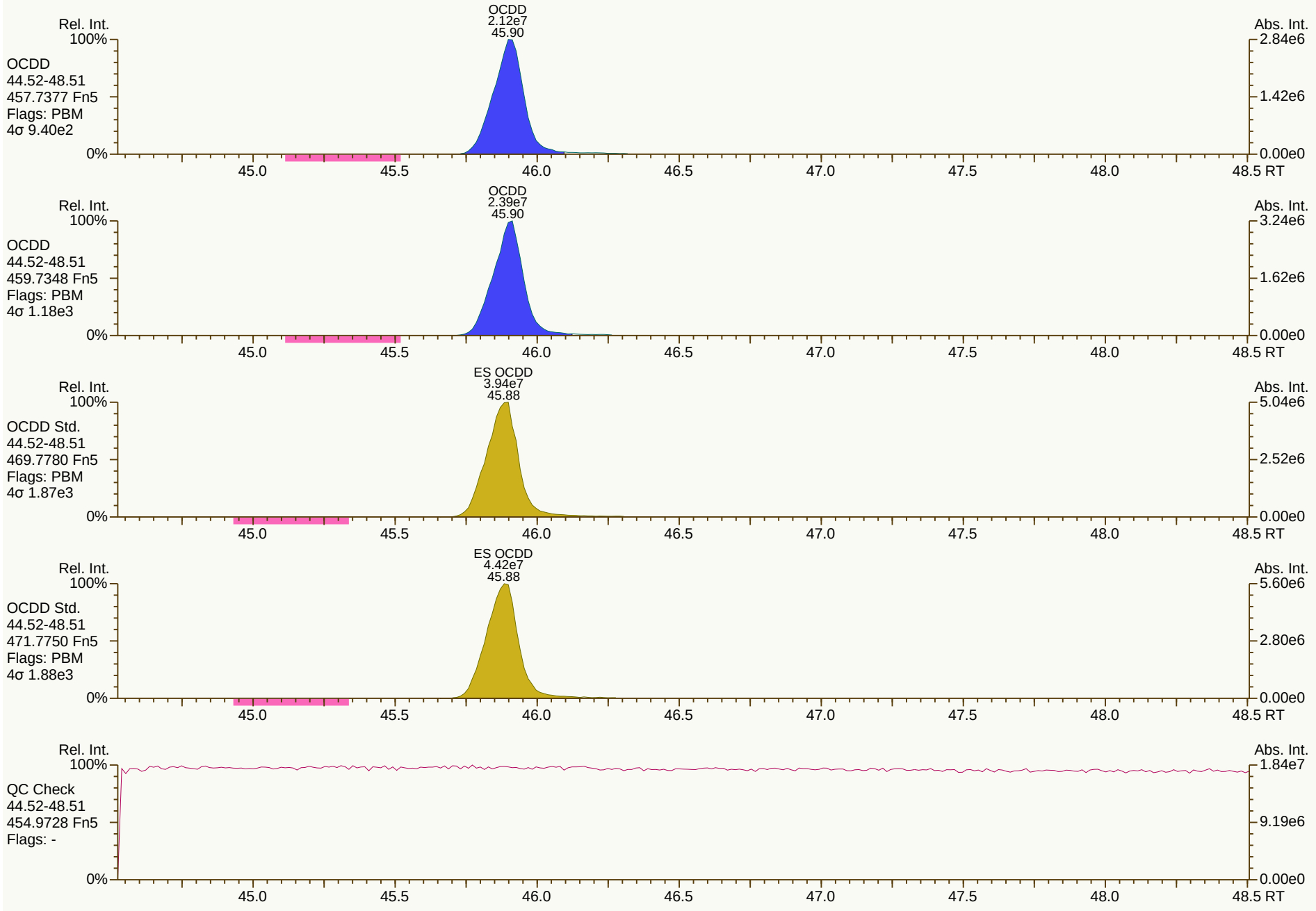
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 4156, 7059 scc: 029-563 *PKD: 12-Oct-2014 13:05 Printed: 12-Oct-2014 13:28 Page 4 of 12*

SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



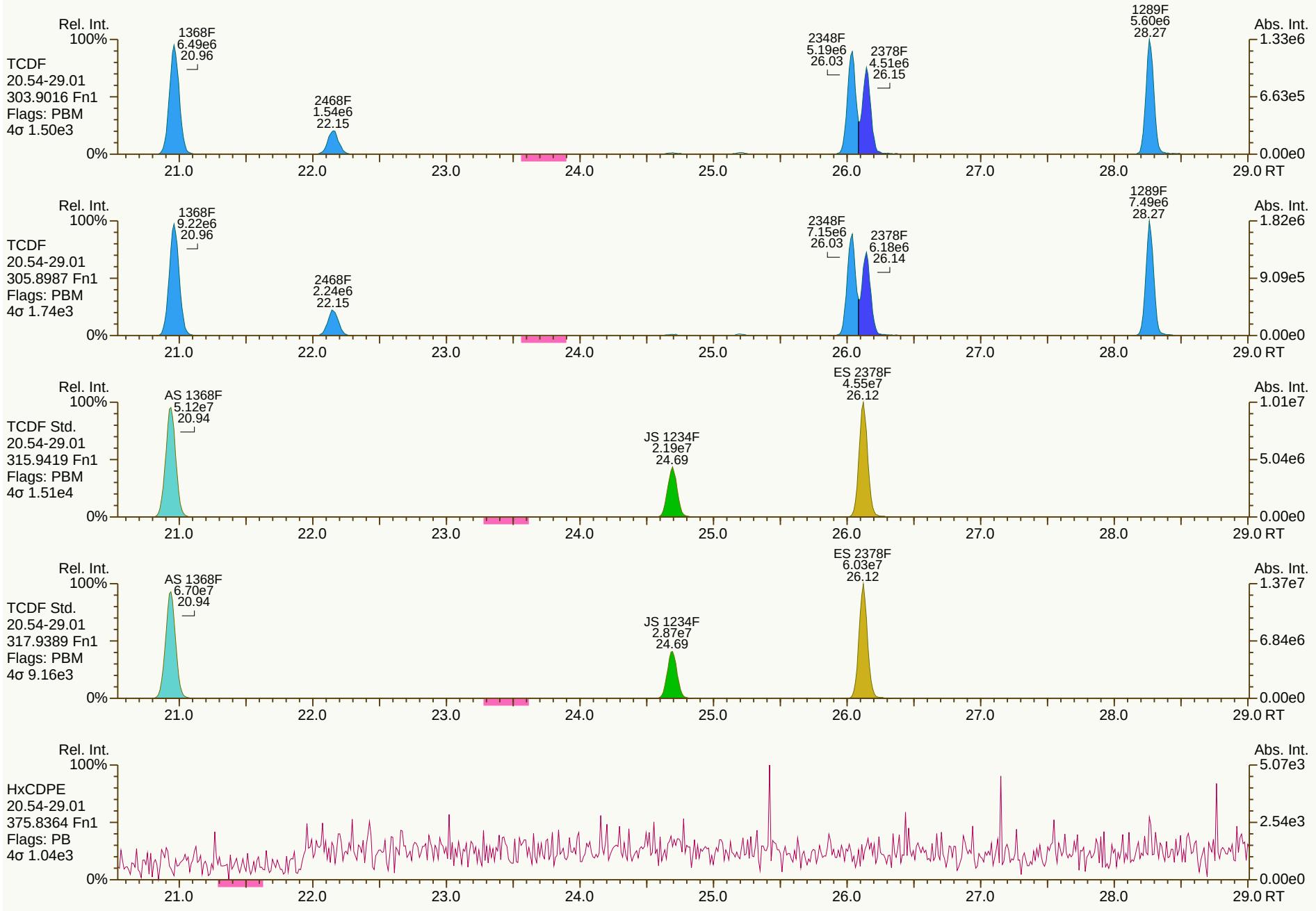
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SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



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SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



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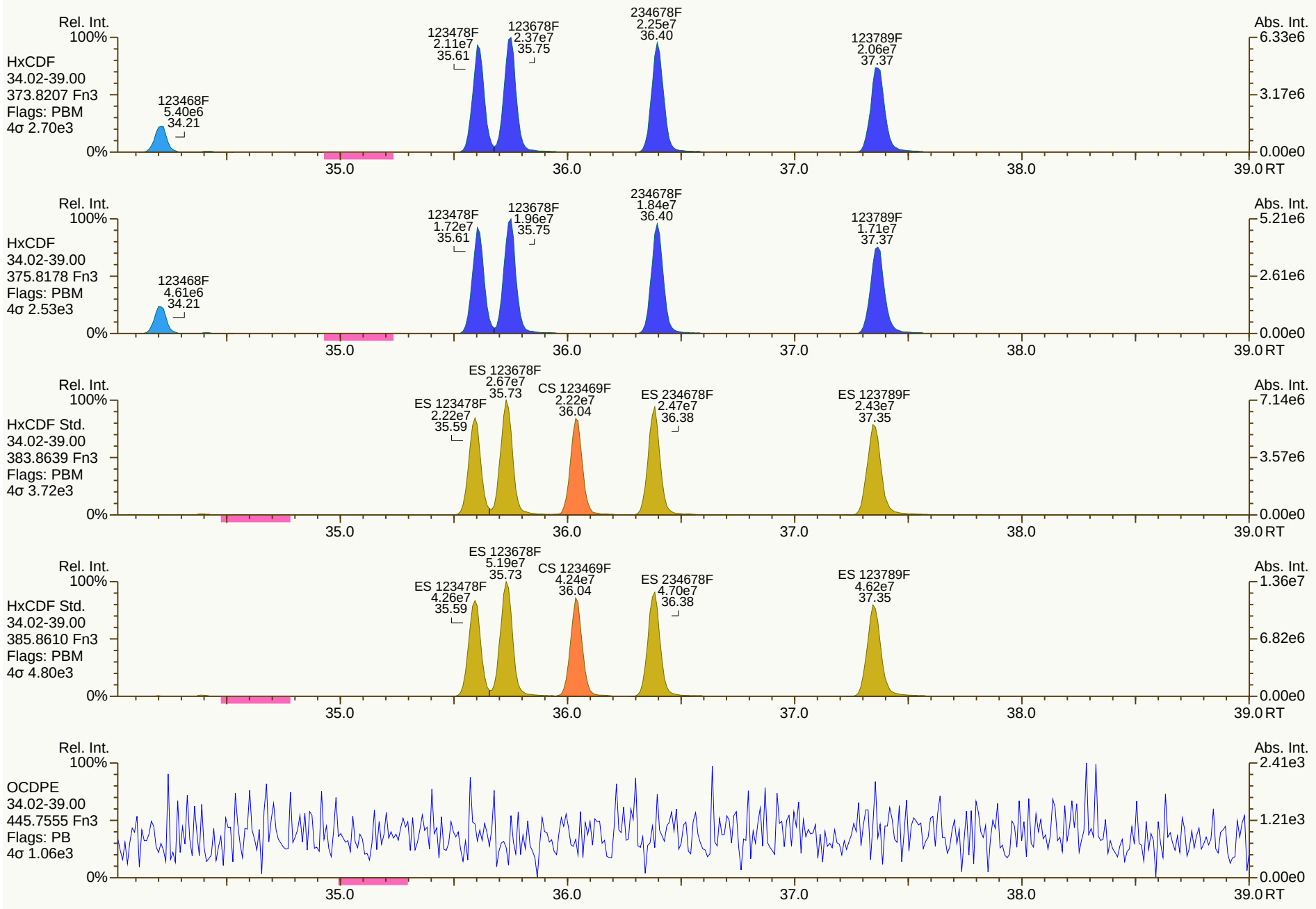
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Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\BCS3_12600_DF_PA.utp_res, saved 12-Oct-2014 13:25 (ACC) *Peak annotation: Areas, Centroids*

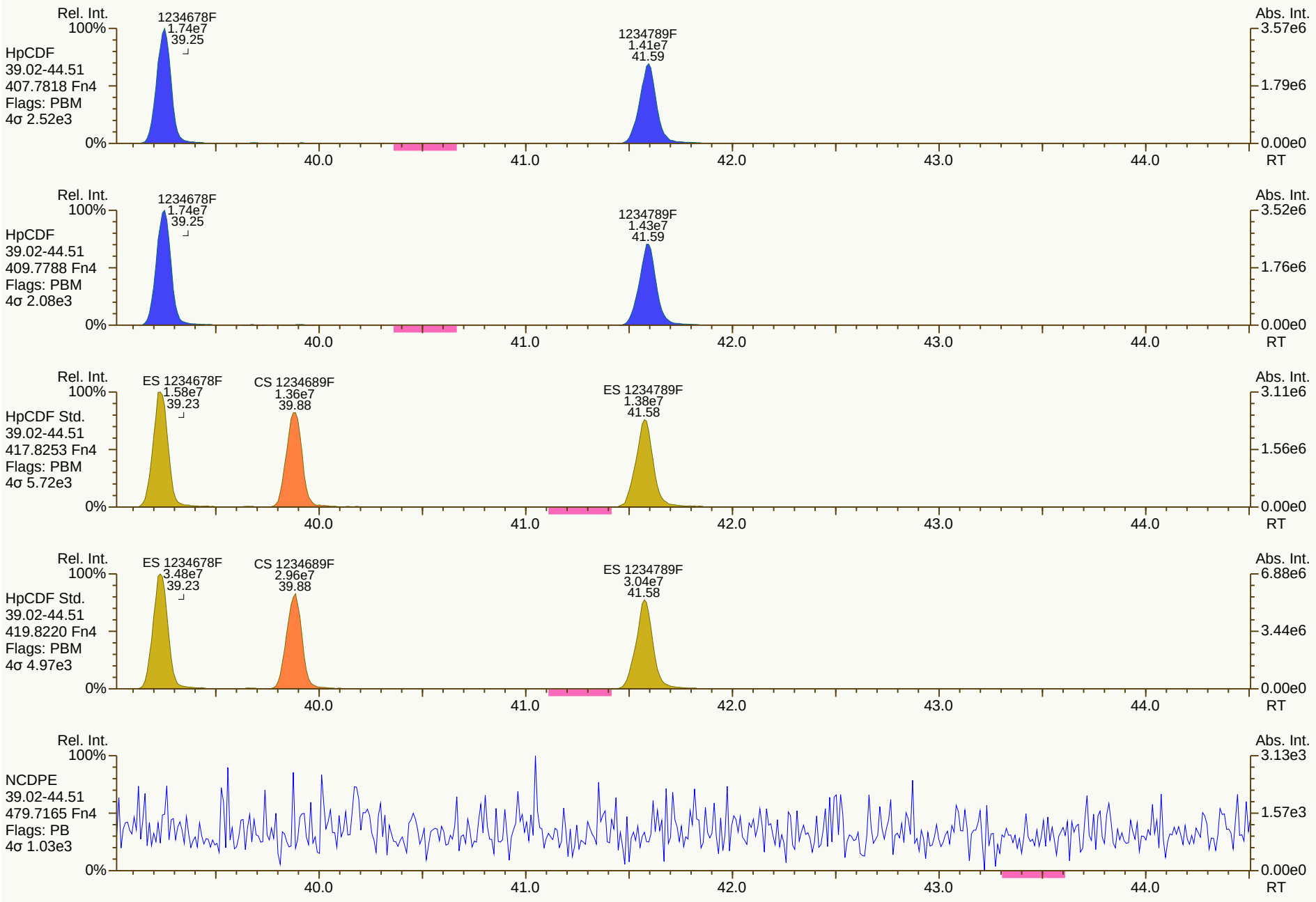
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SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



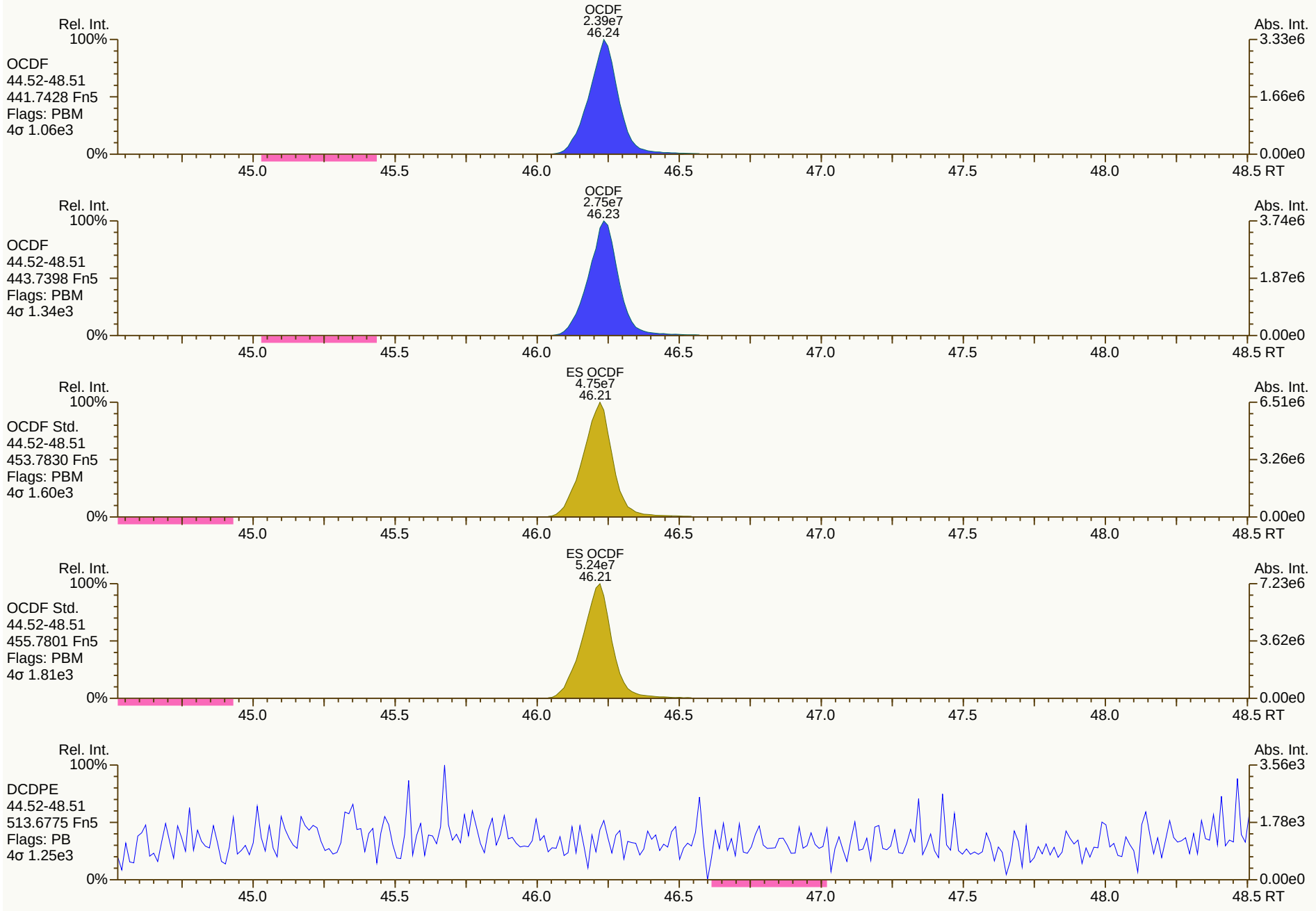
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SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



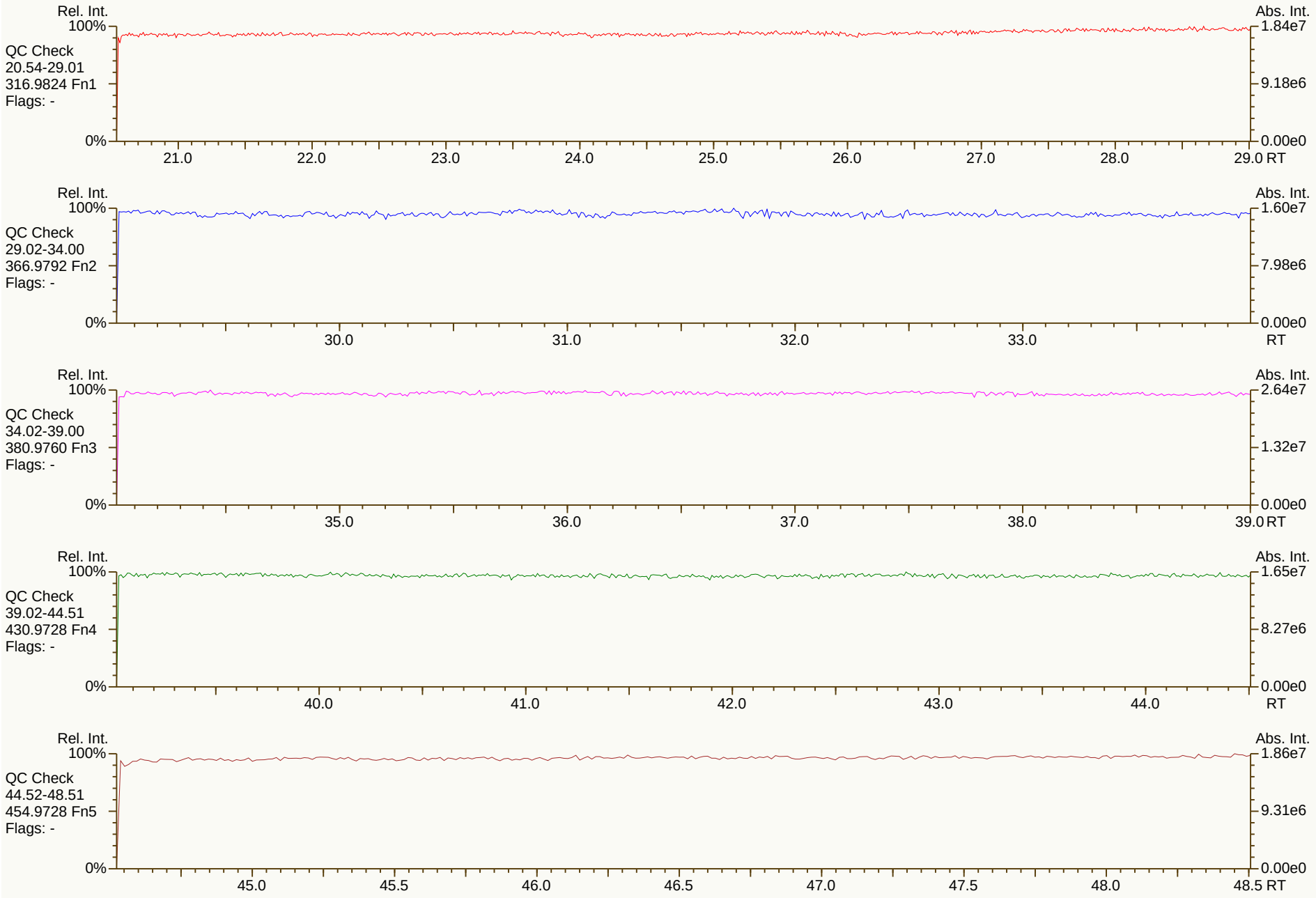
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SGS ID: BCS3_12600_DF_PA **Sample ID: BCS3_12600_DF_PA** **Acq: 09-Oct-2014 19:04:05**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P02**



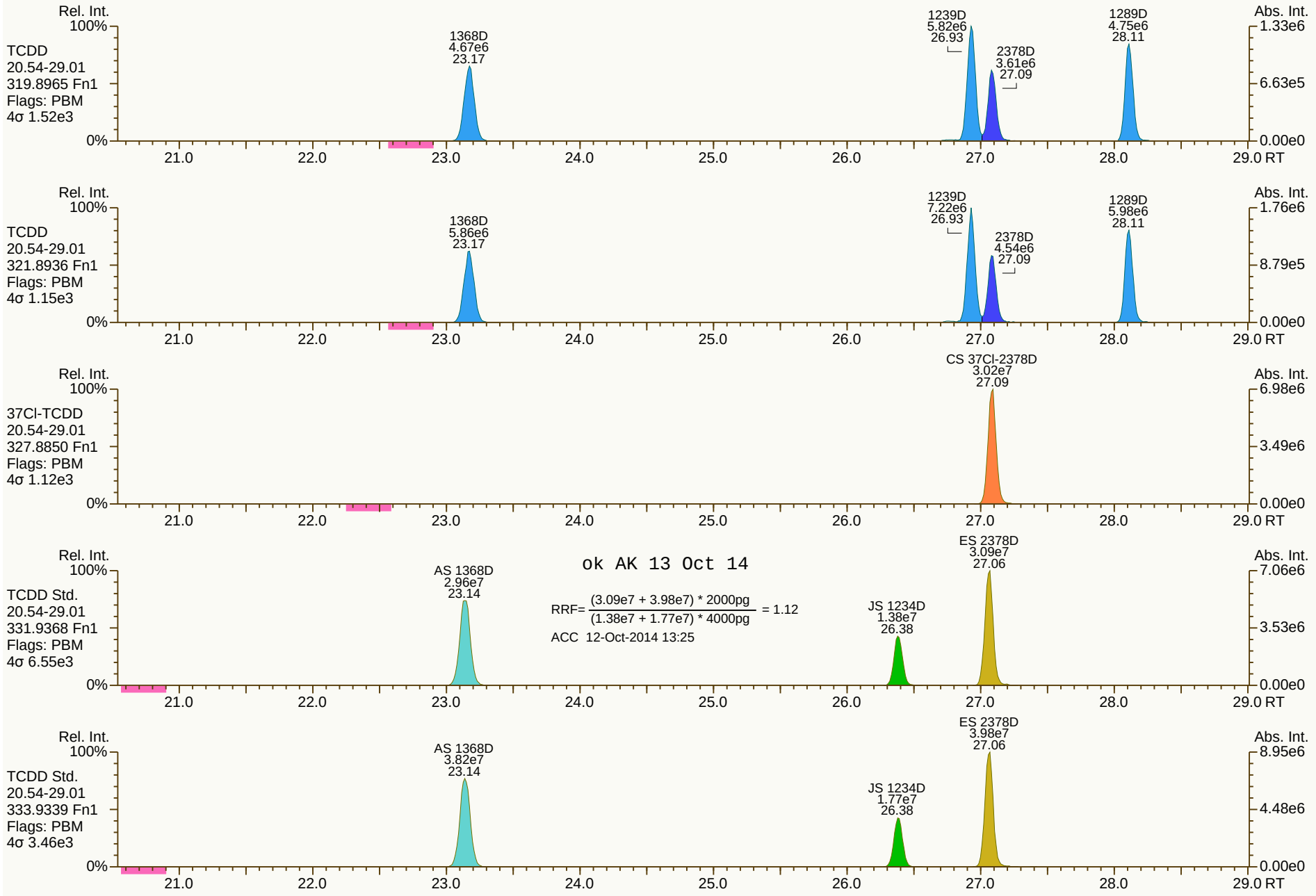
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 0606, 1865, 3391 scc: 029-563 *Revised: 12-Oct-2014 08:05 (ACC) Printed: 12-Oct-2014 13:29 Page 12 of 12*

SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



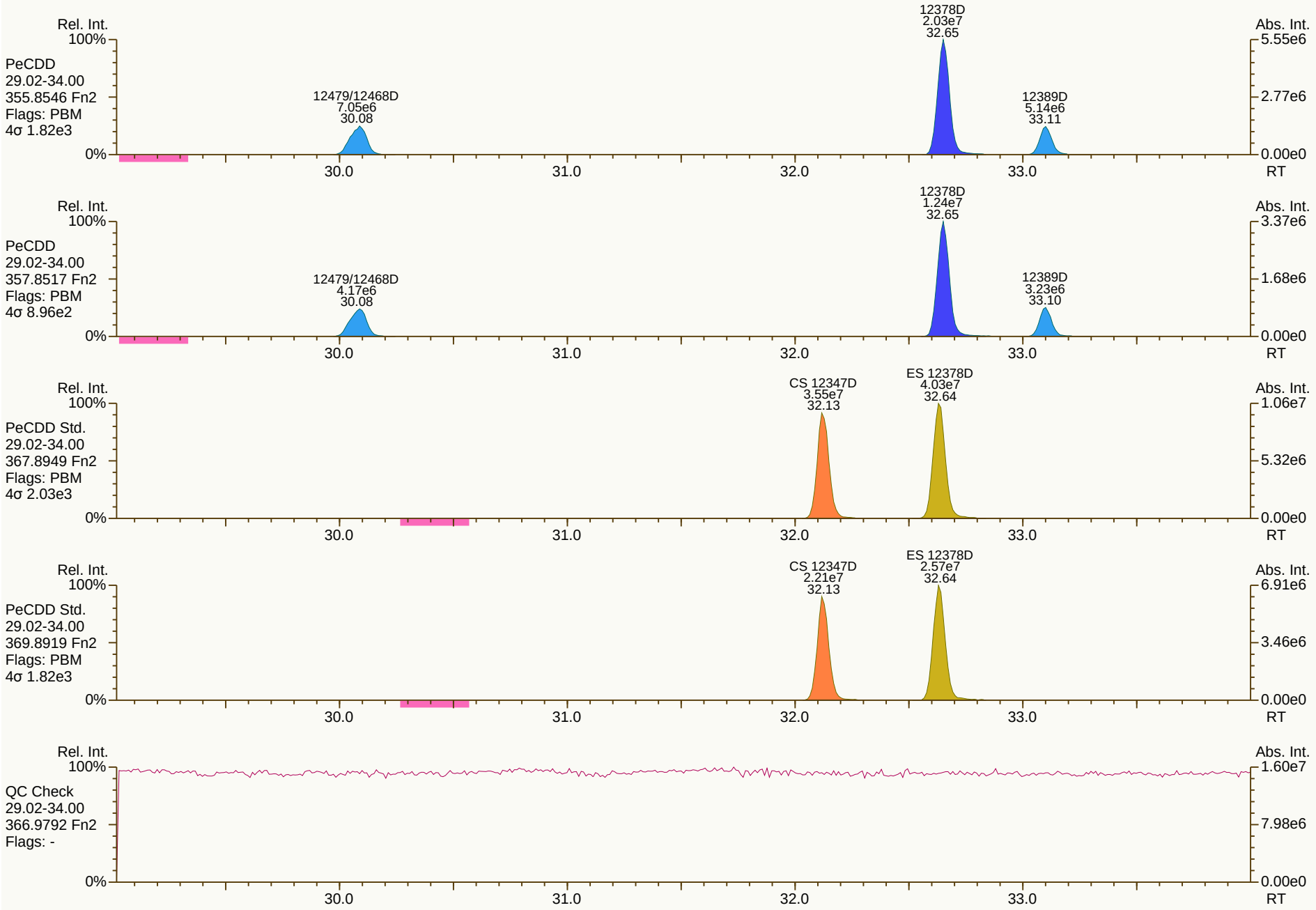
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SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



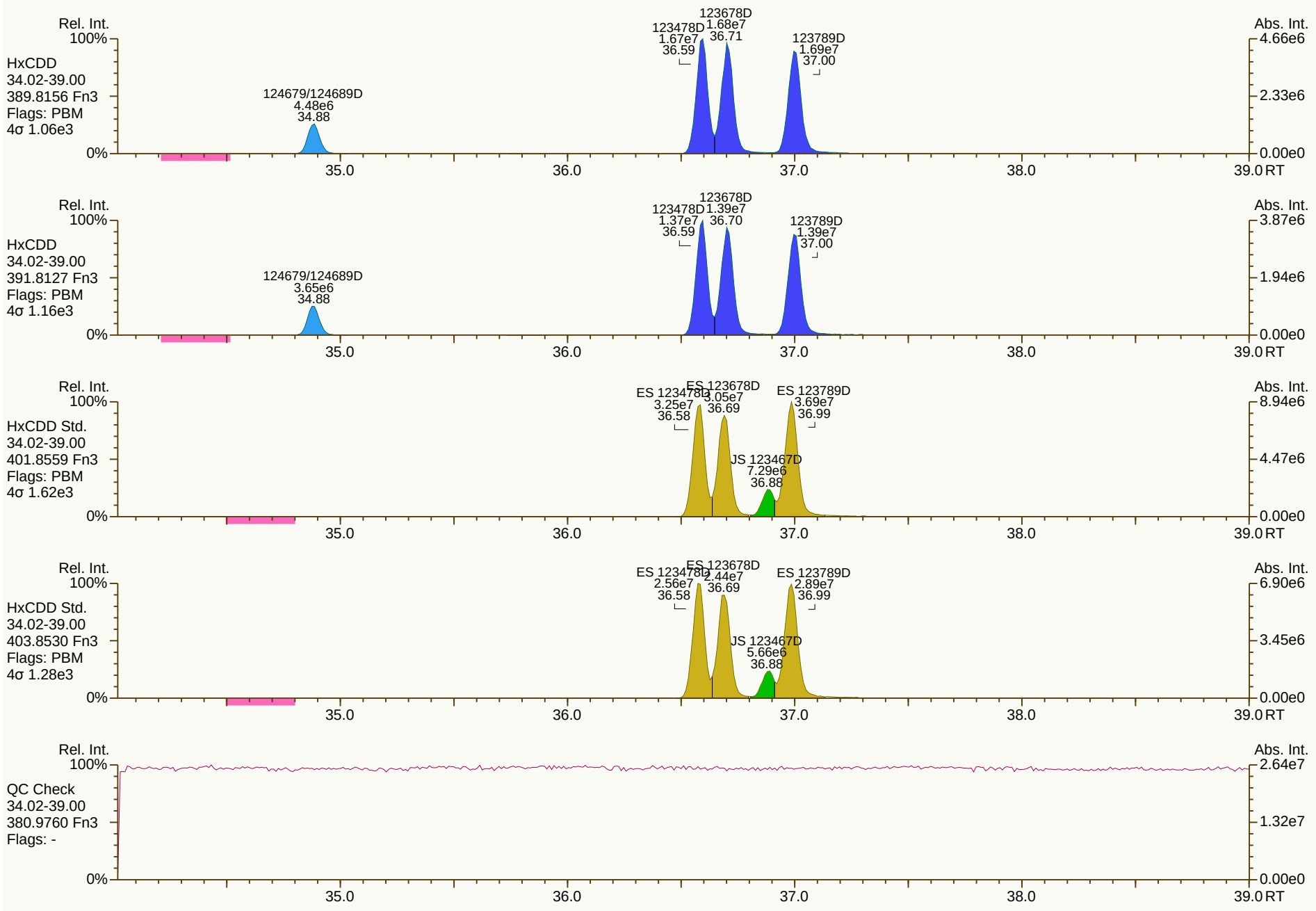
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 3513, 3707, 8572 scc: 214-053 *PKD: 12-Oct-2014 13:17 Printed: 12-Oct-2014 13:31 Page 2 of 12*

SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\BCS3_12600_DF_PB.utp_res, saved 12-Oct-2014 13:26 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 5037, 4693 scc: 214-053 *PKD: 12-Oct-2014 13:17 Printed: 12-Oct-2014 13:31 Page 3 of 12*

SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



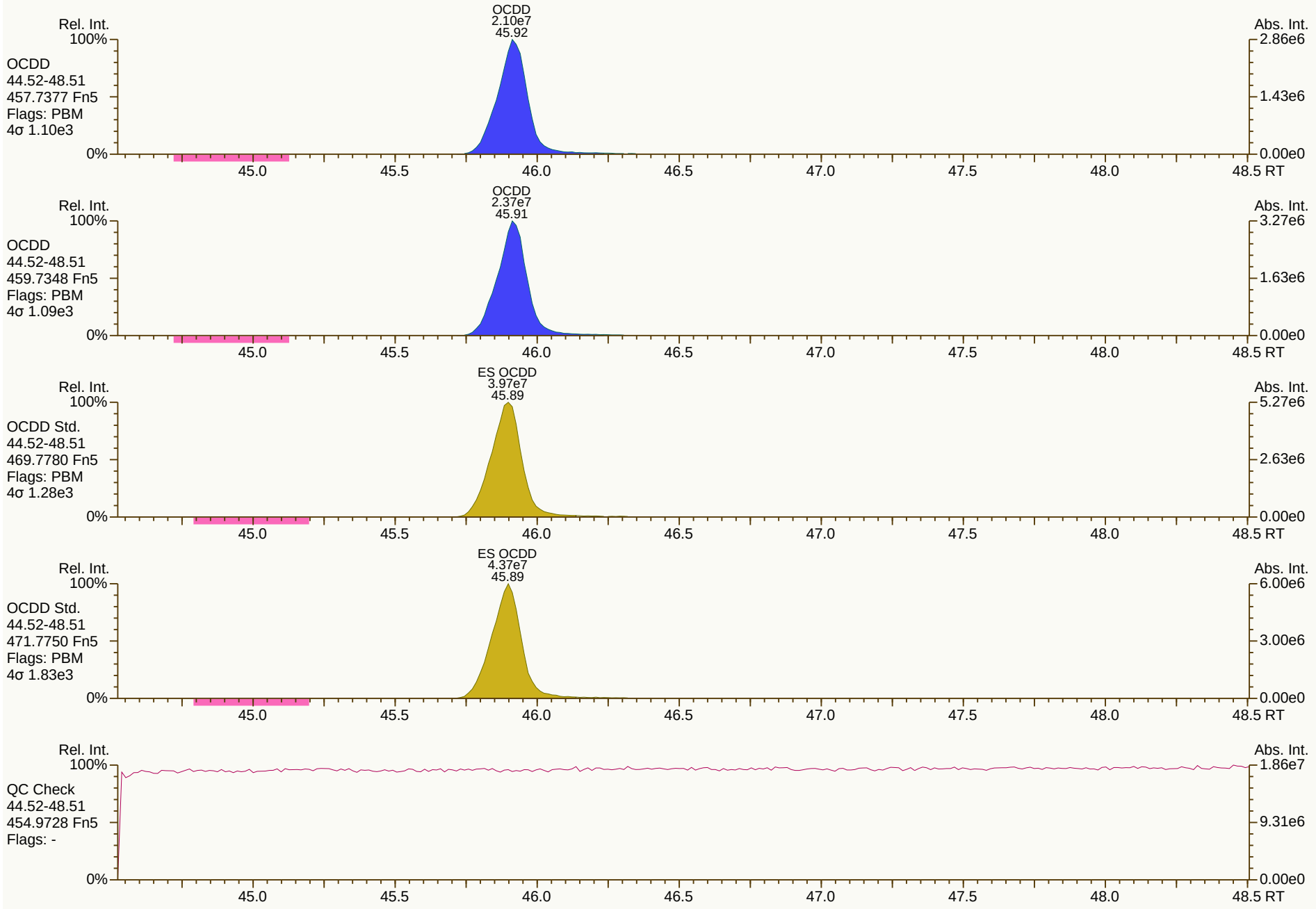
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 3680, 8225 scc: 214-053 *PKD: 12-Oct-2014 13:17 Printed: 12-Oct-2014 13:31 Page 4 of 12*

SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



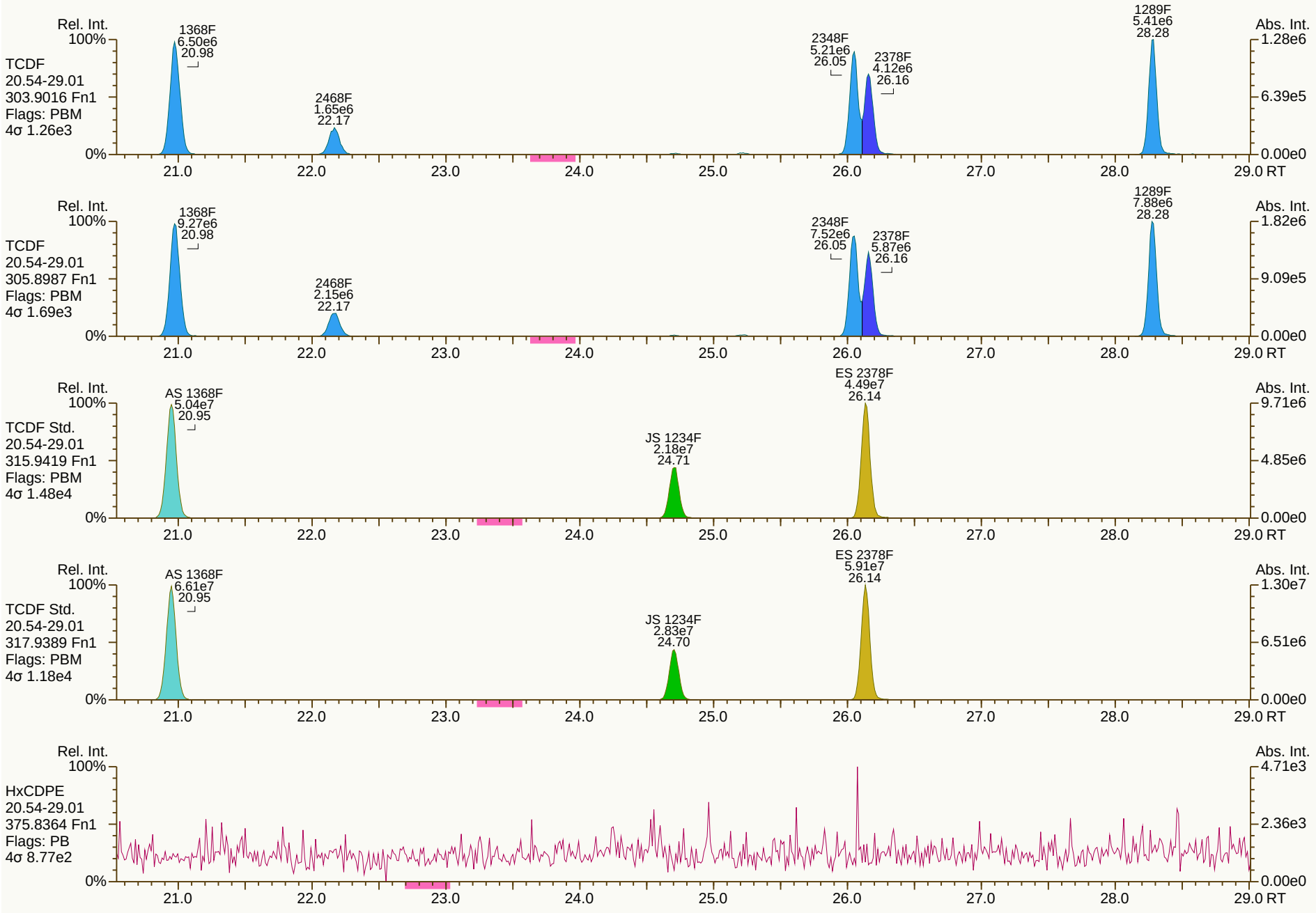
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 0963, 8932 scc: 214-053 *Revised: 12-Oct-2014 13:18 (ACC) Printed: 12-Oct-2014 13:31 Page 5 of 12*

SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\BCS3_12600_DF_PB.utp_res, saved 12-Oct-2014 13:26 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 9471, 9649 scc: 214-053 *Revised: 12-Oct-2014 08:11 (ACC) Printed: 12-Oct-2014 13:31 Page 6 of 12*

SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



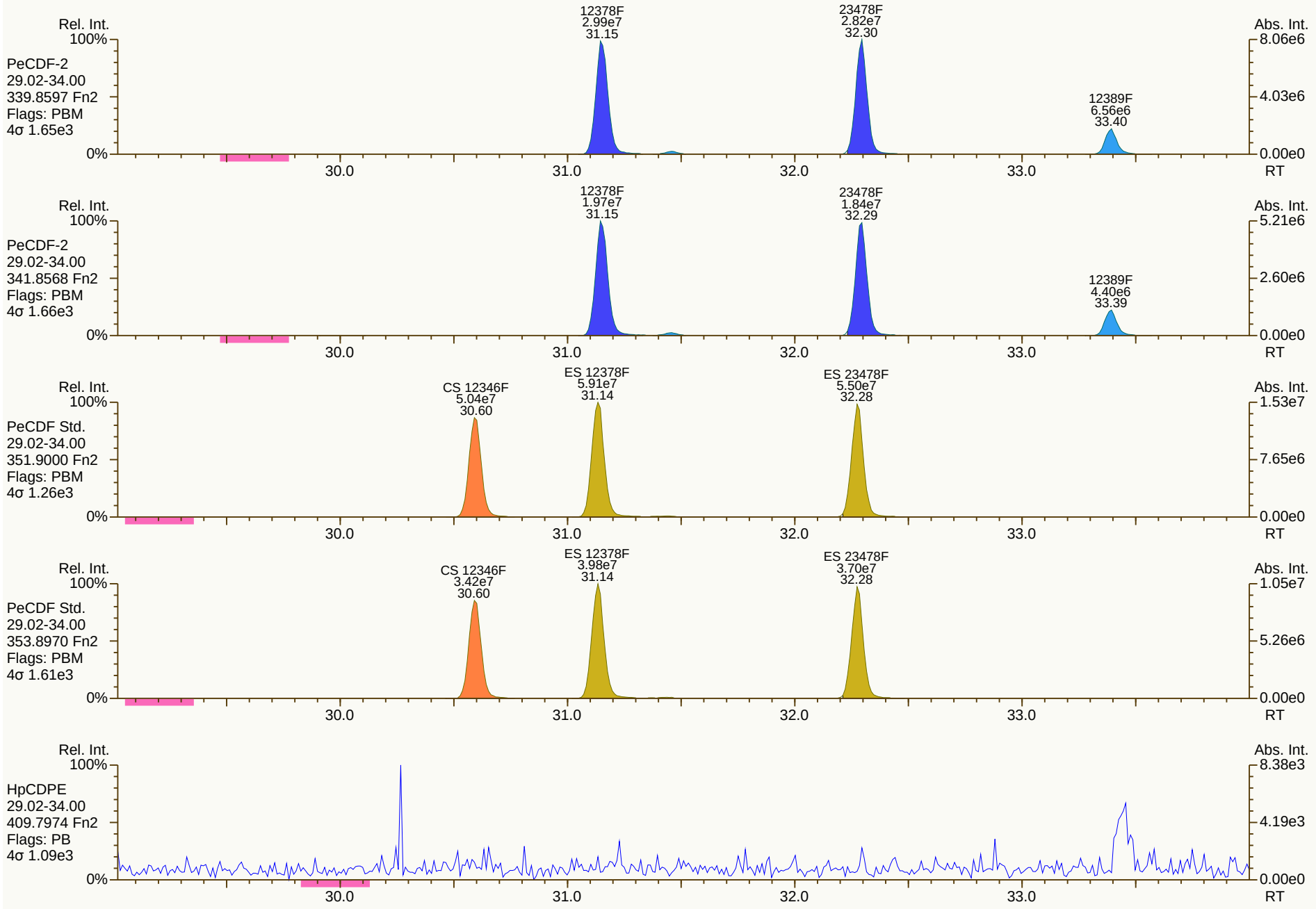
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SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



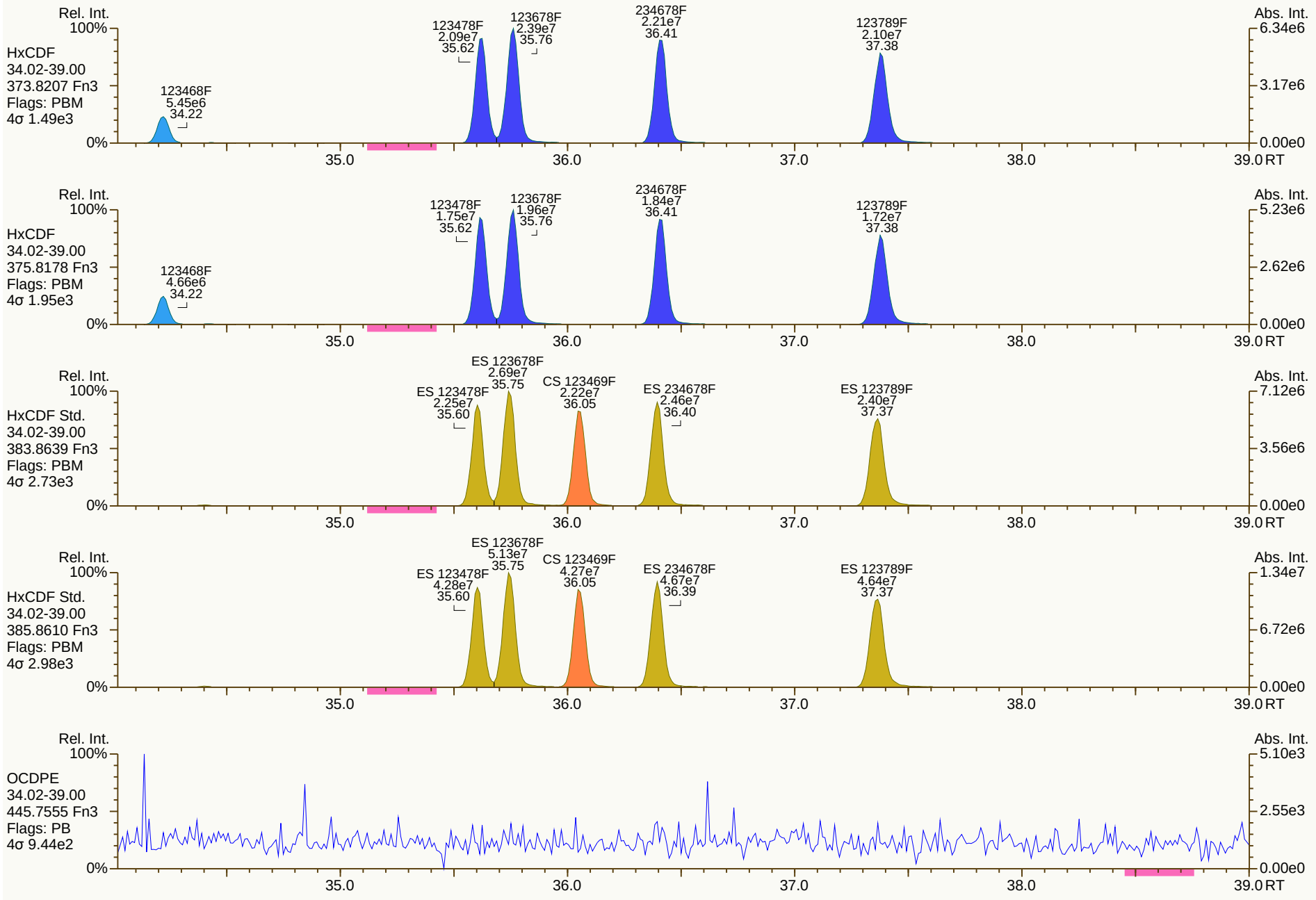
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 1166 scc: 214-053 *PKD: 12-Oct-2014 13:17 Printed: 12-Oct-2014 13:31 Page 8 of 12*

SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



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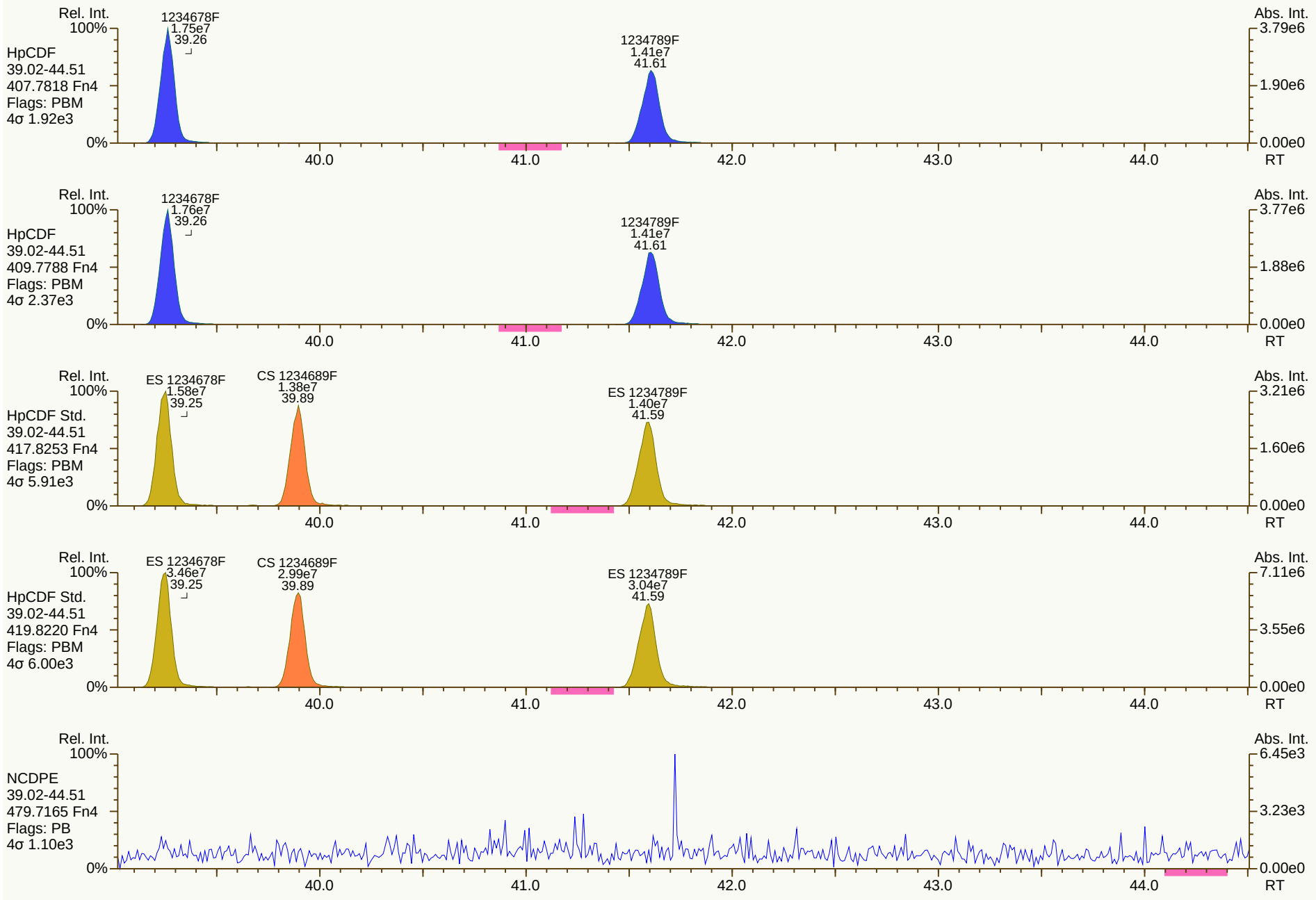
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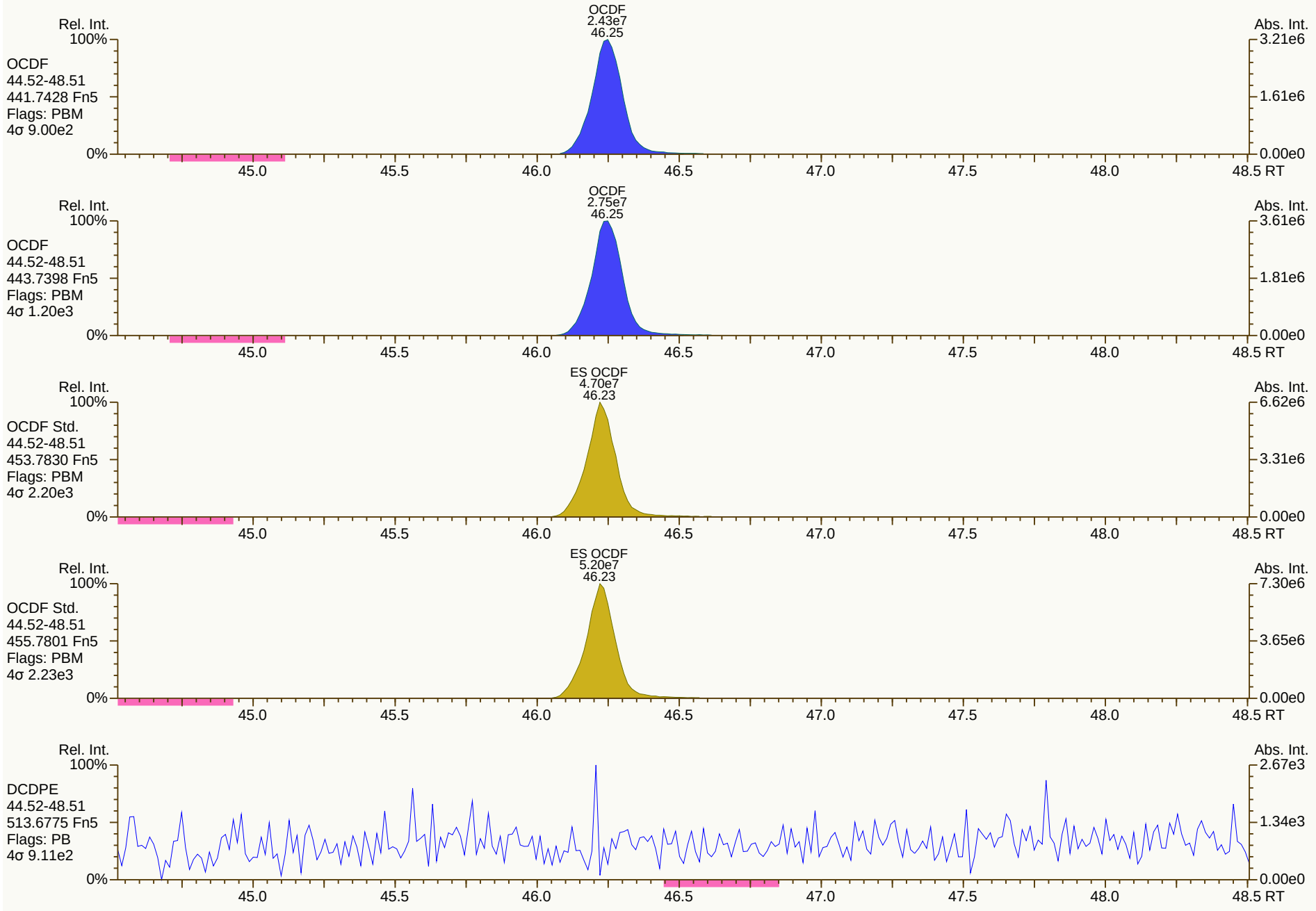
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SGS ID: BCS3_12600_DF_PB **Sample ID: BCS3_12600_DF_PB** **Acq: 10-Oct-2014 03:03:30**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 15** **User: ACC Datafile: 141009P11**



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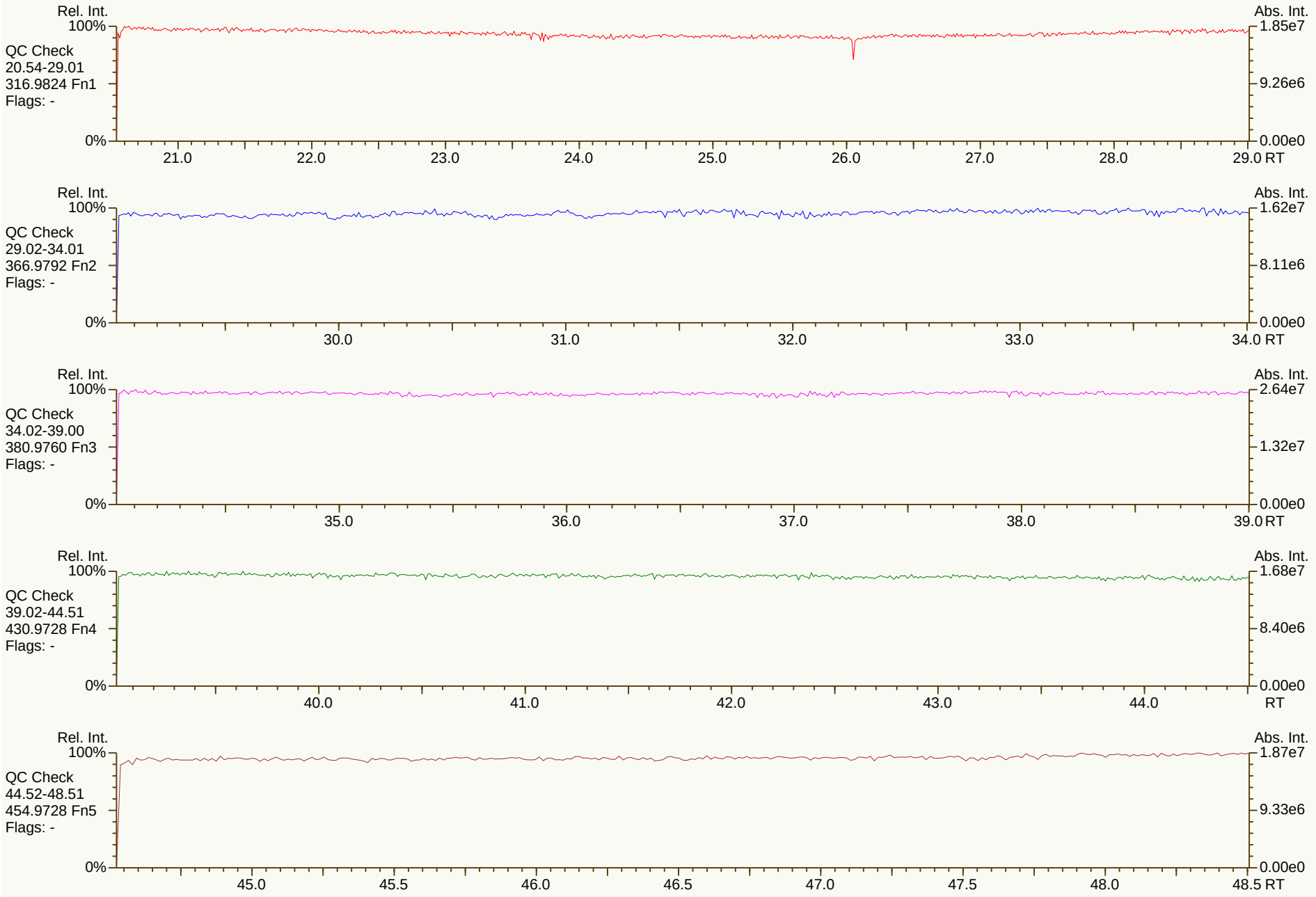
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 1873, 7727, 1895 scc: 214-053 *Revised: 12-Oct-2014 08:10 (ACC) Printed: 12-Oct-2014 13:31 Page 12 of 12*

SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



Results: P:\A7100_A7199\A7185\A7185_12600 DF\Resources\SBS_141009_DF_PA.utp_res, saved 12-Oct-2014 13:05 (ACC) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 scc: 743-599 *PKD: n/a Printed: 12-Oct-2014 13:29 Page 1 of 12*

SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 3123, 5278, 7072 scc: 743-599 *PKD: 12-Oct-2014 08:06 Printed: 12-Oct-2014 13:29 Page 2 of 12*

SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**

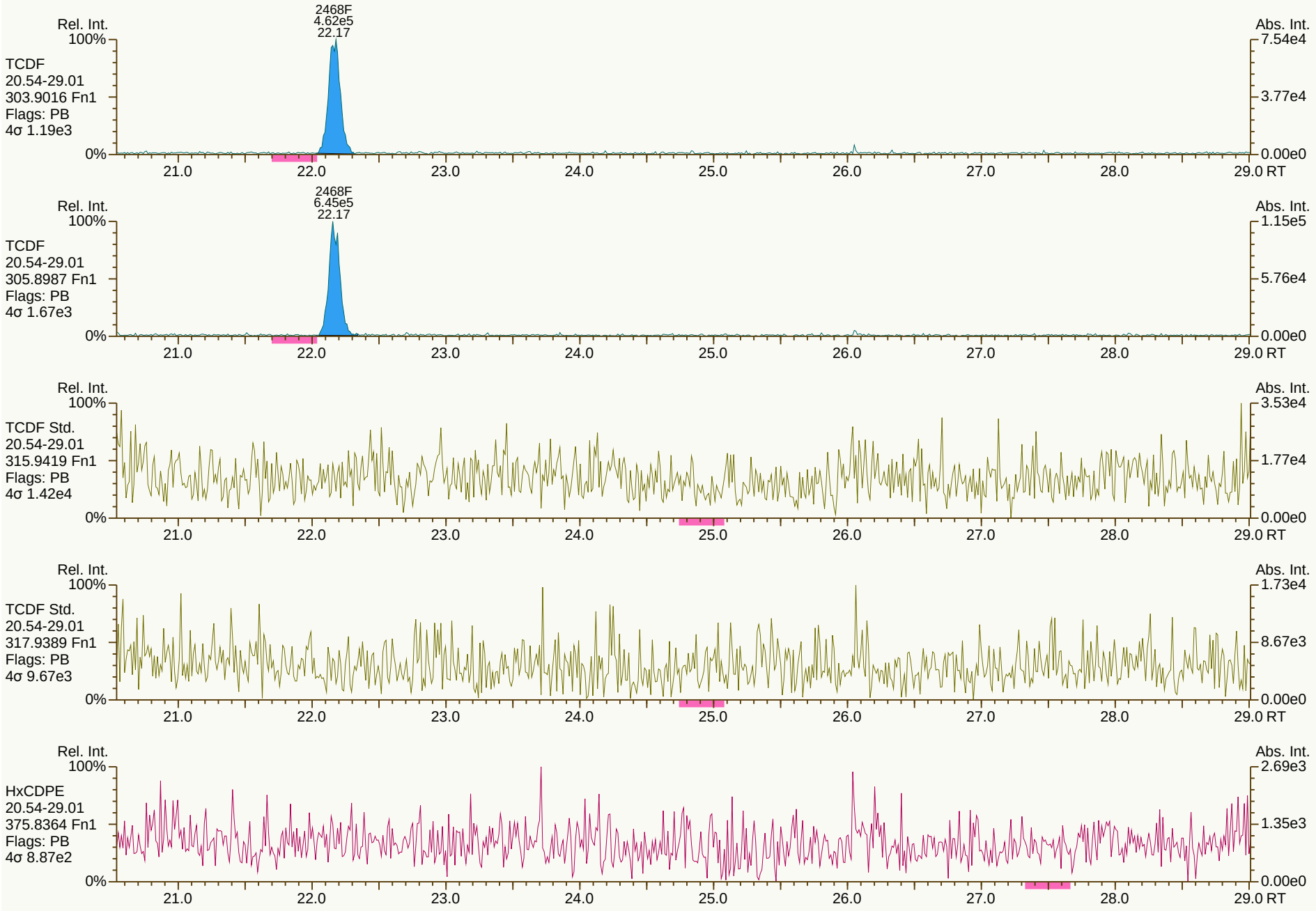


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SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



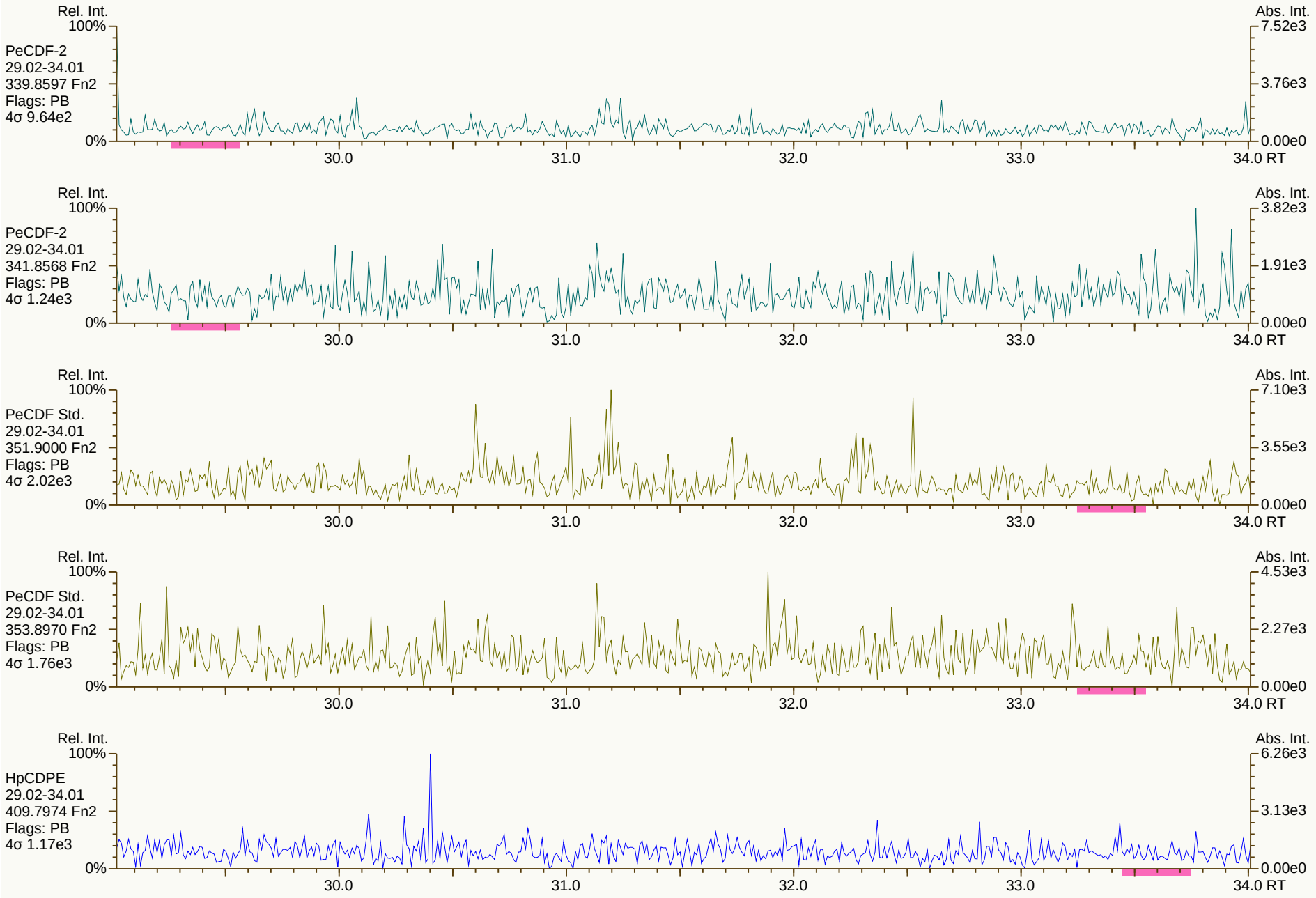
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 1004, 4362, 7907 scc: 743-599 *Revised: 12-Oct-2014 08:06 (ACC) Printed: 12-Oct-2014 13:29 Page 7 of 12*

SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



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SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
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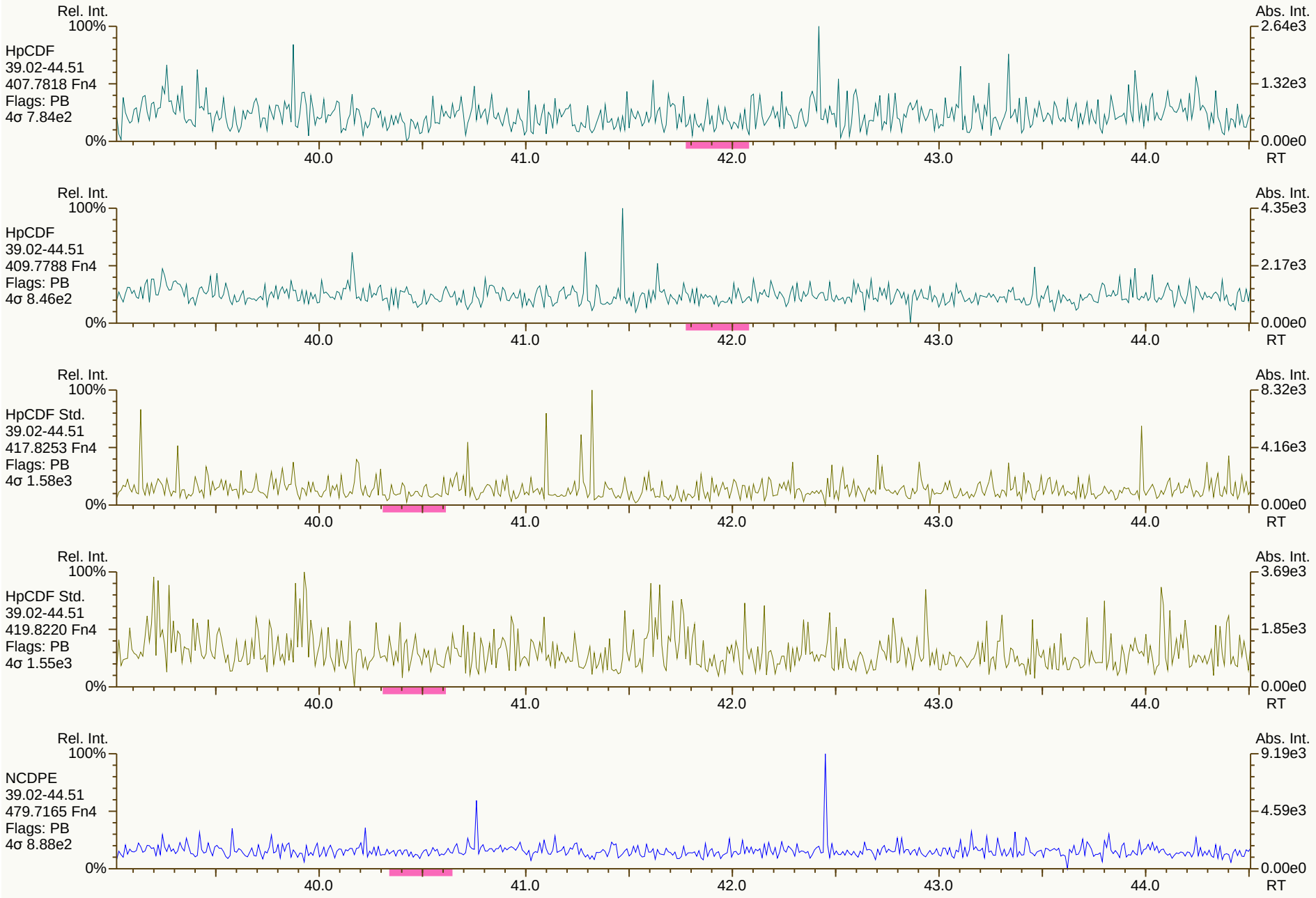
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 8688, 9314, 3487 scc: 743-599 *Revised: 12-Oct-2014 08:06 (ACC) Printed: 12-Oct-2014 13:29 Page 9 of 12*

SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P03**



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SGS ID: SBS_141009_DF_PA **Sample ID: SIL 12-70-1** **Acq: 09-Oct-2014 19:57:21**
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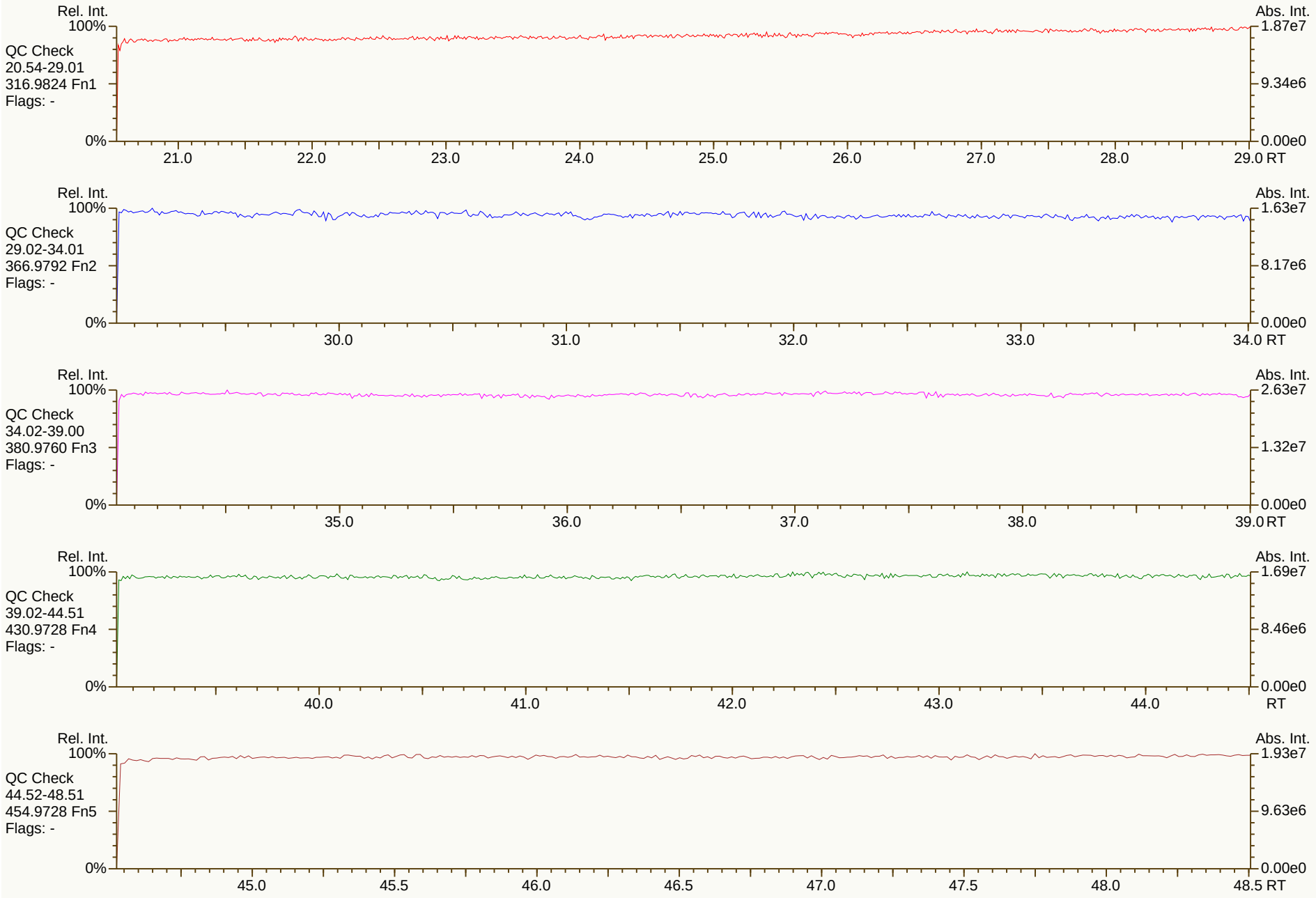


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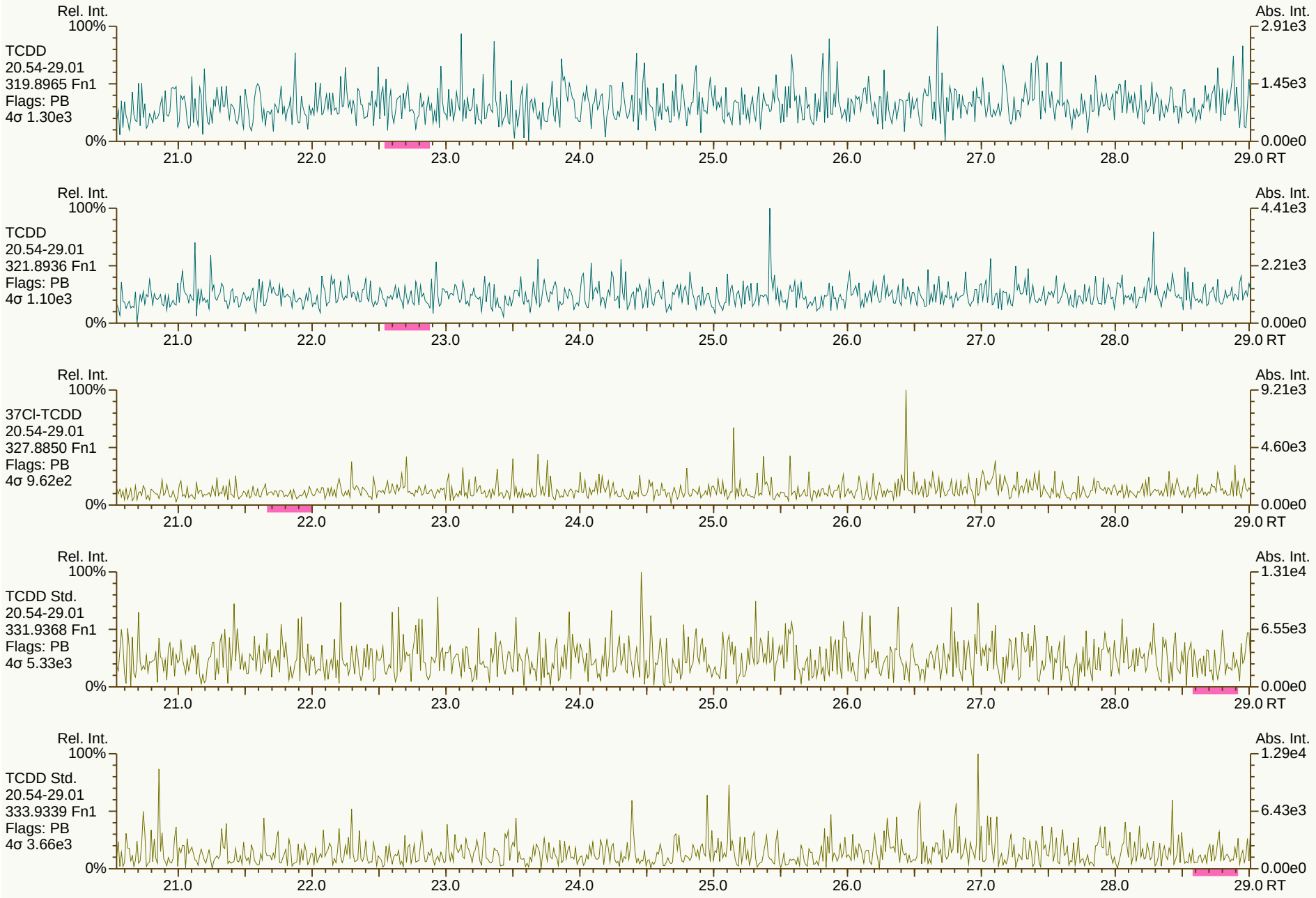
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 6266, 4656, 7249 scc: 743-599 *Revised: 12-Oct-2014 08:06 (ACC) Printed: 12-Oct-2014 13:29 Page 12 of 12*

SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 scc: 307-281 *PKD: n/a Printed: 12-Oct-2014 13:30 Page 1 of 12*

SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 7542, 8859, 9801 scc: 307-281 *Revised: 12-Oct-2014 08:10 (ACC) Printed: 12-Oct-2014 13:30 Page 2 of 12*

SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



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SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



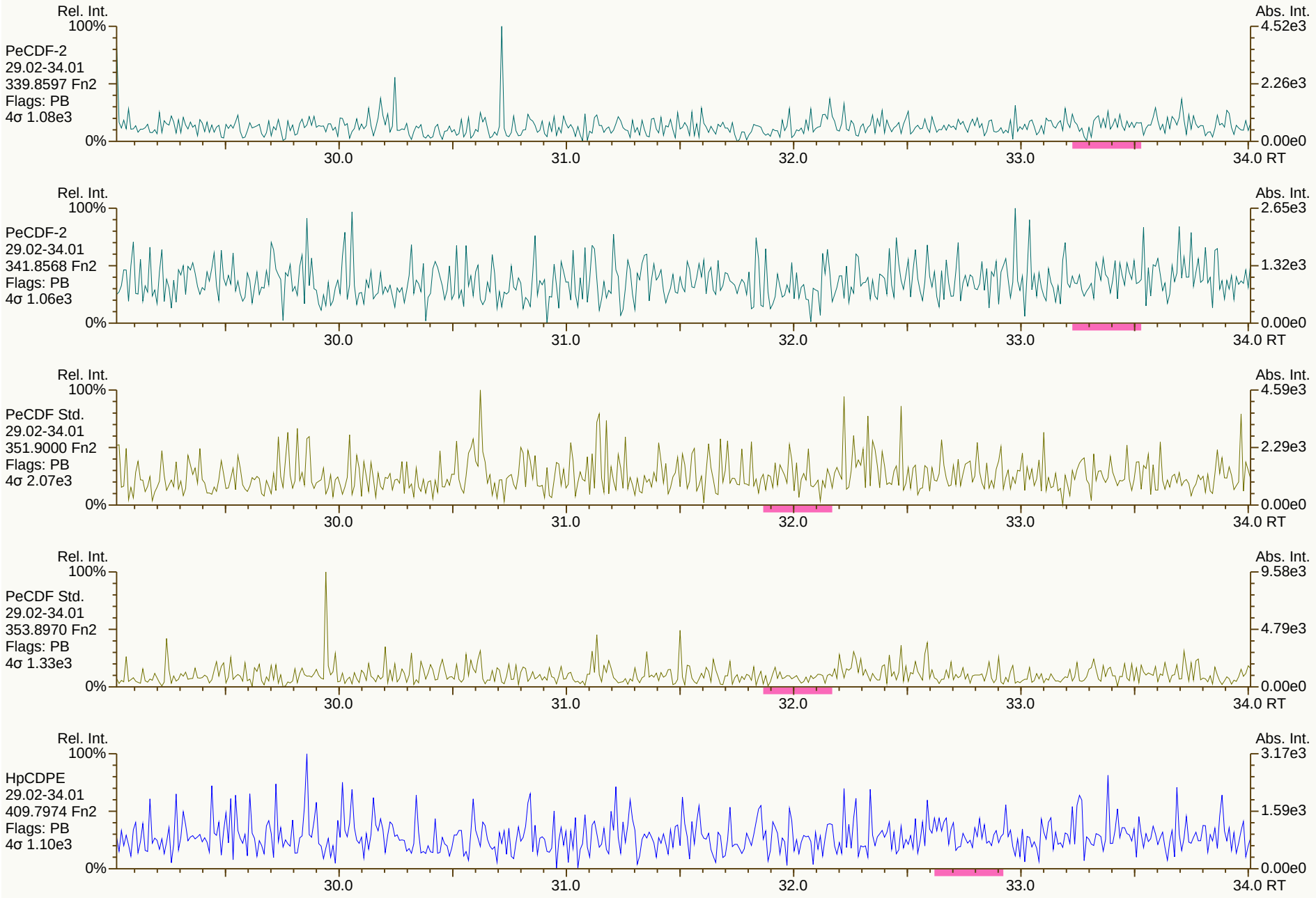
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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 1389, 9546, 6037 scc: 307-281 *Revised: 12-Oct-2014 08:10 (ACC) Printed: 12-Oct-2014 13:31 Page 7 of 12*

SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
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SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



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SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**



SGS ID: SBS_141009_DF_PB **Sample ID: SIL 12-70-1** **Acq: 10-Oct-2014 02:10:13**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 141009P10**

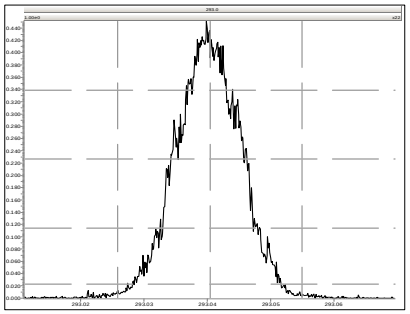


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SGS UltraTrace-Pro V4.86 User/System: ACC/US0006689 cc: 7363, 1909, 4326 scc: 307-281 *Revised: 12-Oct-2014 08:10 (ACC) Printed: 12-Oct-2014 13:31 Page 12 of 12*

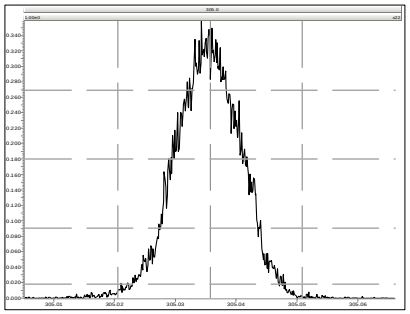
Resolution Check Report **MassLynx 4.1 SCN640** Page 1 of 4

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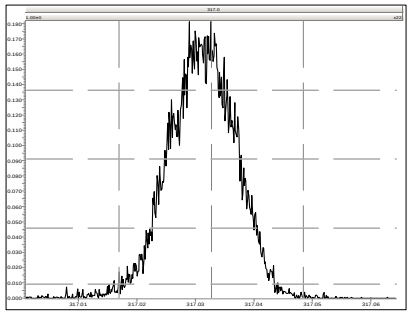
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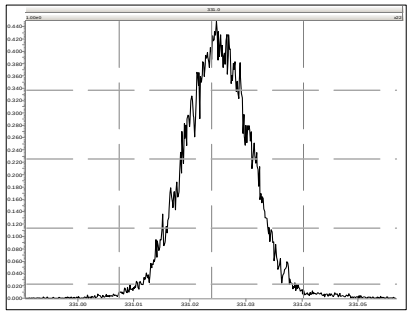
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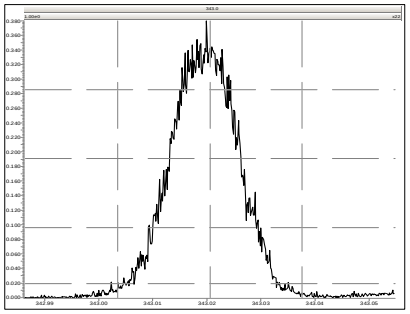
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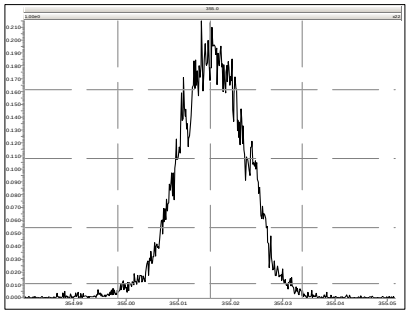
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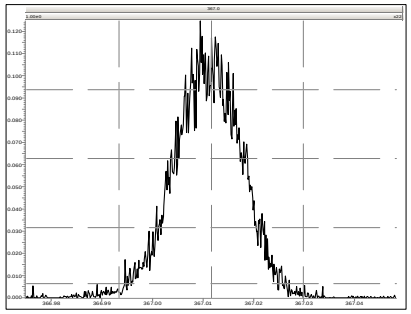
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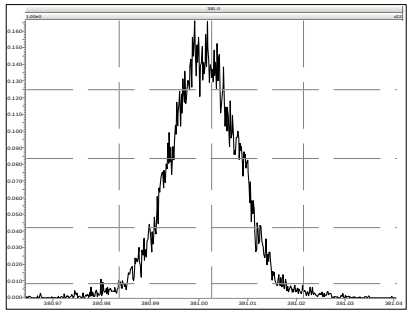
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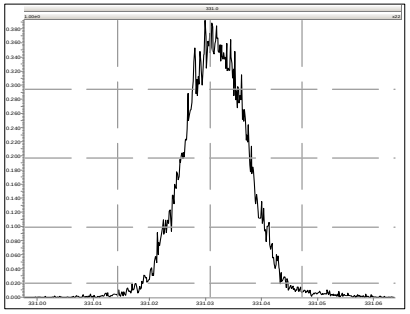
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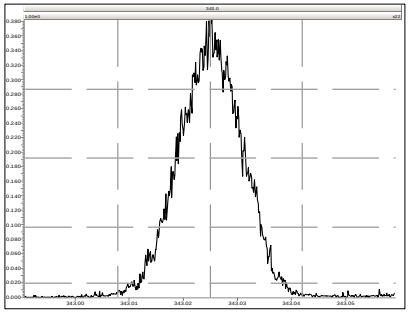
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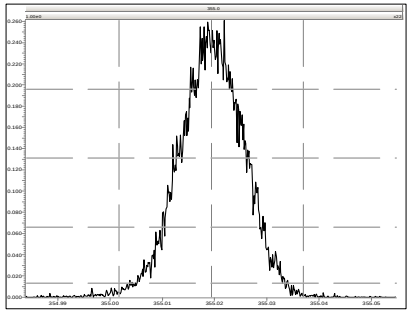
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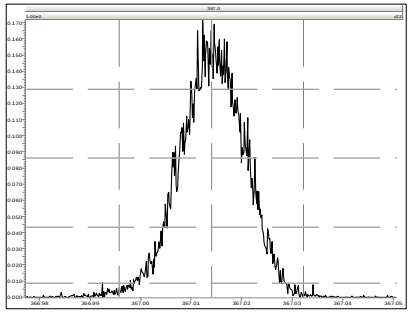
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M 354.9792 R 12659

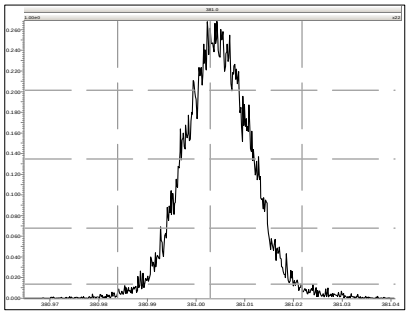


M 366.9792 R 11990

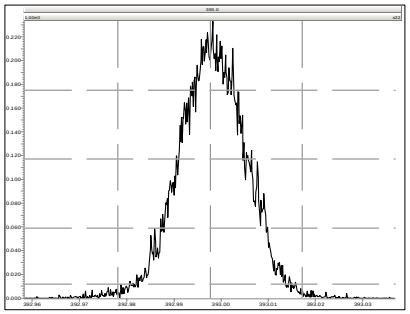


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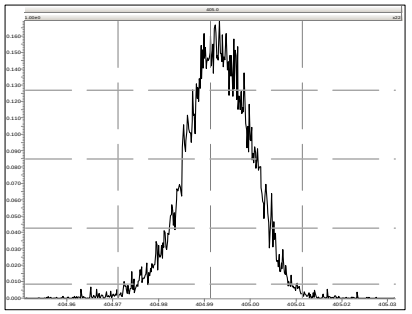
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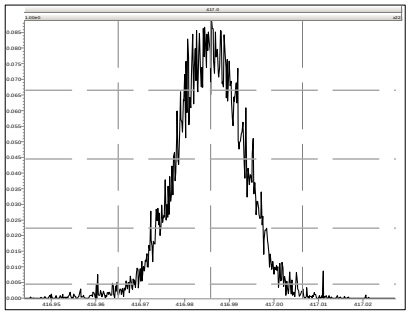
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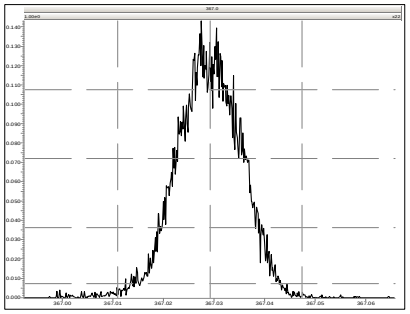
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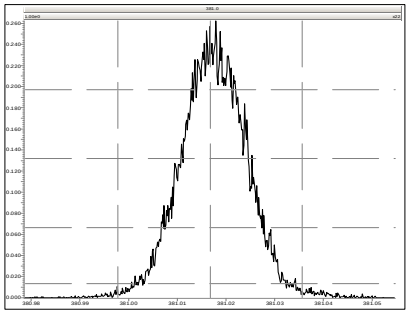
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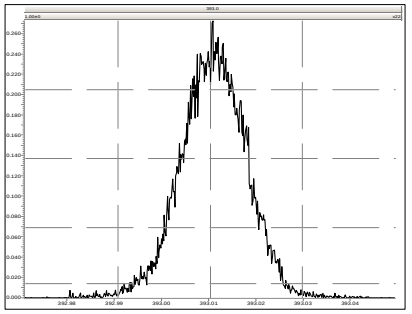
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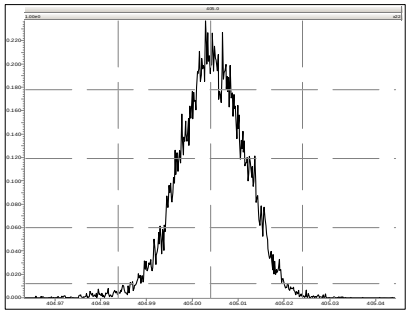
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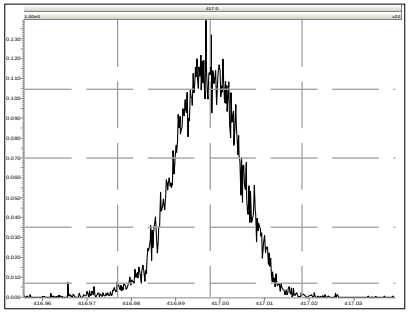
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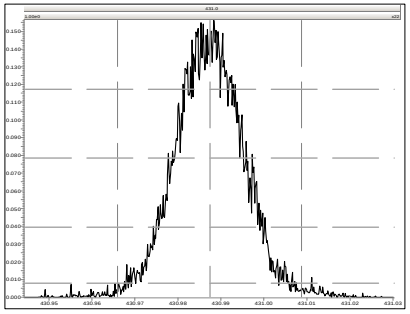
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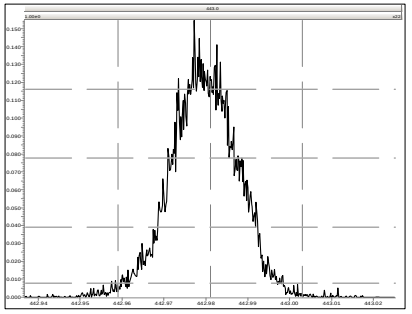
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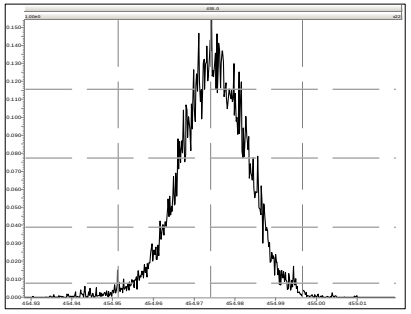
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M 442.9728 R 12322

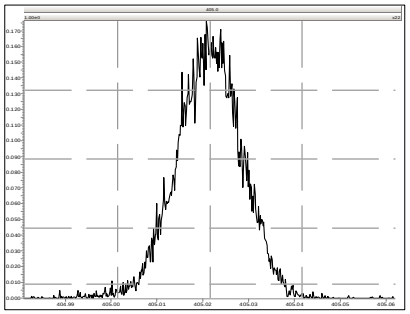


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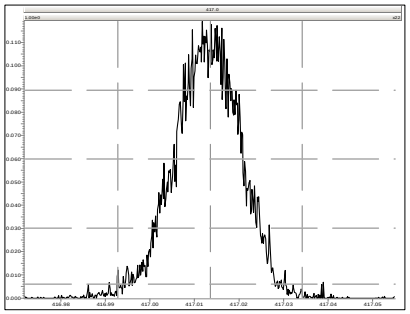


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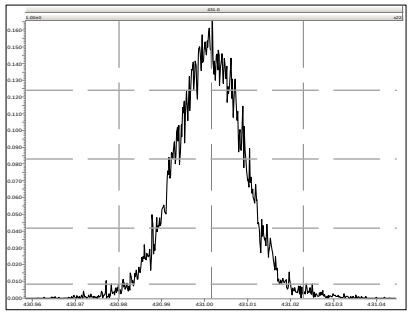
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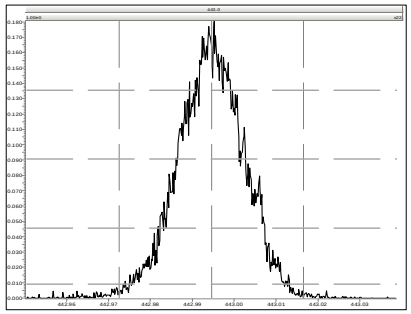
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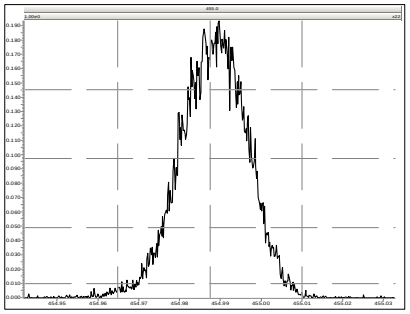
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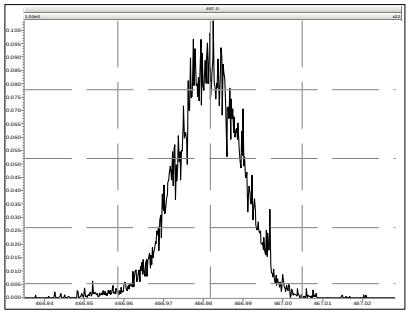
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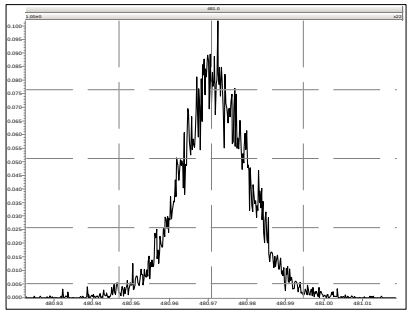
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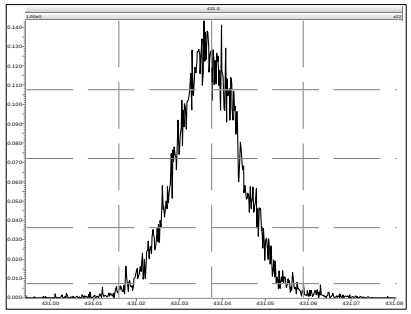
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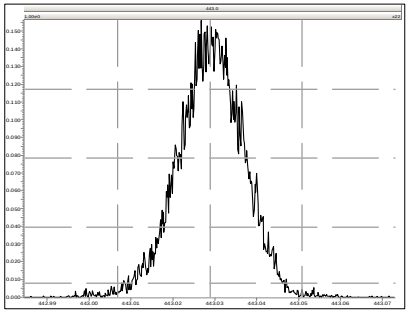
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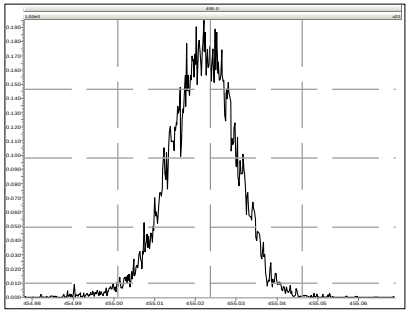
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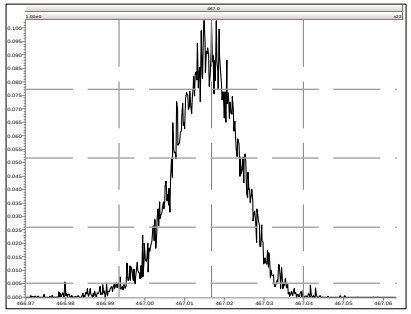
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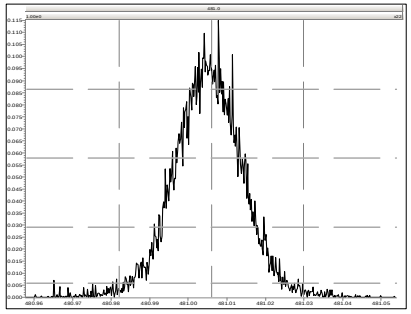
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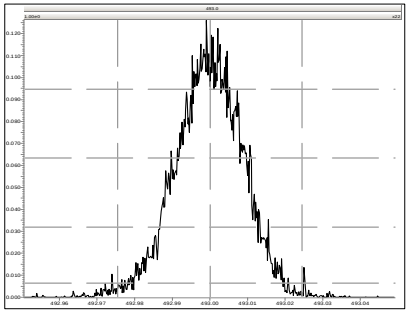


M 480.9696 R 12469

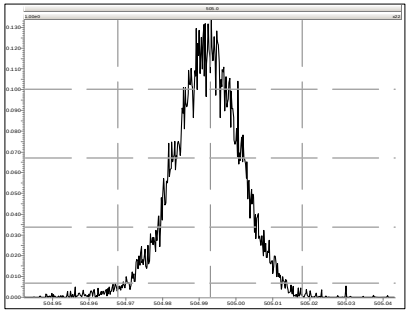


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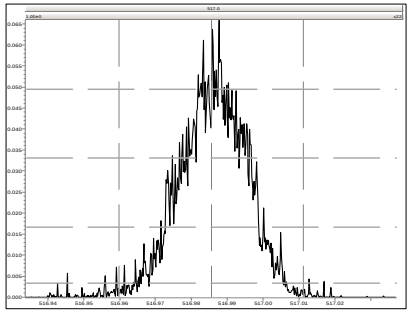
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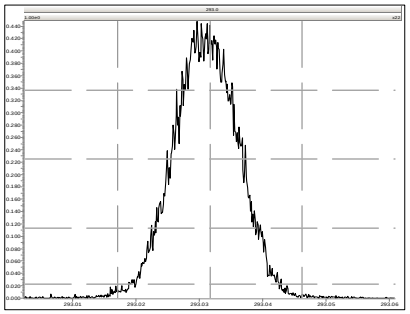
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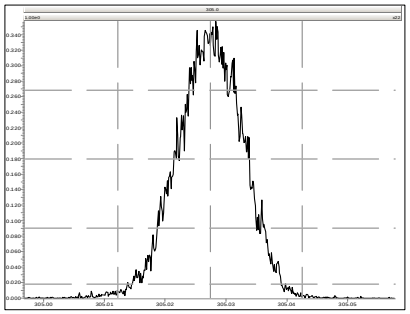
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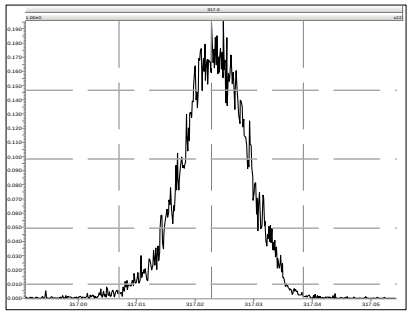
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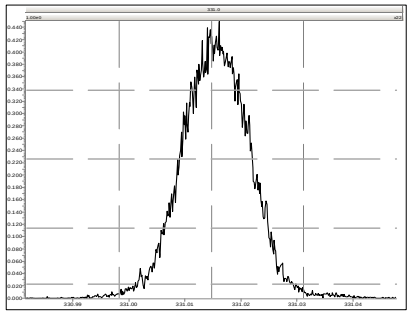
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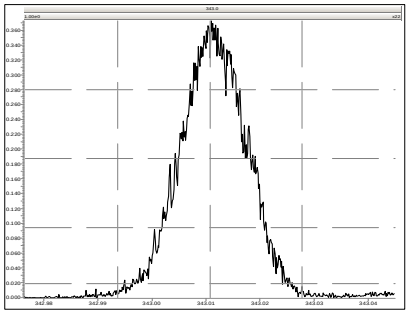
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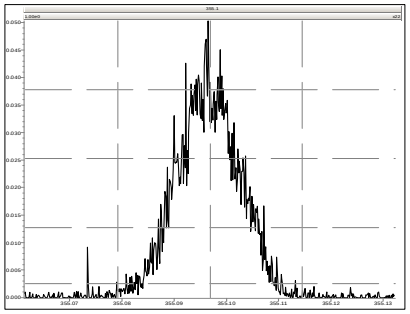
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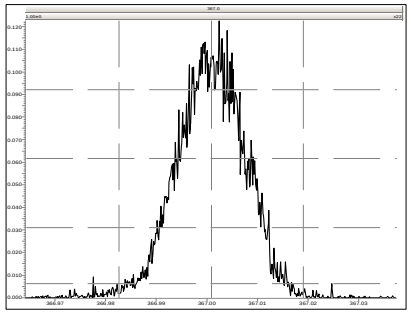
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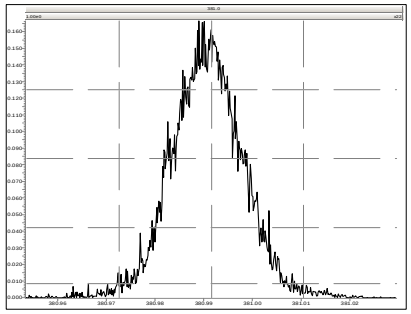
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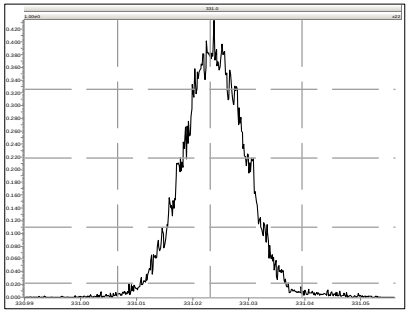
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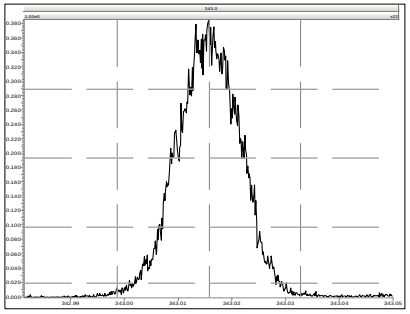
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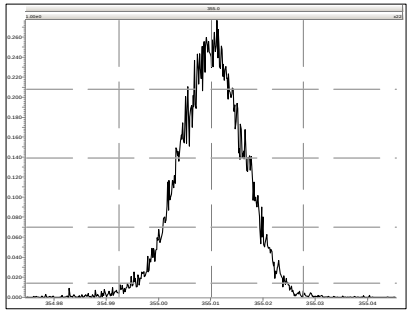
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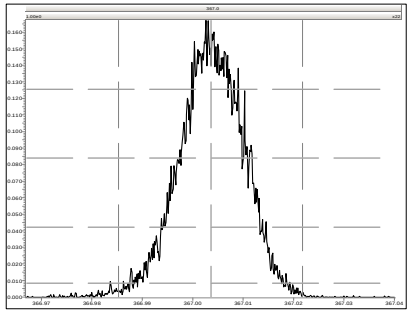
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M 354.9792 R 12820

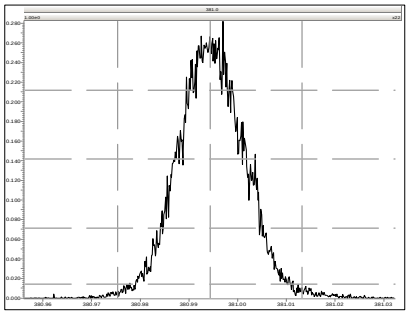


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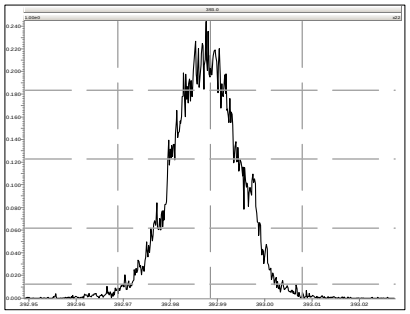


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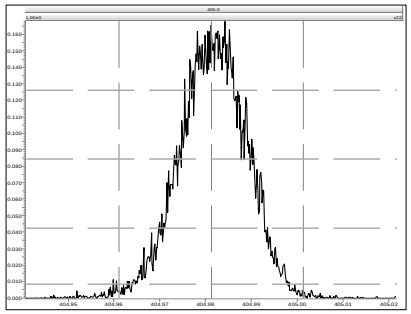
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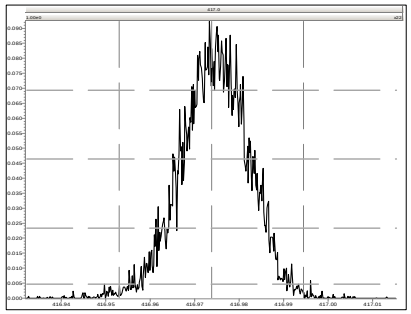
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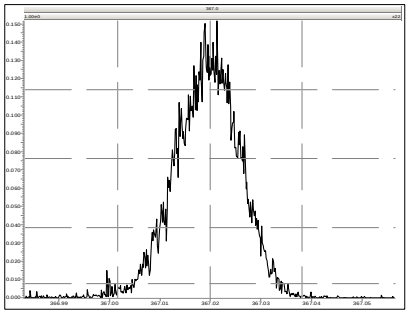
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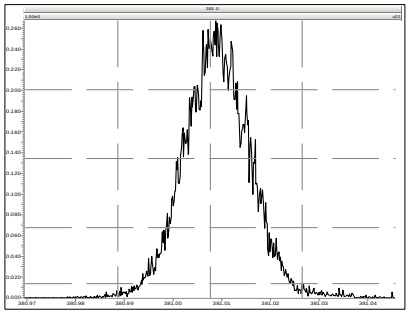
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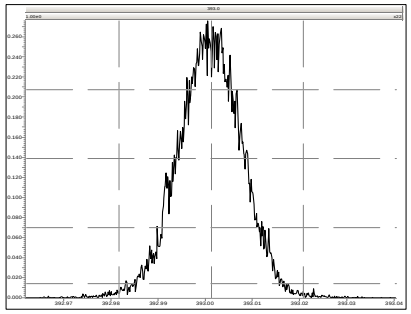
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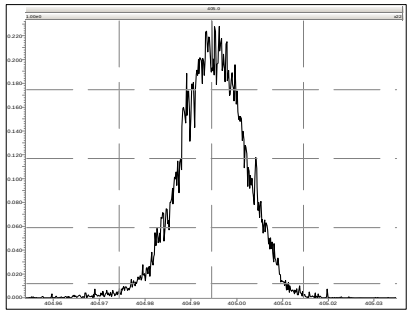
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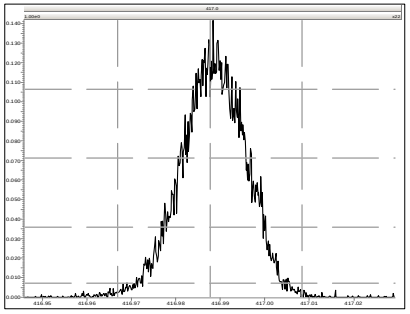
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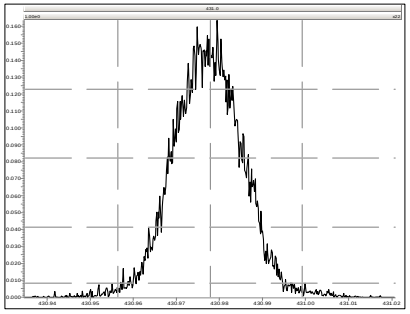
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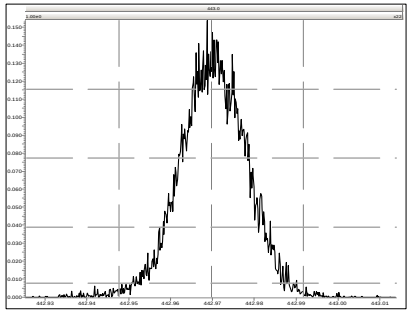
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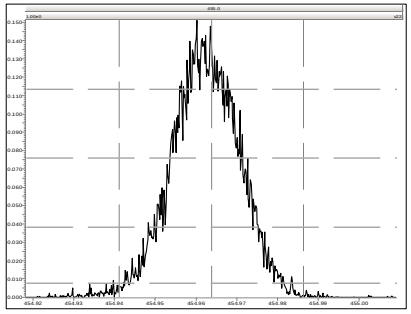
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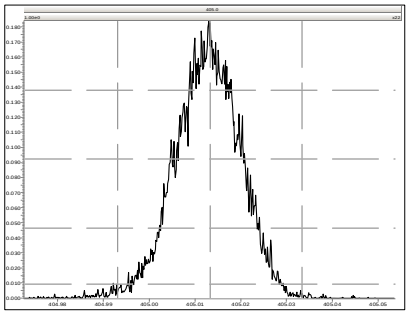
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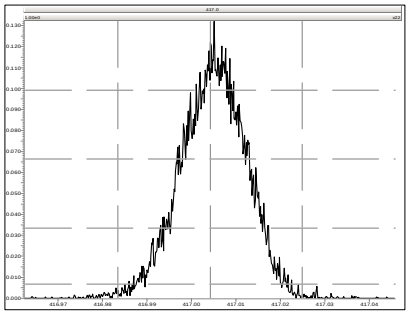
Resolution Check Report **MassLynx 4.1 SCN640**

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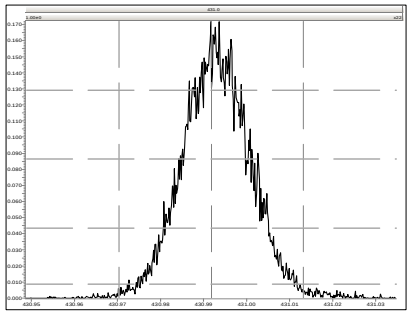
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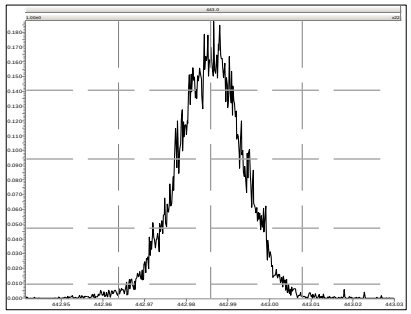
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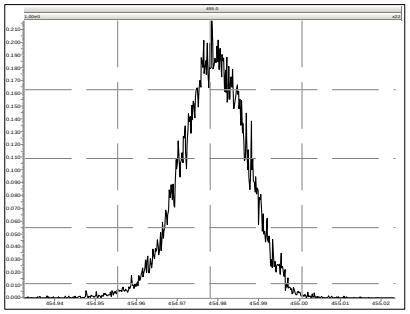
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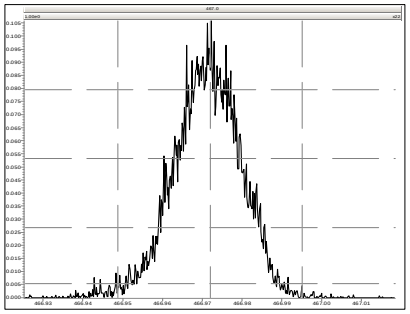
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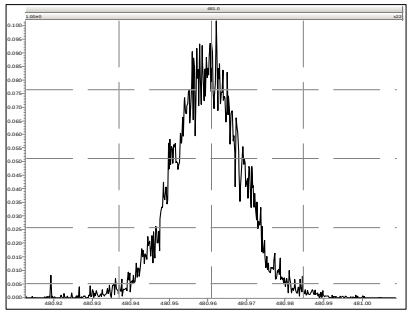
M 454.9728 R 12181



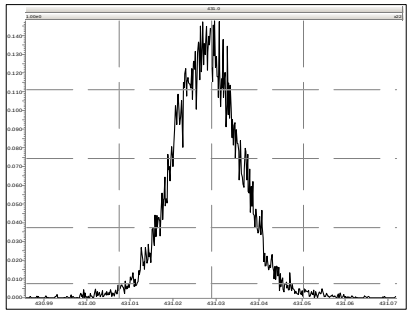
M 466.9728 R 12230



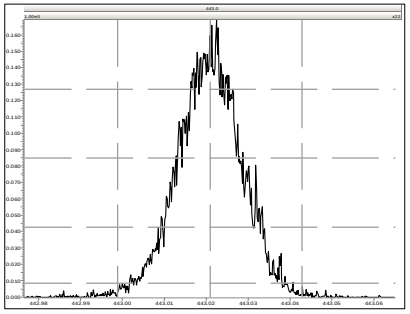
M 480.9696 R 12290



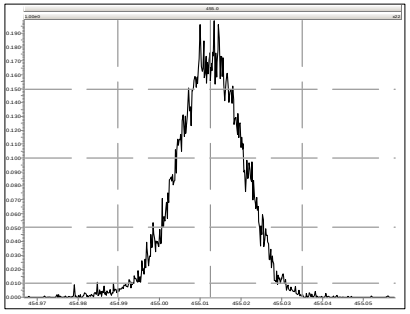
M 430.9728 R 13020



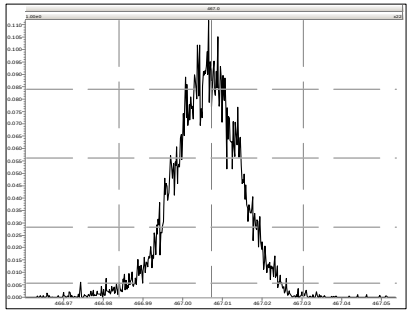
M 442.9728 R 12445



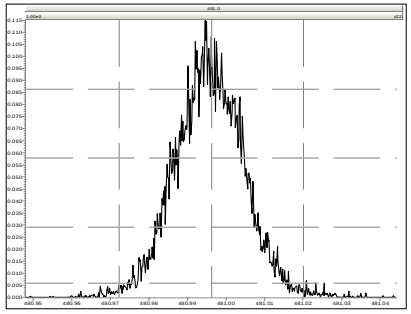
M 454.9728 R 12199



M 466.9728 R 12886

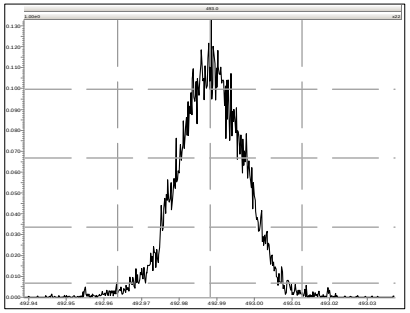


M 480.9696 R 12196

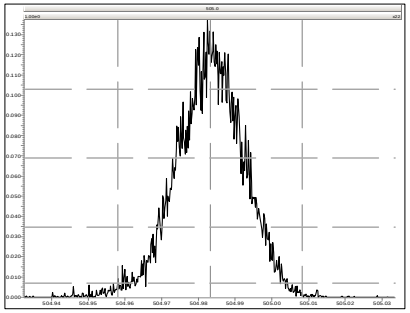


Printed: Friday, October 10, 2014 04:04:43 Eastern Daylight Time

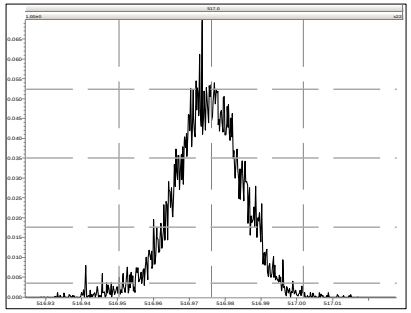
M 492.9696 R 12872



M 504.9696 R 12929



M 516.9697 R 12722



Dioxin/Furan ICAL Summary — SGS Environmental Services — Processed: 19 Sep 2014 10:12

ICAL: MM1_DF_01172014_18SEP2014
Data Acquired: 18-Sep-2014

Name	Mean	% RSD	140918P06 0.25 pg/uL CS0	140918P07 0.5 pg/uL CS1	140918P08 2.0 pg/uL CS2	140918P09 10 pg/uL CS3	140918P10 40 pg/uL CS4	140918P11 200 pg/uL CS5	140918P12 500 pg/uL CS6
2378-TCDD	1.18	3.7%	1.14	1.16	1.16	1.15	1.17	1.22	1.26
12378-PeCDD	0.99	5.9%	0.94	0.94	0.92	0.99	1.04	1.06	1.05
123478-HxCDD	1.02	4.9%	0.95	0.96	1.04	1.02	1.07	1.07	1.06
123678-HxCDD	1.05	4.8%	1.00	0.97	1.03	1.06	1.10	1.10	1.09
123789-HxCDD	0.96	6.8%	0.88	0.88	0.92	0.96	1.03	1.02	1.01
1234678-HpCDD	0.99	4.7%	0.96	0.91	0.97	1.00	1.03	1.04	1.03
OCDD	1.06	5.1%	1.00	0.97	1.06	1.06	1.07	1.11	1.11
2378-TCDF	0.97	6.0%	0.98	0.94	0.87	0.95	0.99	1.03	1.05
12378-PeCDF	0.98	6.5%	0.88	0.93	0.96	0.97	1.04	1.04	1.05
23478-PeCDF	0.96	6.9%	0.87	0.89	0.92	0.96	1.01	1.03	1.03
123478-HxCDF	1.17	7.8%	1.06	1.05	1.14	1.20	1.23	1.27	1.25
123678-HxCDF	1.09	7.3%	1.04	0.95	1.04	1.12	1.15	1.14	1.16
234678-HxCDF	1.09	6.0%	1.02	1.00	1.07	1.09	1.13	1.17	1.17
123789-HxCDF	1.09	4.5%	1.02	1.05	1.07	1.09	1.11	1.15	1.15
1234678-HpCDF	1.29	6.2%	1.21	1.18	1.24	1.28	1.35	1.37	1.39
1234789-HpCDF	1.22	5.9%	1.15	1.15	1.16	1.24	1.27	1.31	1.30
OCDF	1.00	4.6%	0.94	0.96	0.98	1.00	1.04	1.05	1.06
ES 2378-TCDD	1.08	2.9%	1.05	1.06	1.05	1.07	1.08	1.12	1.12
ES 12378-PeCDD	1.01	6.4%	0.96	0.98	0.98	0.98	0.97	1.06	1.14
ES 123478-HxCDD	1.04	3.8%	1.05	1.04	1.00	0.97	1.03	1.08	1.08
ES 123678-HxCDD	1.01	3.1%	1.01	1.01	1.00	0.95	1.00	1.05	1.03
ES 123789-HxCDD	1.17	4.1%	1.21	1.21	1.17	1.10	1.11	1.20	1.20
ES 1234678-HpCDD	0.86	5.4%	0.86	0.89	0.87	0.80	0.81	0.87	0.94
ES OCDD	0.65	9.9%	0.63	0.70	0.67	0.59	0.57	0.65	0.76
ES 2378-TCDF	1.03	1.8%	1.02	1.01	1.01	1.03	1.02	1.05	1.06
ES 12378-PeCDF	0.94	4.1%	0.91	0.92	0.92	0.92	0.91	0.97	1.01
ES 23478-PeCDF	0.91	4.5%	0.88	0.90	0.89	0.88	0.87	0.94	0.98
ES 123478-HxCDF	1.24	2.5%	1.26	1.24	1.21	1.19	1.24	1.28	1.25
ES 123678-HxCDF	1.44	3.1%	1.45	1.45	1.43	1.37	1.44	1.52	1.45
ES 234678-HxCDF	1.30	2.2%	1.32	1.31	1.29	1.25	1.31	1.34	1.31
ES 123789-HxCDF	1.20	3.6%	1.21	1.20	1.20	1.13	1.17	1.25	1.25
ES 1234678-HpCDF	0.90	4.3%	0.90	0.94	0.91	0.84	0.86	0.92	0.95
ES 1234789-HpCDF	0.75	6.7%	0.74	0.78	0.77	0.69	0.70	0.76	0.83
ES OCDF	0.83	10.2%	0.79	0.88	0.84	0.74	0.72	0.84	0.97

Dioxin/Furan ICAL Summary	SGS Environmental Services	Processed: 19 Sep 2014 10:12

ICAL: MM1_DF_01172014_18SEP2014

Data Acquired: 18-Jun-2009

Name	Mean	% RSD	140918P06 0.25 pg/uL CS0	140918P07 0.5 pg/uL CS1	140918P08 2.0 pg/uL CS2	140918P09 10 pg/uL CS3	140918P10 40 pg/uL CS4	140918P11 200 pg/uL CS5	140918P12 500 pg/uL CS6
CS 37Cl-2378-TCDD	1.28	4.4%	-	1.32	1.21	1.27	1.27	1.35	-
CS 12347-PeCDD	0.96	1.3%	0.96	0.96	0.95	0.94	0.97	0.96	0.98
CS 12346-PeCDF	0.91	1.8%	0.92	0.92	0.88	0.93	0.92	0.92	0.92
CS 123469-HxCDF	1.33	4.2%	1.39	1.37	1.34	1.30	1.35	1.31	1.22
CS 1234689-HpCDF	0.82	7.0%	0.86	0.90	0.86	0.79	0.79	0.77	0.74
SS 37Cl-2378-TCDD	1.19	3.2%	-	1.25	1.15	1.19	1.18	1.20	-
SS 12347-PeCDD	0.95	5.3%	1.00	0.97	0.97	0.96	0.99	0.91	0.86
SS 12346-PeCDF	0.98	4.1%	1.01	0.99	0.96	1.01	1.01	0.94	0.91
SS 123469-HxCDF	0.92	5.1%	0.95	0.95	0.94	0.95	0.94	0.86	0.84
SS 1234689-HpCDF	0.91	7.5%	0.95	0.96	0.95	0.94	0.92	0.84	0.79
AS 1368-TCDD	1.08	1.4%	1.07	1.07	1.07	1.06	1.10	1.09	1.10
AS 1368-TCDF	1.18	0.7%	1.18	1.19	1.17	1.19	1.18	1.19	1.19
OCDD-a	0.07	4.3%	-	-	0.07	0.06	0.07	0.07	0.07
OCDF-a	0.06	2.6%	-	-	0.06	0.06	0.06	0.06	0.06
Totals									
Total TCDD	1.18	3.7%	1.14	1.16	1.16	1.15	1.17	1.22	1.26
Total PeCDD	0.99	5.9%	0.94	0.94	0.92	0.99	1.04	1.06	1.05
Total HxCDD	1.01	5.4%	0.94	0.94	1.00	1.01	1.07	1.06	1.05
Total HpCDD	0.99	4.7%	0.96	0.91	0.97	1.00	1.03	1.04	1.03
Total TCDF	0.97	6.0%	0.98	0.94	0.87	0.95	0.99	1.03	1.05
Total PeCDF	0.97	6.6%	0.88	0.91	0.94	0.96	1.02	1.03	1.04
Total HxCDF	1.11	6.3%	1.04	1.01	1.08	1.12	1.16	1.18	1.18
Total HpCDF	1.26	6.0%	1.18	1.16	1.20	1.26	1.31	1.34	1.34
FS 1278-TCDD	1.28	2.3%	1.31	1.30	1.31	1.29	1.29	1.23	1.26
FS 12478-PeCDD	1.18	4.5%	1.23	1.19	1.22	1.23	1.20	1.12	1.09
FS 123468-HxCDD	1.35	6.0%	1.42	1.37	1.41	1.41	1.37	1.28	1.20
FS 1234679-HpCDD	1.27	7.4%	1.34	1.34	1.32	1.31	1.30	1.19	1.09
TS 1378-TCDD	1.22	2.1%	1.23	1.23	1.23	1.25	1.22	1.17	1.21

8290B ICALs

Ax	MM1-DF-010606-25JAN06	MM1-DF-010606-16MAR06	MM1_SIL4181_20OCT06	MM1_DF_091806B_06NOV06	MM1_DF_091806B_14MAR07	MM1_DF_091806B_31MAR07	MM1_DF_091806B_16APR07	MM1_DF_07012007A_06Aug07
2,3,7,8-TCDD	1	1.06	1.12	1.13	1.03	1.18	1.1	1.13
1,2,3,7,8-PeCDD	0.88	0.93	1.1	0.94	0.9	0.93	0.97	0.99
1,2,3,4,7,8-HxCDD	0.92	1	1.2	1.1	0.98	1.1	1.13	1.12
1,2,3,6,7,8-HxCDD	0.93	1.03	1.06	1.03	0.94	1.03	1.04	1
1,2,3,7,8,9-HxCDD	0.91	0.99	1.07	1	0.9	1.03	1	1.08
1,2,3,4,6,7,8-HpCDD	0.83	0.9	1.08	0.87	0.75	0.94	0.91	0.98
OCDD	0.98	1.04	1.1	0.9	0.81	0.93	0.94	1.1
2,3,7,8-TCDF	0.86	0.99	1.09	1.05	0.97	1.07	1.03	1.04
1,2,3,7,8-PeCDF	0.79	0.89	1.18	0.9	0.83	0.97	0.96	0.96
2,3,4,7,8-PeCDF	0.94	1.08	1.15	0.94	0.87	1	0.99	1
1,2,3,4,7,8-HxCDF	1.02	1.17	1.30	1.03	0.96	1.11	1.13	1.22
1,2,3,6,7,8-HxCDF	0.99	1.12	1.27	1.02	0.94	1.12	1.12	1.17
2,3,4,6,7,8-HxCDF	0.95	1.1	1.24	0.99	0.9	1.07	1.06	1.14
1,2,3,7,8,9-HxCDF	1.03	1.19	1.24	1.03	0.94	1.12	1.12	1.14
1,2,3,4,6,7,8-HpCDF	1.17	1.32	1.46	1.15	0.99	1.18	1.2	1.39
1,2,3,4,7,8,9-HpCDF	1.22	1.37	1.51	1.16	1	1.21	1.2	1.37
OCDF	0.86	0.99	1.07	0.78	0.72	0.86	0.83	0.95
ES								
2,3,7,8-TCDD	1.03	1.03	1.05	1.11	1.1	1.12	1.09	1.05
1,2,3,7,8-PeCDD	0.77	0.83	0.95	1.05	1.02	1	1.02	0.92
1,2,3,4,7,8-HxCDD	1.06	1.09	1.19	1.06	1.04	1.1	1.06	1.09
1,2,3,6,7,8-HxCDD	1.22	1.2	1.3	1.16	1.19	1.16	1.2	1.13
1,2,3,7,8,9-HxCDD	1.26	1.22	1.35	1.24	1.25	1.23	1.25	1.17
1,2,3,4,6,7,8-HpCDD	0.92	0.94	1.11	1.17	1.04	1.01	1.09	1.03
OCDD	0.7	0.68	0.86	0.98	0.8	0.72	0.83	0.68
2,3,7,8-TCDF	0.94	0.96	1.02	1.04	0.97	1.04	1	0.99
1,2,3,7,8-PeCDF	0.73	0.8	0.96	1.05	1.01	0.91	0.9	0.91
2,3,4,7,8-PeCDF	0.67	0.73	0.96	1.05	1.04	0.94	1	0.89
1,2,3,4,7,8-HxCDF	1.24	1.4	1.58	1.65	1.39	1.73	1.64	1.57
1,2,3,6,7,8-HxCDF	1.43	1.55	1.79	1.89	1.65	1.86	1.88	1.71
2,3,4,6,7,8-HxCDF	1.32	1.44	1.66	1.71	1.5	1.75	1.74	1.61
1,2,3,7,8,9-HxCDF	1.16	1.29	1.5	1.52	1.26	1.58	1.53	1.45
1,2,3,4,6,7,8-HpCDF	0.86	1.06	1.28	1.3	1.03	1.28	1.32	1.23
1,2,3,4,7,8,9-HpCDF	0.7	0.83	1.04	1.12	0.85	1.04	1.11	1.01
OCDF	0.85	0.95	1.2	1.39	1.05	1.08	1.26	1.06

8290B ICALs

Ax	MM1_DF_07012007A_26 DEC07	MM1_DF_07012007A_25 DEC08	MM1_DF_SIL4-18-1_22NOV09	MM1_ical_122509	MM1_DF_03312010_25O CT10	MM1_DF_03312010A_25 DEC10	MM1_DF_7MAY11	MM1_DF_6JUN11
2,3,7,8-TCDD	1.14	1.08	1.11	1.23	1.27	1.21	1.12	1.22
1,2,3,7,8-PeCDD	1.03	1	1.04	1.14	1.16	1.06	0.99	1.03
1,2,3,4,7,8-HxCDD	1.16	1.08	1.19	1.19	1.22	1.17	1.21	1.16
1,2,3,6,7,8-HxCDD	1.04	0.94	1.06	1.09	1.09	1.04	1.05	1.02
1,2,3,7,8,9-HxCDD	1.1	0.99	1.08	1.08	1.12	1.09	1.08	1.06
1,2,3,4,6,7,8-HpCDD	1	0.97	1.05	1.04	1.09	1.03	0.98	1.02
OCDD	1.11	1.06	1.11	1.1	1.11	1.07	0.97	1.06
2,3,7,8-TCDF	1.15	1.05	1.06	1.13	1.24	1.14	1.00	1.09
1,2,3,7,8-PeCDF	1.05	0.98	1.14	1.16	1.10	1.01	0.95	1.00
2,3,4,7,8-PeCDF	1.09	1.01	1.1	1.13	1.20	1.10	1.02	1.08
1,2,3,4,7,8-HxCDF	1.28	1.22	1.26	1.26	1.34	1.27	1.18	1.25
1,2,3,6,7,8-HxCDF	1.2	1.15	1.24	1.25	1.33	1.24	1.15	1.22
2,3,4,6,7,8-HxCDF	1.18	1.13	1.19	1.18	1.27	1.18	1.09	1.16
1,2,3,7,8,9-HxCDF	1.19	1.12	1.23	1.2	1.32	1.22	1.13	1.20
1,2,3,4,6,7,8-HpCDF	1.42	1.37	1.41	1.39	1.44	1.39	1.29	1.44
1,2,3,4,7,8,9-HpCDF	1.4	1.32	1.46	1.42	1.52	1.43	1.34	1.48
OCDF	0.97	0.94	1.03	1.01	1.09	1.01	0.95	0.99
ES								
2,3,7,8-TCDD	1.02	0.99	1.04	1.04	1.04	1.05	1.01	1.02
1,2,3,7,8-PeCDD	0.96	0.83	0.91	0.96	1.11	0.98	0.78	0.94
1,2,3,4,7,8-HxCDD	1.12	1.08	1	1.01	1.02	1.05	1.00	1.02
1,2,3,6,7,8-HxCDD	1.23	1.23	1.14	1.14	1.18	1.20	1.30	1.21
1,2,3,7,8,9-HxCDD	1.23	1.21	1.14	1.14	1.18	1.19	1.25	1.18
1,2,3,4,6,7,8-HpCDD	1.14	0.98	0.99	0.98	0.99	0.94	0.96	0.88
OCDD	0.72	0.66	0.7	0.76	0.75	0.75	0.76	0.67
2,3,7,8-TCDF	0.94	0.96	1	0.94	1.00	1.00	0.98	1.02
1,2,3,7,8-PeCDF	0.97	0.85	0.93	0.95	1.12	0.92	0.78	0.93
2,3,4,7,8-PeCDF	0.97	0.88	0.94	0.9	1.10	0.90	0.76	0.89
1,2,3,4,7,8-HxCDF	1.66	1.47	1.35	1.5	1.59	1.60	1.55	1.52
1,2,3,6,7,8-HxCDF	1.99	1.78	1.53	1.63	1.76	1.80	1.85	1.80
2,3,4,6,7,8-HxCDF	1.77	1.61	1.45	1.5	1.67	1.67	1.72	1.65
1,2,3,7,8,9-HxCDF	1.57	1.4	1.25	1.32	1.39	1.39	1.37	1.38
1,2,3,4,6,7,8-HpCDF	1.35	1.16	1.17	1.11	1.21	1.20	1.14	1.12
1,2,3,4,7,8,9-HpCDF	1.09	0.92	0.93	0.92	1.03	0.96	0.89	0.90
OCDF	1.16	1.04	1.02	1.07	1.16	1.14	1.05	1.03

8290B ICALs

Ax	MM1_DF_03312010A_13 SEP11	MM1_DF_03312010A_23 SEP11	MM1_11012012A_DF_13 FEB2013	MM1_DF_01172014_24A PR2014	MM1_DF_01172014_18JU L2014	MM1_DF_01172014_18S EP2014	RSD	Mean	sd
2,3,7,8-TCDD	1.19	1.14	1.06	1.08	1.17	1.18	5.5	1.14	0.06
1,2,3,7,8-PeCDD	1.07	1.03	0.94	0.99	1.03	0.99	6.3	1.01	0.06
1,2,3,4,7,8-HxCDD	1.16	1.09	1.02	1.05	1.05	1.02	6.6	1.10	0.07
1,2,3,6,7,8-HxCDD	1.00	1.00	1.04	1.05	1.09	1.05	5.4	1.05	0.06
1,2,3,7,8,9-HxCDD	1.07	1.04	0.98	0.99	1.05	0.96	5.5	1.02	0.06
1,2,3,4,6,7,8-HpCDD	1.02	1.00	1.02	1.01	1.04	0.99	7.3	0.98	0.07
OCDD	1.05	1.07	1.08	1.09	1.14	1.06	7.3	1.03	0.08
2,3,7,8-TCDF	1.07	1.03	0.97	0.99	1.03	0.97	7.2	1.04	0.08
1,2,3,7,8-PeCDF	0.95	0.96	1.00	1.00	1.04	0.98	8.6	1.00	0.09
2,3,4,7,8-PeCDF	1.03	1.04	0.96	0.99	1.00	0.96	6.9	1.03	0.07
1,2,3,4,7,8-HxCDF	1.21	1.20	1.23	1.29	1.29	1.17	7.8	1.18	0.09
1,2,3,6,7,8-HxCDF	1.18	1.18	1.14	1.17	1.19	1.09	6.9	1.16	0.08
2,3,4,6,7,8-HxCDF	1.12	1.12	1.14	1.17	1.19	1.09	7.5	1.12	0.08
1,2,3,7,8,9-HxCDF	1.17	1.17	1.13	1.17	1.19	1.09	6.4	1.14	0.07
1,2,3,4,6,7,8-HpCDF	1.34	1.34	1.34	1.42	1.40	1.29	7.7	1.34	0.10
1,2,3,4,7,8,9-HpCDF	1.37	1.38	1.30	1.34	1.34	1.22	8.2	1.34	0.11
OCDF	0.98	0.98	1.00	1.07	1.09	1.00	8.5	0.97	0.08
ES									
2,3,7,8-TCDD	1.05	1.02	1.01	1.12	1.09	1.08	4.9	1.08	0.05
1,2,3,7,8-PeCDD	0.92	0.86	0.90	0.99	1.08	1.01	8.5	0.95	0.08
1,2,3,4,7,8-HxCDD	1.03	1.04	0.99	0.99	1.00	1.04	4.0	1.04	0.04
1,2,3,6,7,8-HxCDD	1.16	1.18	1.02	1.02	1.06	1.01	6.5	1.15	0.08
1,2,3,7,8,9-HxCDD	1.17	1.16	1.12	1.15	1.11	1.17	4.5	1.20	0.05
1,2,3,4,6,7,8-HpCDD	1.00	0.94	0.90	0.92	0.89	0.86	9.0	0.96	0.09
OCDD	0.85	0.72	0.74	0.67	0.70	0.65	11.4	0.75	0.09
2,3,7,8-TCDF	1.00	1.01	1.05	1.11	1.08	1.03	3.9	1.00	0.04
1,2,3,7,8-PeCDF	0.87	0.85	0.88	0.95	0.94	0.94	10.0	0.88	0.09
2,3,4,7,8-PeCDF	0.88	0.85	0.91	0.96	0.98	0.91	9.9	0.90	0.09
1,2,3,4,7,8-HxCDF	1.41	1.41	1.25	1.29	1.30	1.24	9.7	1.48	0.14
1,2,3,6,7,8-HxCDF	1.54	1.58	1.40	1.45	1.49	1.44	10.0	1.65	0.17
2,3,4,6,7,8-HxCDF	1.49	1.48	1.29	1.31	1.42	1.30	9.3	1.54	0.14
1,2,3,7,8,9-HxCDF	1.34	1.32	1.17	1.20	1.25	1.20	9.3	1.33	0.12
1,2,3,4,6,7,8-HpCDF	1.13	1.10	1.03	1.05	1.10	0.90	11.2	1.12	0.13
1,2,3,4,7,8,9-HpCDF	0.96	0.90	0.89	0.87	0.90	0.75	12.6	0.91	0.12
OCDF	1.22	1.09	1.00	0.85	0.93	0.83	13.6	1.06	0.14

8290B ICALs

Ax	PD from Mean
2,3,7,8-TCDD	4%
1,2,3,7,8-PeCDD	-2%
1,2,3,4,7,8-HxCDD	-8%
1,2,3,6,7,8-HxCDD	0%
1,2,3,7,8,9-HxCDD	-6%
1,2,3,4,6,7,8-HpCDD	1%
OCDD	3%
2,3,7,8-TCDF	-7%
1,2,3,7,8-PeCDF	-2%
2,3,4,7,8-PeCDF	-7%
1,2,3,4,7,8-HxCDF	-1%
1,2,3,6,7,8-HxCDF	-6%
2,3,4,6,7,8-HxCDF	-2%
1,2,3,7,8,9-HxCDF	-5%
1,2,3,4,6,7,8-HpCDF	-4%
1,2,3,4,7,8,9-HpCDF	-9%
OCDF	4%

ES	
2,3,7,8-TCDD	0%
1,2,3,7,8-PeCDD	6%
1,2,3,4,7,8-HxCDD	0%
1,2,3,6,7,8-HxCDD	-12%
1,2,3,7,8,9-HxCDD	-3%
1,2,3,4,6,7,8-HpCDD	-11%
OCDD	-14%
2,3,7,8-TCDF	3%
1,2,3,7,8-PeCDF	6%
2,3,4,7,8-PeCDF	1%
1,2,3,4,7,8-HxCDF	-16%
1,2,3,6,7,8-HxCDF	-13%
2,3,4,6,7,8-HxCDF	-16%
1,2,3,7,8,9-HxCDF	-10%
1,2,3,4,6,7,8-HpCDF	-20%
1,2,3,4,7,8,9-HpCDF	-18%
OCDF	-22%

SGS Analytical Perspectives — Run Log **Project: MM1_DF_01172014_18SEP2014**

Instrument: MM1 (AutoSpec-Ultima) MS Experiment: df_cl4-8 GC Program: zb5-ms_60m

#	Datafile	Vial#	Lab ID	Wt/Vol	Client/Sample ID	Analyst(s)	Checkcode	Acq Date	Acq Time
5	140918P05	2	SBS_140918_DF_PA	1.00	SIL 12-70-1	ACC, AJP	379-626	18-Sep-2014	14:00:01
6	140918P06	85	CS0_140918_DF_PA	1.00	SIL 14-8-7	ACC, AJP	398-283	18-Sep-2014	14:50:00
7	140918P07	86	CS1_140918_DF_PA	1.00	SIL 14-8-6	ACC, AJP	080-182	18-Sep-2014	15:43:16
8	140918P08	87	CS2_140918_DF_PA	1.00	SIL 14-8-5	ACC, AJP	098-973	18-Sep-2014	16:36:32
9	140918P09	88	CS3_140918_DF_PA	1.00	SIL 14-8-4	ACC, AJP	408-457	18-Sep-2014	17:29:48
10	140918P10	89	CS4_140918_DF_PA	1.00	SIL 14-8-3	ACC, AJP	580-740	18-Sep-2014	18:23:04
11	140918P11	90	CS5_140918_DF_PA	1.00	SIL 14-8-2	ACC, AJP	211-796	18-Sep-2014	19:16:19
12	140918P12	91	CS6_140918_DF_PA	1.00	SIL 14-8-1	ACC, AJP	810-162	18-Sep-2014	20:09:36
13	140918P13	2	SBS_140918_DF_PB	1.00	SIL 12-70-1	ACC, AJP	634-542	18-Sep-2014	21:02:52
14	140918P14	2	SBS_140918_DF_PC	1.00	SIL 12-70-1	ACC, AJP	835-329	18-Sep-2014	21:56:08

APPROVED

By Jeremy Kadylak at 3:16 pm, Sep 19, 2014

Dioxin/Furan QC Summary	Acq'd: 18 Sep 2014 14:50 ACC	ICAL: MM1_DF_01172014_18SEP2014
Lab ID: CS0_140918_DF_PA	UTP: 19-Sep-2014 10:09 AJP	Checkcode: 398-283-DRK
Sample ID: SIL 14-8-7	Report: 19 Sep 2014 10:18 AP	Datafile: 140918P06

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
2378-TCDD	27.20	1.30E+05	0.74	Y	1.18	1.14	-3%
12378-PeCDD	32.74	4.90E+05	1.43	Y	0.99	0.94	-5%
123478-HxCDD	36.67	4.25E+05	1.36	Y	1.02	0.95	-7%
123678-HxCDD	36.78	4.27E+05	1.31	Y	1.05	1.00	-5%
123789-HxCDD	37.08	4.50E+05	1.21	Y	0.96	0.88	-8%
1234678-HpCDD	40.91	3.51E+05	1.02	Y	0.99	0.96	-3%
OCDD	46.03	5.34E+05	0.79	Y	1.06	1.00	-6%
2378-TCDF	26.28	1.73E+05	0.67	Y	0.97	0.98	1%
12378-PeCDF	31.25	6.94E+05	1.54	Y	0.98	0.88	-10%
23478-PeCDF	32.38	6.63E+05	1.51	Y	0.96	0.87	-9%
123478-HxCDF	35.70	5.66E+05	1.07	Y	1.17	1.06	-10%
123678-HxCDF	35.84	6.43E+05	1.26	Y	1.09	1.04	-4%
234678-HxCDF	36.48	5.76E+05	1.16	Y	1.09	1.02	-6%
123789-HxCDF	37.45	5.25E+05	1.16	Y	1.09	1.02	-6%
1234678-HpCDF	39.35	4.63E+05	0.97	Y	1.29	1.21	-6%
1234789-HpCDF	41.69	3.62E+05	0.92	Y	1.22	1.15	-6%
OCDF	46.36	6.37E+05	0.89	Y	1.00	0.94	-6%
ES 2378-TCDD	27.18	4.57E+07	0.78	Y	1.08	1.05	-2%
ES 12378-PeCDD	32.72	4.17E+07	1.58	Y	1.01	0.96	-5%
ES 123478-HxCDD	36.65	3.57E+07	1.25	Y	1.04	1.05	1%
ES 123678-HxCDD	36.77	3.42E+07	1.26	Y	1.01	1.01	0%
ES 123789-HxCDD	37.06	4.11E+07	1.26	Y	1.17	1.21	3%
ES 1234678-HpCDD	40.90	2.91E+07	1.08	Y	0.86	0.86	-1%
ES OCDD	46.01	4.29E+07	0.88	Y	0.65	0.63	-3%
ES 2378-TCDF	26.26	7.05E+07	0.75	Y	1.03	1.02	-1%
ES 12378-PeCDF	31.23	6.28E+07	1.50	Y	0.94	0.91	-3%
ES 23478-PeCDF	32.36	6.07E+07	1.54	Y	0.91	0.88	-3%
ES 123478-HxCDF	35.68	4.29E+07	0.53	Y	1.24	1.26	2%
ES 123678-HxCDF	35.82	4.94E+07	0.52	Y	1.44	1.45	1%
ES 234678-HxCDF	36.47	4.50E+07	0.52	Y	1.30	1.32	1%
ES 123789-HxCDF	37.44	4.10E+07	0.53	Y	1.20	1.21	1%
ES 1234678-HpCDF	39.33	3.06E+07	0.46	Y	0.90	0.90	0%
ES 1234789-HpCDF	41.68	2.53E+07	0.44	Y	0.75	0.74	-1%
ES OCDF	46.34	5.40E+07	0.89	Y	0.83	0.79	-4%

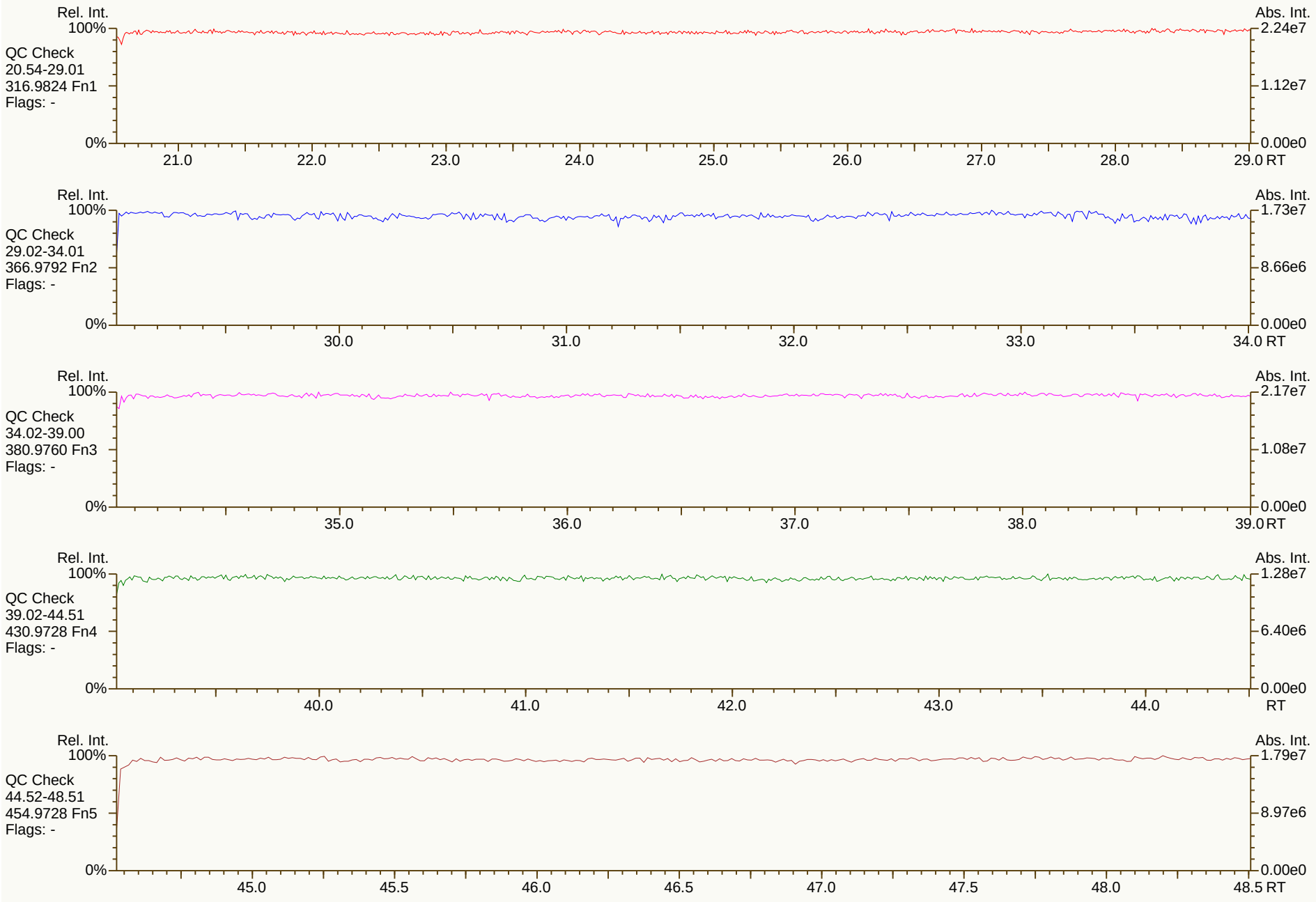
Dioxin/Furan QC Summary | **Acq'd: 18 Sep 2014 14:50 ACC** | **ICAL: MM1_DF_01172014_18SEP2014**

Lab ID: CS0_140918_DF_PA | **UTP: 19-Sep-2014 10:09 AJP** | **Checkcode: 398-283**

Sample ID: SIL 14-8-7 | **Report: 19 Sep 2014 10:18 AD** | **Datafile: 140918P06**

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
JS 1234-TCDD	26.51	4.34E+07	0.78	Y	-	-	-
JS 1234-TCDF	24.84	6.90E+07	0.75	Y	-	-	-
JS 123467-HxCDD	36.96	1.70E+07	1.28	Y	-	-	-
CS 37Cl-2378-TCDD	NotFnd		n/a	-			
CS 12347-PeCDD	32.22	4.16E+07	1.61	Y	0.96	0.96	0%
CS 12346-PeCDF	30.69	6.35E+07	1.49	Y	0.91	0.92	1%
CS 123469-HxCDF	36.13	4.71E+07	0.51	Y	1.33	1.39	5%
CS 1234689-HpCDF	39.98	2.92E+07	0.45	Y	0.82	0.86	5%
SS 37Cl-2378-TCDD	NotFnd		n/a	-			
SS 12347-PeCDD	32.22	4.16E+07	1.61	Y	0.95	1.00	5%
SS 12346-PeCDF	30.69	6.35E+07	1.49	Y	0.98	1.01	4%
SS 123469-HxCDF	36.13	4.71E+07	0.51	Y	0.92	0.95	4%
SS 1234689-HpCDF	39.98	2.92E+07	0.45	Y	0.91	0.95	5%
AS 1368-TCDD	23.30	4.65E+07	0.77	Y	1.08	1.07	-1%
AS 1368-TCDF	21.11	8.12E+07	0.76	Y	1.18	1.18	-1%
FS 1278-TCDD	27.53	5.98E+07	0.78	Y	1.28	1.31	2%
FS 12478-PeCDD	31.47	5.13E+07	1.61	Y	1.18	1.23	4%
FS 123468-HxCDD	35.61	5.05E+07	1.26	Y	1.35	1.42	5%
FS 1234679-HpCDD	39.75	3.92E+07	1.10	Y	1.27	1.34	6%
TS 1378-TCDD	25.45	5.64E+07	0.78	Y	1.22	1.23	1%
OCDD-a	NotFnd				0.07		
OCDF-a	NotFnd				0.06		

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**

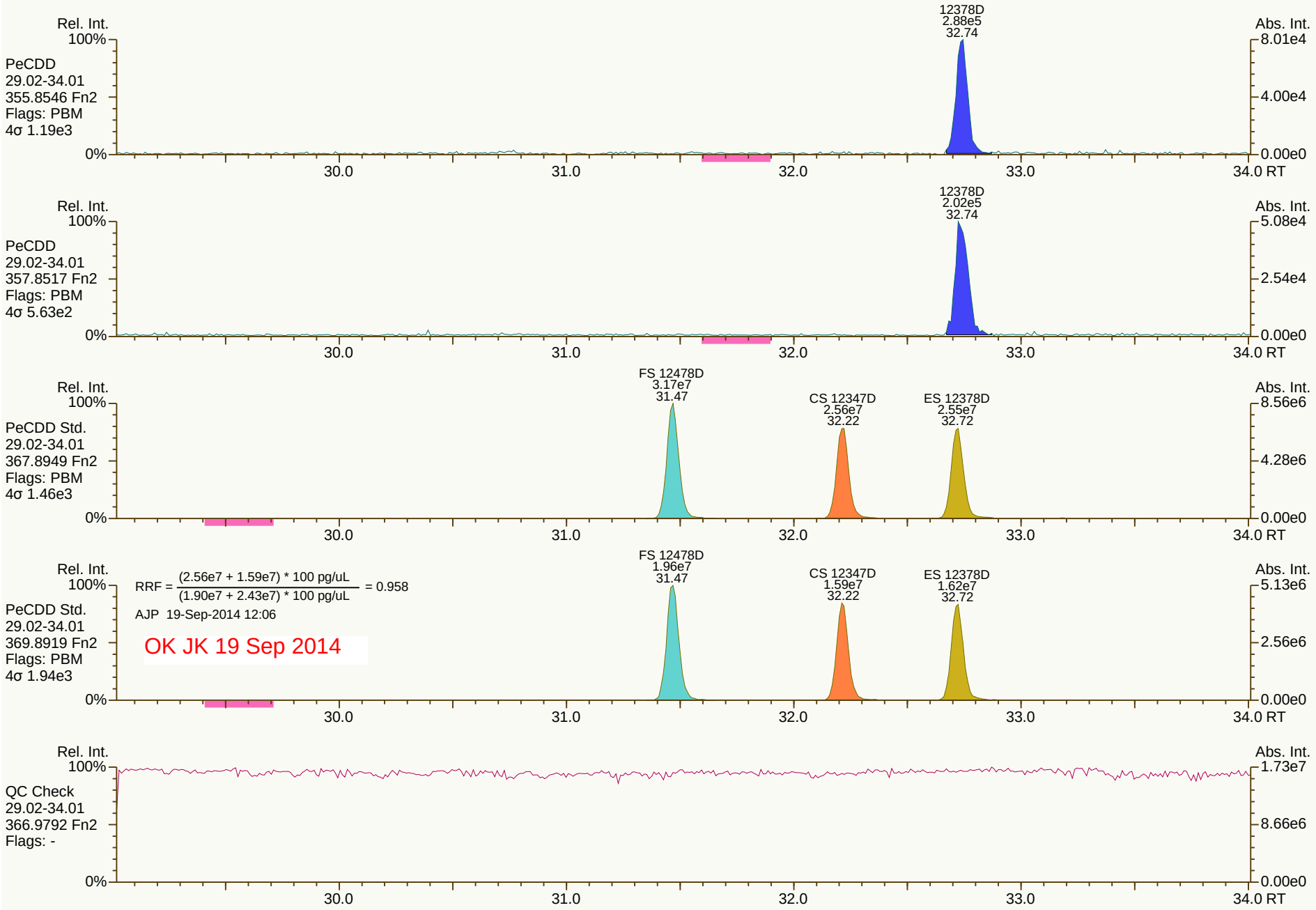


SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



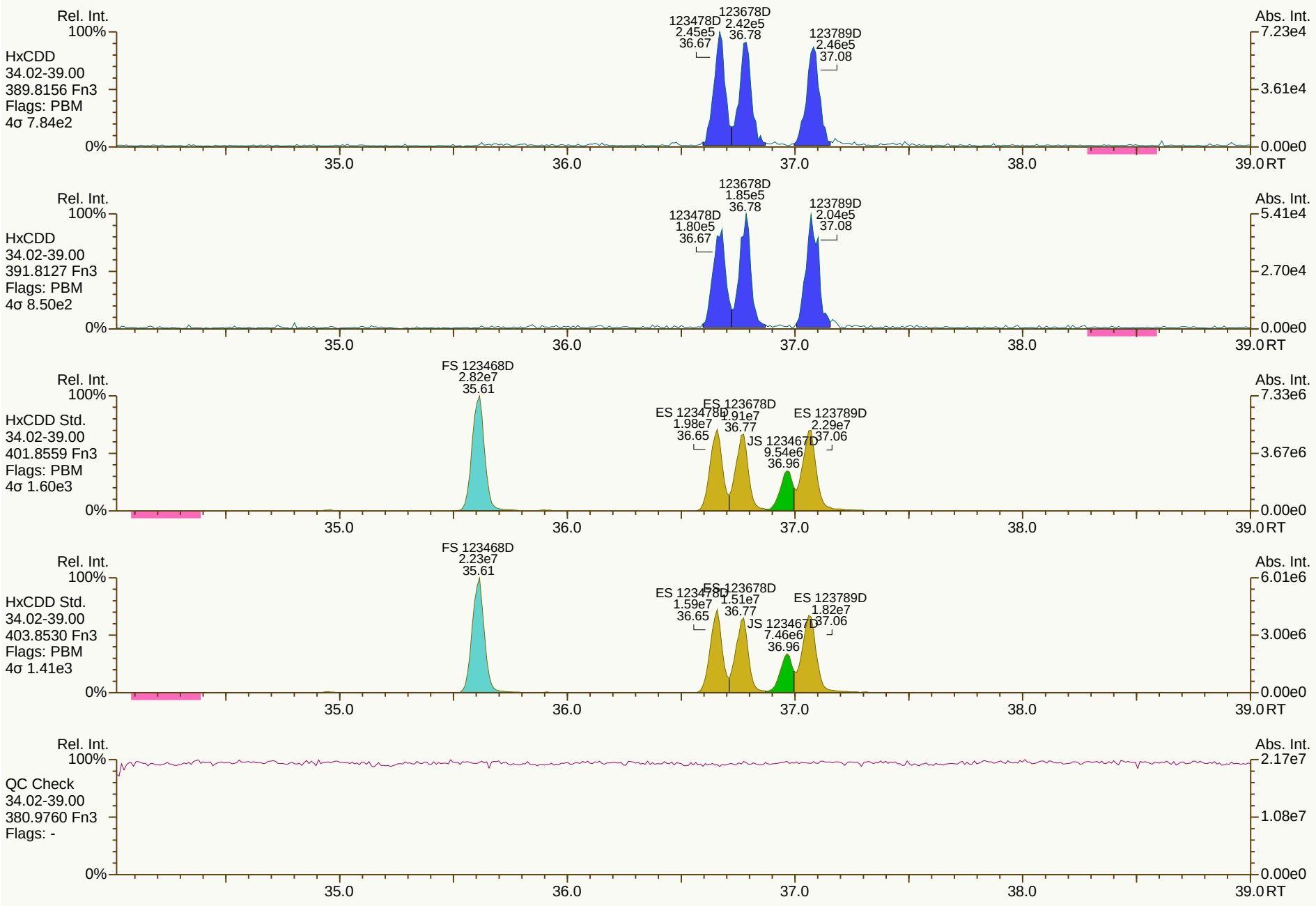
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2792, 2661, 5312 scc: 398-283 *Revised: 19-Sep-2014 09:58 (AJP) Printed: 19-Sep-2014 12:33 Page 2 of 12*

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



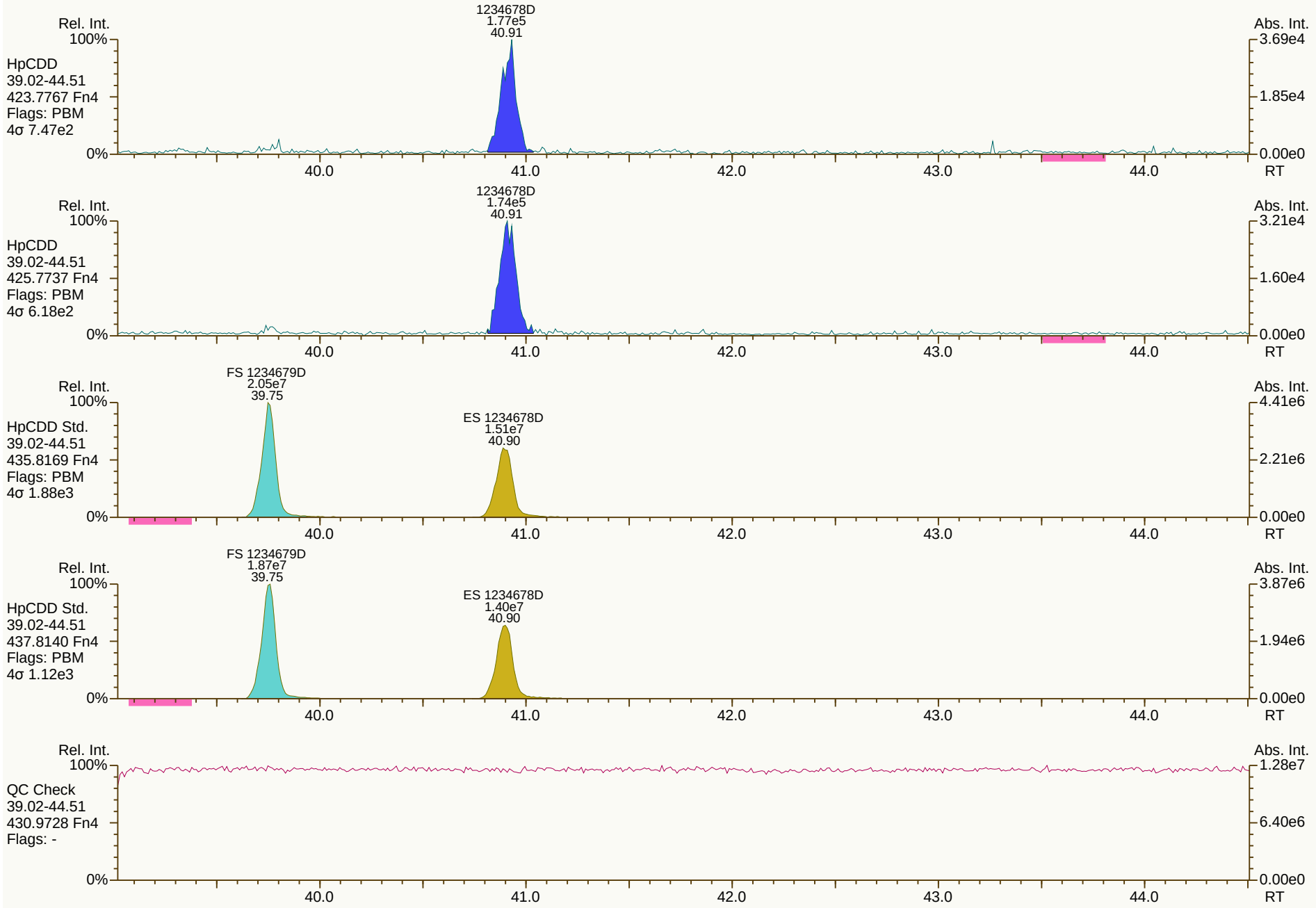
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 1626, 5611 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 3 of 12*

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 4026, 5120 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 4 of 12*

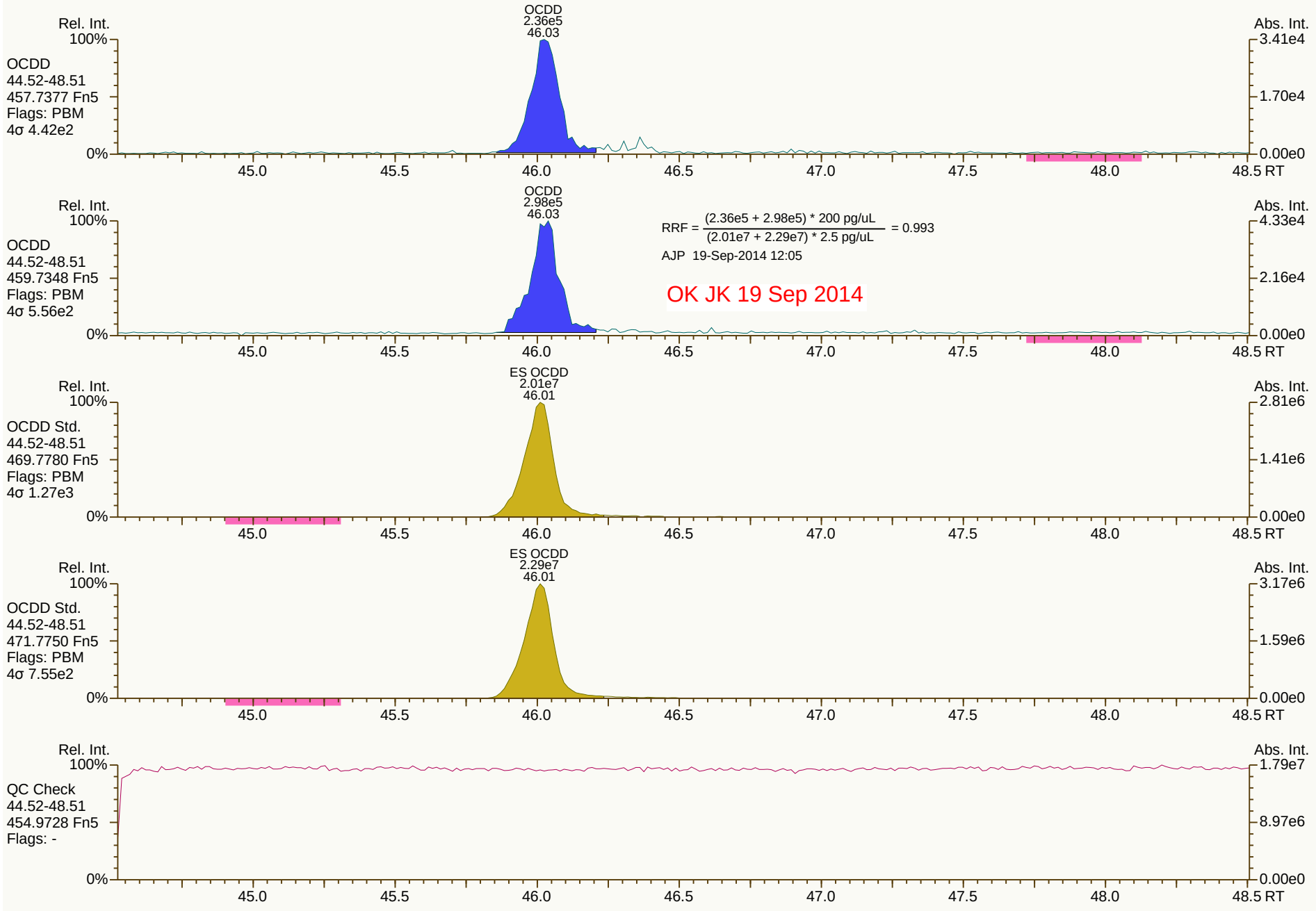
SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

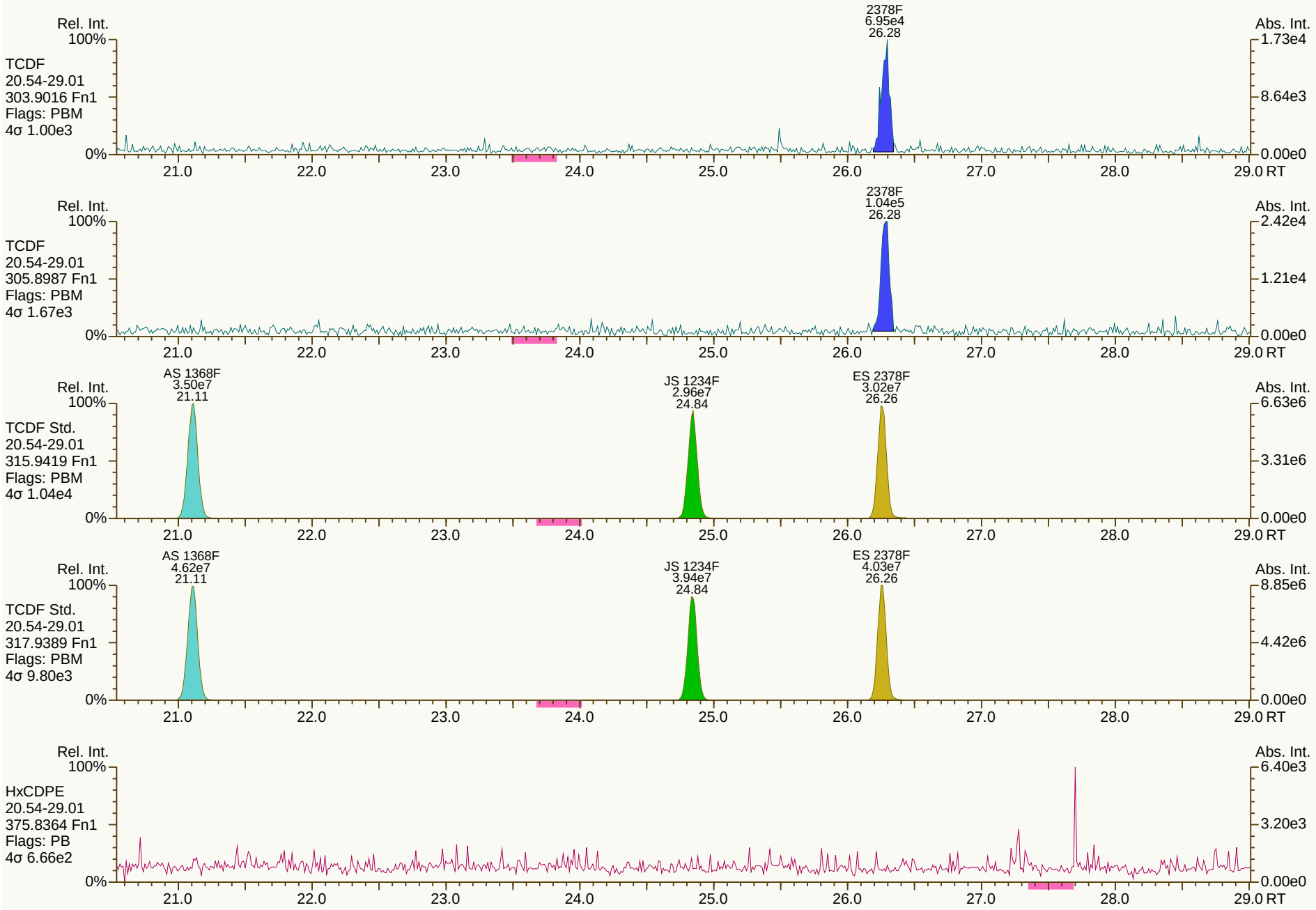
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3022, 8262 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 5 of 12*

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS0_140918_DF_PA | Sample ID: SIL 14-8-7 | Acq: 18-Sep-2014 14:50:00
Instr: [ILM] AutoSpec-Ultima MM1 | VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85 | User: ACC Datafile: 140918P06



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2103, 0190, 5357 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 7 of 12*

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

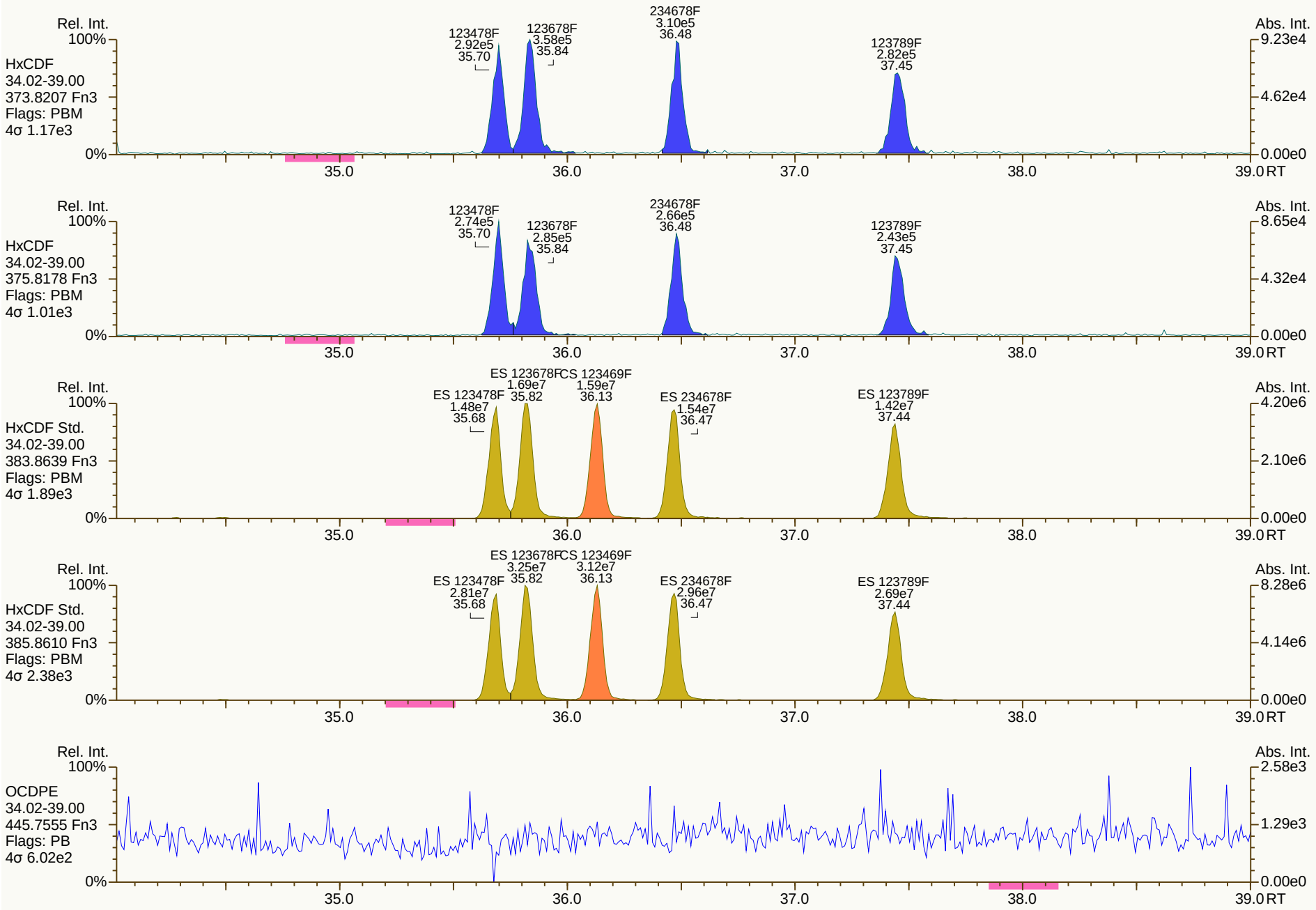
SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

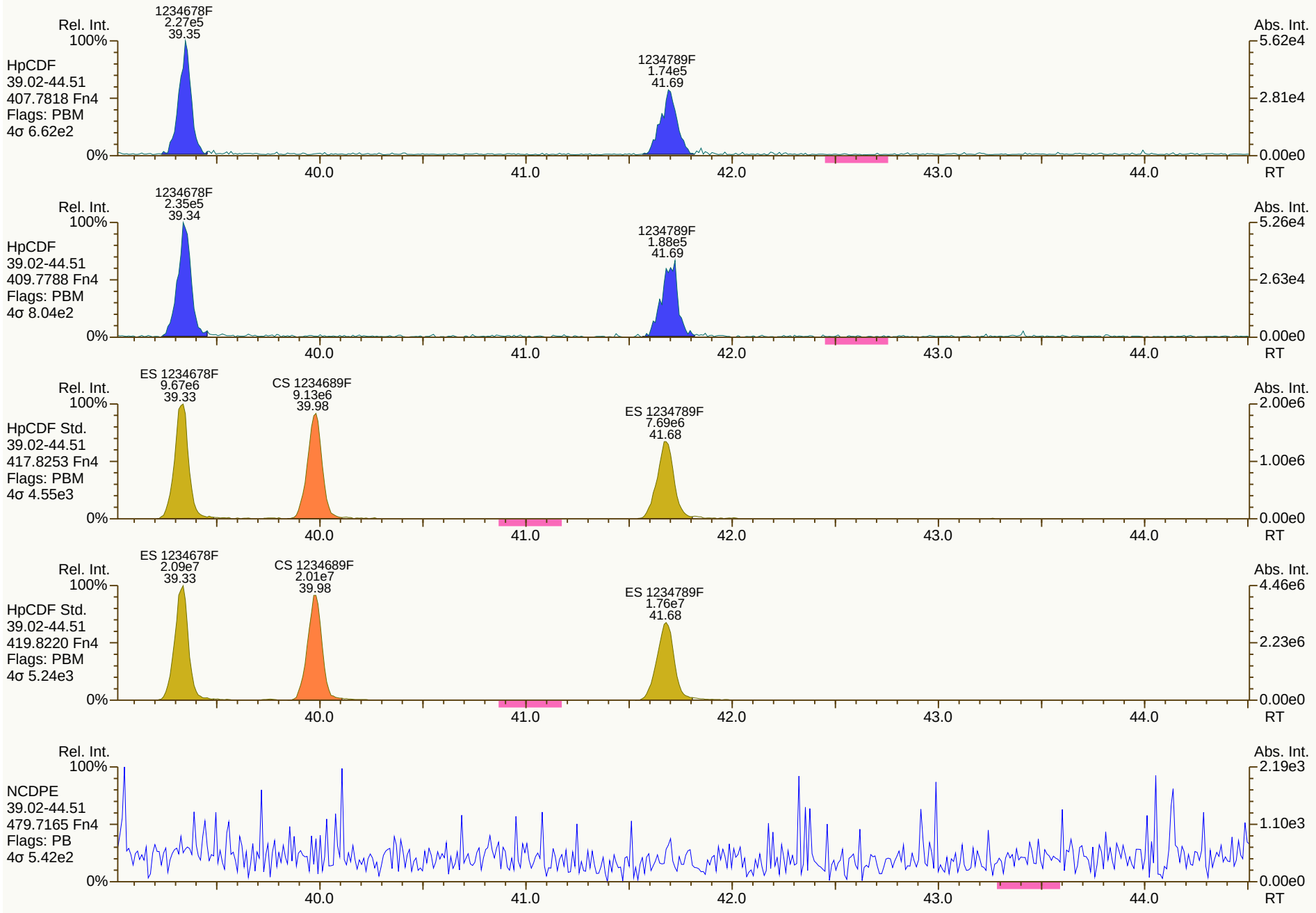
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 9794, 1931, 5011 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 9 of 12*

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 8963, 2307, 0855 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 10 of 12*

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2739, 8249, 1723 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 11 of 12*

SGS ID: CS0_140918_DF_PA **Sample ID: SIL 14-8-7** **Acq: 18-Sep-2014 14:50:00**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 85** **User: ACC Datafile: 140918P06**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS0_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 9158, 2577, 8865 scc: 398-283 *PKD: 19-Sep-2014 08:43 Printed: 19-Sep-2014 12:33 Page 12 of 12*

Dioxin/Furan QC Summary	Acq'd: 18 Sep 2014 15:43 ACC	ICAL: MM1_DF_01172014_18SEP2014
Lab ID: CS1_140918_DF_PA	UTP: 19-Sep-2014 10:09 AJP	Checkcode: 144-083-TSC
Sample ID: SIL 14-8-6	Report: 19 Sep 2014 10:18 AP	Datafile: 140918P07

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
2378-TCDD	27.18	2.59E+05	0.81	Y	1.18	1.16	-2%
12378-PeCDD	32.72	9.74E+05	1.56	Y	0.99	0.94	-5%
123478-HxCDD	36.65	8.53E+05	1.23	Y	1.02	0.96	-7%
123678-HxCDD	36.76	8.40E+05	1.21	Y	1.05	0.97	-7%
123789-HxCDD	37.06	9.09E+05	1.21	Y	0.96	0.88	-8%
1234678-HpCDD	40.89	6.97E+05	1.01	Y	0.99	0.91	-8%
OCDD	46.00	1.16E+06	0.87	Y	1.06	0.97	-8%
2378-TCDF	26.25	3.18E+05	0.69	Y	0.97	0.94	-3%
12378-PeCDF	31.22	1.42E+06	1.52	Y	0.98	0.93	-5%
23478-PeCDF	32.35	1.33E+06	1.46	Y	0.96	0.89	-7%
123478-HxCDF	35.67	1.11E+06	1.20	Y	1.17	1.05	-10%
123678-HxCDF	35.81	1.17E+06	1.20	Y	1.09	0.95	-13%
234678-HxCDF	36.46	1.12E+06	1.14	Y	1.09	1.00	-8%
123789-HxCDF	37.43	1.07E+06	1.21	Y	1.09	1.05	-4%
1234678-HpCDF	39.32	9.45E+05	0.92	Y	1.29	1.18	-8%
1234789-HpCDF	41.67	7.66E+05	0.90	Y	1.22	1.15	-6%
OCDF	46.33	1.44E+06	0.84	Y	1.00	0.96	-5%
ES 2378-TCDD	27.16	4.47E+07	0.79	Y	1.08	1.06	-2%
ES 12378-PeCDD	32.70	4.15E+07	1.56	Y	1.01	0.98	-3%
ES 123478-HxCDD	36.63	3.57E+07	1.26	Y	1.04	1.04	1%
ES 123678-HxCDD	36.74	3.46E+07	1.25	Y	1.01	1.01	0%
ES 123789-HxCDD	37.04	4.14E+07	1.25	Y	1.17	1.21	4%
ES 1234678-HpCDD	40.87	3.05E+07	1.13	Y	0.86	0.89	3%
ES OCDD	45.98	4.78E+07	0.89	Y	0.65	0.70	7%
ES 2378-TCDF	26.23	6.73E+07	0.78	Y	1.03	1.01	-1%
ES 12378-PeCDF	31.20	6.13E+07	1.54	Y	0.94	0.92	-1%
ES 23478-PeCDF	32.34	5.97E+07	1.54	Y	0.91	0.90	-1%
ES 123478-HxCDF	35.66	4.25E+07	0.52	Y	1.24	1.24	0%
ES 123678-HxCDF	35.80	4.94E+07	0.53	Y	1.44	1.45	0%
ES 234678-HxCDF	36.45	4.48E+07	0.53	Y	1.30	1.31	1%
ES 123789-HxCDF	37.41	4.10E+07	0.53	Y	1.20	1.20	0%
ES 1234678-HpCDF	39.31	3.20E+07	0.45	Y	0.90	0.94	4%
ES 1234789-HpCDF	41.65	2.67E+07	0.47	Y	0.75	0.78	4%
ES OCDF	46.31	6.01E+07	0.90	Y	0.83	0.88	6%

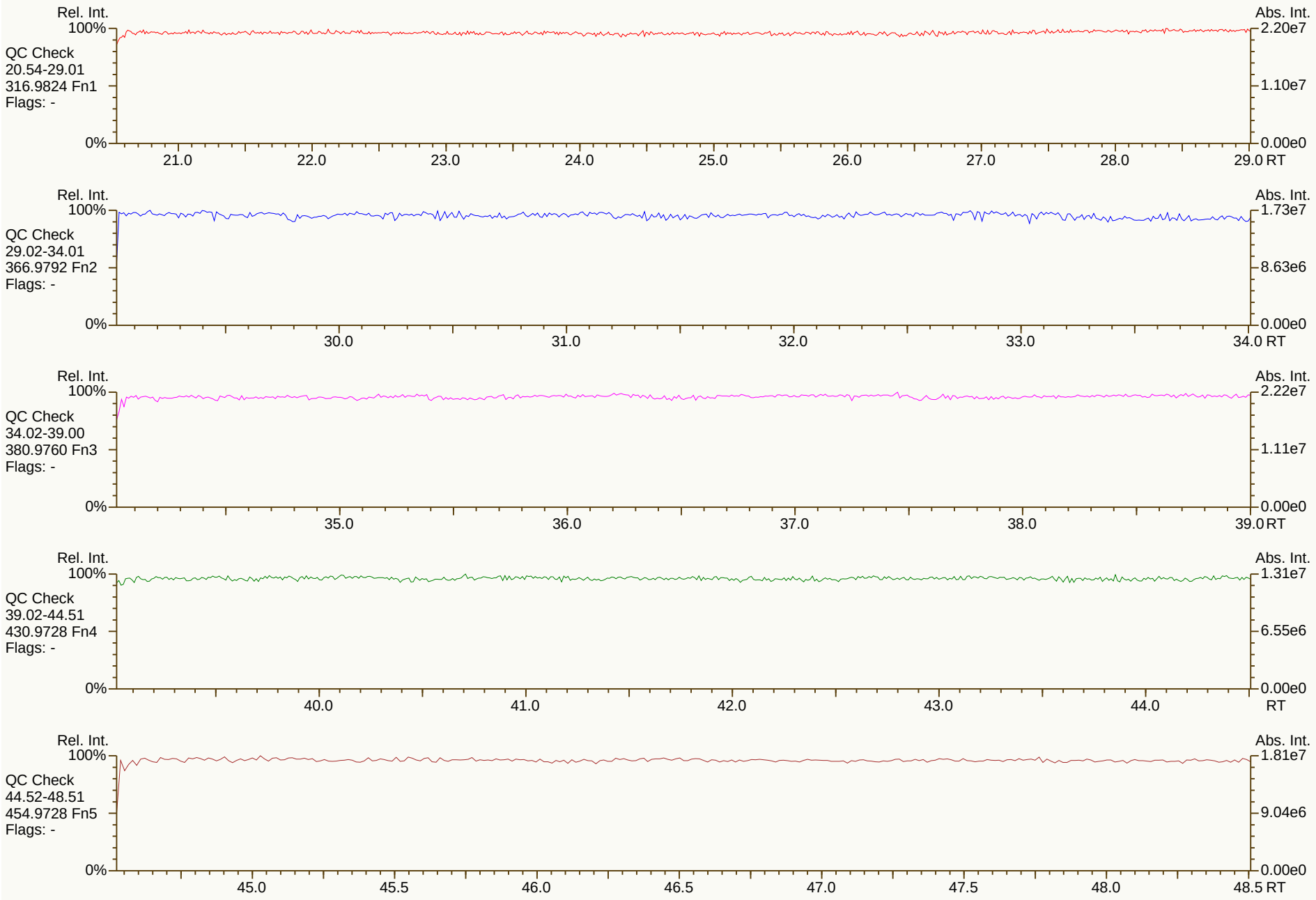
Dioxin/Furan QC Summary | **Acq'd: 18 Sep 2014 15:43 ACC** | **ICAL: MM1_DF_01172014_18SEP2014**

Lab ID: CS1_140918_DF_PA | **UTP: 19-Sep-2014 10:09 AJP** | **Checkcode: 144-083**

Sample ID: SIL 14-8-6 | **Report: 19 Sep 2014 10:18 AD** | **Datafile: 140918P07**

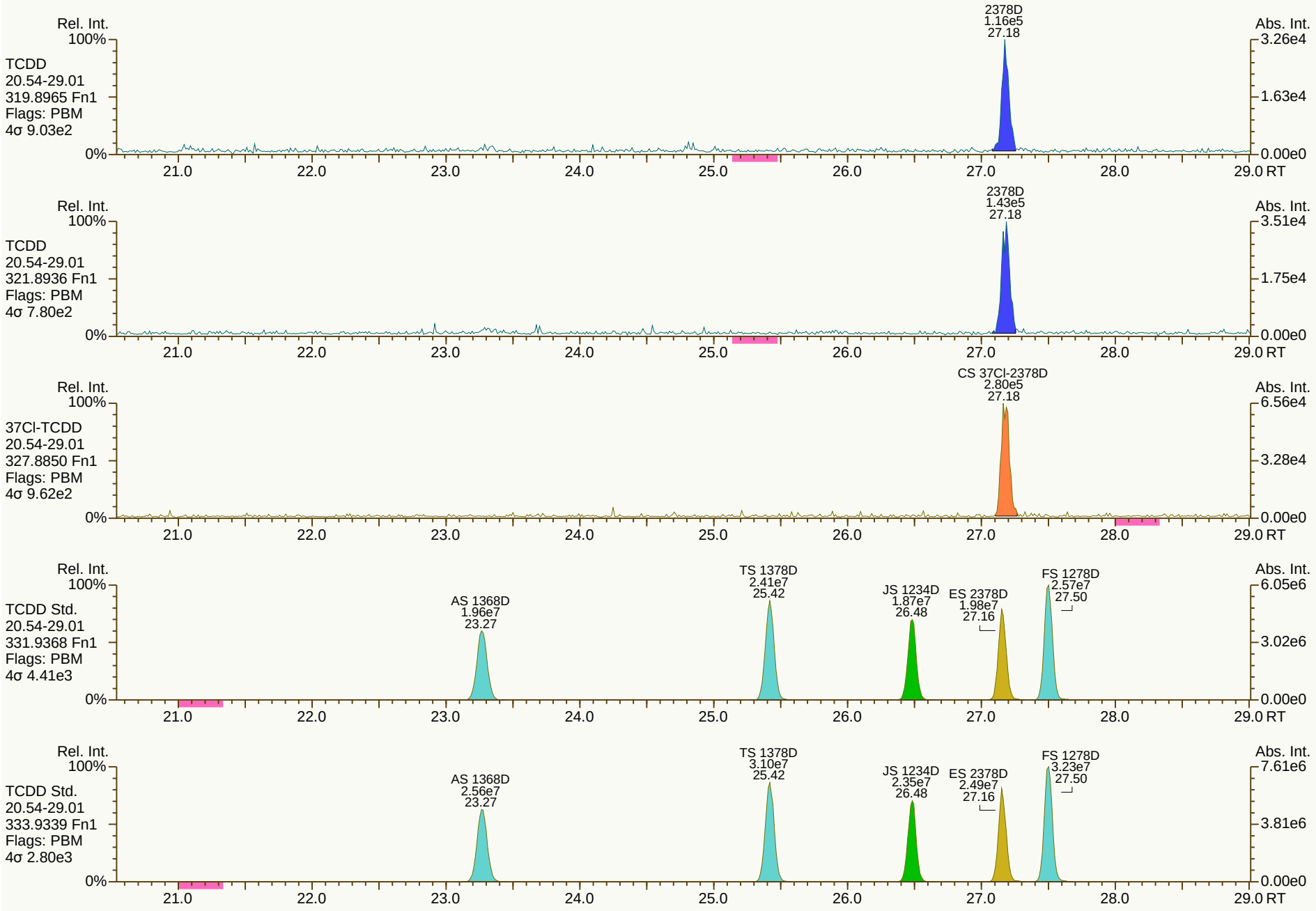
Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
JS 1234-TCDD	26.48	4.22E+07	0.80	Y	-	-	-
JS 1234-TCDF	24.81	6.63E+07	0.79	Y	-	-	-
JS 123467-HxCDD	36.94	1.71E+07	1.27	Y	-	-	-
CS 37Cl-2378-TCDD	27.18	2.80E+05	n/a	-	1.28	1.32	3%
CS 12347-PeCDD	32.19	4.04E+07	1.62	Y	0.96	0.96	0%
CS 12346-PeCDF	30.67	6.07E+07	1.51	Y	0.91	0.92	0%
CS 123469-HxCDF	36.11	4.68E+07	0.52	Y	1.33	1.37	3%
CS 1234689-HpCDF	39.95	3.08E+07	0.46	Y	0.82	0.90	10%
SS 37Cl-2378-TCDD	27.18	2.80E+05	n/a	-	1.19	1.25	5%
SS 12347-PeCDD	32.19	4.04E+07	1.62	Y	0.95	0.97	2%
SS 12346-PeCDF	30.67	6.07E+07	1.51	Y	0.98	0.99	2%
SS 123469-HxCDF	36.11	4.68E+07	0.52	Y	0.92	0.95	3%
SS 1234689-HpCDF	39.95	3.08E+07	0.46	Y	0.91	0.96	6%
AS 1368-TCDD	23.27	4.53E+07	0.76	Y	1.08	1.07	-1%
AS 1368-TCDF	21.07	7.88E+07	0.76	Y	1.18	1.19	0%
FS 1278-TCDD	27.50	5.80E+07	0.79	Y	1.28	1.30	1%
FS 12478-PeCDD	31.45	4.94E+07	1.55	Y	1.18	1.19	1%
FS 123468-HxCDD	35.59	4.88E+07	1.22	Y	1.35	1.37	1%
FS 1234679-HpCDD	39.73	4.08E+07	1.11	Y	1.27	1.34	5%
TS 1378-TCDD	25.42	5.51E+07	0.78	Y	1.22	1.23	1%
OCDD-a	NotFnd				0.07		
OCDF-a	NotFnd				0.06		

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



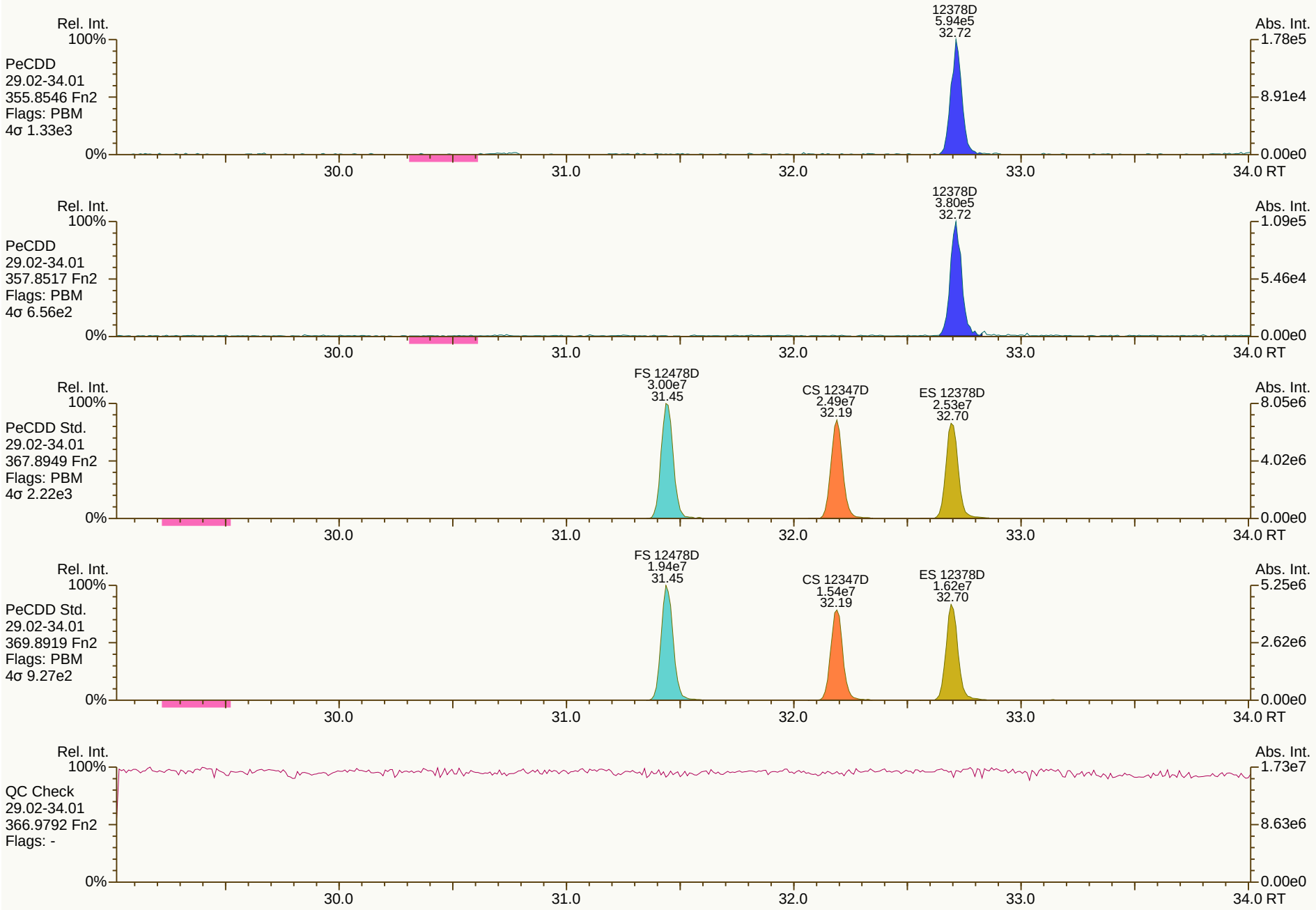
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



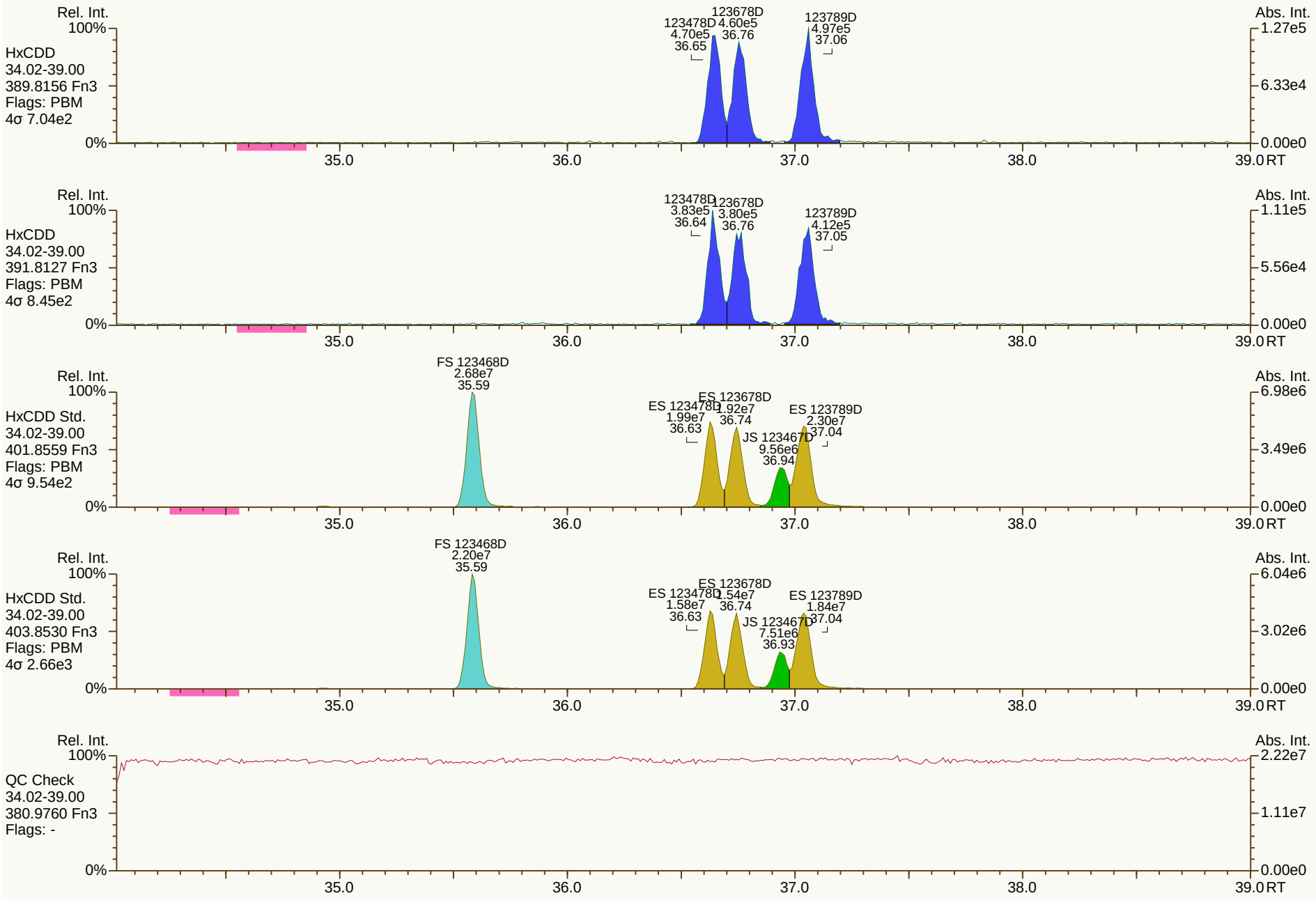
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SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



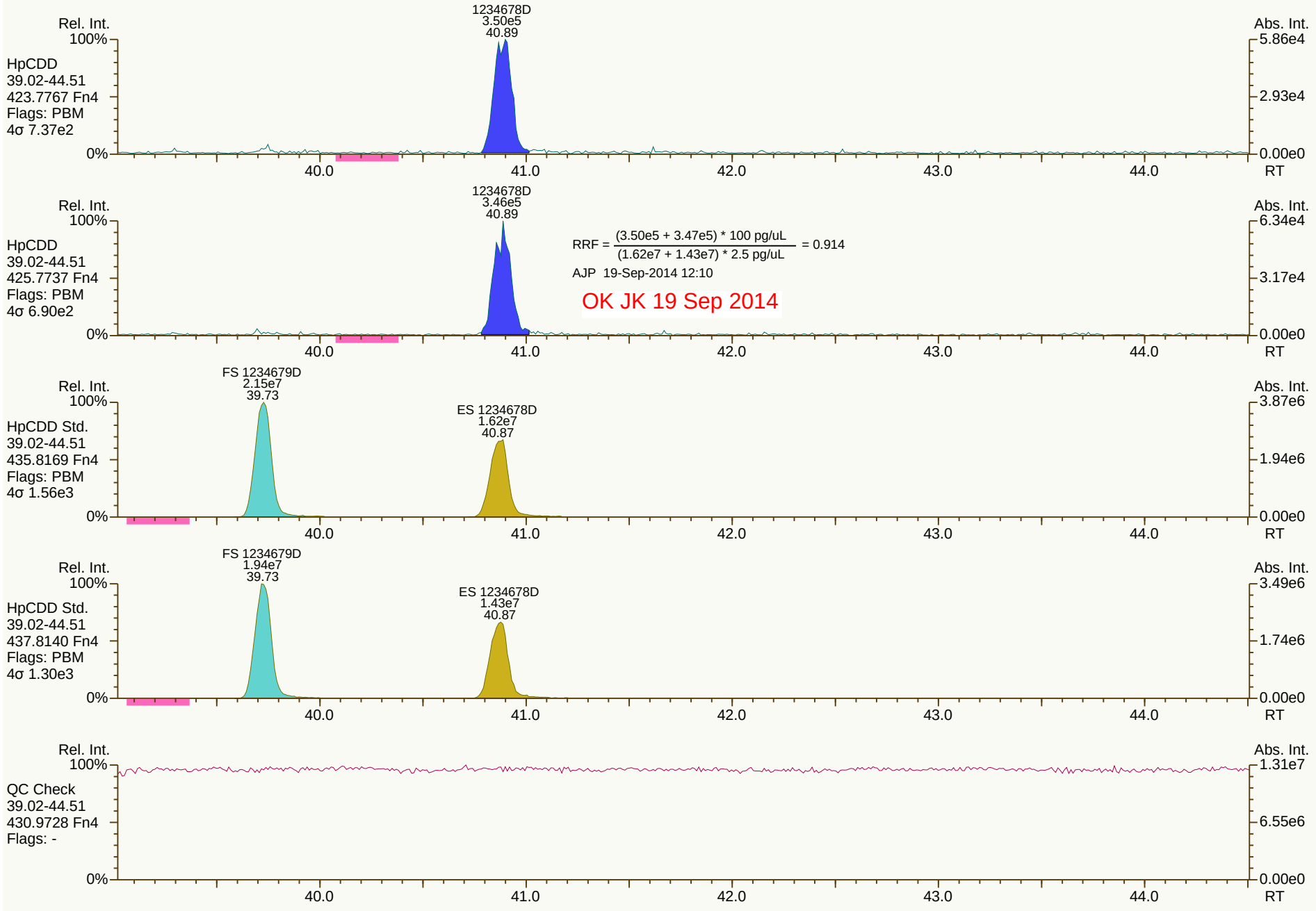
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SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



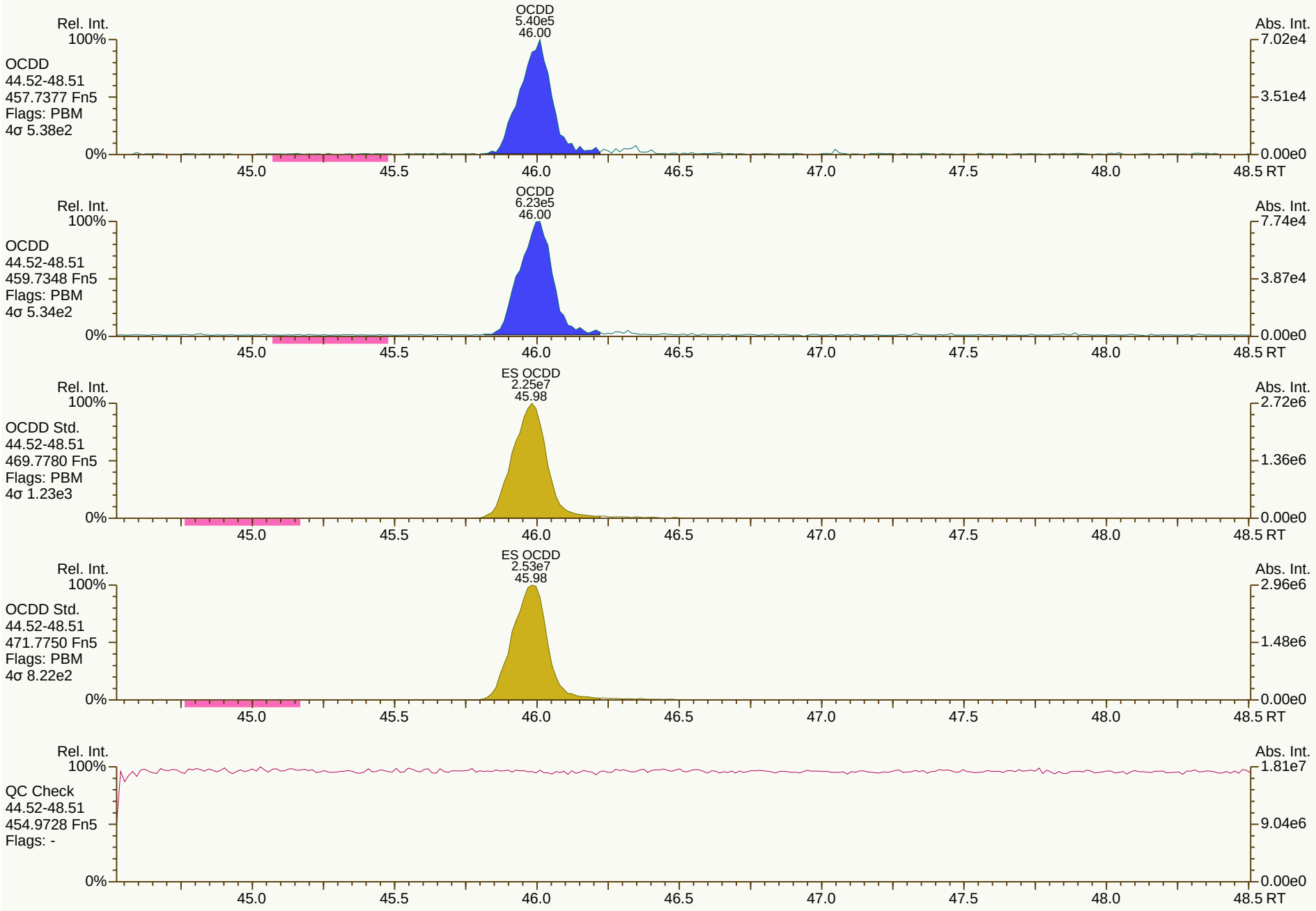
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 8843, 0991 scc: 080-182 *Revised: 19-Sep-2014 12:10 (AJP) Printed: 19-Sep-2014 12:33 Page 5 of 12*

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



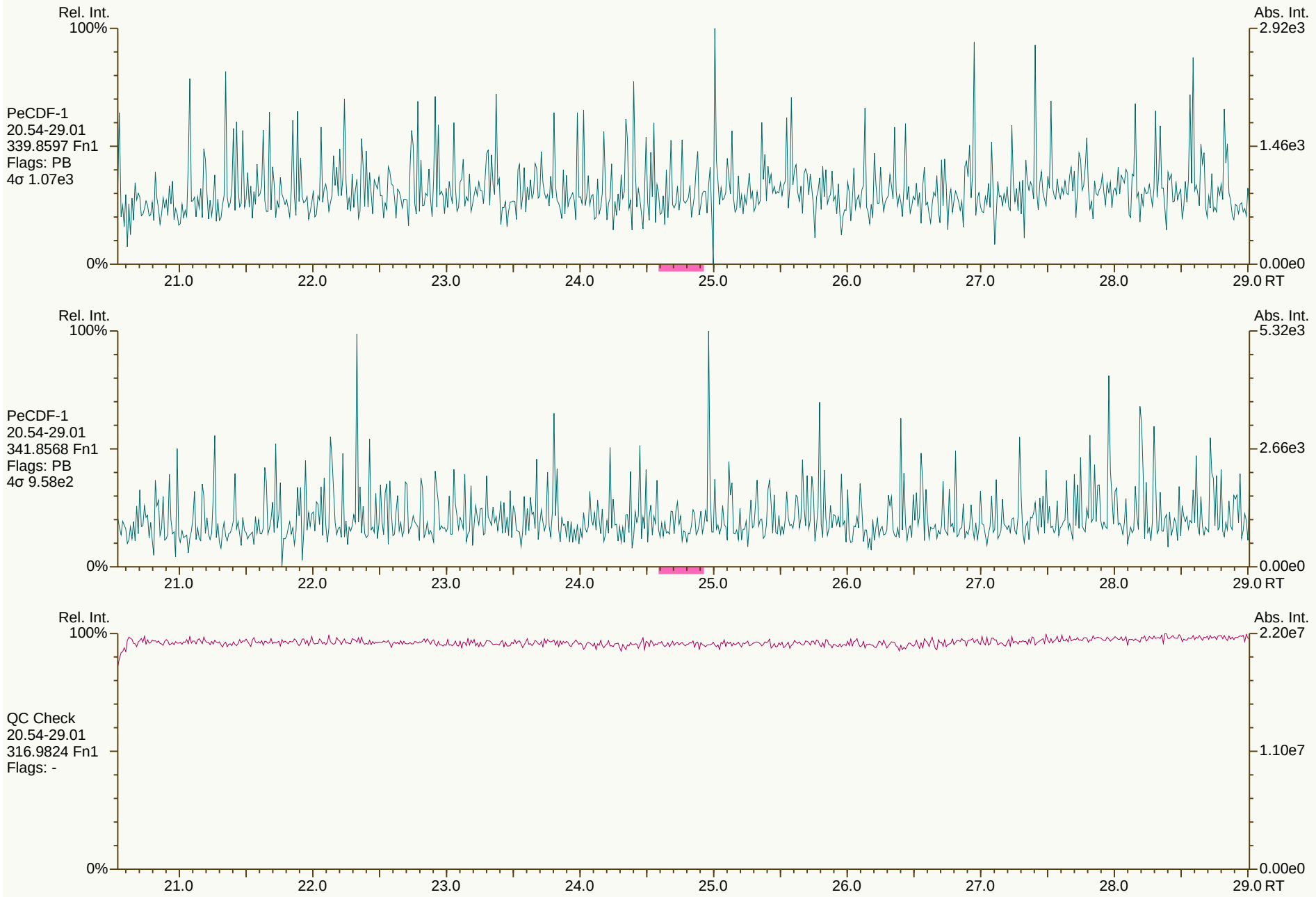
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



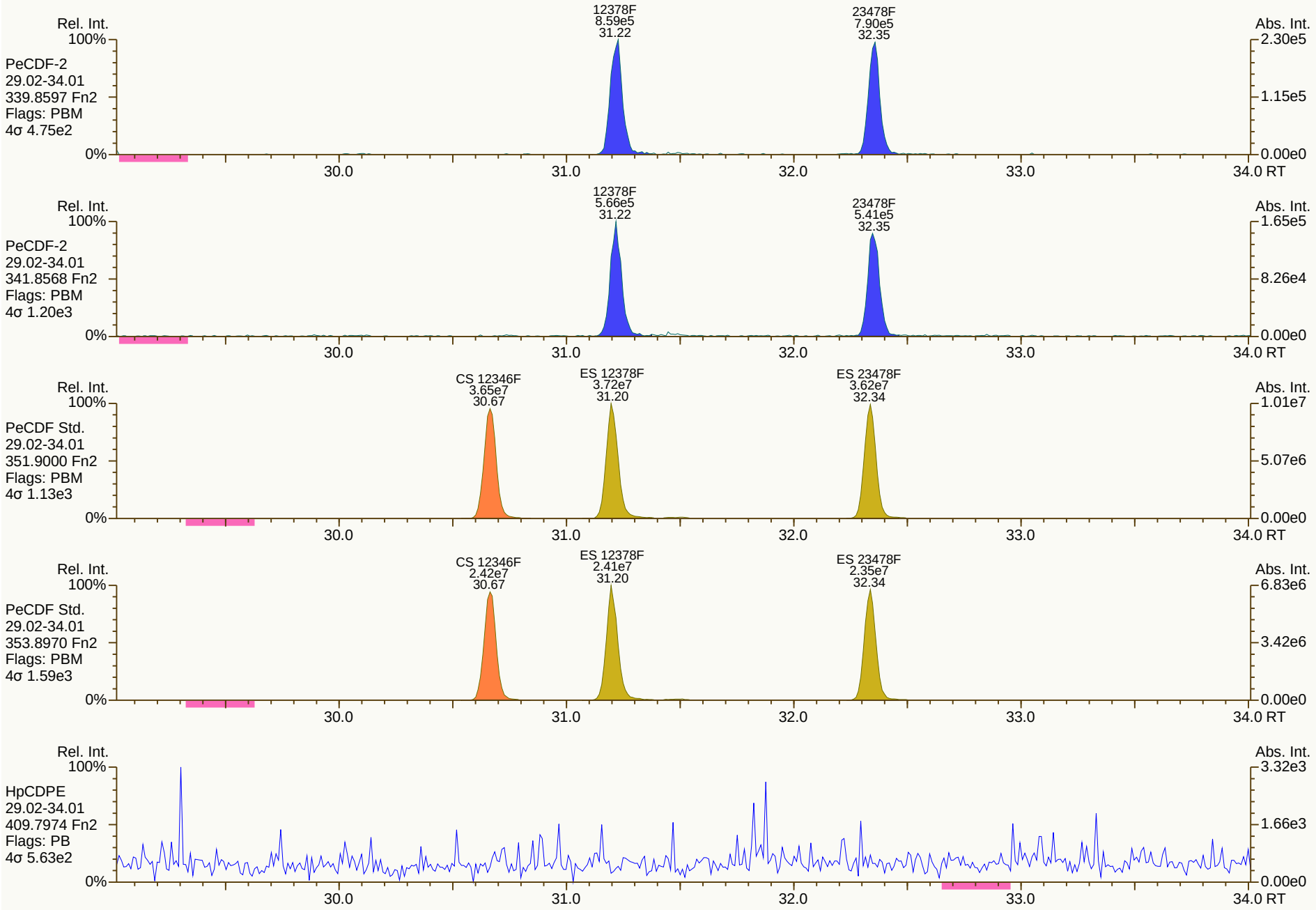
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5614, 8013, 9852 scc: 080-182 *PKD: 19-Sep-2014 08:45 Printed: 19-Sep-2014 12:33 Page 7 of 12*

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

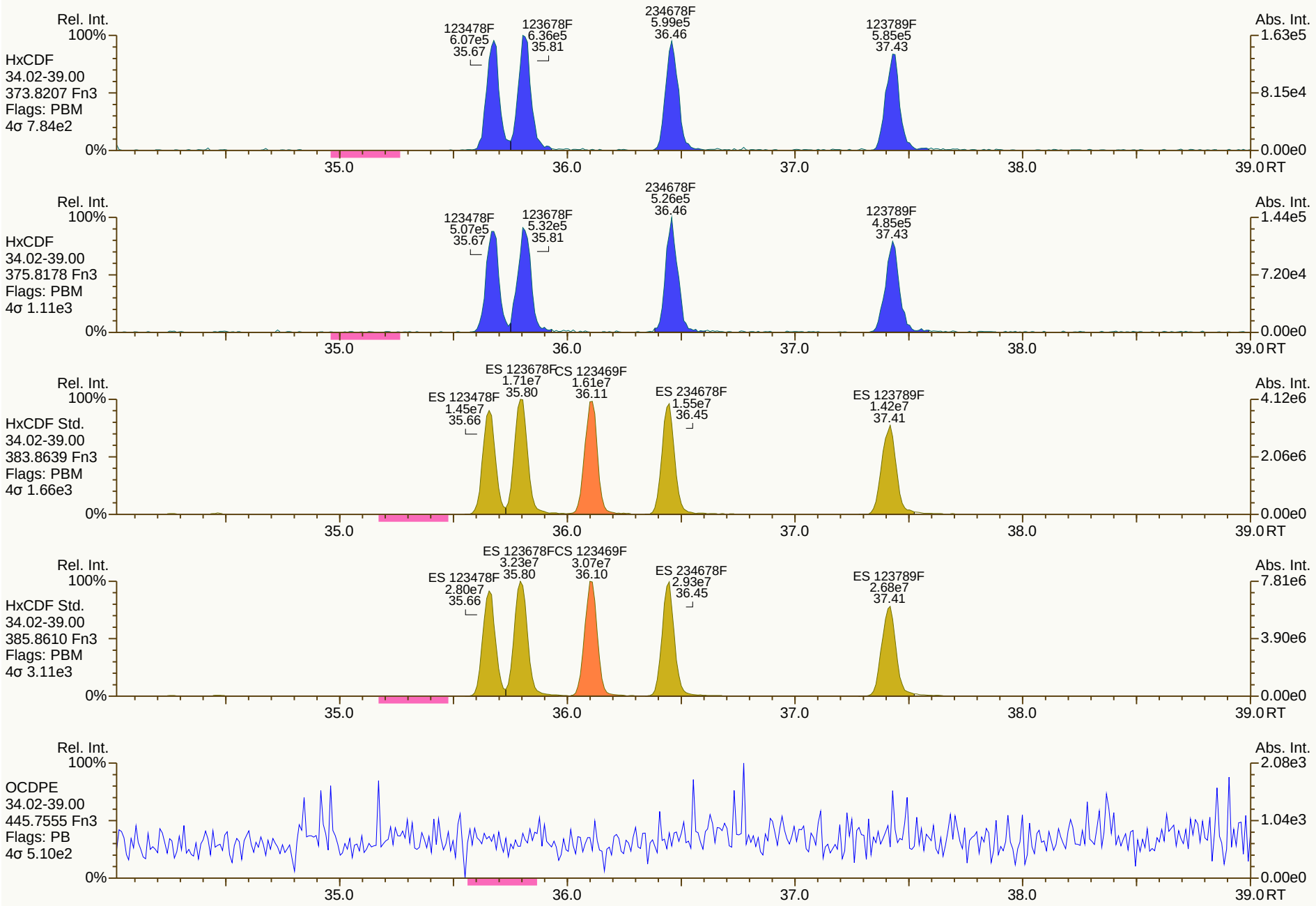
SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



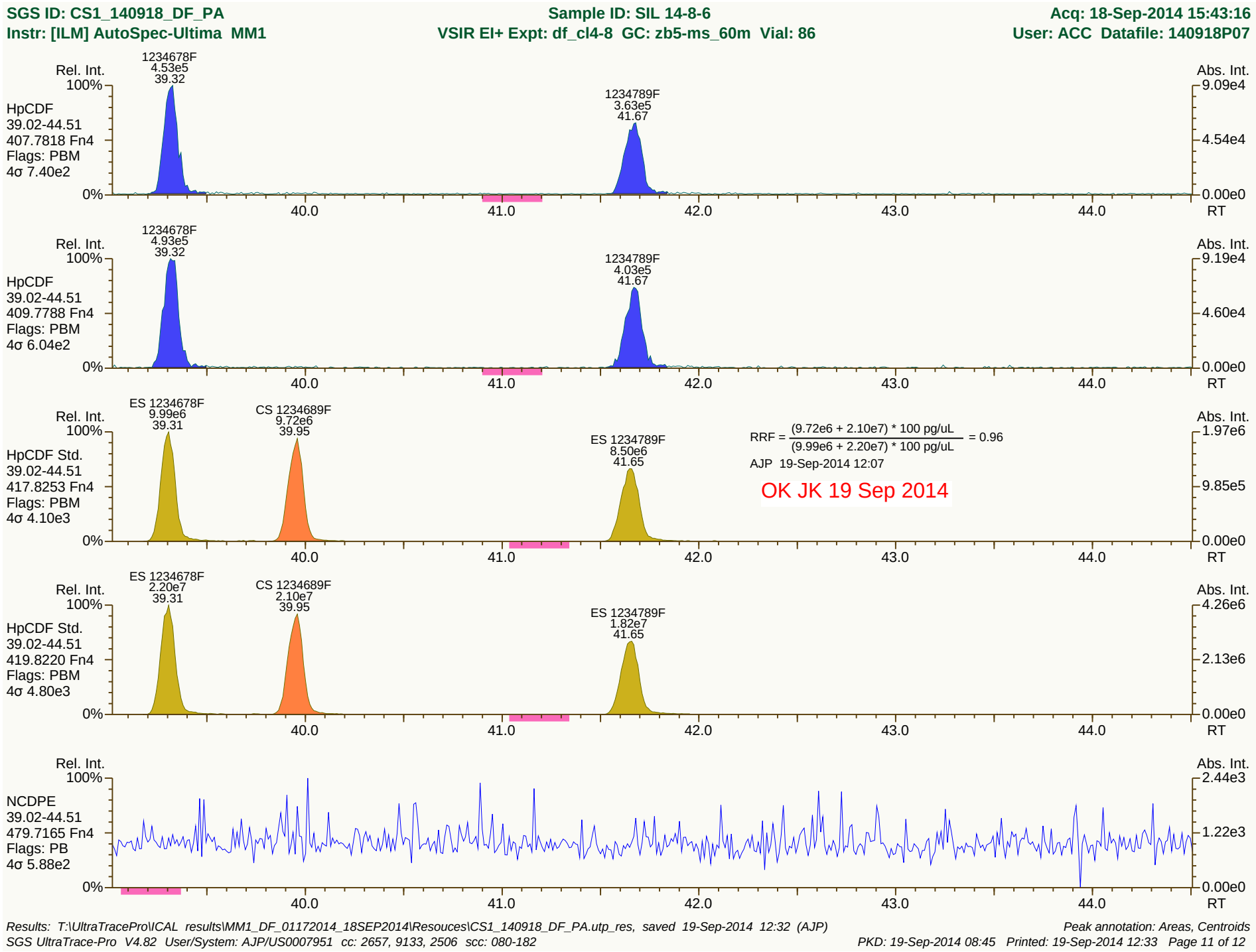
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5826, 4209, 8786 scc: 080-182 *PKD: 19-Sep-2014 08:45 Printed: 19-Sep-2014 12:33 Page 9 of 12*

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 7107, 0552, 8414 scc: 080-182 *PKD: 19-Sep-2014 08:45 Printed: 19-Sep-2014 12:33 Page 10 of 12*


SGS ID: CS1_140918_DF_PA
Sample ID: SIL 14-8-6
Acq: 18-Sep-2014 15:43:16
Instr: [ILM] AutoSpec-Ultima MM1
VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86
User: ACC Datafile: 140918P07
Rel. Int.
Abs. Int.
HpCDF
39.02-44.51
407.7818 Fn4
Flags: PBM
4σ 7.40e2
1234678F
4.53e5
39.32
1234789F
3.63e5
41.67
9.09e4
4.54e4
0.00e0
HpCDF
39.02-44.51
409.7788 Fn4
Flags: PBM
4σ 6.04e2
1234678F
4.93e5
39.32
1234789F
4.03e5
41.67
9.19e4
4.60e4
0.00e0
HpCDF Std.
39.02-44.51
417.8253 Fn4
Flags: PBM
4σ 4.10e3
ES 1234678F
9.99e6
39.31
CS 1234689F
9.72e6
39.95
ES 1234789F
8.50e6
41.65
RRF = (9.72e6 + 2.10e7) * 100 pg/uL / (9.99e6 + 2.20e7) * 100 pg/uL = 0.96
AJP 19-Sep-2014 12:07
OK JK 19 Sep 2014
1.97e6
9.85e5
0.00e0
HpCDF Std.
39.02-44.51
419.8220 Fn4
Flags: PBM
4σ 4.80e3
ES 1234678F
2.20e7
39.31
CS 1234689F
2.10e7
39.95
ES 1234789F
1.82e7
41.65
4.26e6
2.13e6
0.00e0
NCDPE
39.02-44.51
479.7165 Fn4
Flags: PB
4σ 5.88e2
2.44e3
1.22e3
0.00e0
100%
0%
40.0
41.0
42.0
43.0
44.0
RT
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP)
Peak annotation: Areas, Centroids
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2657, 9133, 2506 scc: 080-182
PKD: 19-Sep-2014 08:45 Printed: 19-Sep-2014 12:33 Page 11 of 12

SGS ID: CS1_140918_DF_PA **Sample ID: SIL 14-8-6** **Acq: 18-Sep-2014 15:43:16**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 86** **User: ACC Datafile: 140918P07**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS1_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 7939, 5183, 8642 scc: 080-182 *Revised: 19-Sep-2014 08:44 (DES) Printed: 19-Sep-2014 12:33 Page 12 of 12*

Dioxin/Furan QC Summary	Acq'd: 18 Sep 2014 16:36 ACC	ICAL: MM1_DF_01172014_18SEP2014
Lab ID: CS2_140918_DF_PA	UTP: 19-Sep-2014 10:09 AJP	Checkcode: 098-973-YCG
Sample ID: SIL 14-8-5	Report: 19 Sep 2014 10:19 AP	Datafile: 140918P08

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
2378-TCDD	27.18	1.04E+06	0.78	Y	1.18	1.16	-2%
12378-PeCDD	32.72	3.83E+06	1.62	Y	0.99	0.92	-7%
123478-HxCDD	36.64	3.65E+06	1.27	Y	1.02	1.04	2%
123678-HxCDD	36.76	3.62E+06	1.30	Y	1.05	1.03	-2%
123789-HxCDD	37.05	3.76E+06	1.26	Y	0.96	0.92	-4%
1234678-HpCDD	40.89	2.96E+06	1.07	Y	0.99	0.97	-2%
OCDD	46.00	4.95E+06	0.85	Y	1.06	1.06	0%
2378-TCDF	26.25	1.20E+06	0.72	Y	0.97	0.87	-10%
12378-PeCDF	31.22	5.97E+06	1.55	Y	0.98	0.96	-2%
23478-PeCDF	32.35	5.51E+06	1.54	Y	0.96	0.92	-4%
123478-HxCDF	35.67	4.85E+06	1.15	Y	1.17	1.14	-2%
123678-HxCDF	35.82	5.21E+06	1.14	Y	1.09	1.04	-4%
234678-HxCDF	36.46	4.82E+06	1.18	Y	1.09	1.07	-3%
123789-HxCDF	37.43	4.47E+06	1.23	Y	1.09	1.07	-2%
1234678-HpCDF	39.32	3.96E+06	1.04	Y	1.29	1.24	-4%
1234789-HpCDF	41.67	3.13E+06	0.96	Y	1.22	1.16	-5%
OCDF	46.32	5.76E+06	0.87	Y	1.00	0.98	-2%
ES 2378-TCDD	27.16	4.46E+07	0.78	Y	1.08	1.05	-3%
ES 12378-PeCDD	32.70	4.15E+07	1.57	Y	1.01	0.98	-3%
ES 123478-HxCDD	36.63	3.50E+07	1.27	Y	1.04	1.00	-4%
ES 123678-HxCDD	36.74	3.52E+07	1.22	Y	1.01	1.00	0%
ES 123789-HxCDD	37.04	4.10E+07	1.25	Y	1.17	1.17	0%
ES 1234678-HpCDD	40.87	3.06E+07	1.10	Y	0.86	0.87	1%
ES OCDD	45.98	4.68E+07	0.89	Y	0.65	0.67	2%
ES 2378-TCDF	26.23	6.86E+07	0.75	Y	1.03	1.01	-2%
ES 12378-PeCDF	31.20	6.22E+07	1.48	Y	0.94	0.92	-2%
ES 23478-PeCDF	32.34	6.02E+07	1.54	Y	0.91	0.89	-2%
ES 123478-HxCDF	35.66	4.25E+07	0.53	Y	1.24	1.21	-2%
ES 123678-HxCDF	35.80	5.00E+07	0.54	Y	1.44	1.43	-1%
ES 234678-HxCDF	36.45	4.52E+07	0.53	Y	1.30	1.29	-1%
ES 123789-HxCDF	37.42	4.19E+07	0.53	Y	1.20	1.20	0%
ES 1234678-HpCDF	39.30	3.19E+07	0.46	Y	0.90	0.91	1%
ES 1234789-HpCDF	41.65	2.69E+07	0.45	Y	0.75	0.77	2%
ES OCDF	46.31	5.89E+07	0.89	Y	0.83	0.84	2%

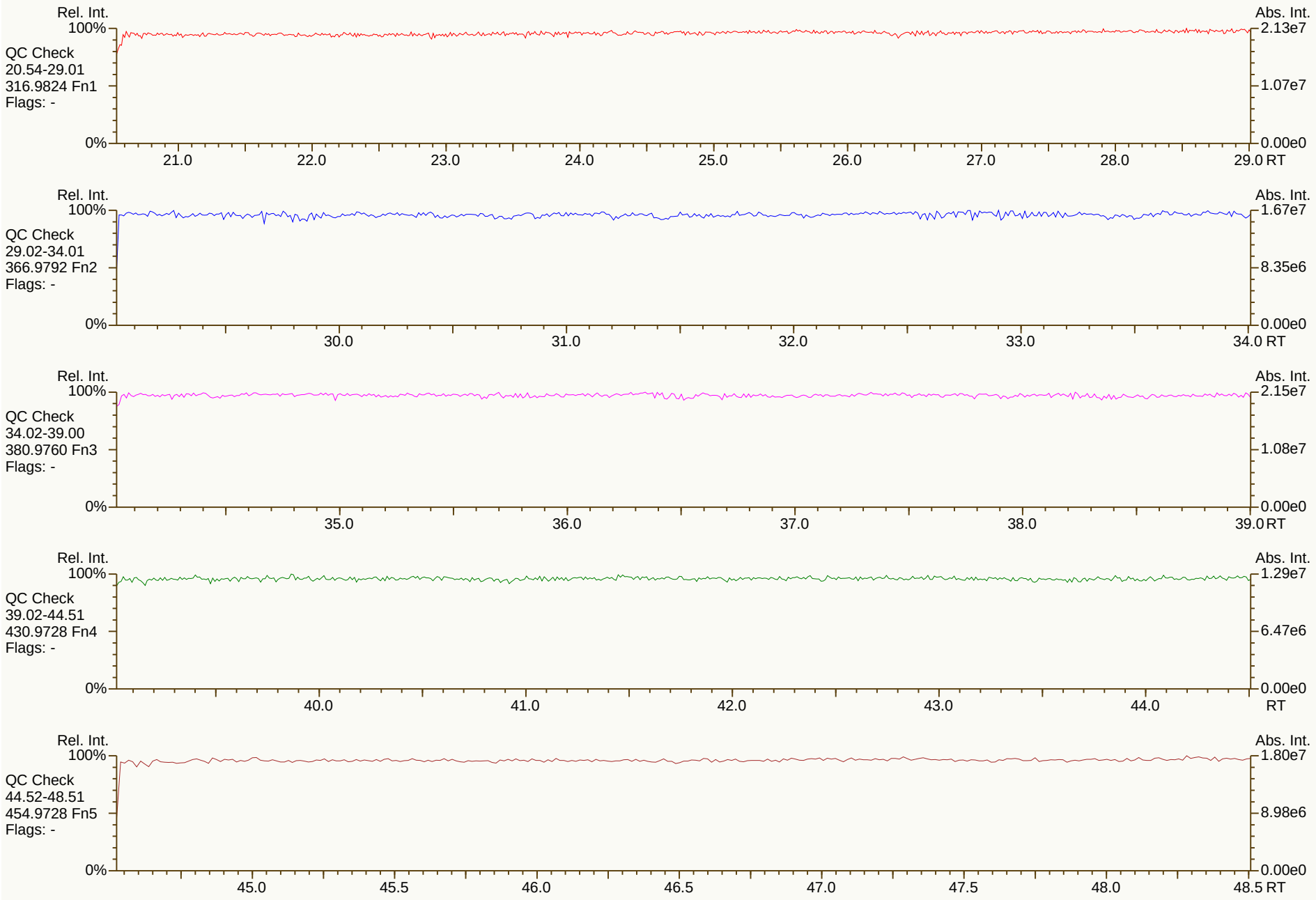
Dioxin/Furan QC Summary | **Acq'd: 18 Sep 2014 16:36 ACC** | **ICAL: MM1_DF_01172014_18SEP2014**

Lab ID: CS2_140918_DF_PA | **UTP: 19-Sep-2014 10:09 AJP** | **Checkcode: 098-973**

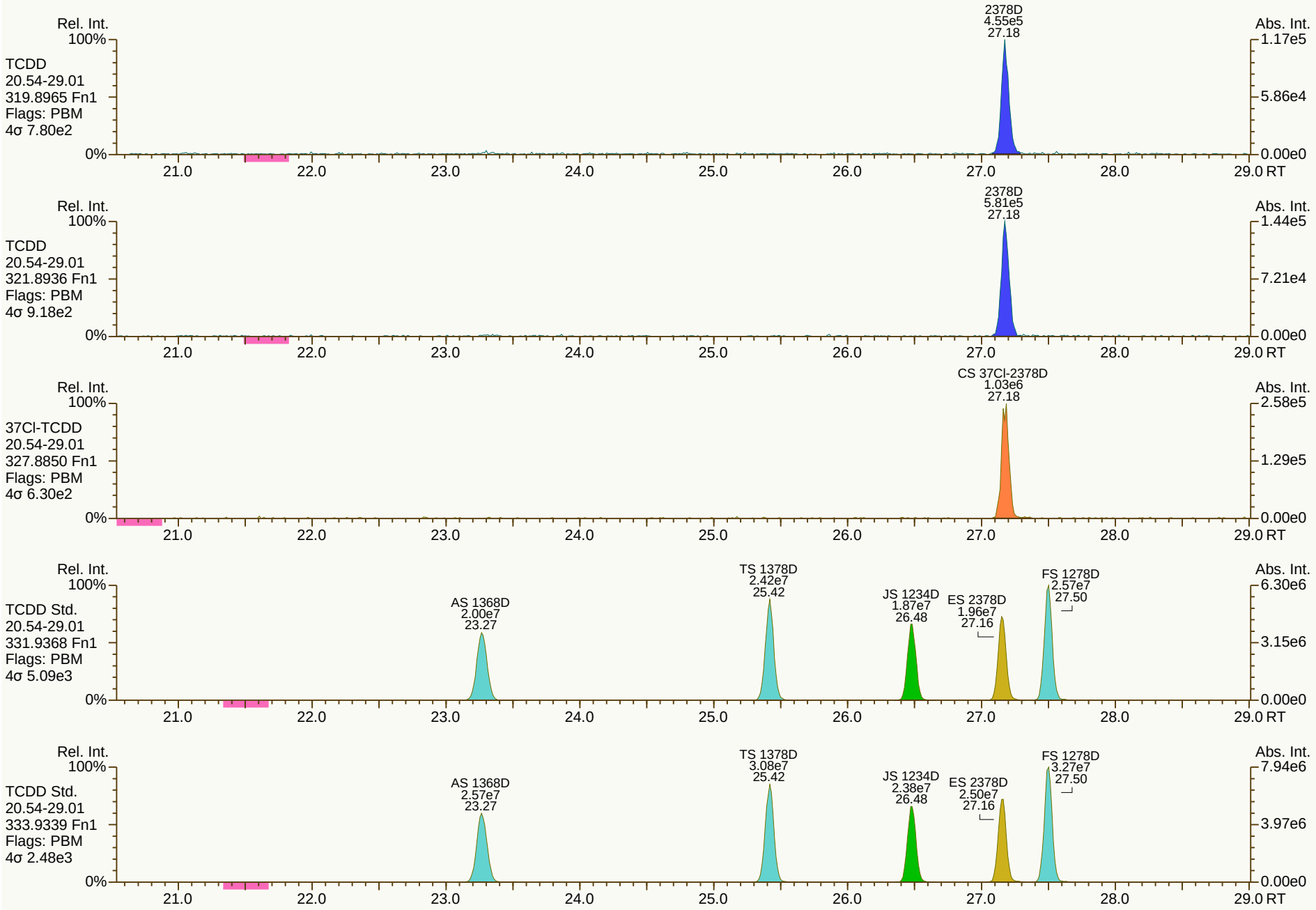
Sample ID: SIL 14-8-5 | **Report: 19 Sep 2014 10:19 AD** | **Datafile: 140918P08**

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
JS 1234-TCDD	26.48	4.26E+07	0.79	Y	-	-	-
JS 1234-TCDF	24.81	6.79E+07	0.76	Y	-	-	-
JS 123467-HxCDD	36.93	1.75E+07	1.25	Y	-	-	-
CS 37Cl-2378-TCDD	27.18	1.03E+06	n/a	-	1.28	1.21	-6%
CS 12347-PeCDD	32.19	4.03E+07	1.58	Y	0.96	0.95	-1%
CS 12346-PeCDF	30.66	5.96E+07	1.50	Y	0.91	0.88	-4%
CS 123469-HxCDF	36.10	4.70E+07	0.53	Y	1.33	1.34	1%
CS 1234689-HpCDF	39.95	3.02E+07	0.45	Y	0.82	0.86	5%
SS 37Cl-2378-TCDD	27.18	1.03E+06	n/a	-	1.19	1.15	-4%
SS 12347-PeCDD	32.19	4.03E+07	1.58	Y	0.95	0.97	2%
SS 12346-PeCDF	30.66	5.96E+07	1.50	Y	0.98	0.96	-2%
SS 123469-HxCDF	36.10	4.70E+07	0.53	Y	0.92	0.94	2%
SS 1234689-HpCDF	39.95	3.02E+07	0.45	Y	0.91	0.95	4%
AS 1368-TCDD	23.27	4.57E+07	0.78	Y	1.08	1.07	-1%
AS 1368-TCDF	21.07	7.95E+07	0.75	Y	1.18	1.17	-1%
FS 1278-TCDD	27.50	5.84E+07	0.78	Y	1.28	1.31	2%
FS 12478-PeCDD	31.44	5.05E+07	1.59	Y	1.18	1.22	3%
FS 123468-HxCDD	35.59	4.93E+07	1.25	Y	1.35	1.41	5%
FS 1234679-HpCDD	39.73	4.04E+07	1.08	Y	1.27	1.32	4%
TS 1378-TCDD	25.42	5.50E+07	0.79	Y	1.22	1.23	1%
OCDD-a	45.99	3.16E+05	2.44	Y	0.07	0.07	0%
OCDF-a	46.32	3.56E+05	2.45	Y	0.06	0.06	0%

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



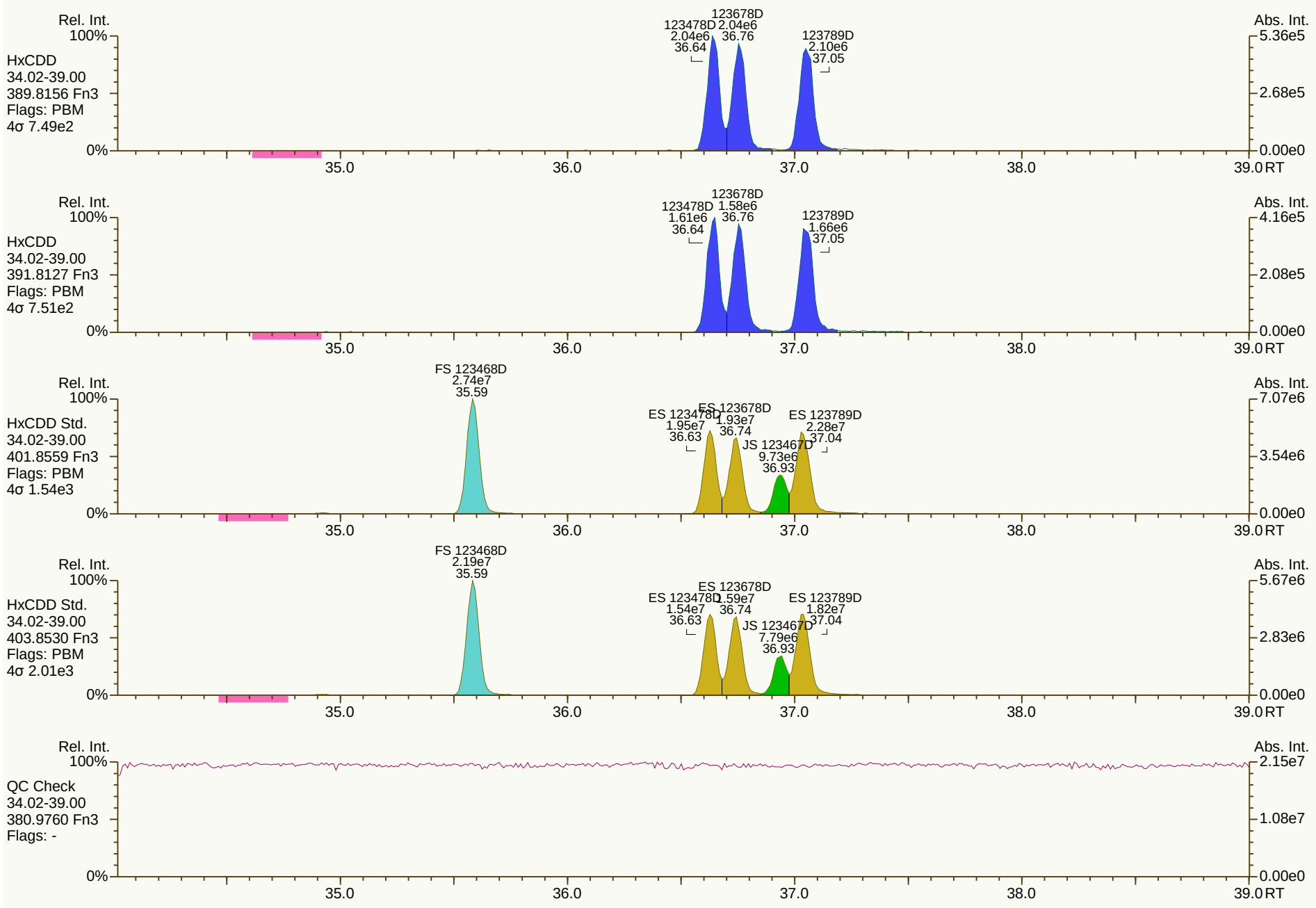
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 4718, 4574, 6816 scc: 098-973 *PKD: 19-Sep-2014 08:46 Printed: 19-Sep-2014 12:34 Page 2 of 12*

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



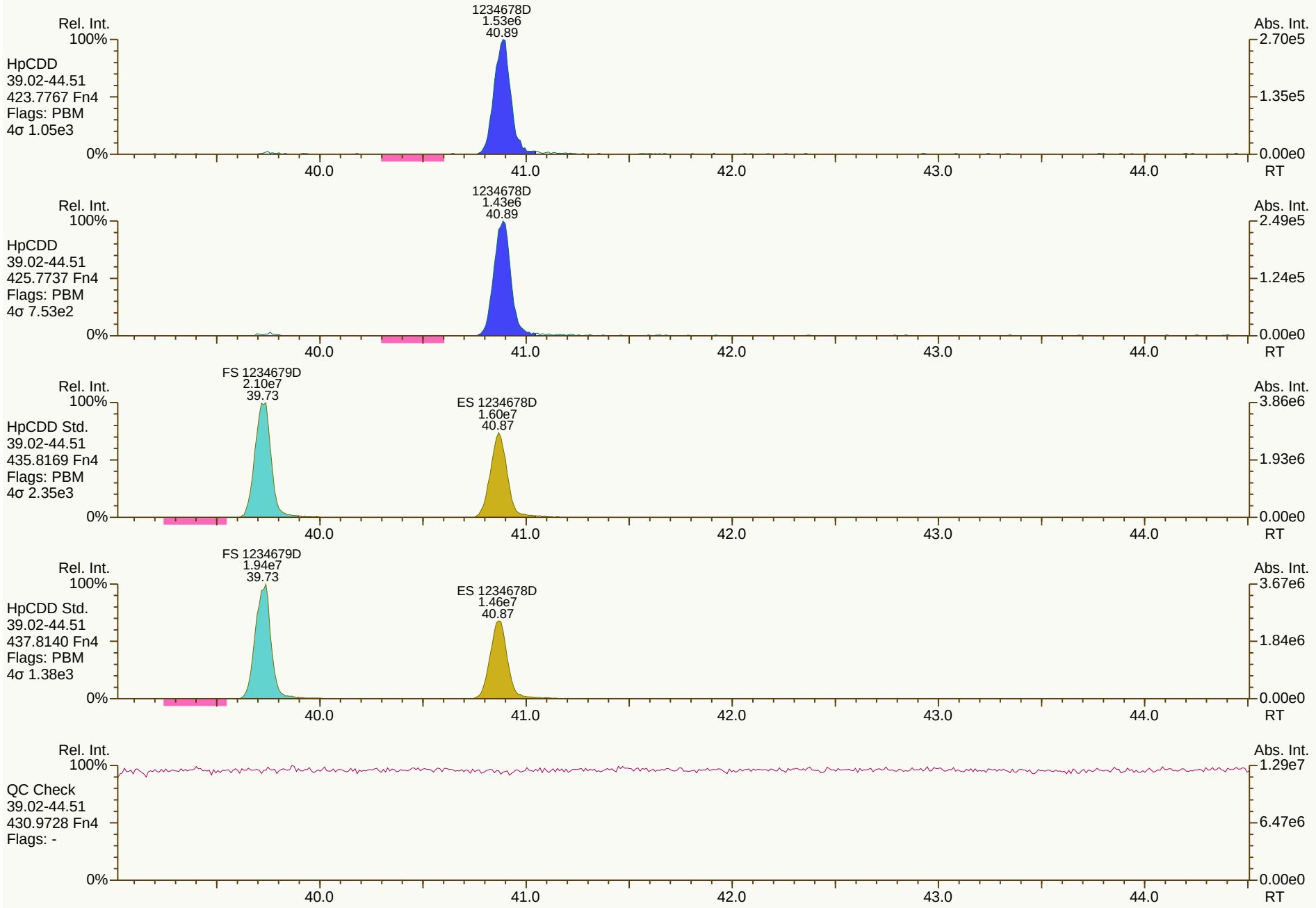
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 7856, 7335 scc: 098-973 *PKD: 19-Sep-2014 08:46 Printed: 19-Sep-2014 12:34 Page 3 of 12*

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



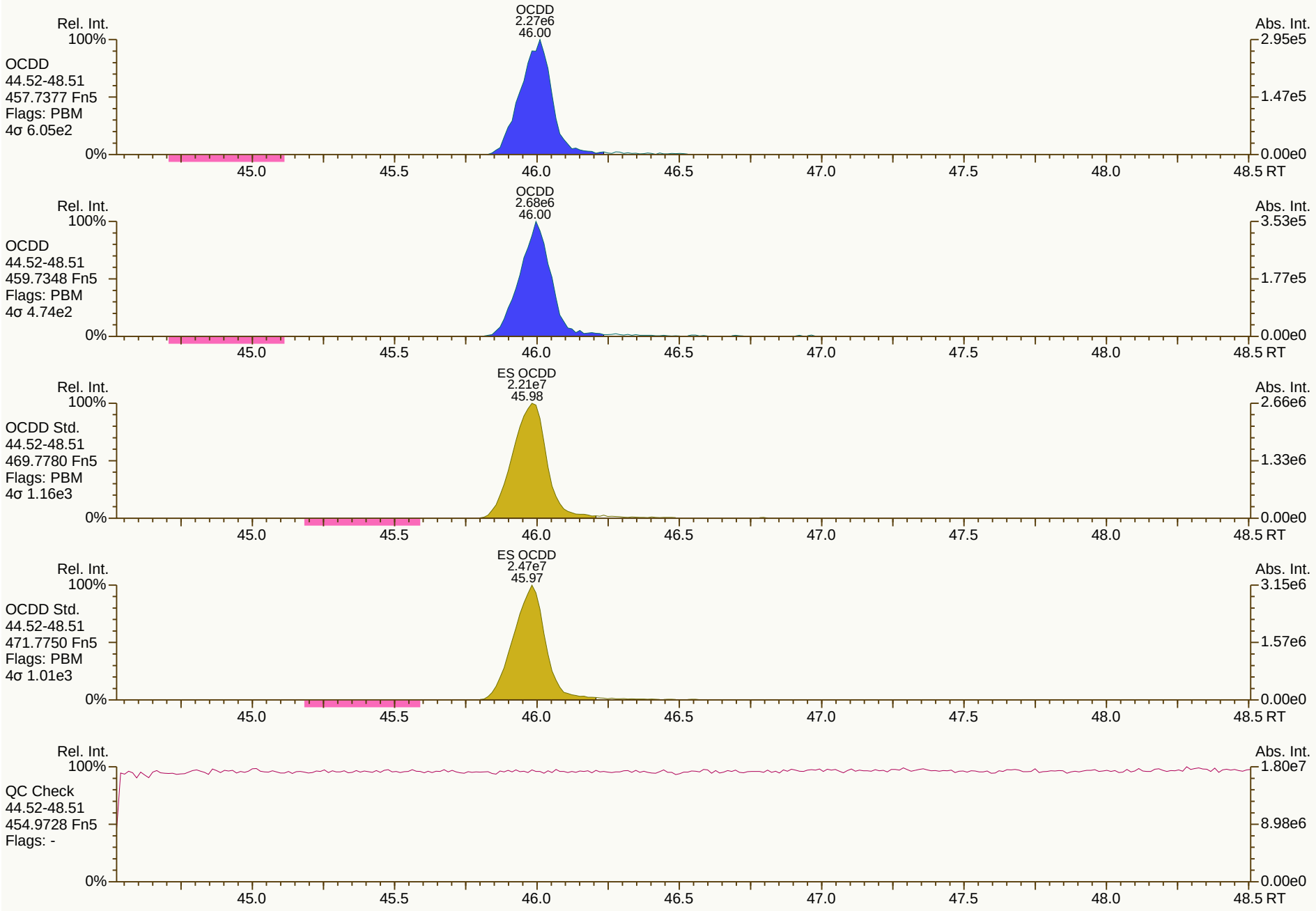
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SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 4756, 8041 scc: 098-973 *PKD: 19-Sep-2014 08:46 Printed: 19-Sep-2014 12:34 Page 5 of 12*

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 6599, 0923, 4832 scc: 098-973 *PKD: 19-Sep-2014 08:46 Printed: 19-Sep-2014 12:34 Page 7 of 12*

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**

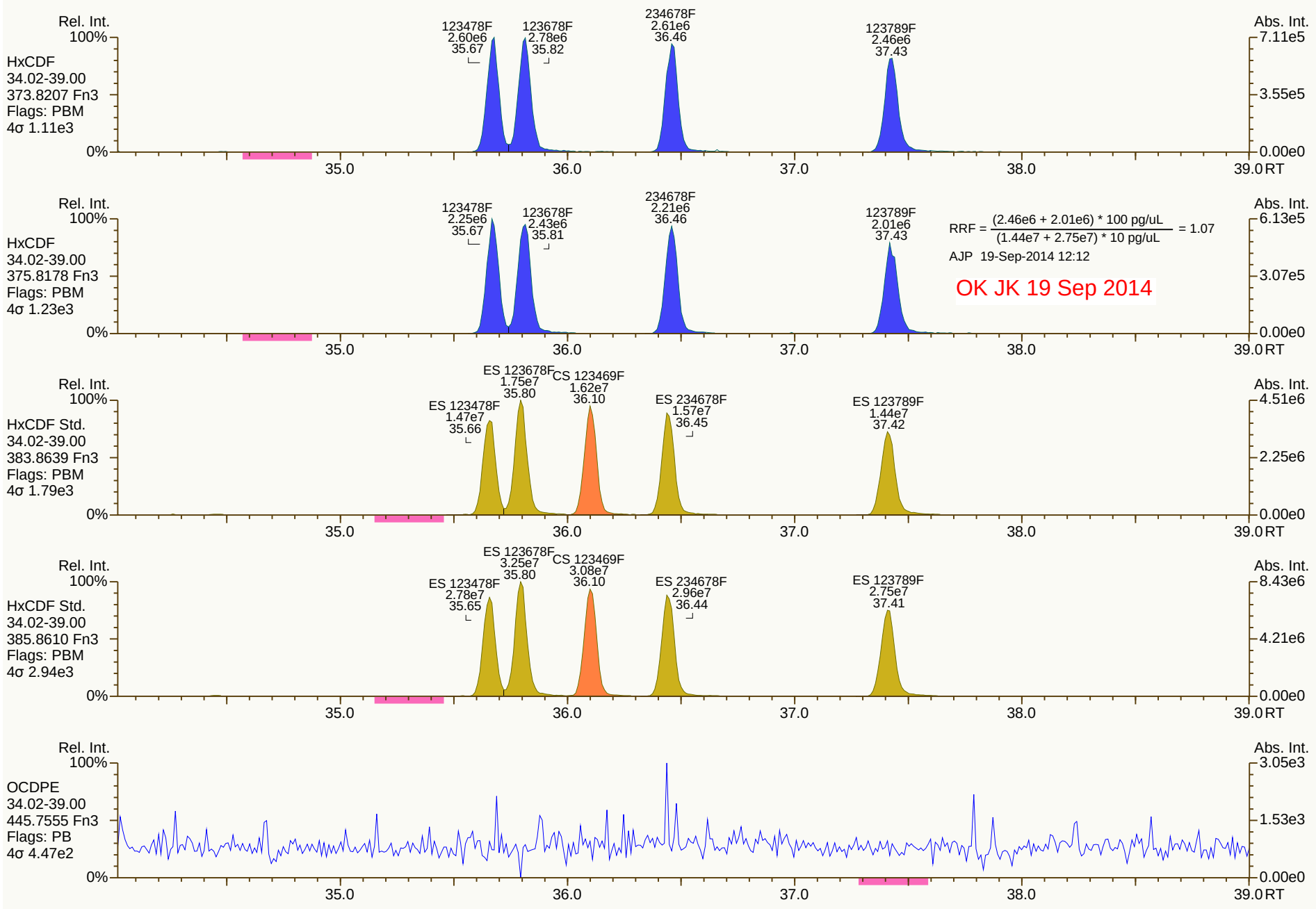


SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2185, 0034, 5704 scc: 098-973 *PKD: 19-Sep-2014 08:46 Printed: 19-Sep-2014 12:34 Page 9 of 12*

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2346, 5376, 5082 scc: 098-973 *PKD: 19-Sep-2014 08:46 Printed: 19-Sep-2014 12:34 Page 10 of 12*

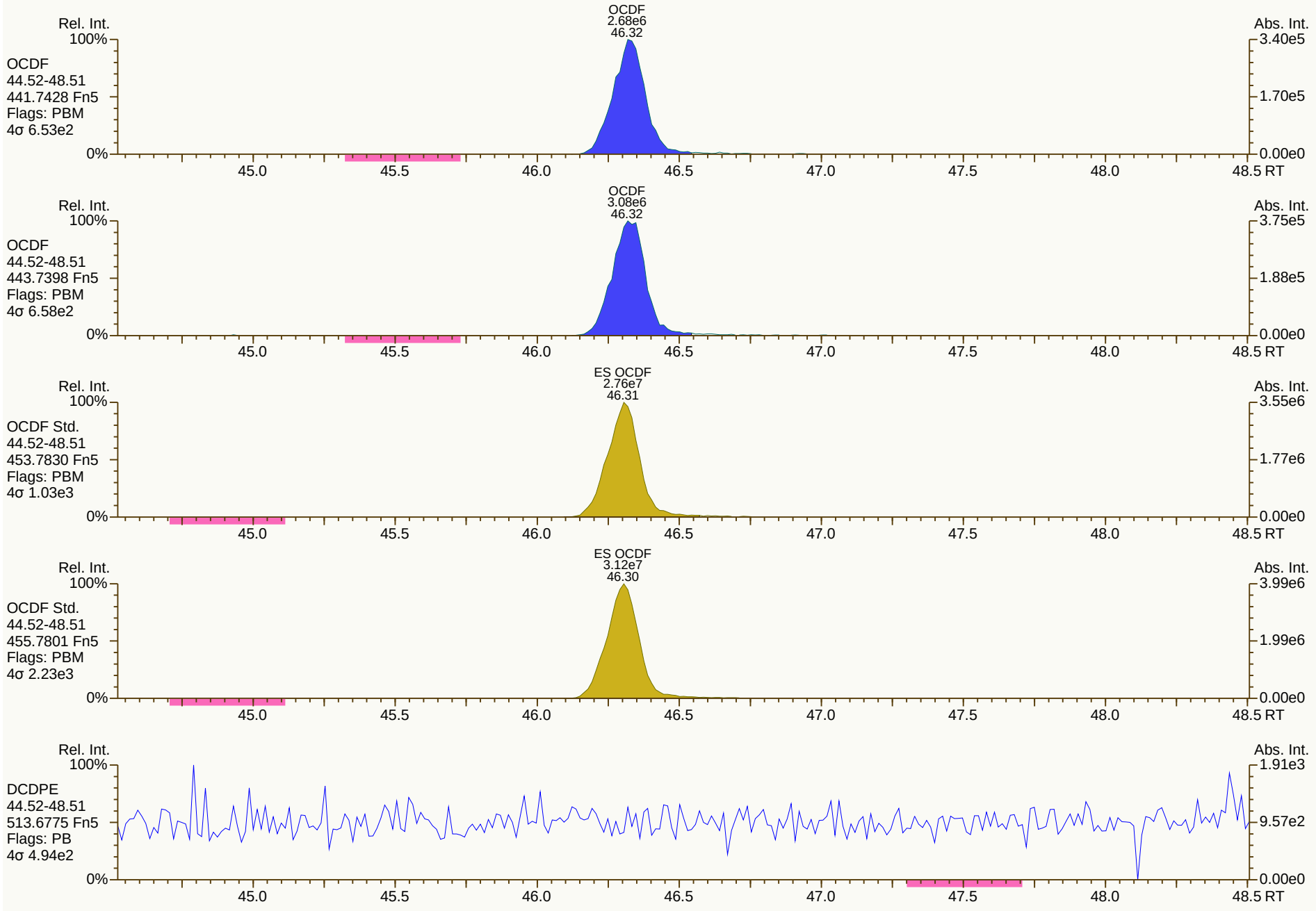
SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3117, 9531, 8683 scc: 098-973 *PKD: 19-Sep-2014 08:46 Printed: 19-Sep-2014 12:34 Page 11 of 12*

SGS ID: CS2_140918_DF_PA **Sample ID: SIL 14-8-5** **Acq: 18-Sep-2014 16:36:32**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 87** **User: ACC Datafile: 140918P08**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS2_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 0763, 5165, 3618 scc: 098-973 *Revised: 19-Sep-2014 08:45 (DES) Printed: 19-Sep-2014 12:34 Page 12 of 12*

Dioxin/Furan QC Summary	Acq'd: 18 Sep 2014 17:29 ACC	ICAL: MM1_DF_01172014_18SEP2014
Lab ID: CS3_140918_DF_PA	UTP: 19-Sep-2014 10:09 AJP	Checkcode: 408-457-KDB
Sample ID: SIL 14-8-4	Report: 19 Sep 2014 10:19 AP	Datafile: 140918P09

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
2378-TCDD	27.19	4.85E+06	0.79	Y	1.18	1.15	-3%
12378-PeCDD	32.73	1.93E+07	1.66	Y	0.99	0.99	0%
123478-HxCDD	36.66	1.65E+07	1.26	Y	1.02	1.02	0%
123678-HxCDD	36.77	1.66E+07	1.27	Y	1.05	1.06	1%
123789-HxCDD	37.07	1.75E+07	1.23	Y	0.96	0.96	0%
1234678-HpCDD	40.91	1.33E+07	1.06	Y	0.99	1.00	1%
OCDD	46.02	2.06E+07	0.90	Y	1.06	1.06	0%
2378-TCDF	26.27	6.18E+06	0.74	Y	0.97	0.95	-2%
12378-PeCDF	31.23	2.84E+07	1.55	Y	0.98	0.97	-1%
23478-PeCDF	32.37	2.68E+07	1.46	Y	0.96	0.96	0%
123478-HxCDF	35.69	2.35E+07	1.20	Y	1.17	1.20	2%
123678-HxCDF	35.83	2.53E+07	1.19	Y	1.09	1.12	3%
234678-HxCDF	36.47	2.26E+07	1.17	Y	1.09	1.09	0%
123789-HxCDF	37.44	2.04E+07	1.21	Y	1.09	1.09	0%
1234678-HpCDF	39.34	1.79E+07	0.99	Y	1.29	1.28	0%
1234789-HpCDF	41.69	1.41E+07	0.94	Y	1.22	1.24	1%
OCDF	46.35	2.45E+07	0.88	Y	1.00	1.00	0%
ES 2378-TCDD	27.17	4.24E+07	0.80	Y	1.08	1.07	-1%
ES 12378-PeCDD	32.71	3.89E+07	1.55	Y	1.01	0.98	-3%
ES 123478-HxCDD	36.64	3.23E+07	1.28	Y	1.04	0.97	-6%
ES 123678-HxCDD	36.76	3.15E+07	1.27	Y	1.01	0.95	-6%
ES 123789-HxCDD	37.06	3.64E+07	1.28	Y	1.17	1.10	-6%
ES 1234678-HpCDD	40.89	2.67E+07	1.09	Y	0.86	0.80	-7%
ES OCDD	46.00	3.88E+07	0.89	Y	0.65	0.59	-10%
ES 2378-TCDF	26.24	6.50E+07	0.77	Y	1.03	1.03	0%
ES 12378-PeCDF	31.22	5.84E+07	1.49	Y	0.94	0.92	-2%
ES 23478-PeCDF	32.35	5.60E+07	1.49	Y	0.91	0.88	-3%
ES 123478-HxCDF	35.67	3.93E+07	0.53	Y	1.24	1.19	-4%
ES 123678-HxCDF	35.81	4.53E+07	0.54	Y	1.44	1.37	-5%
ES 234678-HxCDF	36.46	4.14E+07	0.53	Y	1.30	1.25	-4%
ES 123789-HxCDF	37.43	3.73E+07	0.52	Y	1.20	1.13	-6%
ES 1234678-HpCDF	39.32	2.79E+07	0.45	Y	0.90	0.84	-7%
ES 1234789-HpCDF	41.67	2.27E+07	0.45	Y	0.75	0.69	-9%
ES OCDF	46.33	4.90E+07	0.88	Y	0.83	0.74	-10%

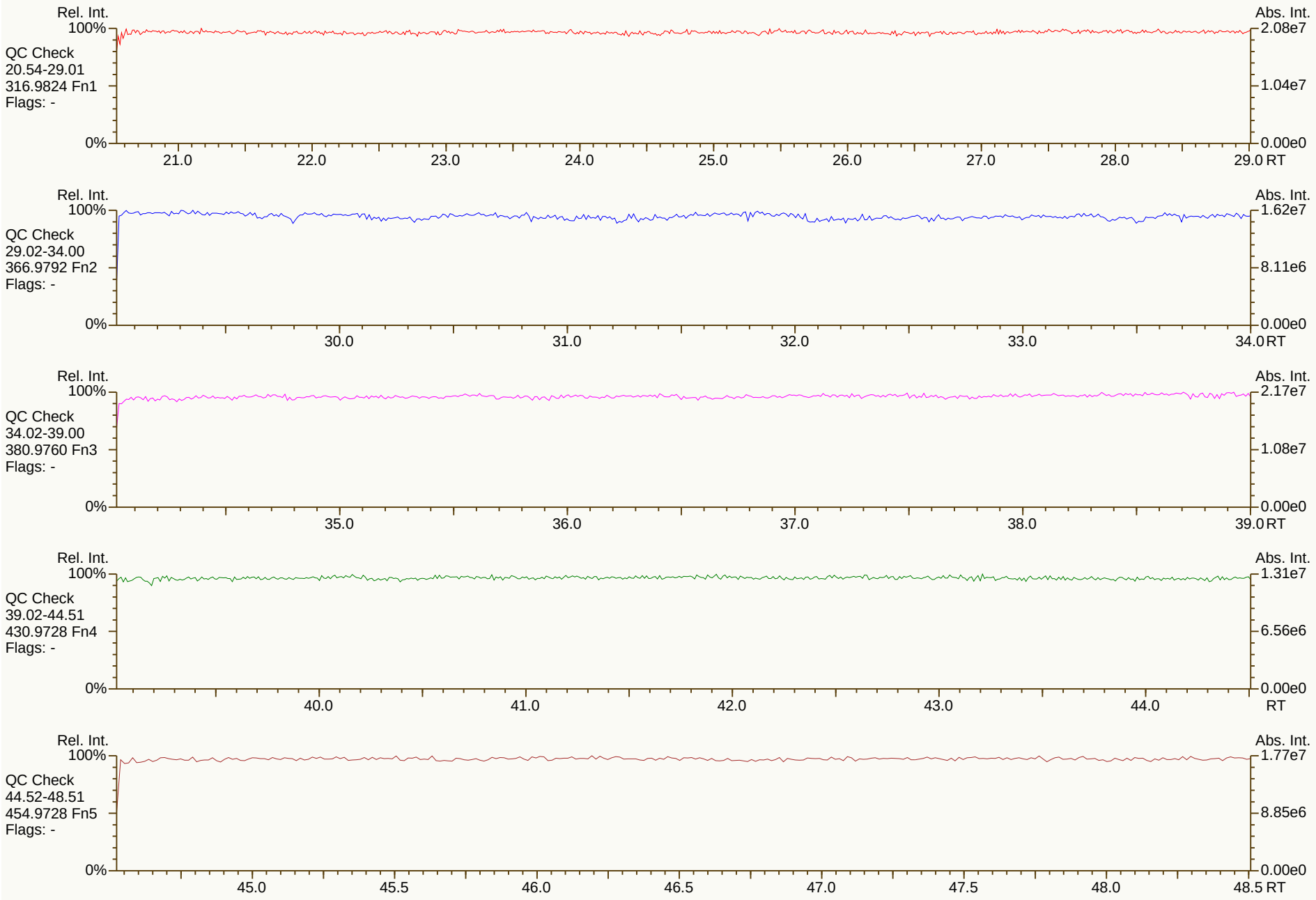
Dioxin/Furan QC Summary | **Acq'd: 18 Sep 2014 17:29 ACC** | **ICAL: MM1_DF_01172014_18SEP2014**

Lab ID: CS3_140918_DF_PA | **UTP: 19-Sep-2014 10:09 AJP** | **Checkcode: 408-457**

Sample ID: SIL 14-8-4 | **Report: 19 Sep 2014 10:19 AD** | **Datafile: 140918P09**

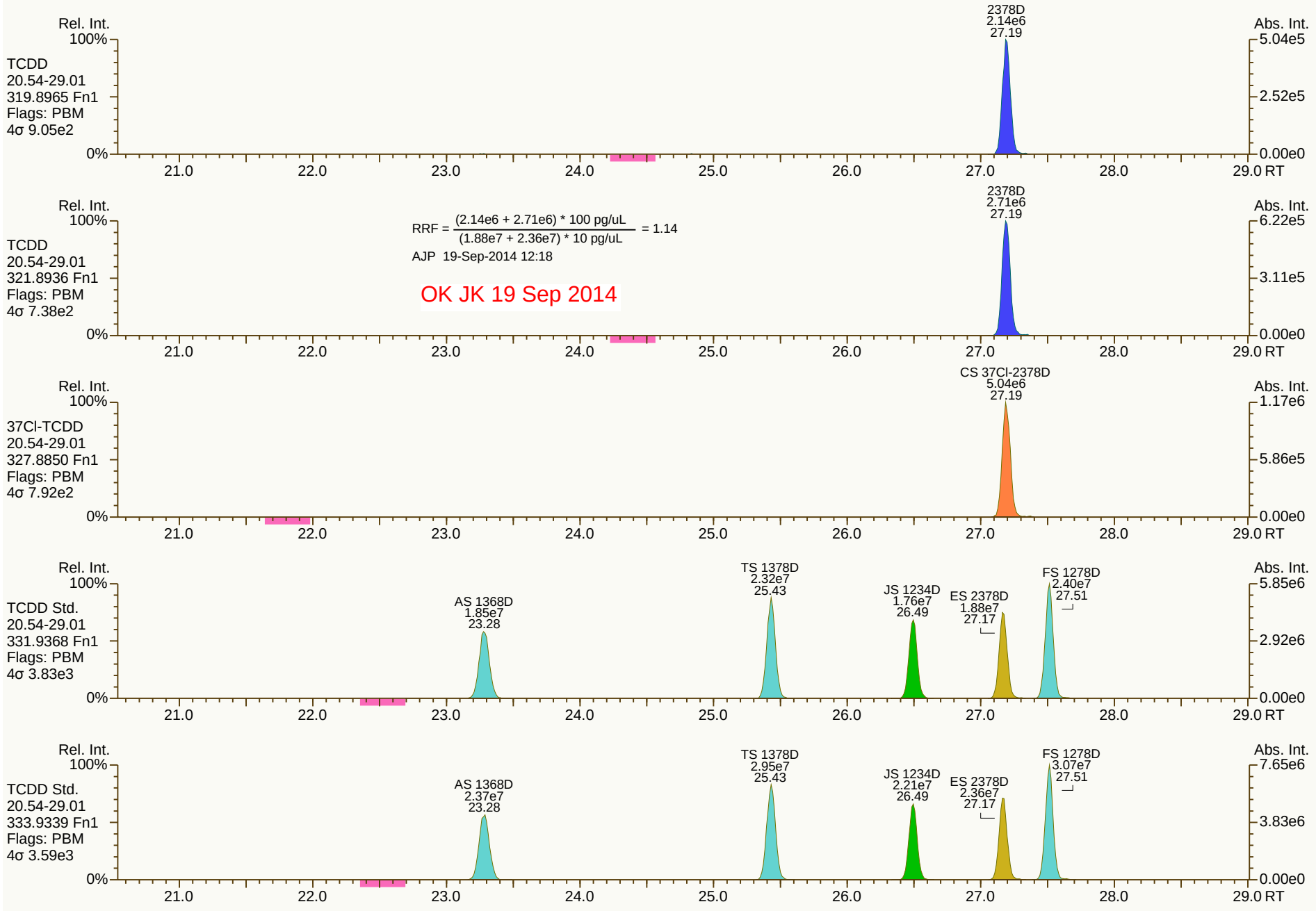
Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
JS 1234-TCDD	26.49	3.97E+07	0.80	Y	-	-	-
JS 1234-TCDF	24.83	6.34E+07	0.76	Y	-	-	-
JS 123467-HxCDD	36.95	1.66E+07	1.29	Y	-	-	-
CS 37Cl-2378-TCDD	27.19	5.04E+06	n/a	-	1.28	1.27	-1%
CS 12347-PeCDD	32.20	3.72E+07	1.56	Y	0.96	0.94	-2%
CS 12346-PeCDF	30.68	5.88E+07	1.53	Y	0.91	0.93	1%
CS 123469-HxCDF	36.12	4.31E+07	0.51	Y	1.33	1.30	-2%
CS 1234689-HpCDF	39.97	2.61E+07	0.45	Y	0.82	0.79	-3%
SS 37Cl-2378-TCDD	27.19	5.04E+06	n/a	-	1.19	1.19	0%
SS 12347-PeCDD	32.20	3.72E+07	1.56	Y	0.95	0.96	1%
SS 12346-PeCDF	30.68	5.88E+07	1.53	Y	0.98	1.01	3%
SS 123469-HxCDF	36.12	4.31E+07	0.51	Y	0.92	0.95	4%
SS 1234689-HpCDF	39.97	2.61E+07	0.45	Y	0.91	0.94	3%
AS 1368-TCDD	23.28	4.22E+07	0.78	Y	1.08	1.06	-2%
AS 1368-TCDF	21.09	7.54E+07	0.75	Y	1.18	1.19	1%
FS 1278-TCDD	27.51	5.47E+07	0.78	Y	1.28	1.29	1%
FS 12478-PeCDD	31.46	4.77E+07	1.60	Y	1.18	1.23	4%
FS 123468-HxCDD	35.60	4.54E+07	1.24	Y	1.35	1.41	4%
FS 1234679-HpCDD	39.74	3.50E+07	1.11	Y	1.27	1.31	3%
TS 1378-TCDD	25.43	5.28E+07	0.79	Y	1.22	1.25	2%
OCDD-a	46.01	1.22E+06	2.27	Y	0.07	0.06	-7%
OCDF-a	46.35	1.41E+06	2.46	Y	0.06	0.06	-4%

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



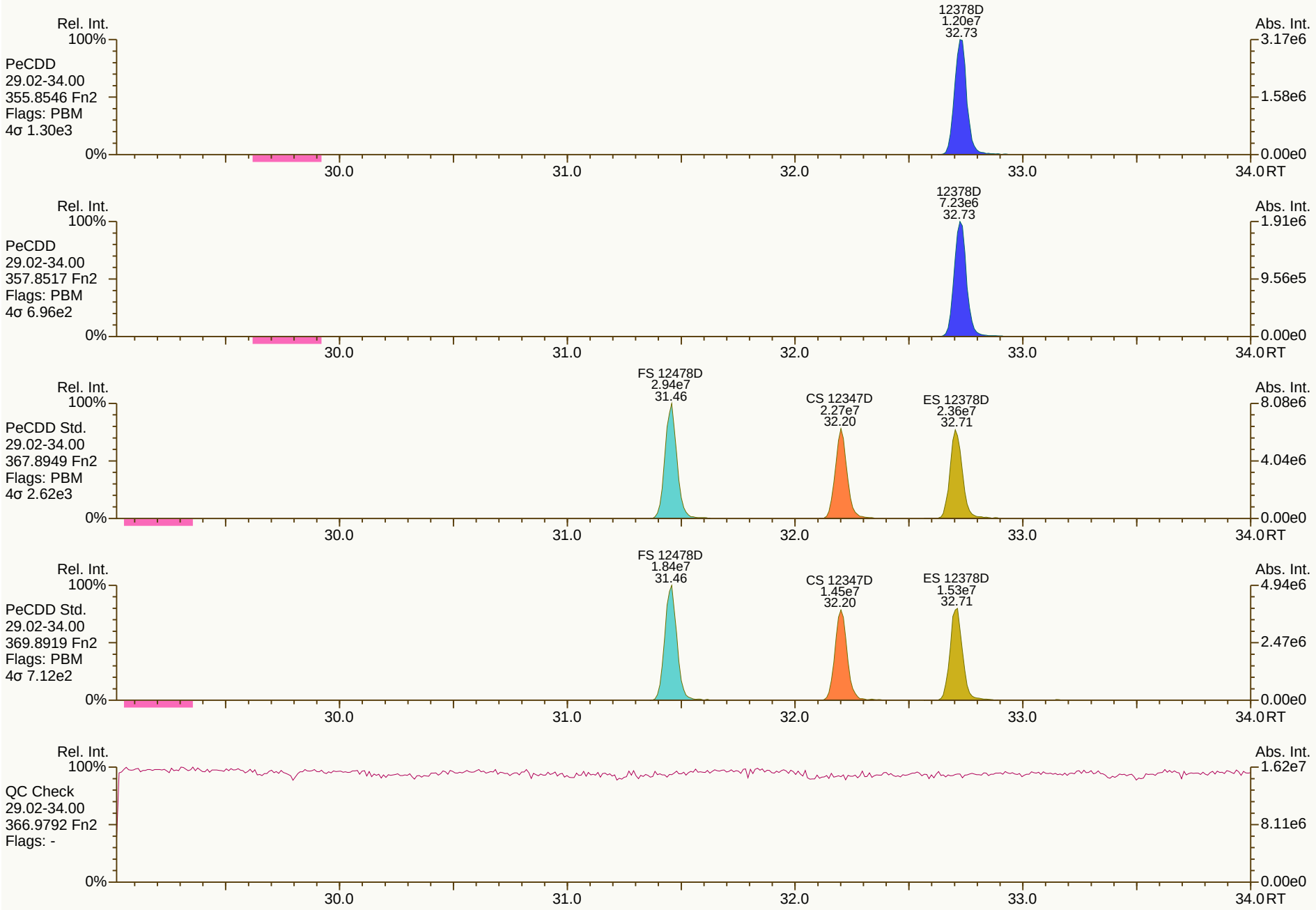
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SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



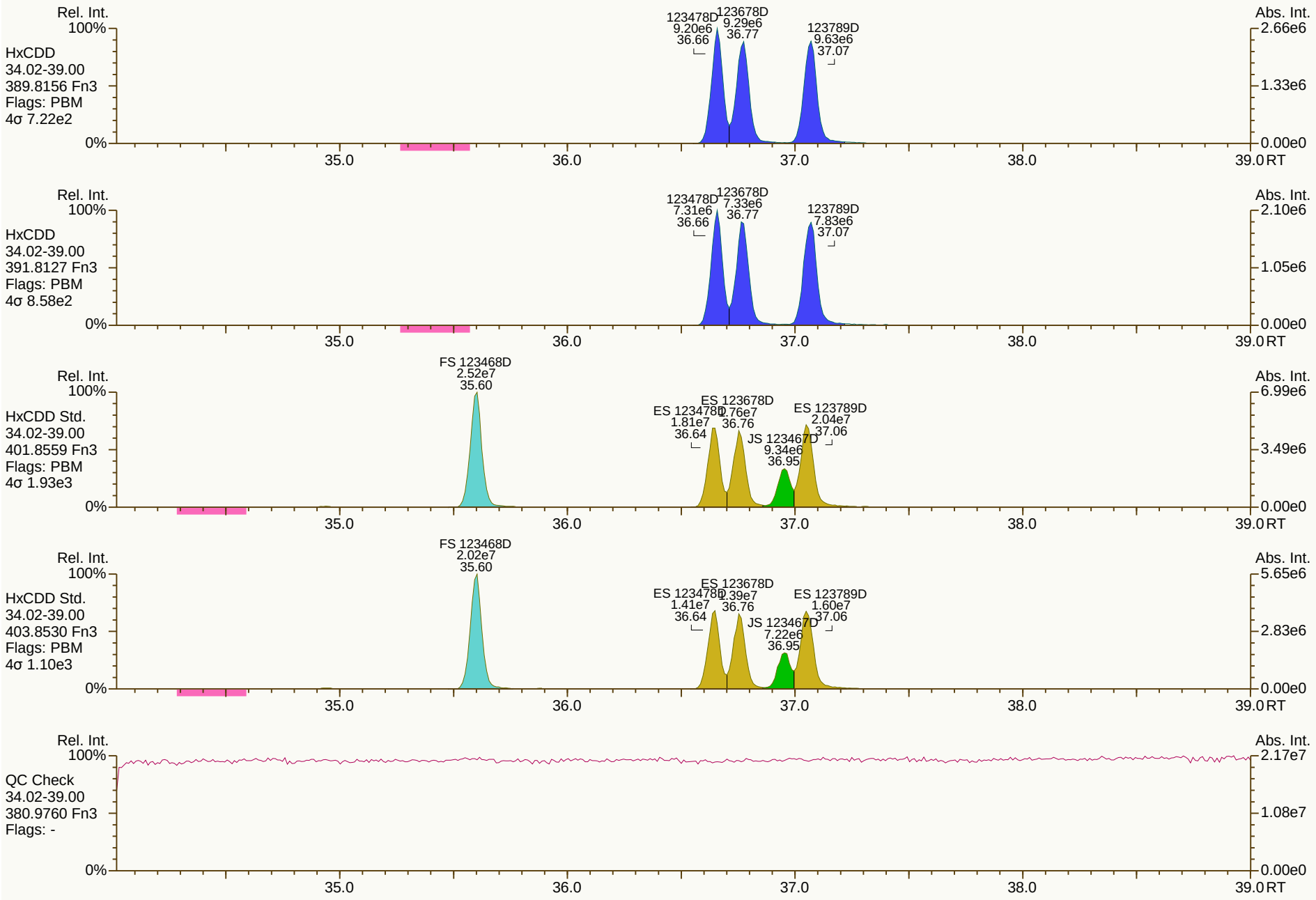
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5268, 7743, 0338 scc: 408-457 *PKD: 19-Sep-2014 08:47 Printed: 19-Sep-2014 12:34 Page 2 of 12*

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



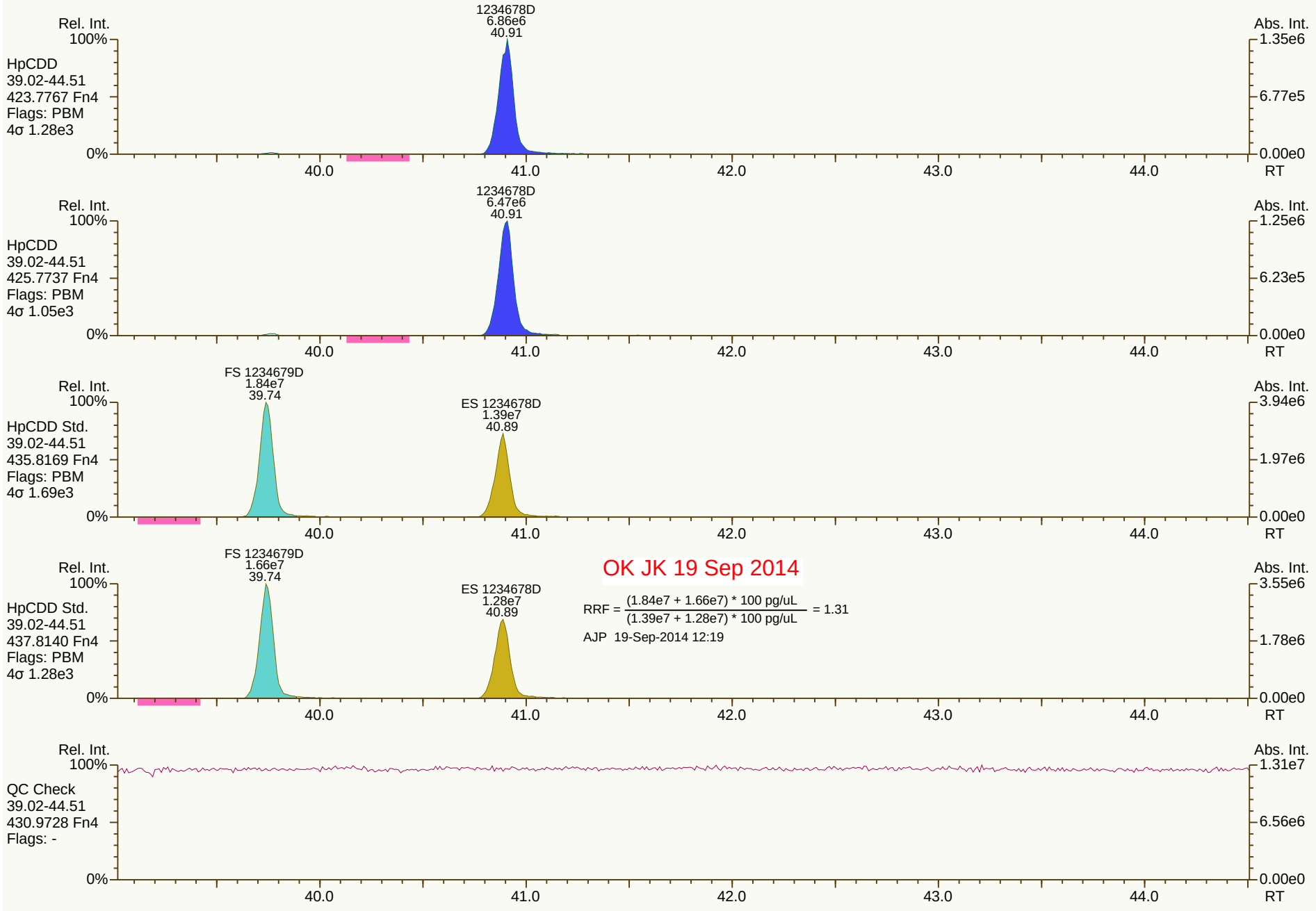
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 6484, 2694 scc: 408-457 *PKD: 19-Sep-2014 08:47 Printed: 19-Sep-2014 12:34 Page 3 of 12*

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS3_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

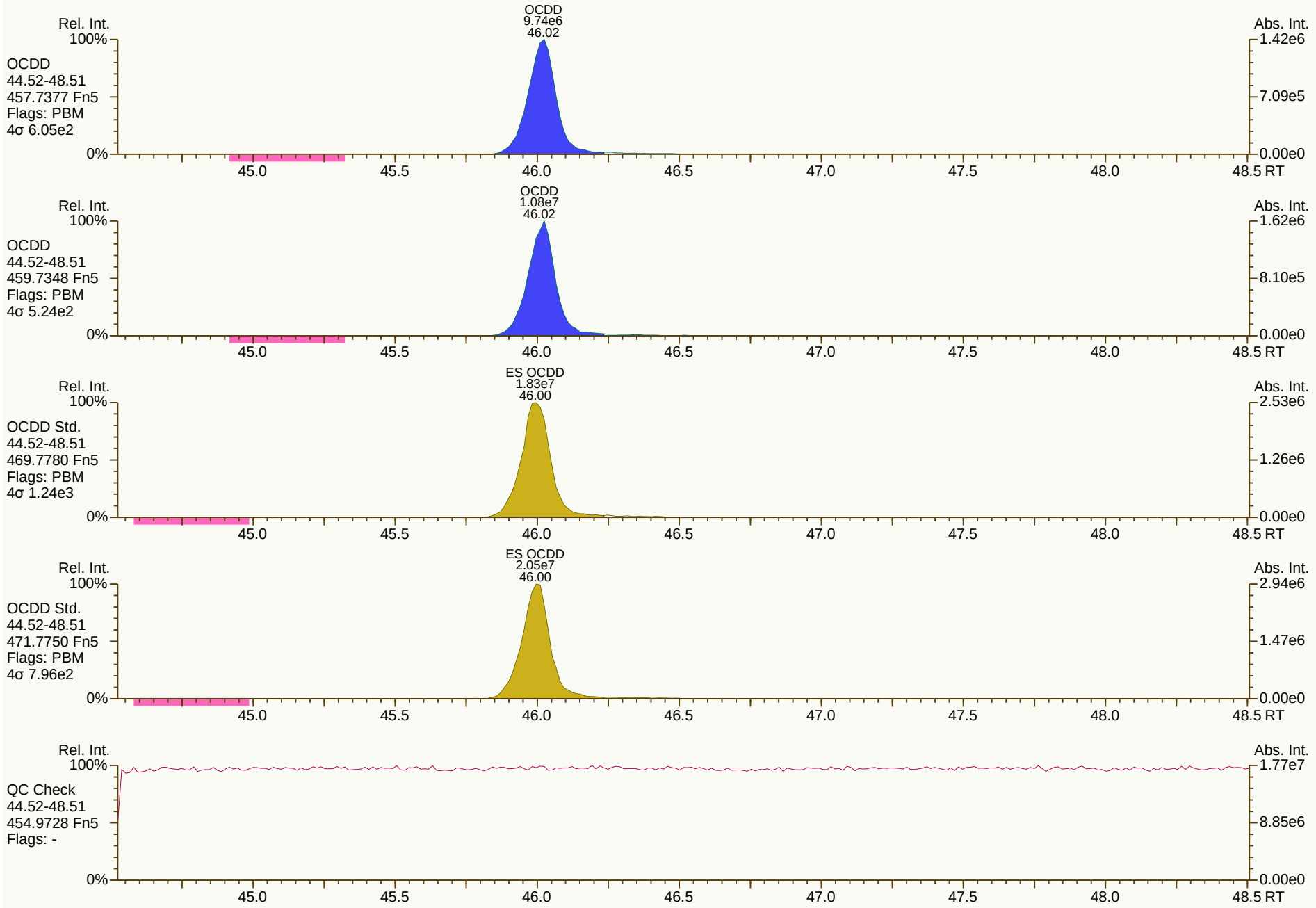
SGS ID: CS3_140918_DF_PA | **Sample ID: SIL 14-8-4** | **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 | **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** | **User: ACC Datafile: 140918P09**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS3_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2097, 5482 scc: 408-457 *Revised: 19-Sep-2014 08:46 (DES) Printed: 19-Sep-2014 12:34 Page 5 of 12*

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS3_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 6653, 5276 scc: 408-457 *Revised: 19-Sep-2014 08:46 (DES) Printed: 19-Sep-2014 12:34 Page 6 of 12*

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS3_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 1942, 2864, 6260 scc: 408-457 *PKD: 19-Sep-2014 08:47 Printed: 19-Sep-2014 12:34 Page 7 of 12*

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**

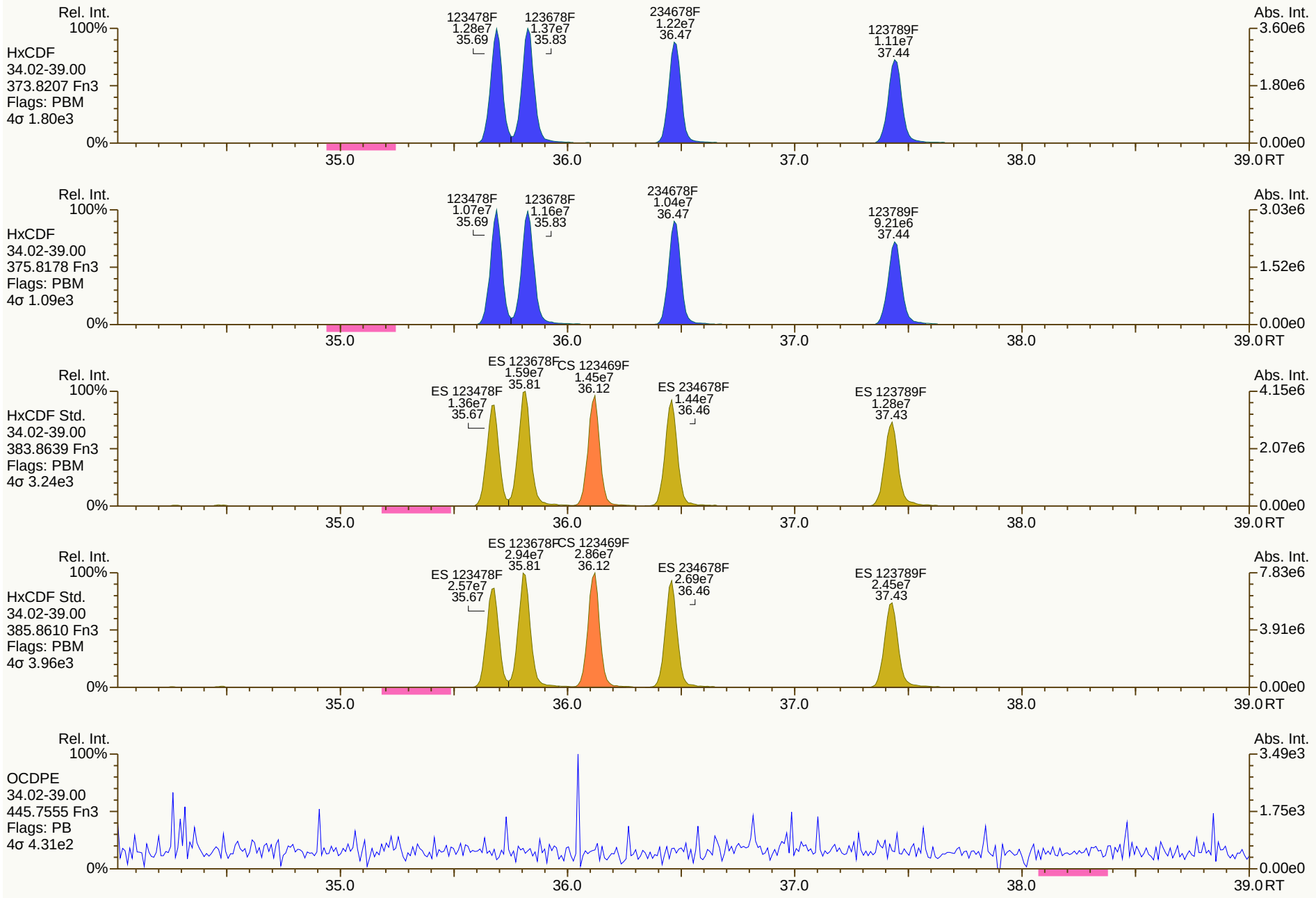


SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**

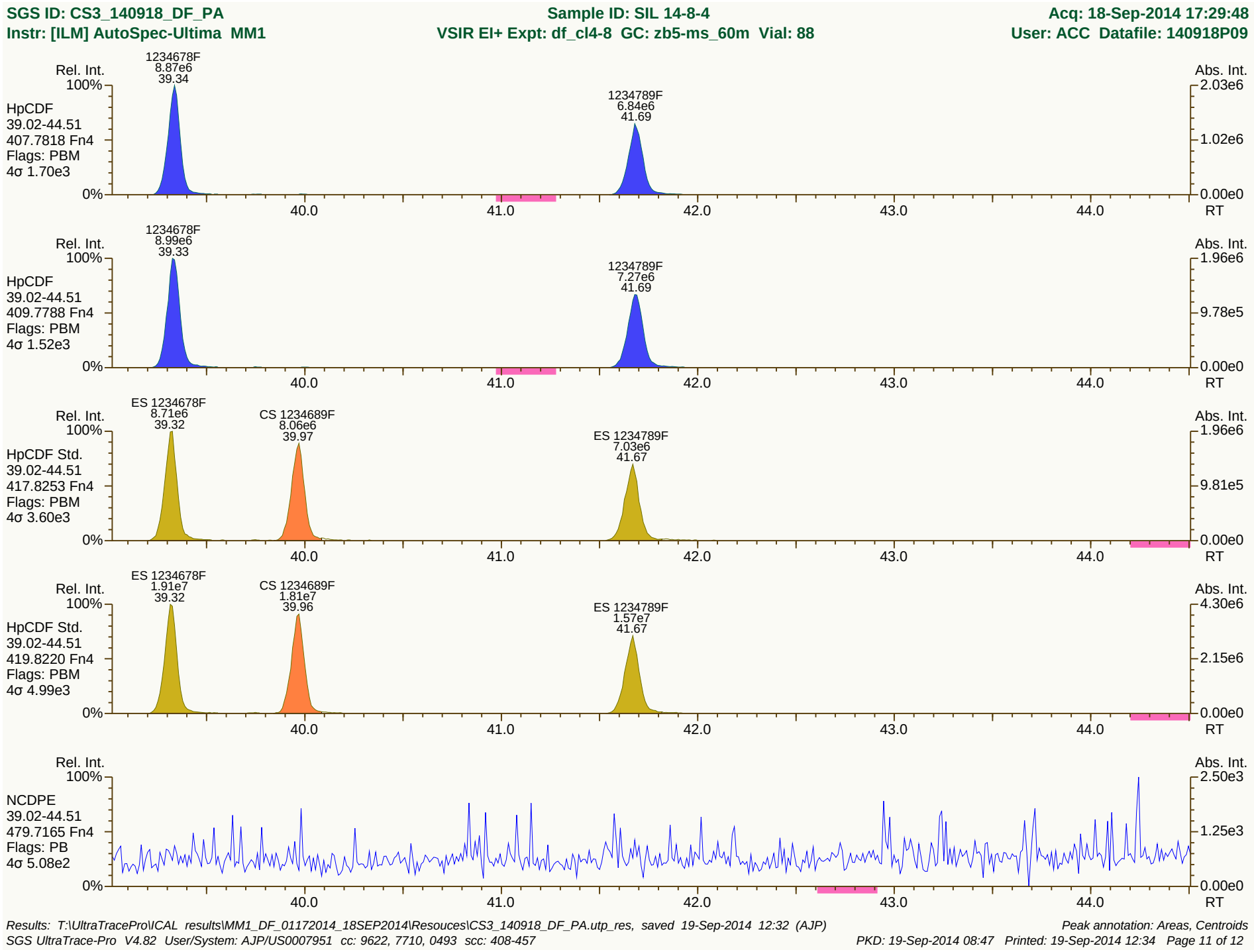


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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 6532, 5687, 7027 scc: 408-457 *PKD: 19-Sep-2014 08:47 Printed: 19-Sep-2014 12:34 Page 9 of 12*

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS3_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5319, 5086, 3317 scc: 408-457 *PKD: 19-Sep-2014 08:47 Printed: 19-Sep-2014 12:34 Page 10 of 12*


SGS ID: CS3_140918_DF_PA
Sample ID: SIL 14-8-4
Acq: 18-Sep-2014 17:29:48
Instr: [ILM] AutoSpec-Ultima MM1
VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88
User: ACC Datafile: 140918P09
Rel. Int.
Abs. Int.
HpCDF
39.02-44.51
407.7818 Fn4
Flags: PBM
4σ 1.70e3
1234678F
8.87e6
39.34
1234789F
6.84e6
41.69
2.03e6
1.02e6
0.00e0
HpCDF
39.02-44.51
409.7788 Fn4
Flags: PBM
4σ 1.52e3
1234678F
8.99e6
39.33
1234789F
7.27e6
41.69
1.96e6
9.78e5
0.00e0
HpCDF Std.
39.02-44.51
417.8253 Fn4
Flags: PBM
4σ 3.60e3
ES 1234678F
8.71e6
39.32
CS 1234689F
8.06e6
39.97
ES 1234789F
7.03e6
41.67
1.96e6
9.81e5
0.00e0
HpCDF Std.
39.02-44.51
419.8220 Fn4
Flags: PBM
4σ 4.99e3
ES 1234678F
1.91e7
39.32
CS 1234689F
1.81e7
39.96
ES 1234789F
1.57e7
41.67
4.30e6
2.15e6
0.00e0
NCDPE
39.02-44.51
479.7165 Fn4
Flags: PB
4σ 5.08e2
2.50e3
1.25e3
0.00e0
100%
0%
40.0
41.0
42.0
43.0
44.0
RT
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS3_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP)
Peak annotation: Areas, Centroids
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 9622, 7710, 0493 scc: 408-457
PKD: 19-Sep-2014 08:47 Printed: 19-Sep-2014 12:34 Page 11 of 12

SGS ID: CS3_140918_DF_PA **Sample ID: SIL 14-8-4** **Acq: 18-Sep-2014 17:29:48**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 88** **User: ACC Datafile: 140918P09**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS3_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3430, 0269, 2931 scc: 408-457 *PKD: 19-Sep-2014 08:47 Printed: 19-Sep-2014 12:34 Page 12 of 12*

Dioxin/Furan QC Summary	Acq'd: 18 Sep 2014 18:23 ACC	ICAL: MM1_DF_01172014_18SEP2014
Lab ID: CS4_140918_DF_PA	UTP: 19-Sep-2014 10:10 AJP	Checkcode: 580-740-VXL
Sample ID: SIL 14-8-3	Report: 19 Sep 2014 10:20 AP	Datafile: 140918P10

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
2378-TCDD	27.21	2.04E+07	0.81	Y	1.18	1.17	-1%
12378-PeCDD	32.75	8.13E+07	1.61	Y	0.99	1.04	5%
123478-HxCDD	36.68	6.89E+07	1.25	Y	1.02	1.07	4%
123678-HxCDD	36.79	6.88E+07	1.25	Y	1.05	1.10	5%
123789-HxCDD	37.09	7.16E+07	1.25	Y	0.96	1.03	8%
1234678-HpCDD	40.93	5.21E+07	1.02	Y	0.99	1.03	3%
OCDD	46.05	7.73E+07	0.87	Y	1.06	1.07	2%
2378-TCDF	26.29	2.65E+07	0.73	Y	0.97	0.99	2%
12378-PeCDF	31.25	1.23E+08	1.53	Y	0.98	1.04	6%
23478-PeCDF	32.39	1.15E+08	1.52	Y	0.96	1.01	5%
123478-HxCDF	35.71	9.55E+07	1.24	Y	1.17	1.23	5%
123678-HxCDF	35.85	1.04E+08	1.20	Y	1.09	1.15	6%
234678-HxCDF	36.49	9.28E+07	1.24	Y	1.09	1.13	3%
123789-HxCDF	37.47	8.14E+07	1.19	Y	1.09	1.11	2%
1234678-HpCDF	39.36	7.26E+07	0.98	Y	1.29	1.35	4%
1234789-HpCDF	41.71	5.54E+07	0.96	Y	1.22	1.27	3%
OCDF	46.38	9.48E+07	0.87	Y	1.00	1.04	4%
ES 2378-TCDD	27.19	4.34E+07	0.80	Y	1.08	1.08	0%
ES 12378-PeCDD	32.73	3.92E+07	1.57	Y	1.01	0.97	-4%
ES 123478-HxCDD	36.66	3.23E+07	1.24	Y	1.04	1.03	-1%
ES 123678-HxCDD	36.78	3.14E+07	1.23	Y	1.01	1.00	-1%
ES 123789-HxCDD	37.07	3.47E+07	1.25	Y	1.17	1.11	-5%
ES 1234678-HpCDD	40.91	2.54E+07	1.10	Y	0.86	0.81	-6%
ES OCDD	46.03	3.60E+07	0.89	Y	0.65	0.57	-12%
ES 2378-TCDF	26.26	6.66E+07	0.77	Y	1.03	1.02	-1%
ES 12378-PeCDF	31.23	5.91E+07	1.55	Y	0.94	0.91	-3%
ES 23478-PeCDF	32.37	5.70E+07	1.54	Y	0.91	0.87	-4%
ES 123478-HxCDF	35.69	3.89E+07	0.50	Y	1.24	1.24	0%
ES 123678-HxCDF	35.83	4.51E+07	0.53	Y	1.44	1.44	0%
ES 234678-HxCDF	36.48	4.11E+07	0.51	Y	1.30	1.31	1%
ES 123789-HxCDF	37.45	3.65E+07	0.51	Y	1.20	1.17	-3%
ES 1234678-HpCDF	39.34	2.70E+07	0.46	Y	0.90	0.86	-5%
ES 1234789-HpCDF	41.69	2.19E+07	0.46	Y	0.75	0.70	-7%
ES OCDF	46.36	4.54E+07	0.90	Y	0.83	0.72	-12%

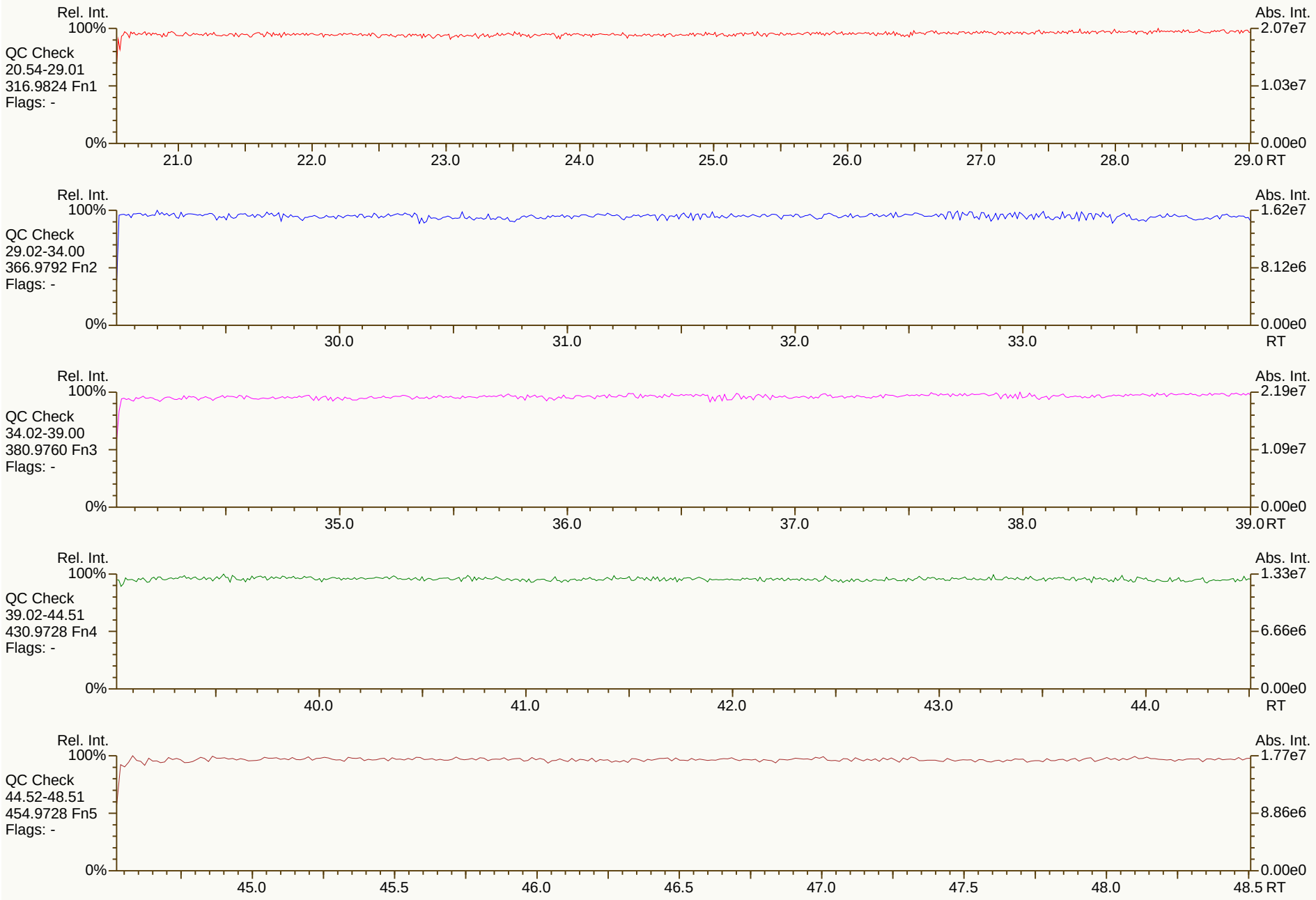
Dioxin/Furan QC Summary | **Acq'd: 18 Sep 2014 18:23 ACC** | **ICAL: MM1_DF_01172014_18SEP2014**

Lab ID: CS4_140918_DF_PA | **UTP: 19-Sep-2014 10:10 AJP** | **Checkcode: 580-740**

Sample ID: SIL 14-8-3 | **Report: 19 Sep 2014 10:20 AD** | **Datafile: 140918P10**

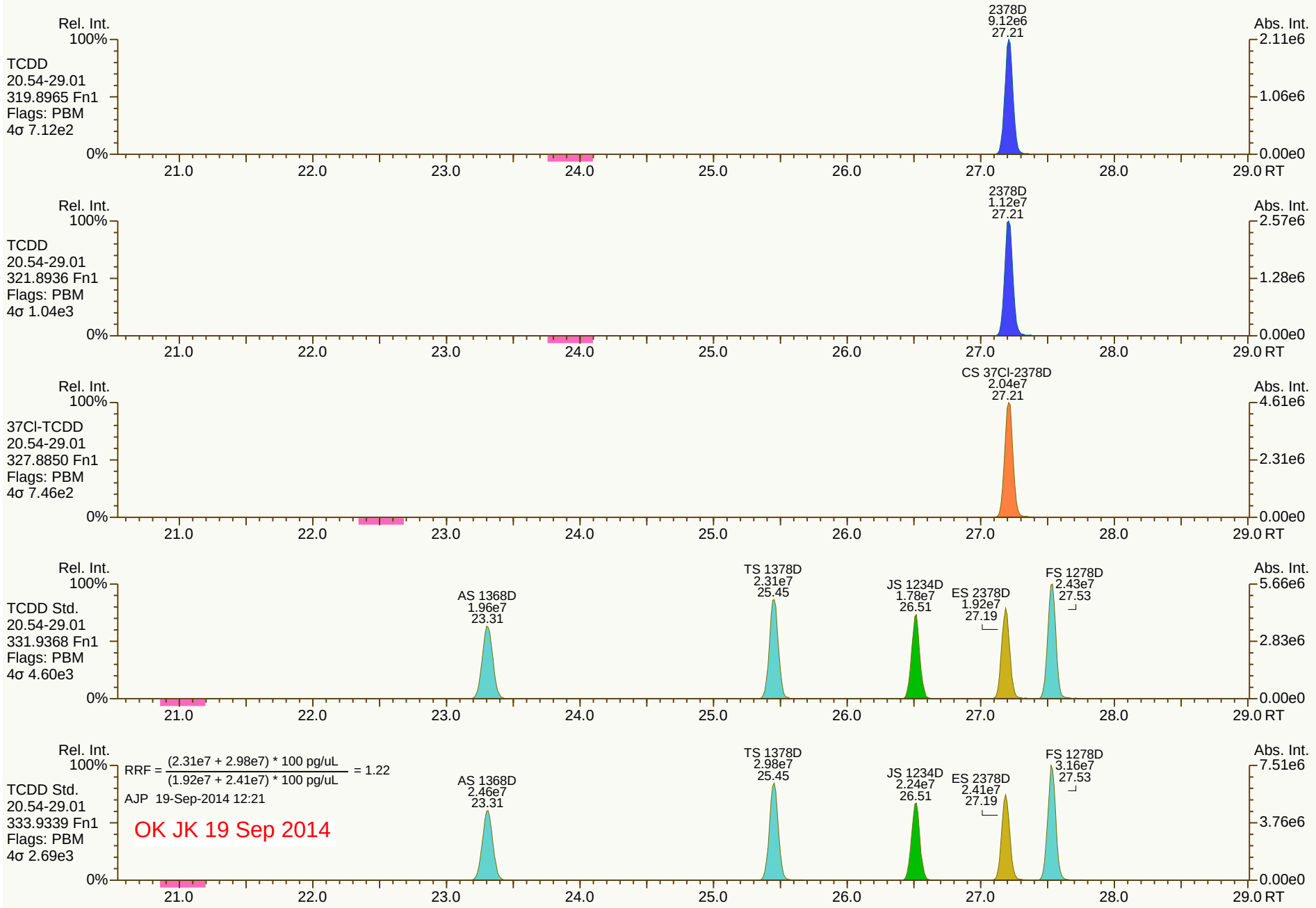
Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
JS 1234-TCDD	26.51	4.03E+07	0.79	Y	-	-	-
JS 1234-TCDF	24.85	6.52E+07	0.76	Y	-	-	-
JS 123467-HxCDD	36.97	1.57E+07	1.25	Y	-	-	-
CS 37Cl-2378-TCDD	27.21	2.04E+07	n/a	-	1.28	1.27	-1%
CS 12347-PeCDD	32.22	3.89E+07	1.62	Y	0.96	0.97	1%
CS 12346-PeCDF	30.70	5.99E+07	1.49	Y	0.91	0.92	1%
CS 123469-HxCDF	36.14	4.24E+07	0.52	Y	1.33	1.35	2%
CS 1234689-HpCDF	39.99	2.49E+07	0.45	Y	0.82	0.79	-3%
SS 37Cl-2378-TCDD	27.21	2.04E+07	n/a	-	1.19	1.18	-1%
SS 12347-PeCDD	32.22	3.89E+07	1.62	Y	0.95	0.99	4%
SS 12346-PeCDF	30.70	5.99E+07	1.49	Y	0.98	1.01	4%
SS 123469-HxCDF	36.14	4.24E+07	0.52	Y	0.92	0.94	2%
SS 1234689-HpCDF	39.99	2.49E+07	0.45	Y	0.91	0.92	2%
AS 1368-TCDD	23.31	4.42E+07	0.79	Y	1.08	1.10	1%
AS 1368-TCDF	21.11	7.69E+07	0.77	Y	1.18	1.18	0%
FS 1278-TCDD	27.53	5.59E+07	0.77	Y	1.28	1.29	0%
FS 12478-PeCDD	31.47	4.68E+07	1.59	Y	1.18	1.20	1%
FS 123468-HxCDD	35.62	4.42E+07	1.24	Y	1.35	1.37	1%
FS 1234679-HpCDD	39.76	3.31E+07	1.12	Y	1.27	1.30	3%
TS 1378-TCDD	25.45	5.30E+07	0.77	Y	1.22	1.22	0%
OCDD-a	46.04	4.99E+06	2.44	Y	0.07	0.07	3%
OCDF-a	46.37	5.60E+06	2.50	Y	0.06	0.06	2%

SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



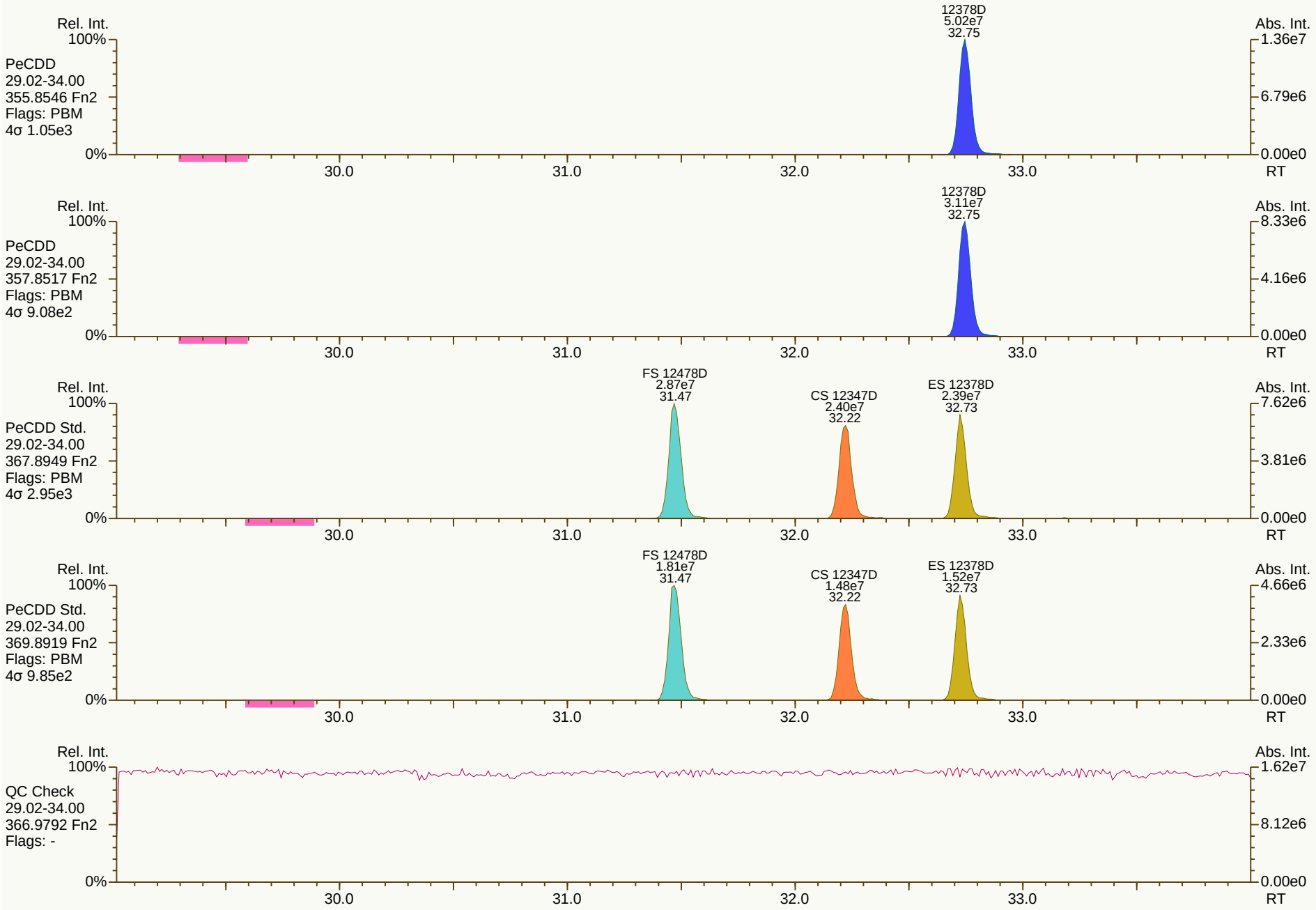
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SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



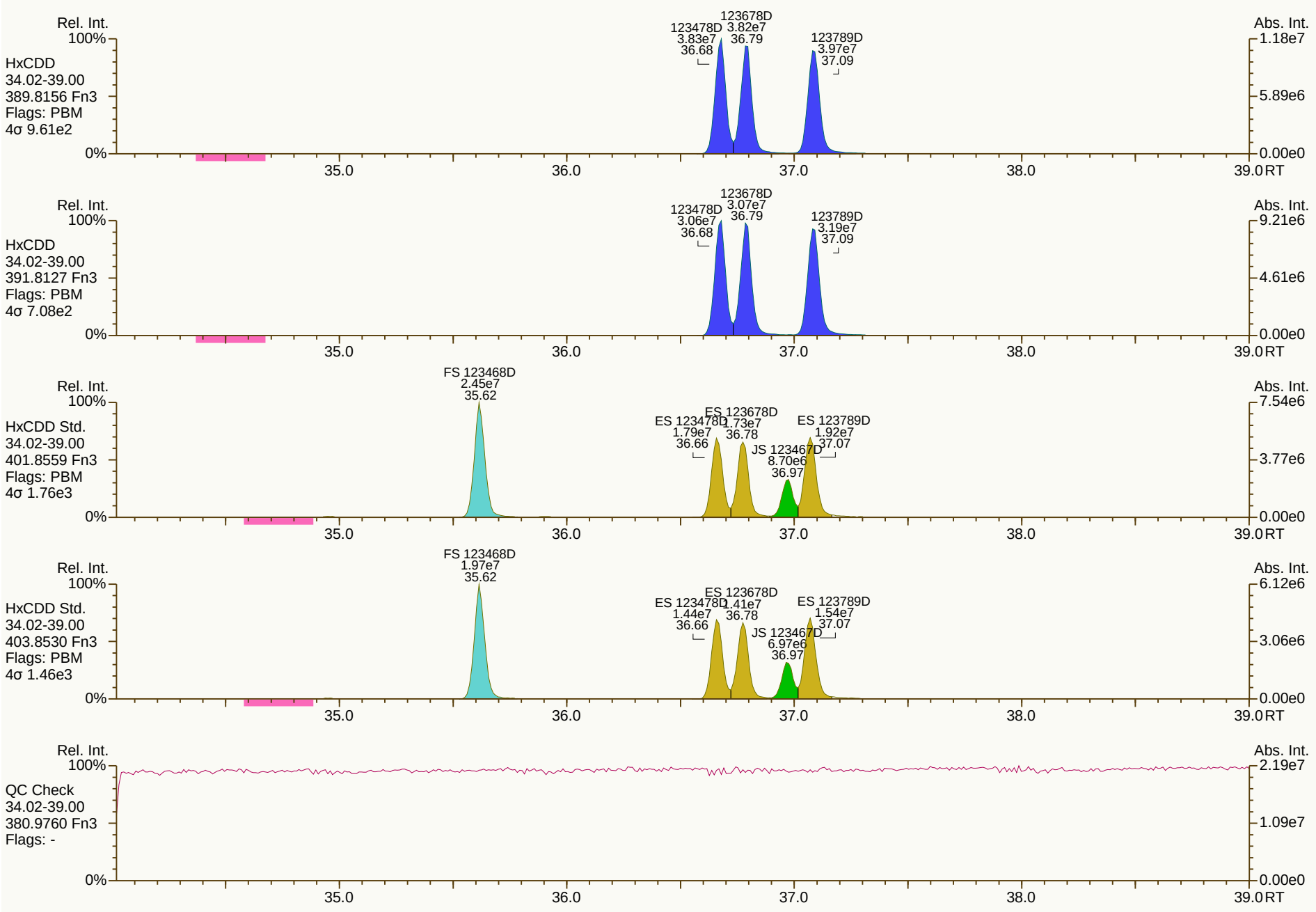
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SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



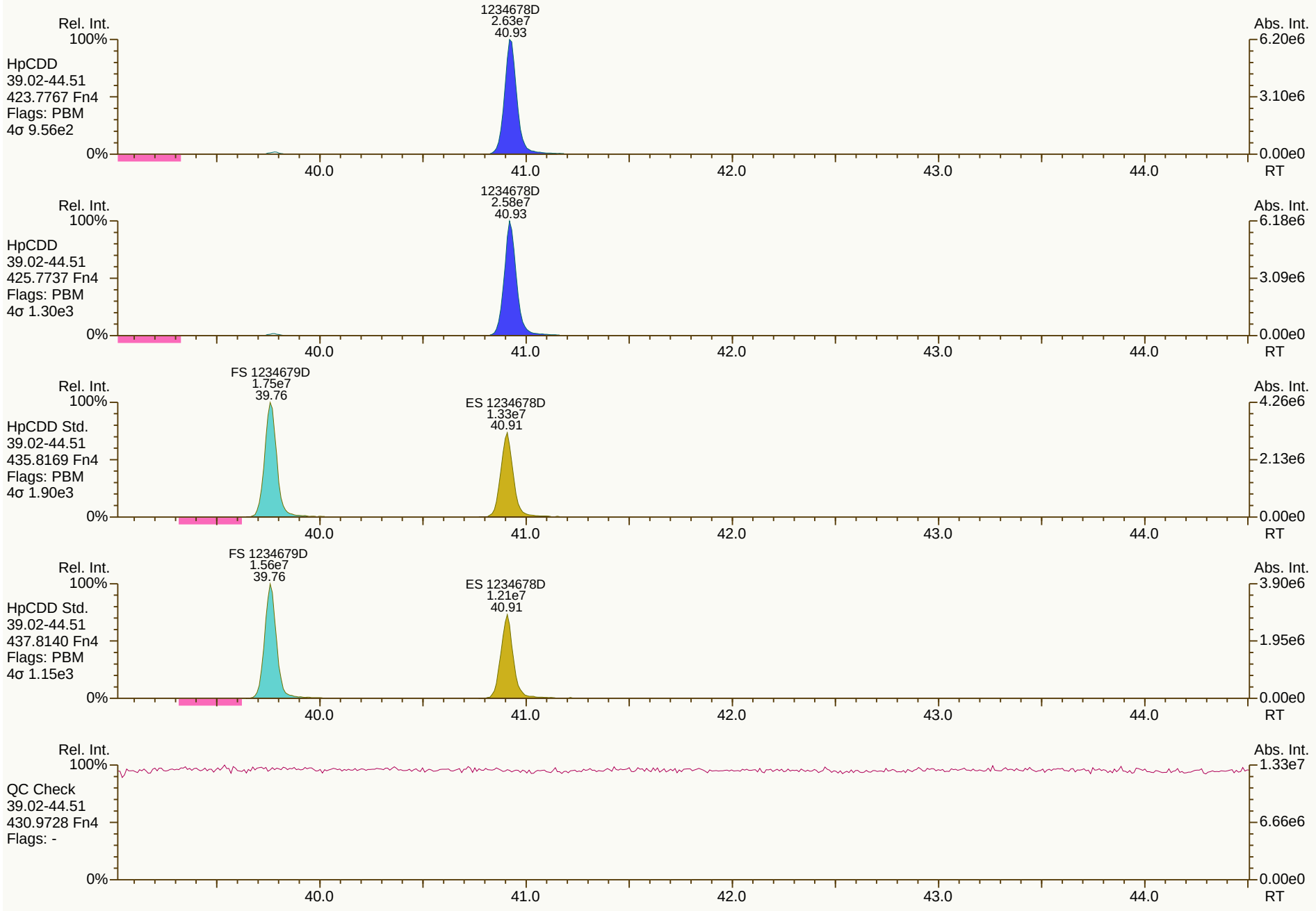
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SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



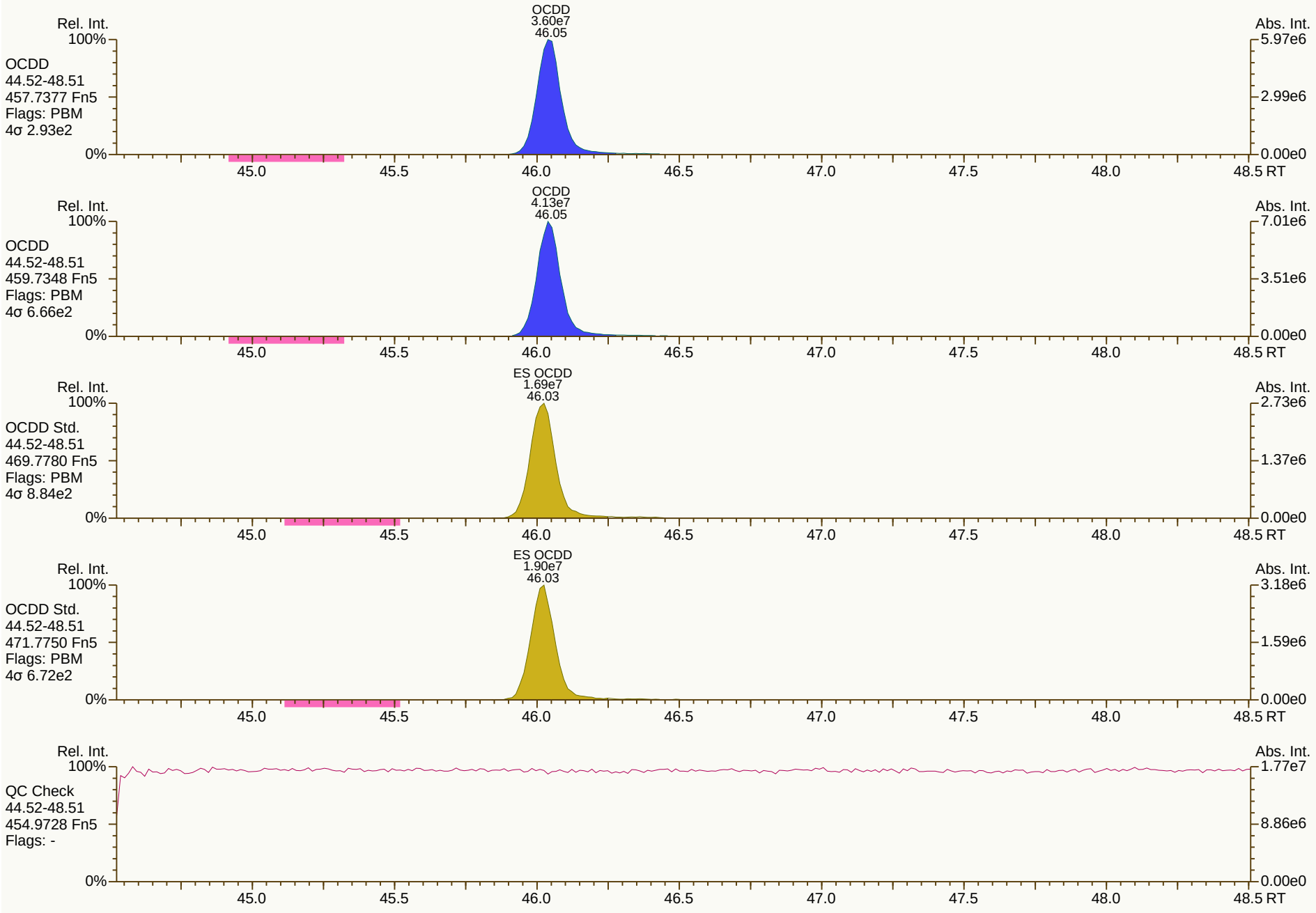
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS4_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3012, 1578 scc: 580-740 *PKD: 19-Sep-2014 08:50 Printed: 19-Sep-2014 12:34 Page 4 of 12*

SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS4_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 9694, 8924 scc: 580-740 *PKD: 19-Sep-2014 08:50 Printed: 19-Sep-2014 12:34 Page 5 of 12*

SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS4_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



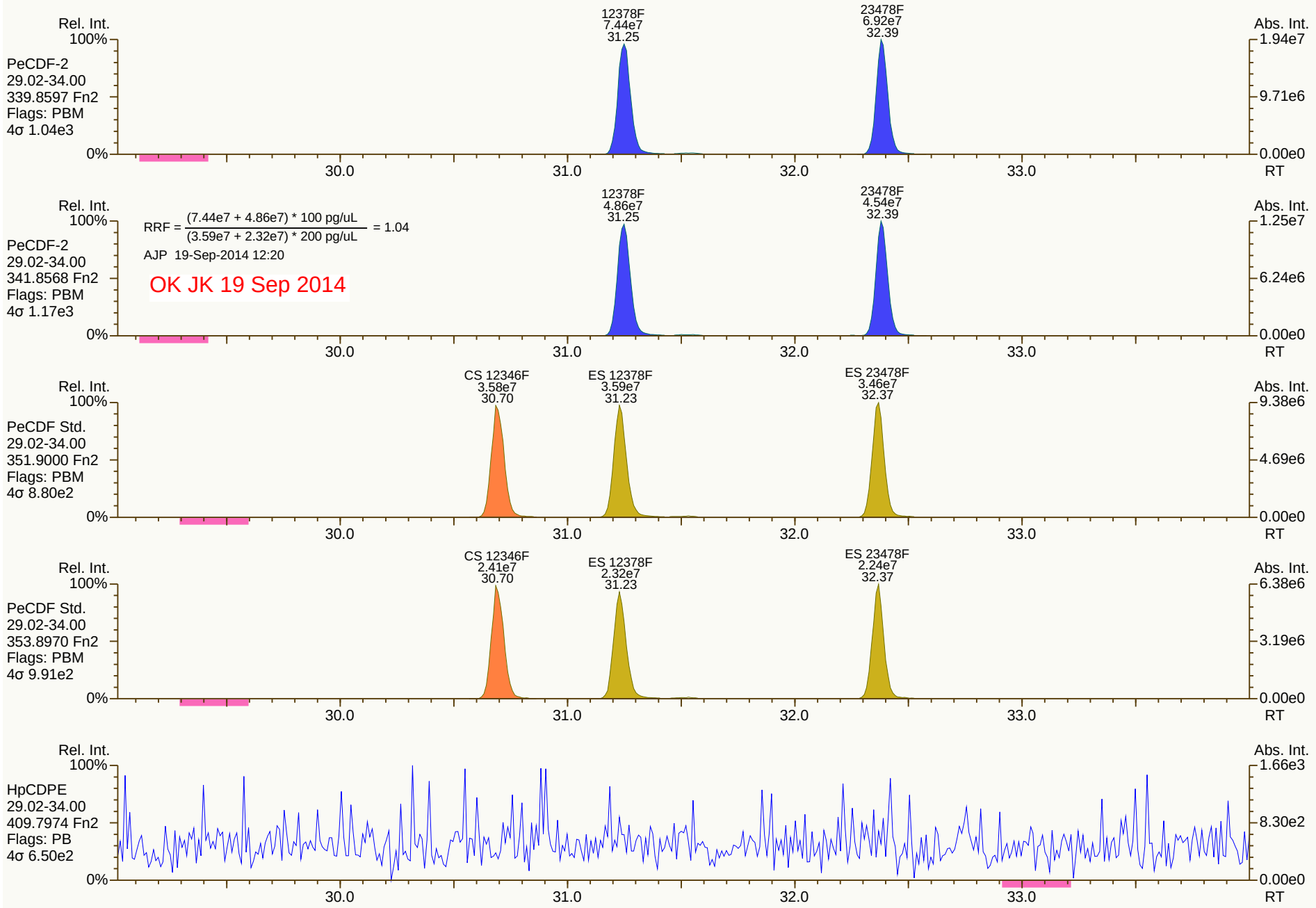
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SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



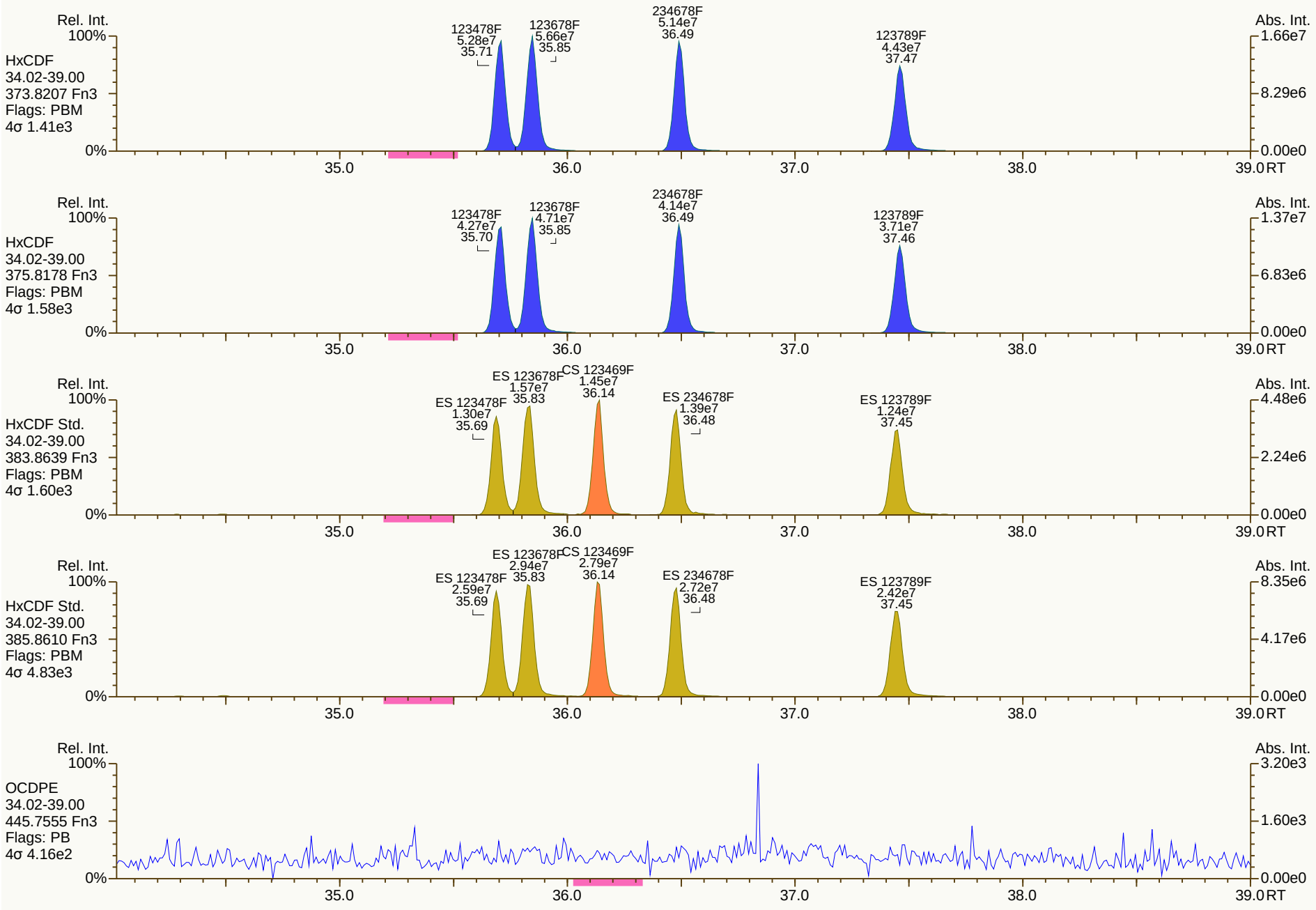
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS4_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3080 scc: 580-740 *Revised: 19-Sep-2014 08:48 (DES) Printed: 19-Sep-2014 12:34 Page 8 of 12*

SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



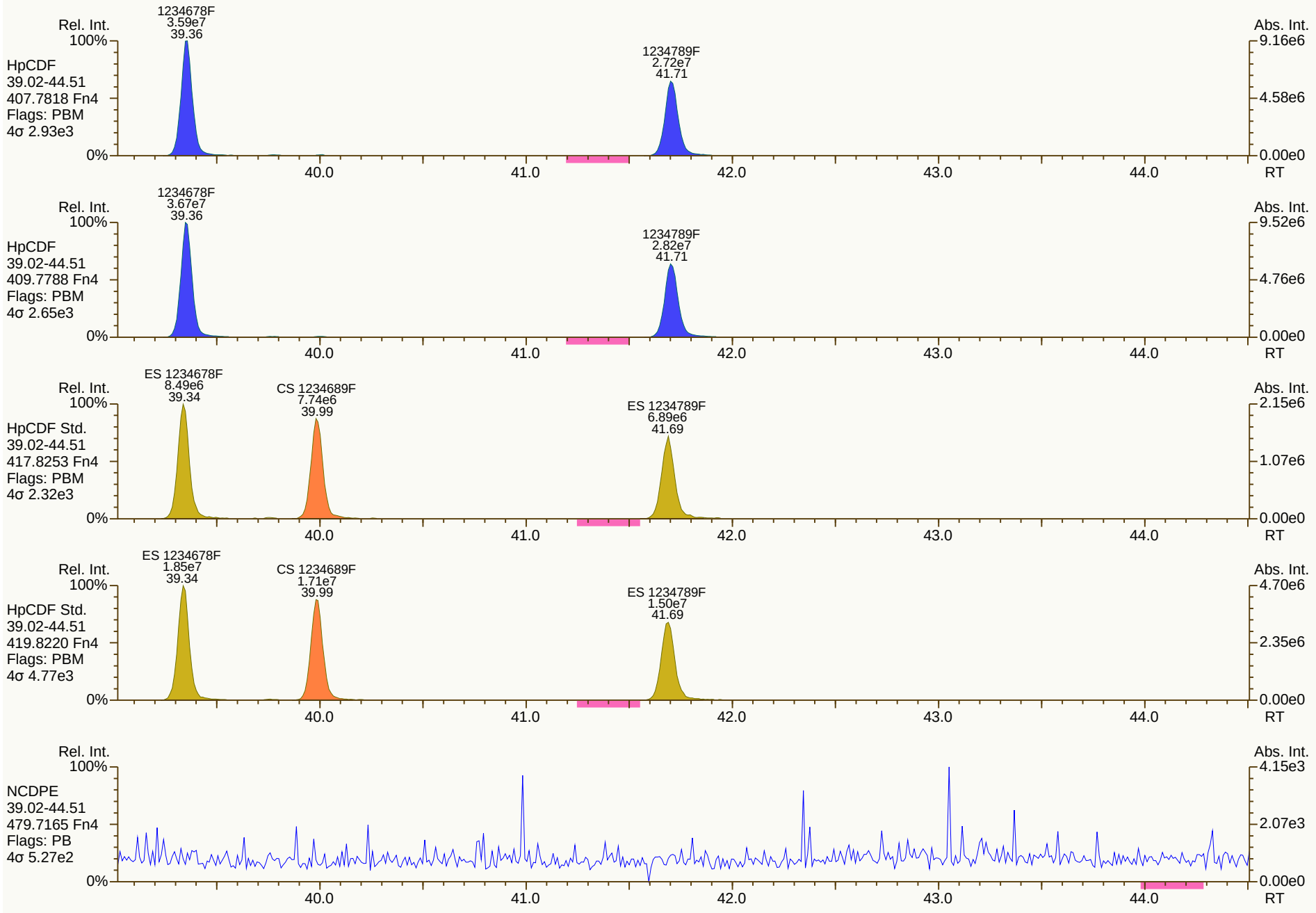
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS4_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 7628, 8882, 9647 scc: 580-740 *PKD: 19-Sep-2014 08:50 Printed: 19-Sep-2014 12:34 Page 9 of 12*

SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS4_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5681, 2430, 0936 scc: 580-740 *PKD: 19-Sep-2014 08:50 Printed: 19-Sep-2014 12:34 Page 10 of 12*

SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



SGS ID: CS4_140918_DF_PA **Sample ID: SIL 14-8-3** **Acq: 18-Sep-2014 18:23:04**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 89** **User: ACC Datafile: 140918P10**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS4_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 8766, 8677, 7550 scc: 580-740 *PKD: 19-Sep-2014 08:50 Printed: 19-Sep-2014 12:34 Page 12 of 12*

Dioxin/Furan QC Summary	Acq'd: 18 Sep 2014 19:16 ACC	ICAL: MM1_DF_01172014_18SEP2014
Lab ID: CS5_140918_DF_PA	UTP: 19-Sep-2014 10:10 AJP	Checkcode: 211-796-PNN
Sample ID: SIL 14-8-2	Report: 19 Sep 2014 10:20 AP	Datafile: 140918P11

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
2378-TCDD	27.19	1.07E+08	0.79	Y	1.18	1.22	3%
12378-PeCDD	32.73	4.40E+08	1.64	Y	0.99	1.06	7%
123478-HxCDD	36.66	3.68E+08	1.25	Y	1.02	1.07	4%
123678-HxCDD	36.77	3.71E+08	1.25	Y	1.05	1.10	5%
123789-HxCDD	37.07	3.89E+08	1.24	Y	0.96	1.02	6%
1234678-HpCDD	40.91	2.90E+08	1.05	Y	0.99	1.04	5%
OCDD	46.03	4.64E+08	0.89	Y	1.06	1.11	6%
2378-TCDF	26.27	1.36E+08	0.71	Y	0.97	1.03	6%
12378-PeCDF	31.23	6.36E+08	1.56	Y	0.98	1.04	6%
23478-PeCDF	32.37	6.09E+08	1.54	Y	0.96	1.03	7%
123478-HxCDF	35.69	5.18E+08	1.22	Y	1.17	1.27	8%
123678-HxCDF	35.83	5.56E+08	1.22	Y	1.09	1.14	5%
234678-HxCDF	36.48	5.00E+08	1.21	Y	1.09	1.17	7%
123789-HxCDF	37.45	4.58E+08	1.23	Y	1.09	1.15	5%
1234678-HpCDF	39.34	4.02E+08	1.01	Y	1.29	1.37	6%
1234789-HpCDF	41.69	3.19E+08	0.98	Y	1.22	1.31	7%
OCDF	46.37	5.61E+08	0.88	Y	1.00	1.05	4%
ES 2378-TCDD	27.17	4.38E+07	0.77	Y	1.08	1.12	4%
ES 12378-PeCDD	32.72	4.15E+07	1.60	Y	1.01	1.06	5%
ES 123478-HxCDD	36.65	3.44E+07	1.27	Y	1.04	1.08	4%
ES 123678-HxCDD	36.76	3.37E+07	1.26	Y	1.01	1.05	5%
ES 123789-HxCDD	37.06	3.83E+07	1.24	Y	1.17	1.20	2%
ES 1234678-HpCDD	40.90	2.77E+07	1.12	Y	0.86	0.87	0%
ES OCDD	46.01	4.16E+07	0.91	Y	0.65	0.65	0%
ES 2378-TCDF	26.24	6.59E+07	0.76	Y	1.03	1.05	2%
ES 12378-PeCDF	31.22	6.13E+07	1.48	Y	0.94	0.97	4%
ES 23478-PeCDF	32.35	5.92E+07	1.54	Y	0.91	0.94	4%
ES 123478-HxCDF	35.67	4.08E+07	0.52	Y	1.24	1.28	3%
ES 123678-HxCDF	35.81	4.86E+07	0.54	Y	1.44	1.52	5%
ES 234678-HxCDF	36.46	4.27E+07	0.54	Y	1.30	1.34	2%
ES 123789-HxCDF	37.43	3.99E+07	0.52	Y	1.20	1.25	4%
ES 1234678-HpCDF	39.33	2.94E+07	0.46	Y	0.90	0.92	2%
ES 1234789-HpCDF	41.68	2.44E+07	0.46	Y	0.75	0.76	1%
ES OCDF	46.34	5.35E+07	0.89	Y	0.83	0.84	1%

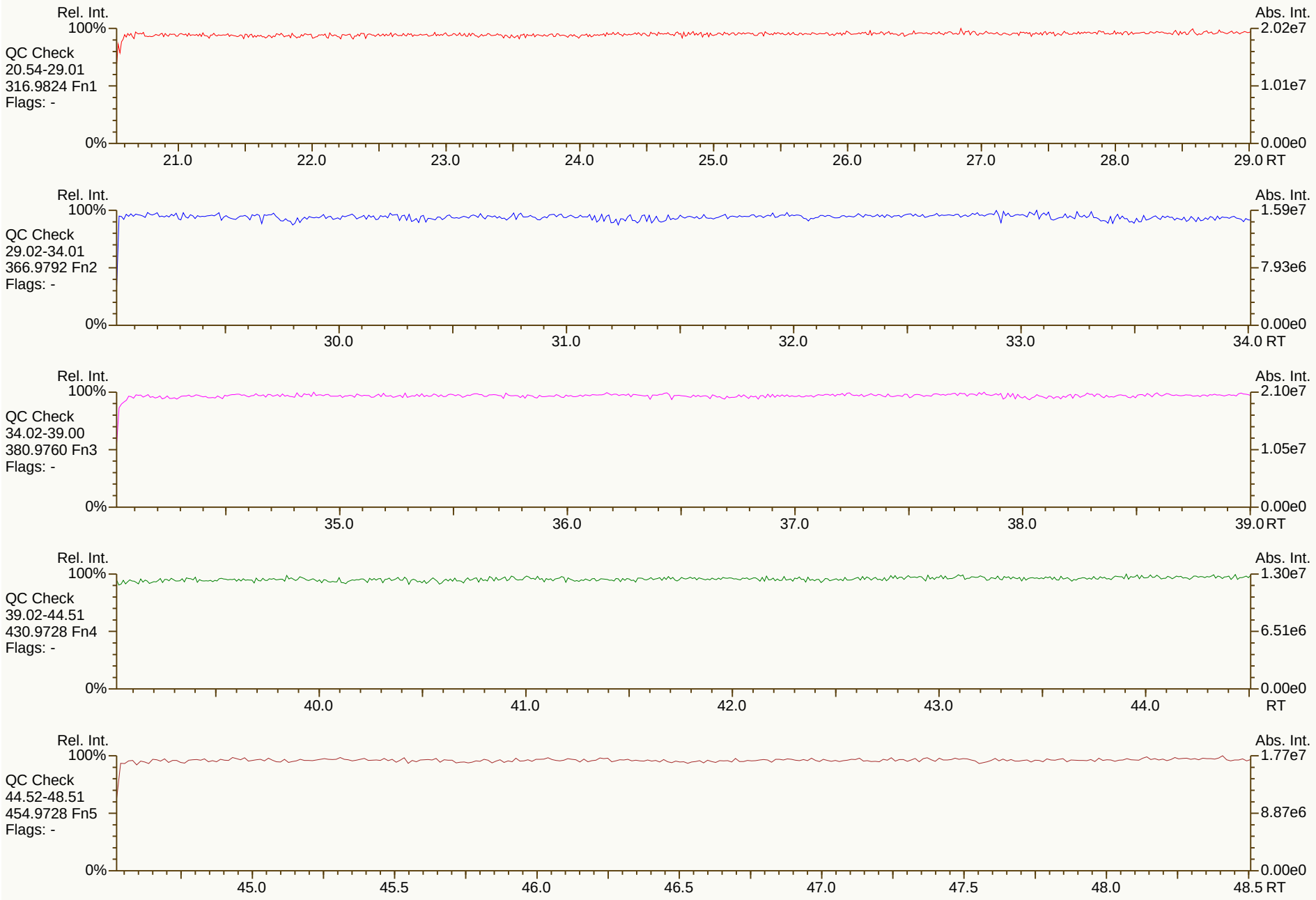
Dioxin/Furan QC Summary | **Acq'd: 18 Sep 2014 19:16 ACC** | **ICAL: MM1_DF_01172014_18SEP2014**

Lab ID: CS5_140918_DF_PA | **UTP: 19-Sep-2014 10:10 AJP** | **Checkcode: 211-796**

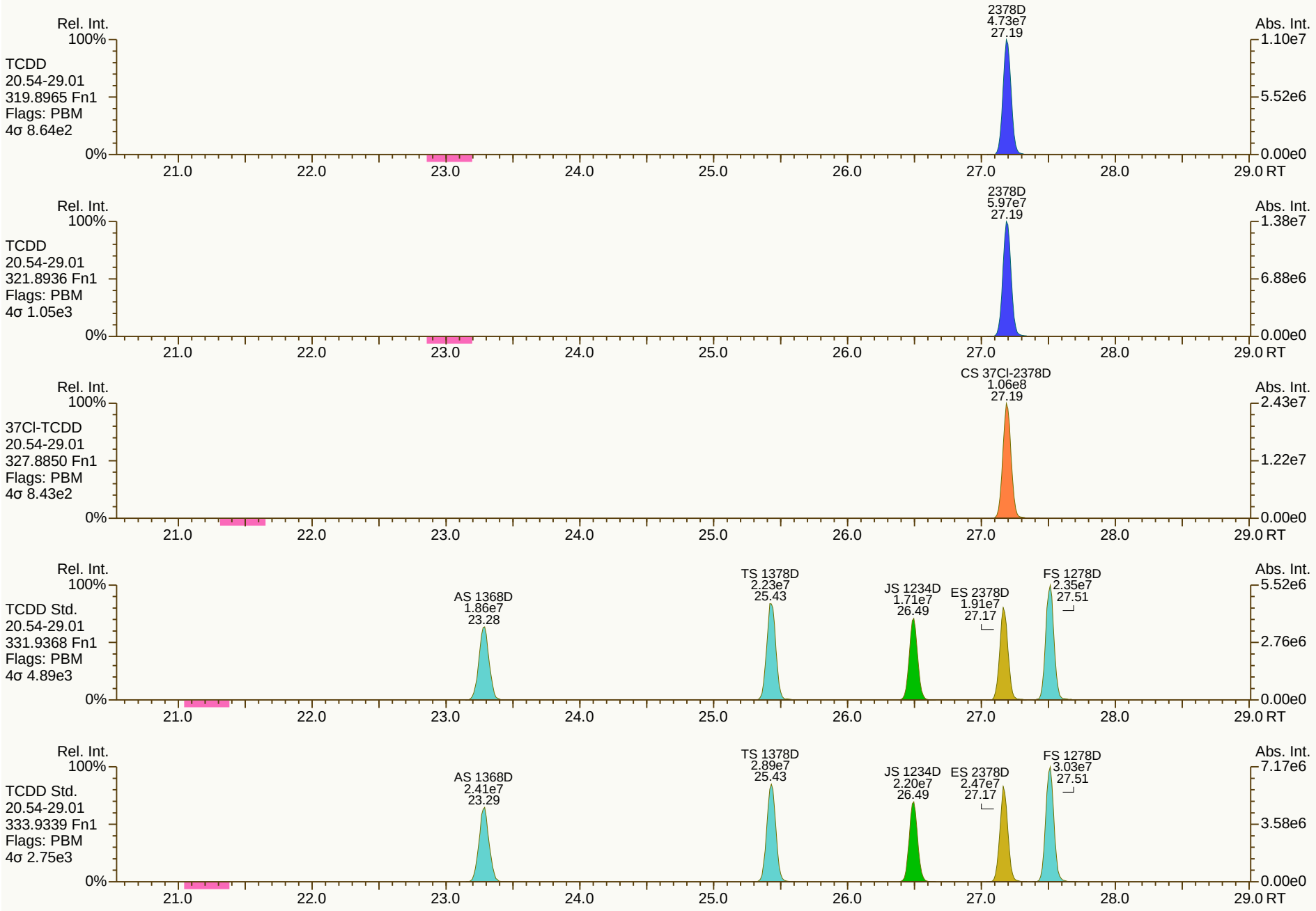
Sample ID: SIL 14-8-2 | **Report: 19 Sep 2014 10:20 AD** | **Datafile: 140918P11**

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
JS 1234-TCDD	26.49	3.91E+07	0.78	Y	-	-	-
JS 1234-TCDF	24.83	6.30E+07	0.76	Y	-	-	-
JS 123467-HxCDD	36.95	1.60E+07	1.26	Y	-	-	-
CS 37Cl-2378-TCDD	27.19	1.06E+08	n/a	-	1.28	1.35	5%
CS 12347-PeCDD	32.21	3.76E+07	1.62	Y	0.96	0.96	0%
CS 12346-PeCDF	30.68	5.79E+07	1.52	Y	0.91	0.92	1%
CS 123469-HxCDF	36.12	4.18E+07	0.51	Y	1.33	1.31	-1%
CS 1234689-HpCDF	39.97	2.46E+07	0.45	Y	0.82	0.77	-6%
SS 37Cl-2378-TCDD	27.19	1.06E+08	n/a	-	1.19	1.20	1%
SS 12347-PeCDD	32.21	3.76E+07	1.62	Y	0.95	0.91	-5%
SS 12346-PeCDF	30.68	5.79E+07	1.52	Y	0.98	0.94	-3%
SS 123469-HxCDF	36.12	4.18E+07	0.51	Y	0.92	0.86	-6%
SS 1234689-HpCDF	39.97	2.46E+07	0.45	Y	0.91	0.84	-8%
AS 1368-TCDD	23.28	4.27E+07	0.77	Y	1.08	1.09	1%
AS 1368-TCDF	21.09	7.50E+07	0.76	Y	1.18	1.19	1%
FS 1278-TCDD	27.51	5.38E+07	0.78	Y	1.28	1.23	-4%
FS 12478-PeCDD	31.46	4.66E+07	1.55	Y	1.18	1.12	-5%
FS 123468-HxCDD	35.60	4.39E+07	1.26	Y	1.35	1.28	-5%
FS 1234679-HpCDD	39.75	3.30E+07	1.11	Y	1.27	1.19	-6%
TS 1378-TCDD	25.43	5.12E+07	0.77	Y	1.22	1.17	-4%
OCDD-a	46.03	2.88E+07	2.51	Y	0.07	0.07	3%
OCDF-a	46.36	3.23E+07	2.52	Y	0.06	0.06	0%

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**

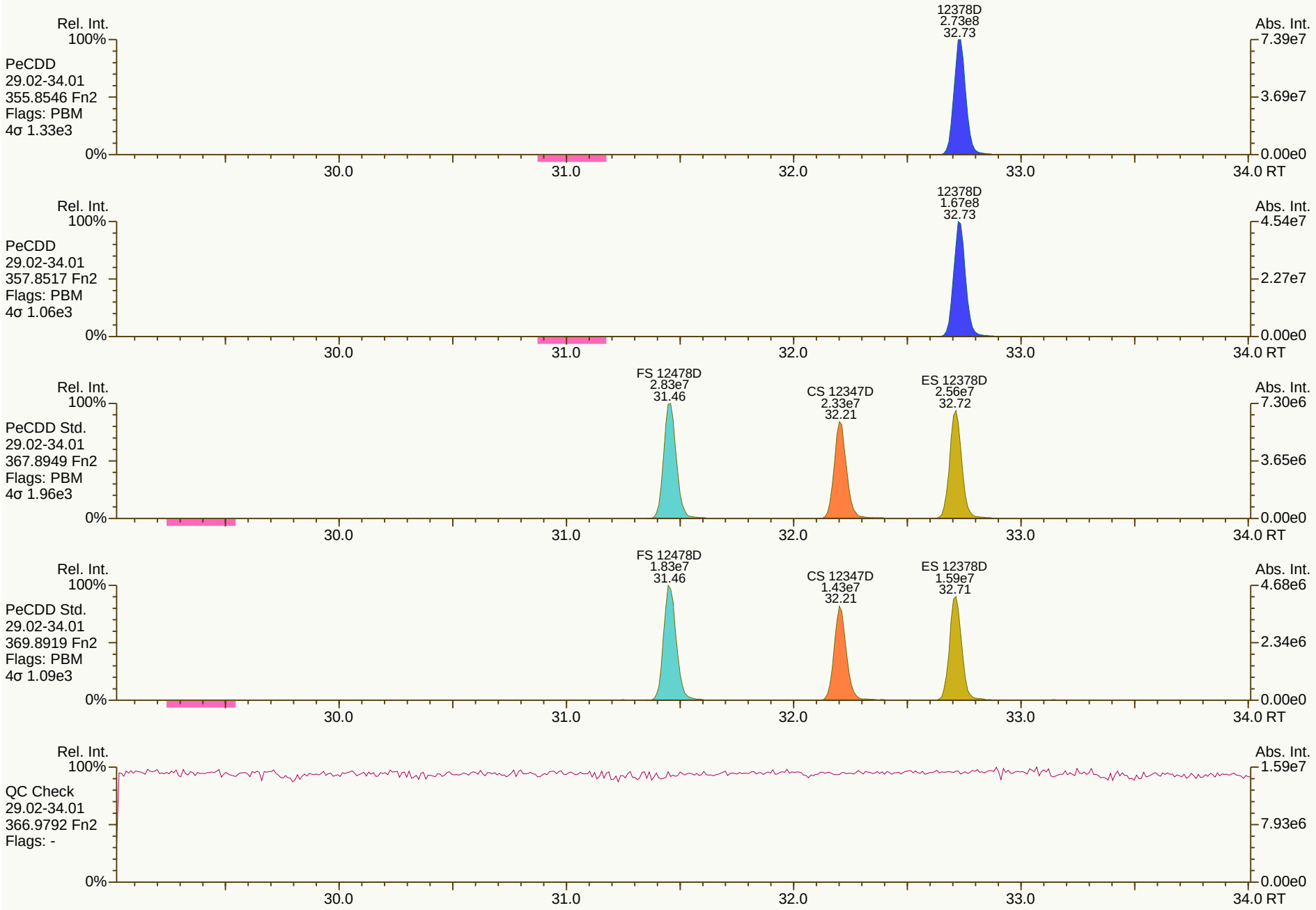


SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



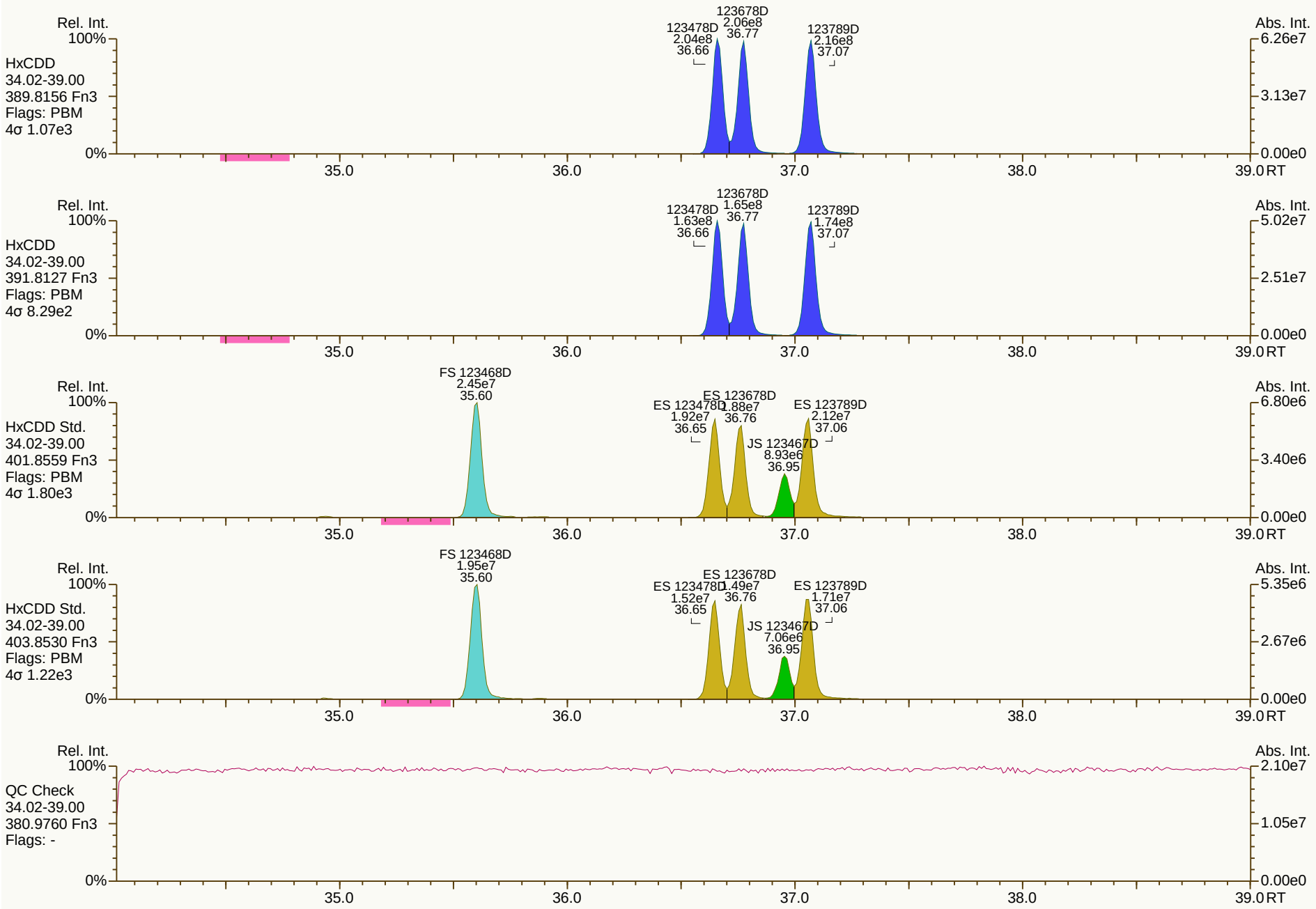
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 0666, 2108, 0332 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:34 Page 2 of 12*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



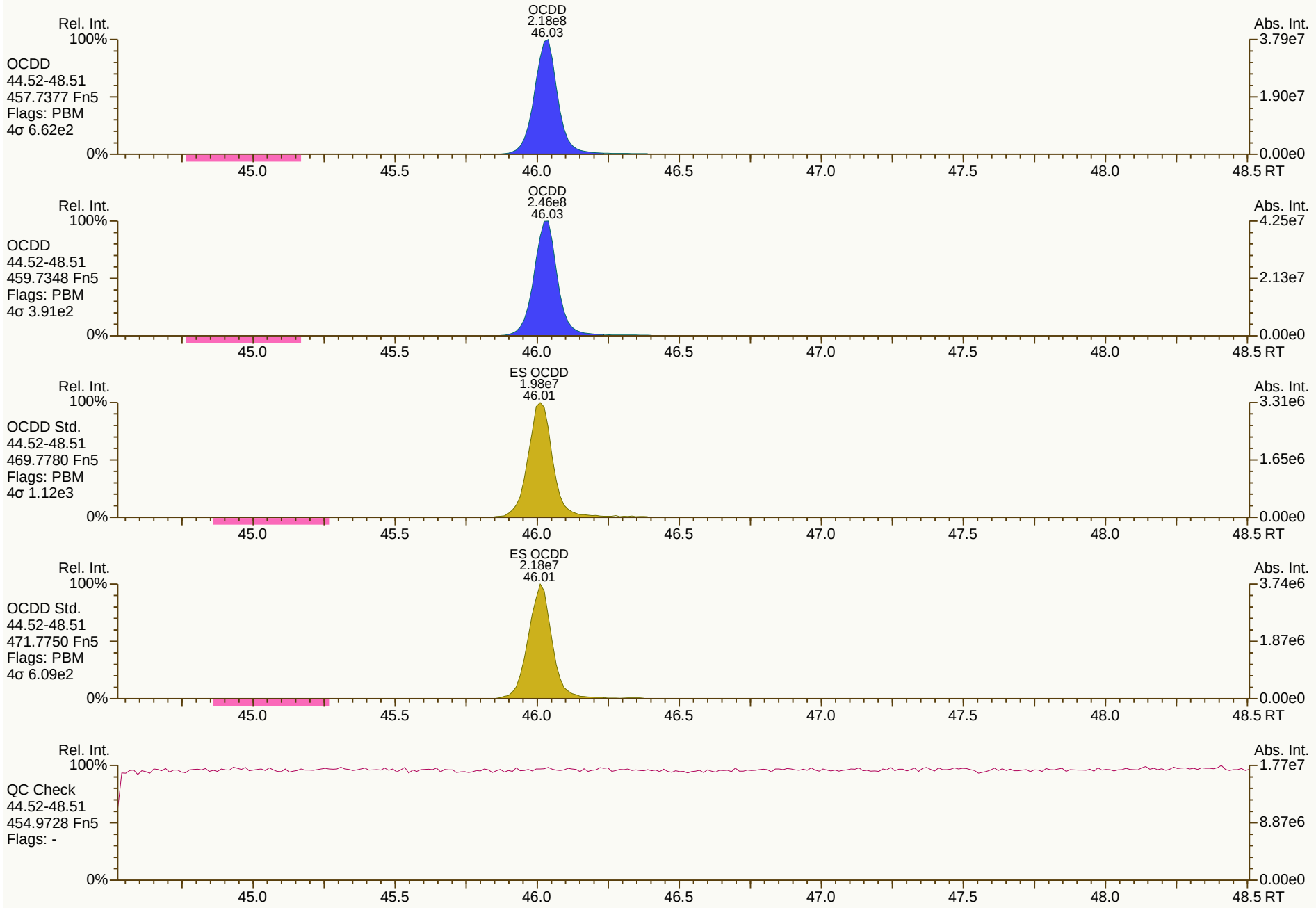
Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3792, 0264 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:34 Page 4 of 12*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 0569, 7704 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:34 Page 5 of 12*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3427, 3171 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:34 Page 6 of 12*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 1132, 6242, 9662 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:35 Page 7 of 12*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



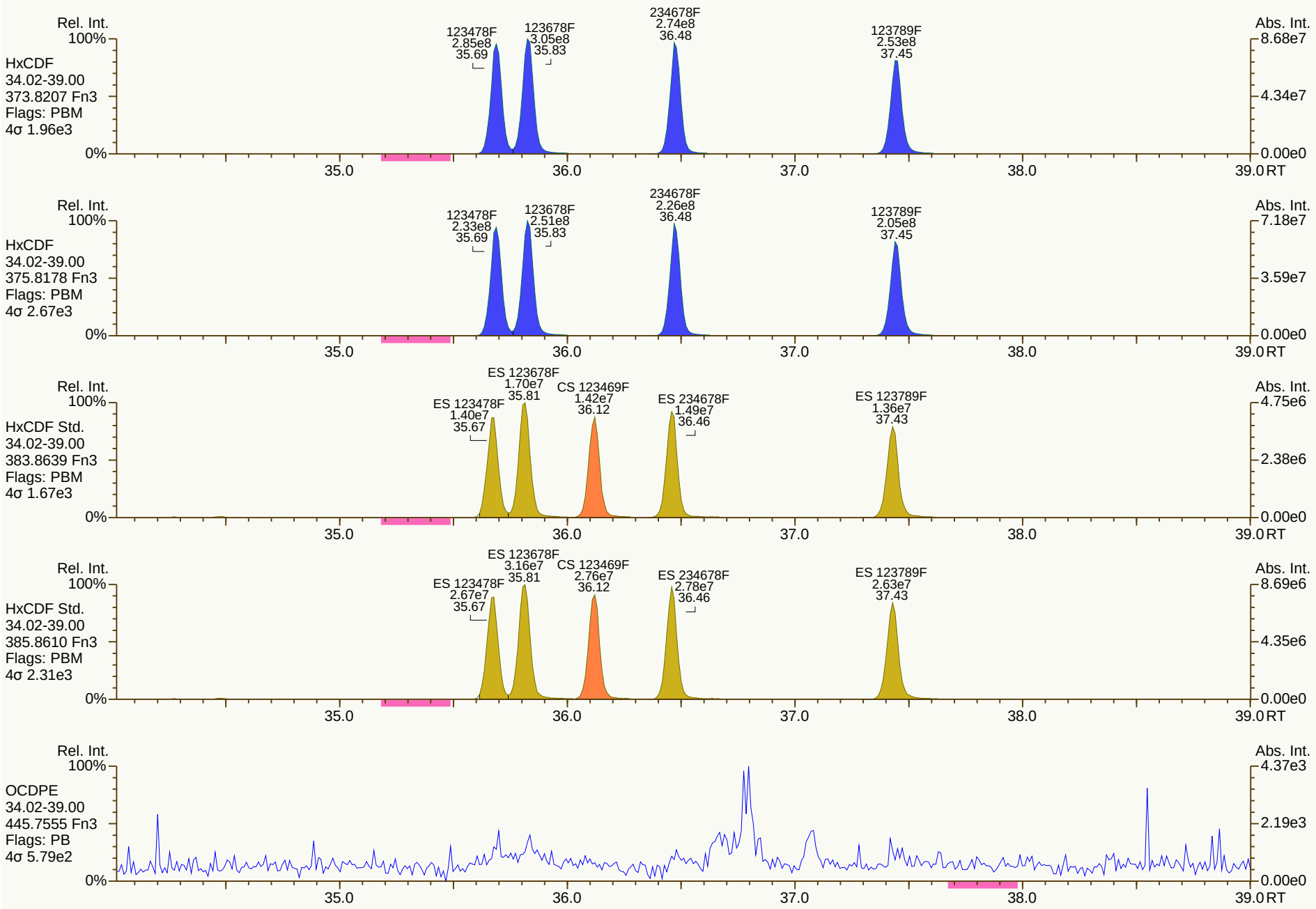
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SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



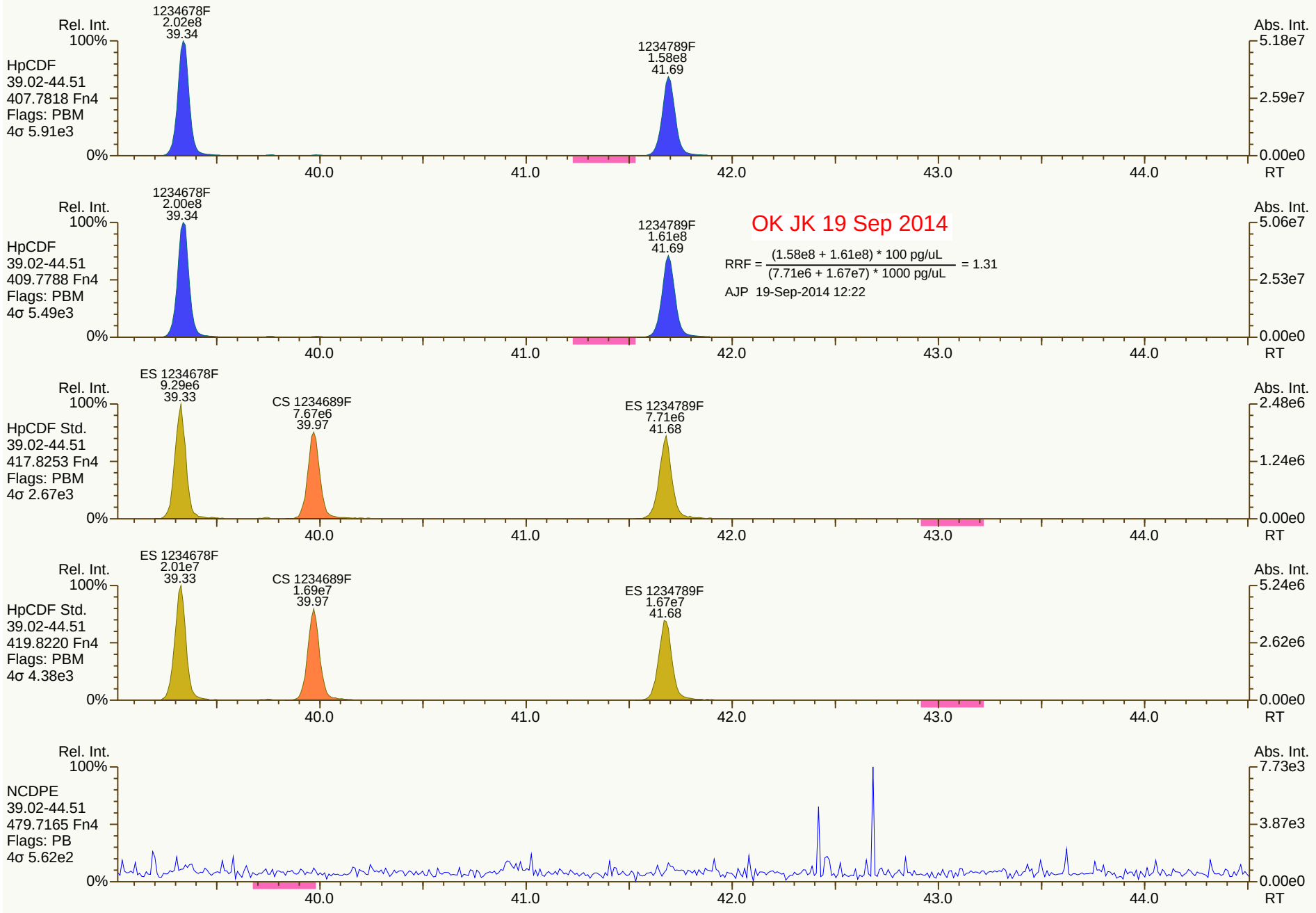
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SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 3619, 1523, 2966 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:35 Page 10 of 12*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5214, 6255, 3127 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:35 Page 11 of 12*

SGS ID: CS5_140918_DF_PA **Sample ID: SIL 14-8-2** **Acq: 18-Sep-2014 19:16:19**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 90** **User: ACC Datafile: 140918P11**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS5_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 8114, 7650, 6405 scc: 211-796 *PKD: 19-Sep-2014 08:51 Printed: 19-Sep-2014 12:35 Page 12 of 12*

Dioxin/Furan QC Summary	Acq'd: 18 Sep 2014 20:09 ACC	ICAL: MM1_DF_01172014_18SEP2014
Lab ID: CS6_140918_DF_PA	UTP: 19-Sep-2014 10:10 AJP	Checkcode: 810-162-TBD
Sample ID: SIL 14-8-1	Report: 19 Sep 2014 10:20 AP	Datafile: 140918P12

Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
2378-TCDD	27.19	2.79E+08	0.78	Y	1.18	1.26	7%
12378-PeCDD	32.73	1.18E+09	1.64	Y	0.99	1.05	6%
123478-HxCDD	36.66	1.05E+09	1.26	Y	1.02	1.06	3%
123678-HxCDD	36.77	1.03E+09	1.25	Y	1.05	1.09	4%
123789-HxCDD	37.07	1.10E+09	1.23	Y	0.96	1.01	5%
1234678-HpCDD	40.90	8.89E+08	1.03	Y	0.99	1.03	4%
OCDD	46.02	1.55E+09	0.89	Y	1.06	1.11	5%
2378-TCDF	26.26	3.55E+08	0.73	Y	0.97	1.05	7%
12378-PeCDF	31.23	1.70E+09	1.55	Y	0.98	1.05	7%
23478-PeCDF	32.37	1.62E+09	1.52	Y	0.96	1.03	8%
123478-HxCDF	35.68	1.44E+09	1.23	Y	1.17	1.25	7%
123678-HxCDF	35.82	1.54E+09	1.22	Y	1.09	1.16	7%
234678-HxCDF	36.47	1.40E+09	1.21	Y	1.09	1.17	7%
123789-HxCDF	37.44	1.32E+09	1.23	Y	1.09	1.15	5%
1234678-HpCDF	39.33	1.20E+09	1.01	Y	1.29	1.39	8%
1234789-HpCDF	41.68	9.91E+08	1.00	Y	1.22	1.30	6%
OCDF	46.35	1.89E+09	0.89	Y	1.00	1.06	5%
ES 2378-TCDD	27.16	4.44E+07	0.77	Y	1.08	1.12	4%
ES 12378-PeCDD	32.71	4.49E+07	1.57	Y	1.01	1.14	13%
ES 123478-HxCDD	36.64	3.96E+07	1.25	Y	1.04	1.08	4%
ES 123678-HxCDD	36.75	3.78E+07	1.29	Y	1.01	1.03	2%
ES 123789-HxCDD	37.05	4.39E+07	1.25	Y	1.17	1.20	2%
ES 1234678-HpCDD	40.89	3.45E+07	1.09	Y	0.86	0.94	9%
ES OCDD	46.00	5.58E+07	0.89	Y	0.65	0.76	16%
ES 2378-TCDF	26.24	6.78E+07	0.76	Y	1.03	1.06	3%
ES 12378-PeCDF	31.21	6.45E+07	1.54	Y	0.94	1.01	8%
ES 23478-PeCDF	32.35	6.30E+07	1.53	Y	0.91	0.98	9%
ES 123478-HxCDF	35.67	4.60E+07	0.52	Y	1.24	1.25	1%
ES 123678-HxCDF	35.81	5.31E+07	0.52	Y	1.44	1.45	0%
ES 234678-HxCDF	36.46	4.79E+07	0.53	Y	1.30	1.31	0%
ES 123789-HxCDF	37.43	4.57E+07	0.53	Y	1.20	1.25	4%
ES 1234678-HpCDF	39.32	3.48E+07	0.46	Y	0.90	0.95	5%
ES 1234789-HpCDF	41.67	3.05E+07	0.44	Y	0.75	0.83	10%
ES OCDF	46.33	7.13E+07	0.90	Y	0.83	0.97	18%

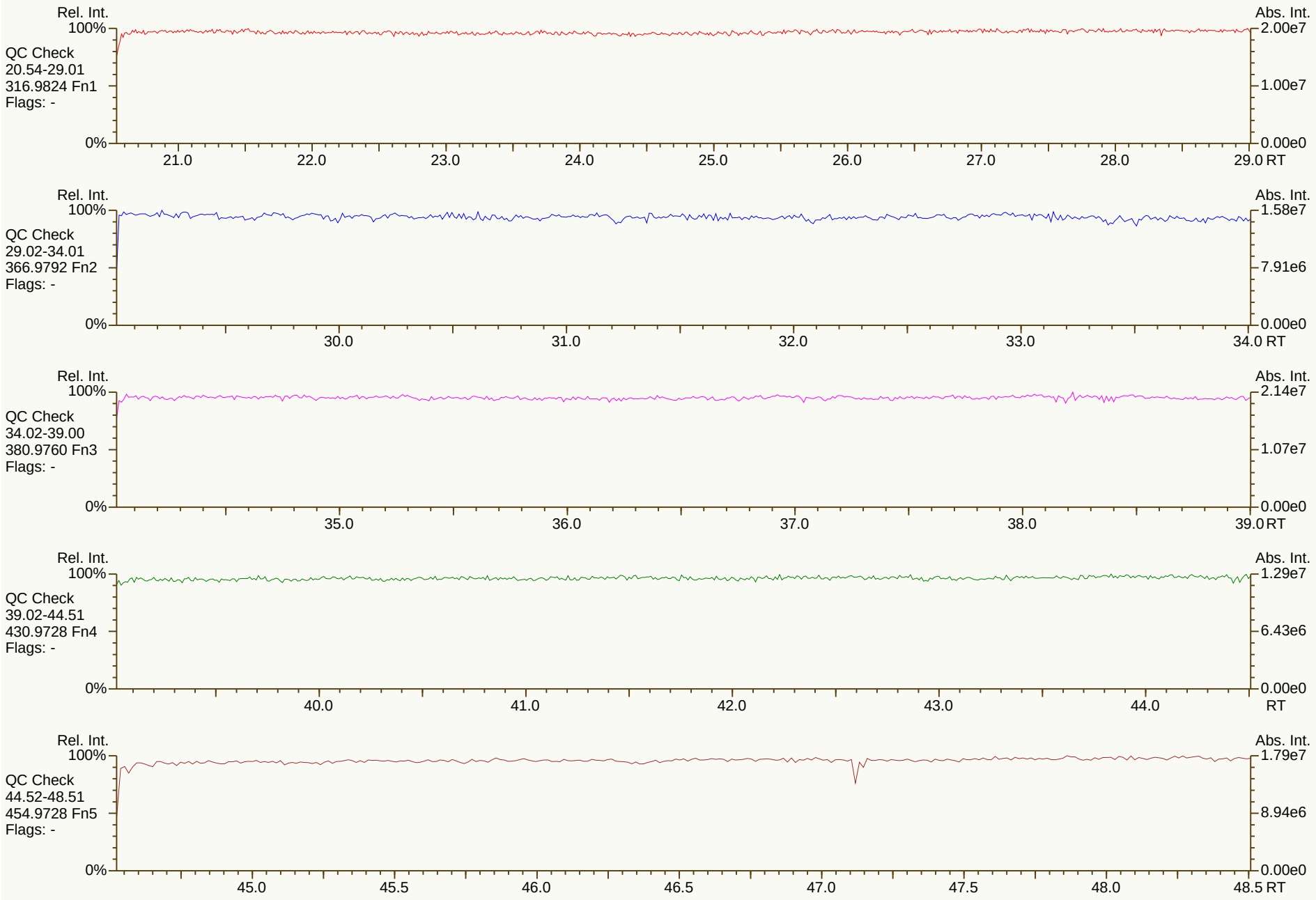
Dioxin/Furan QC Summary | **Acq'd: 18 Sep 2014 20:09 ACC** | **ICAL: MM1_DF_01172014_18SEP2014**

Lab ID: CS6_140918_DF_PA | **UTP: 19-Sep-2014 10:10 AJP** | **Checkcode: 810-162**

Sample ID: SIL 14-8-1 | **Report: 19 Sep 2014 10:20 AD** | **Datafile: 140918P12**

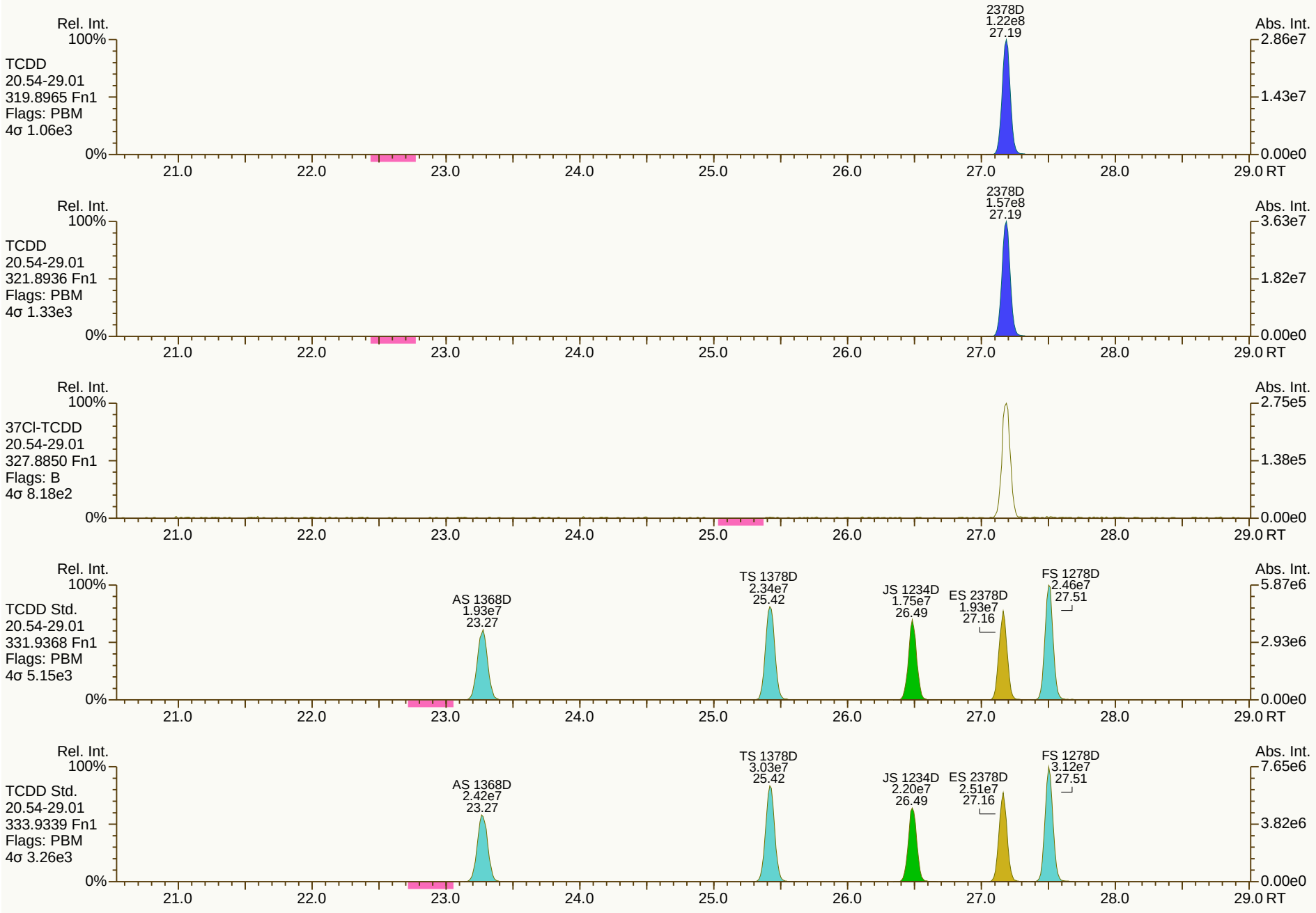
Name	RT	Response	RA	OK	Ref. RRFs	Calc. RRFs	Dev'n
JS 1234-TCDD	26.49	3.95E+07	0.79	Y	-	-	-
JS 1234-TCDF	24.82	6.39E+07	0.78	Y	-	-	-
JS 123467-HxCDD	36.95	1.83E+07	1.24	Y	-	-	-
CS 37Cl-2378-TCDD	NotFnd		n/a	-			
CS 12347-PeCDD	32.20	3.86E+07	1.60	Y	0.96	0.98	2%
CS 12346-PeCDF	30.67	5.87E+07	1.49	Y	0.91	0.92	0%
CS 123469-HxCDF	36.11	4.48E+07	0.53	Y	1.33	1.22	-8%
CS 1234689-HpCDF	39.96	2.73E+07	0.46	Y	0.82	0.74	-9%
SS 37Cl-2378-TCDD	NotFnd		n/a	-			
SS 12347-PeCDD	32.20	3.86E+07	1.60	Y	0.95	0.86	-10%
SS 12346-PeCDF	30.67	5.87E+07	1.49	Y	0.98	0.91	-7%
SS 123469-HxCDF	36.11	4.48E+07	0.53	Y	0.92	0.84	-8%
SS 1234689-HpCDF	39.96	2.73E+07	0.46	Y	0.91	0.79	-13%
AS 1368-TCDD	23.27	4.35E+07	0.79	Y	1.08	1.10	2%
AS 1368-TCDF	21.08	7.59E+07	0.75	Y	1.18	1.19	0%
FS 1278-TCDD	27.51	5.58E+07	0.79	Y	1.28	1.26	-2%
FS 12478-PeCDD	31.45	4.91E+07	1.61	Y	1.18	1.09	-8%
FS 123468-HxCDD	35.60	4.76E+07	1.25	Y	1.35	1.20	-11%
FS 1234679-HpCDD	39.74	3.77E+07	1.10	Y	1.27	1.09	-14%
TS 1378-TCDD	25.42	5.37E+07	0.77	Y	1.22	1.21	-1%
OCDD-a	46.02	9.66E+07	2.52	Y	0.07	0.07	2%
OCDF-a	46.35	1.10E+08	2.50	Y	0.06	0.06	2%

SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



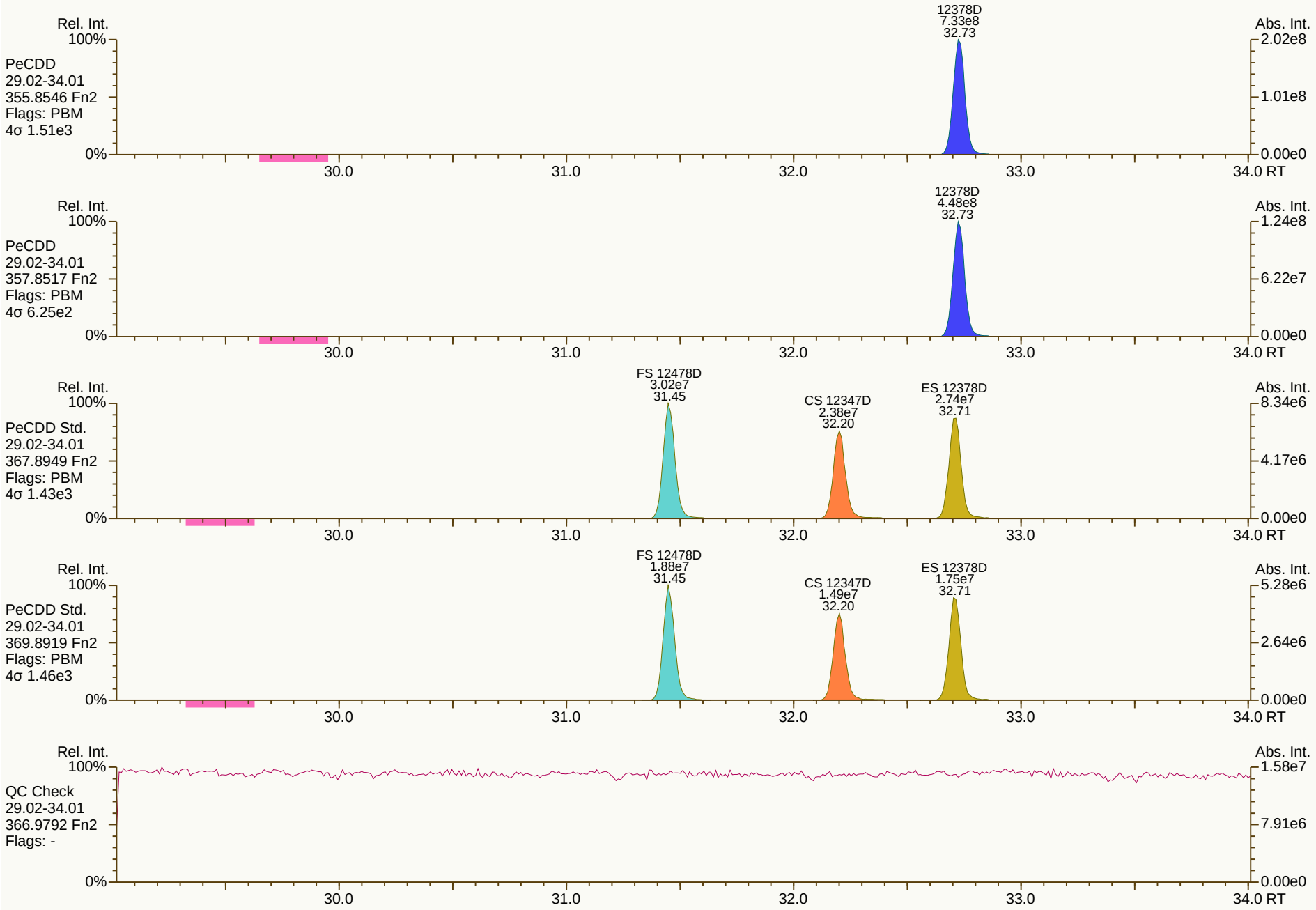
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SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



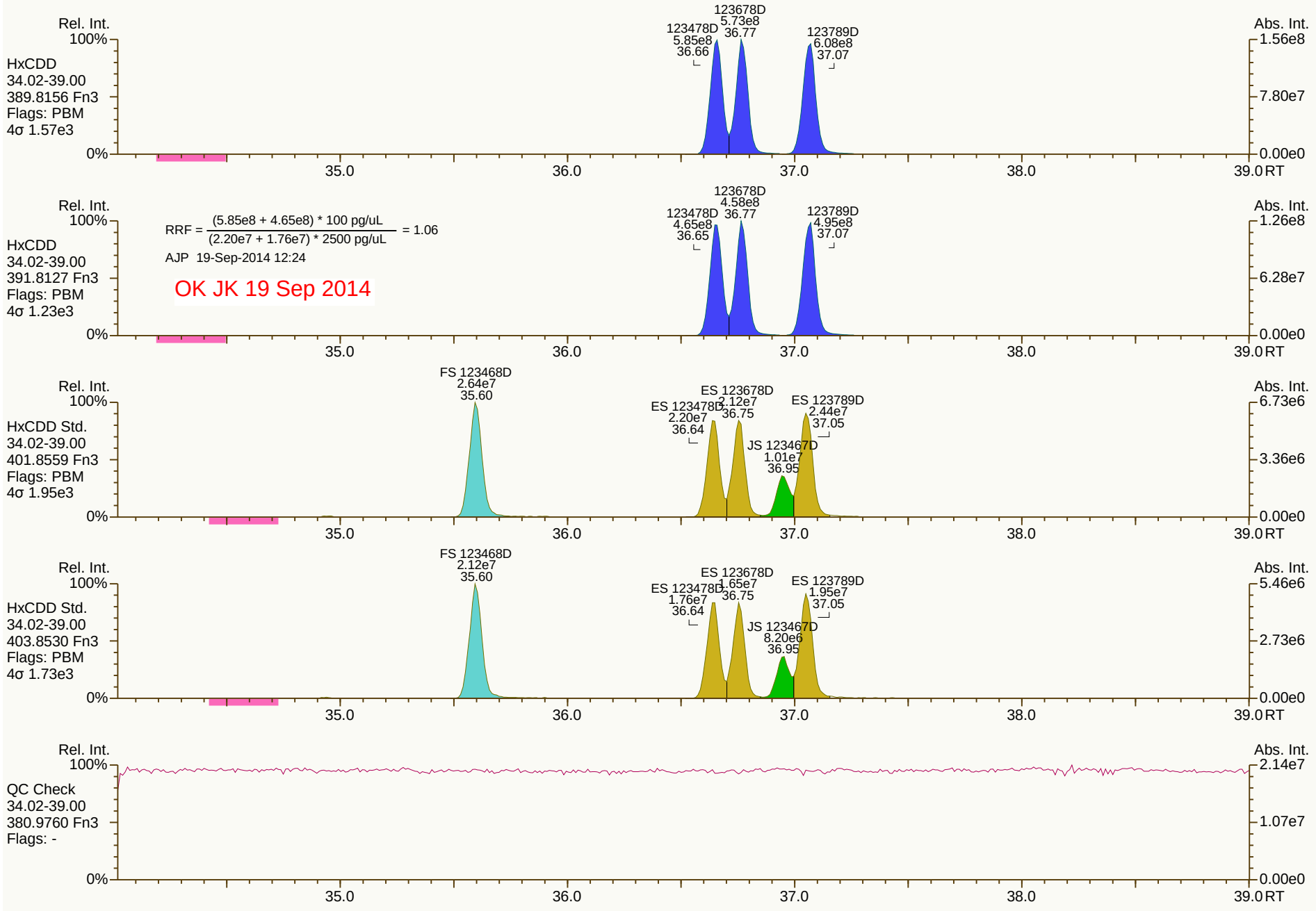
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SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS6_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



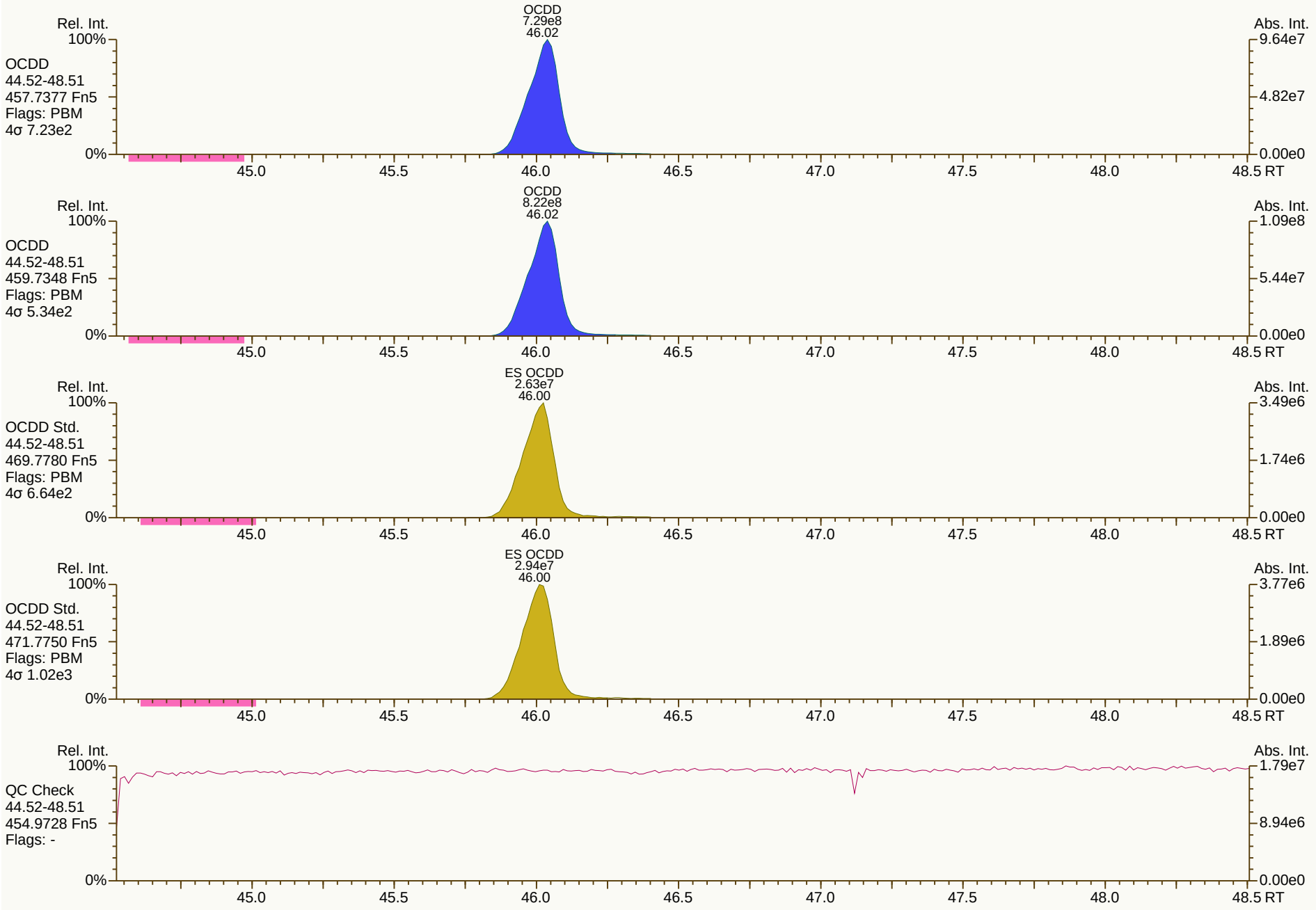
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5085, 4387 scc: 810-162 *Revised: 19-Sep-2014 09:58 (AJP) Printed: 19-Sep-2014 12:35 Page 4 of 12*

SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS6_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 1032, 4864 scc: 810-162 *PKD: 19-Sep-2014 08:53 Printed: 19-Sep-2014 12:35 Page 5 of 12*

SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS6_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 4947, 5643 scc: 810-162 *PKD: 19-Sep-2014 08:53 Printed: 19-Sep-2014 12:35 Page 6 of 12*

SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2421, 7688, 9152 scc: 810-162 *PKD: 19-Sep-2014 08:53 Printed: 19-Sep-2014 12:35 Page 7 of 12*

SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



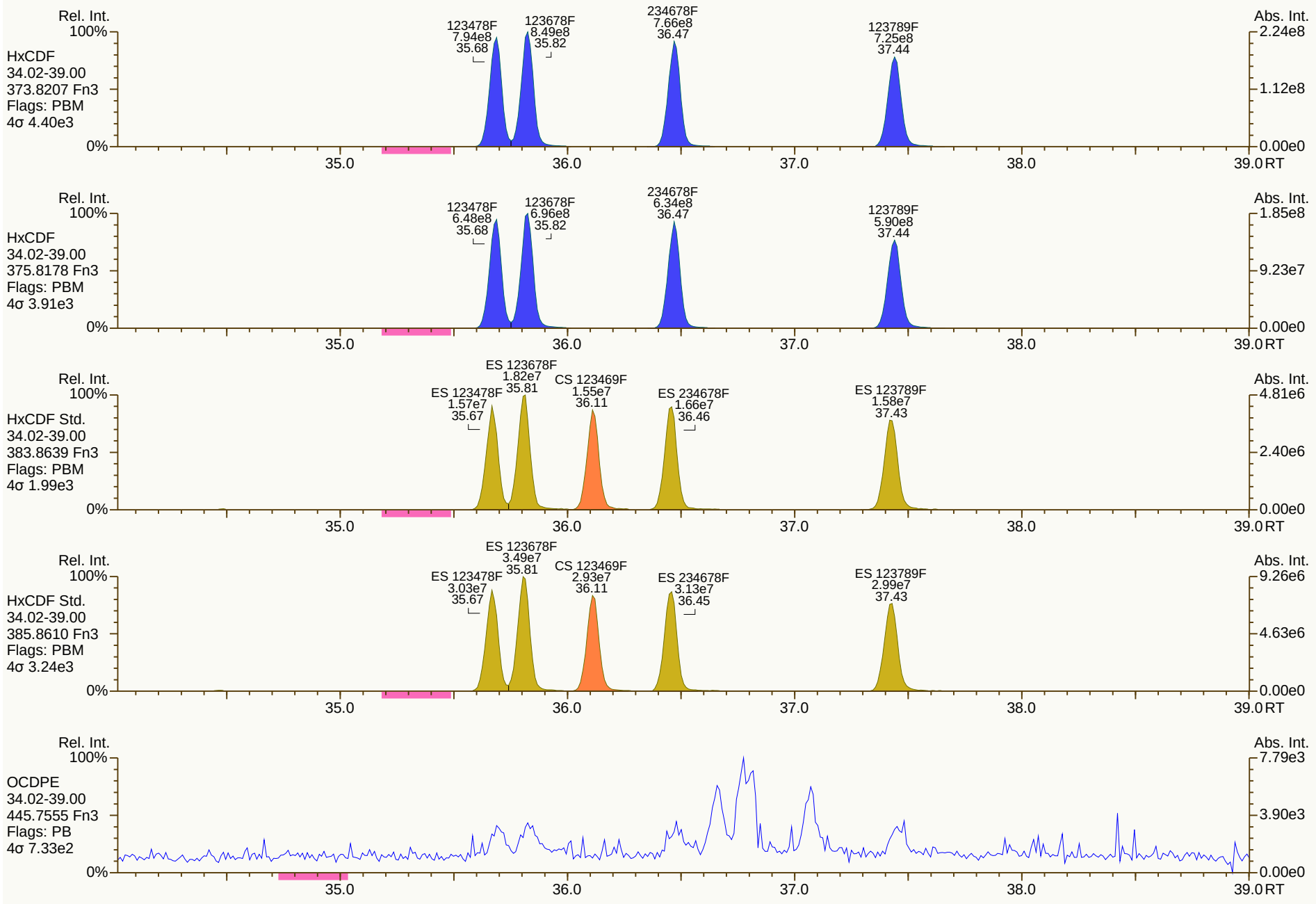
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SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



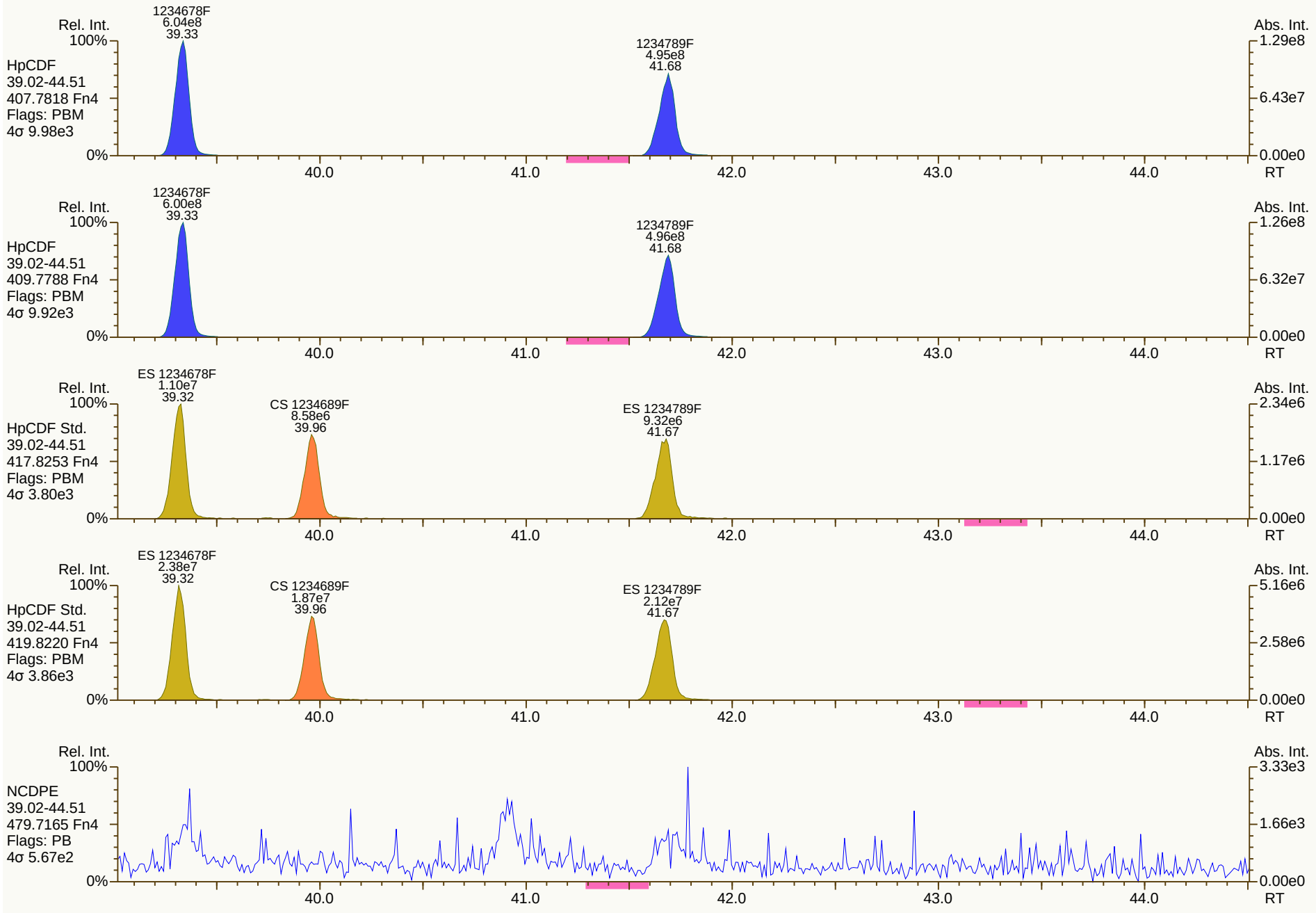
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SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS6_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5884, 5728, 1484 scc: 810-162 *PKD: 19-Sep-2014 08:53 Printed: 19-Sep-2014 12:35 Page 10 of 12*

SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\CS6_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

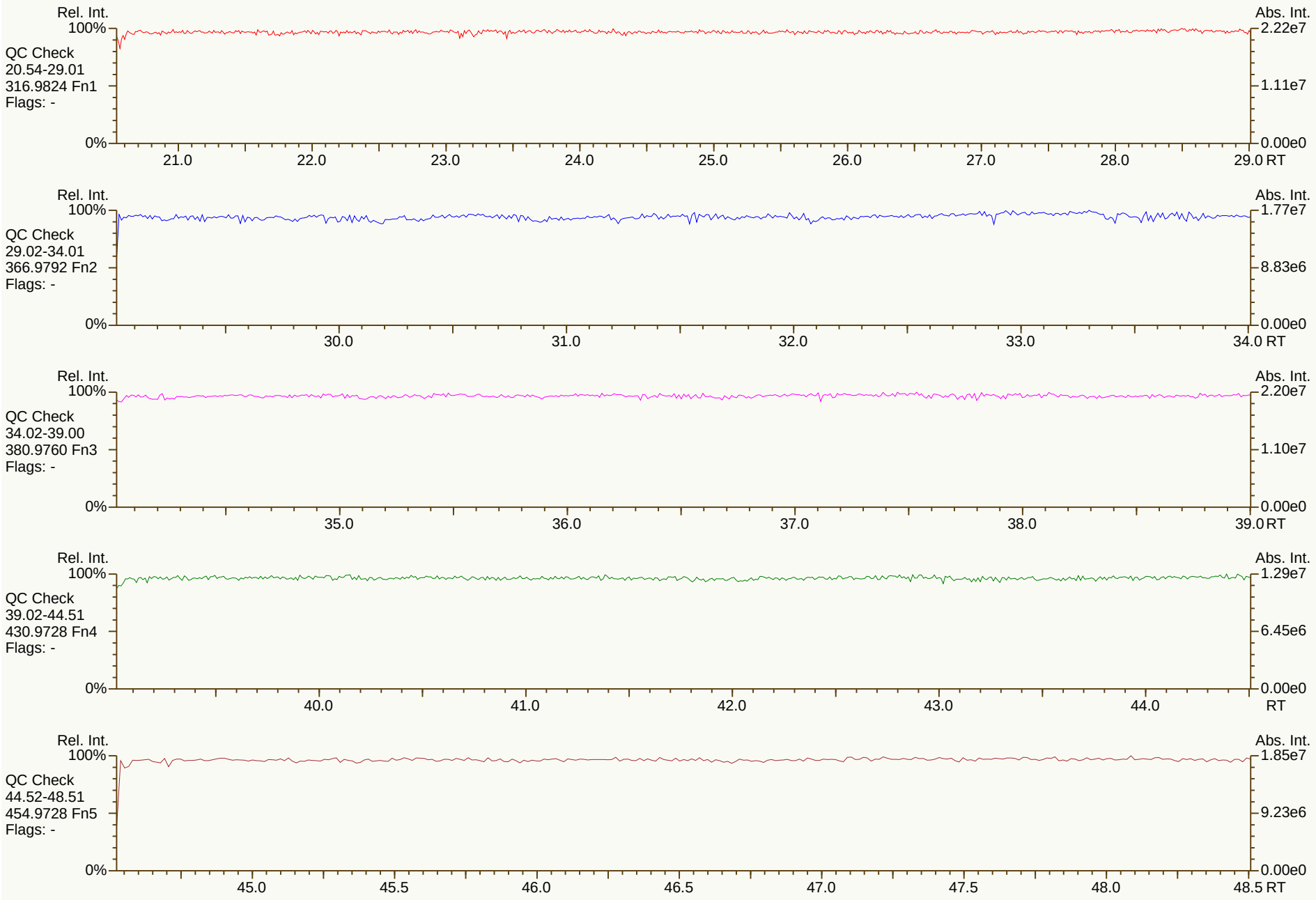
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SGS ID: CS6_140918_DF_PA **Sample ID: SIL 14-8-1** **Acq: 18-Sep-2014 20:09:36**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 91** **User: ACC Datafile: 140918P12**

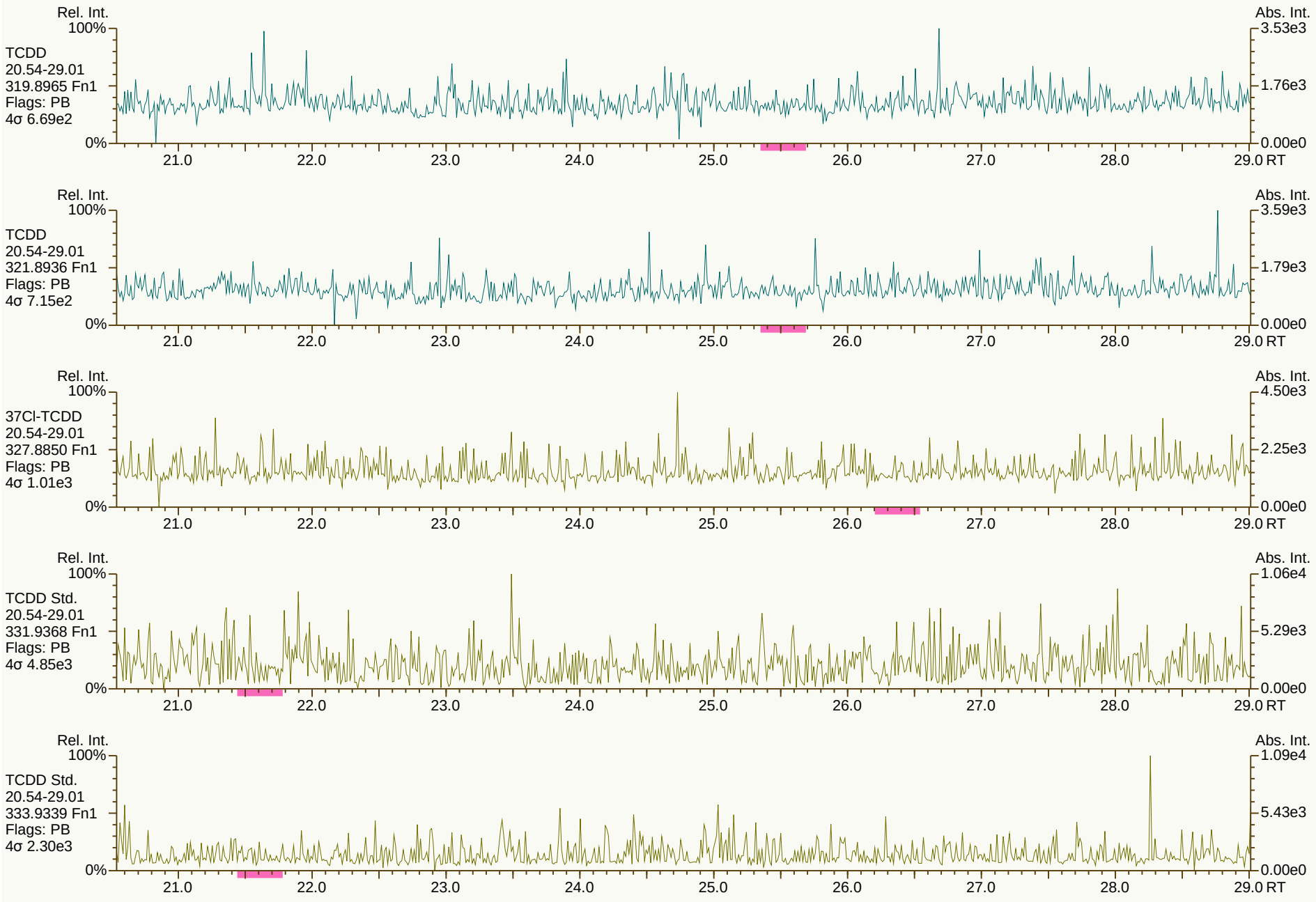


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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 1839, 5853, 4609 scc: 810-162 *PKD: 19-Sep-2014 08:53 Printed: 19-Sep-2014 12:35 Page 12 of 12*

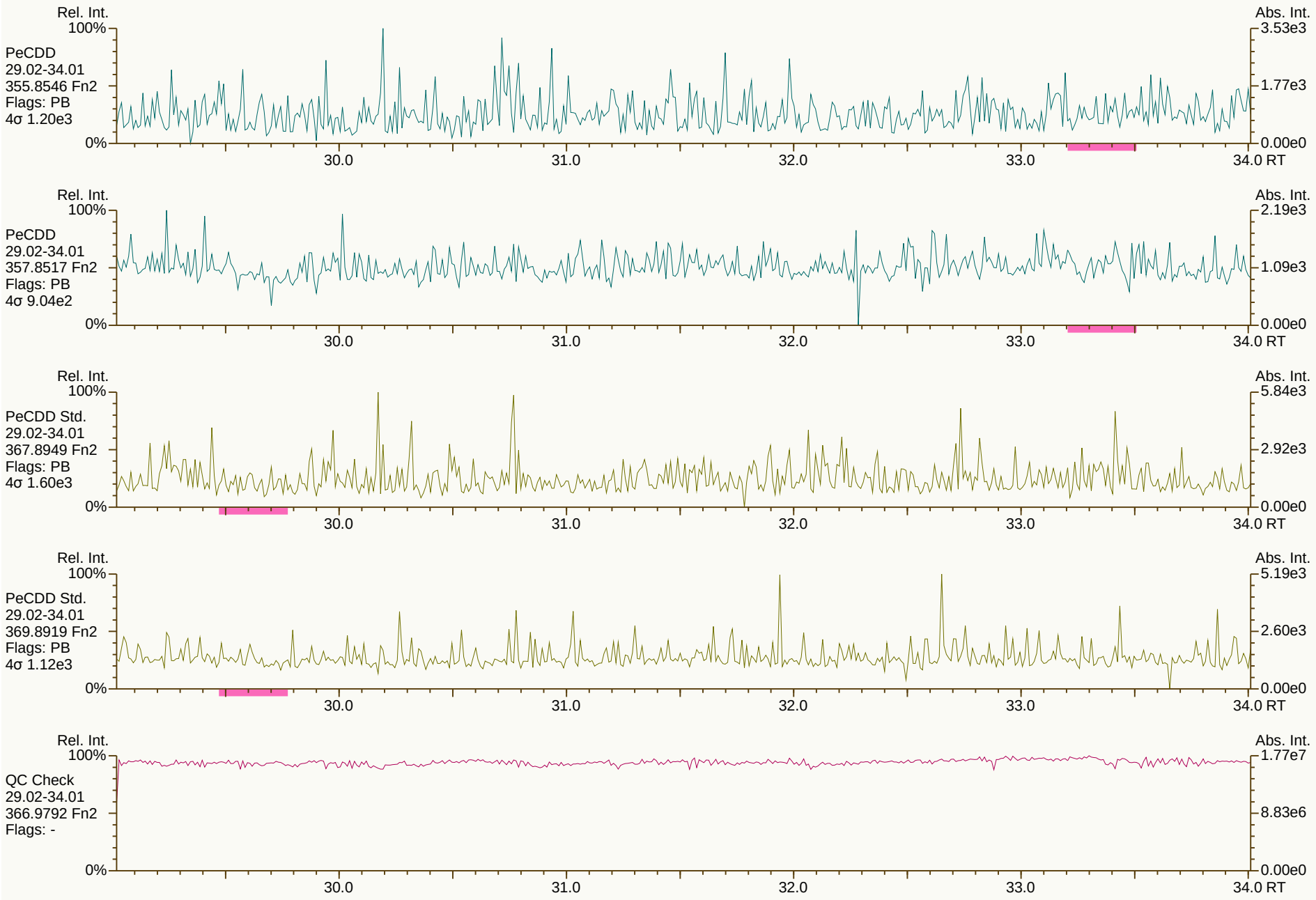
SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

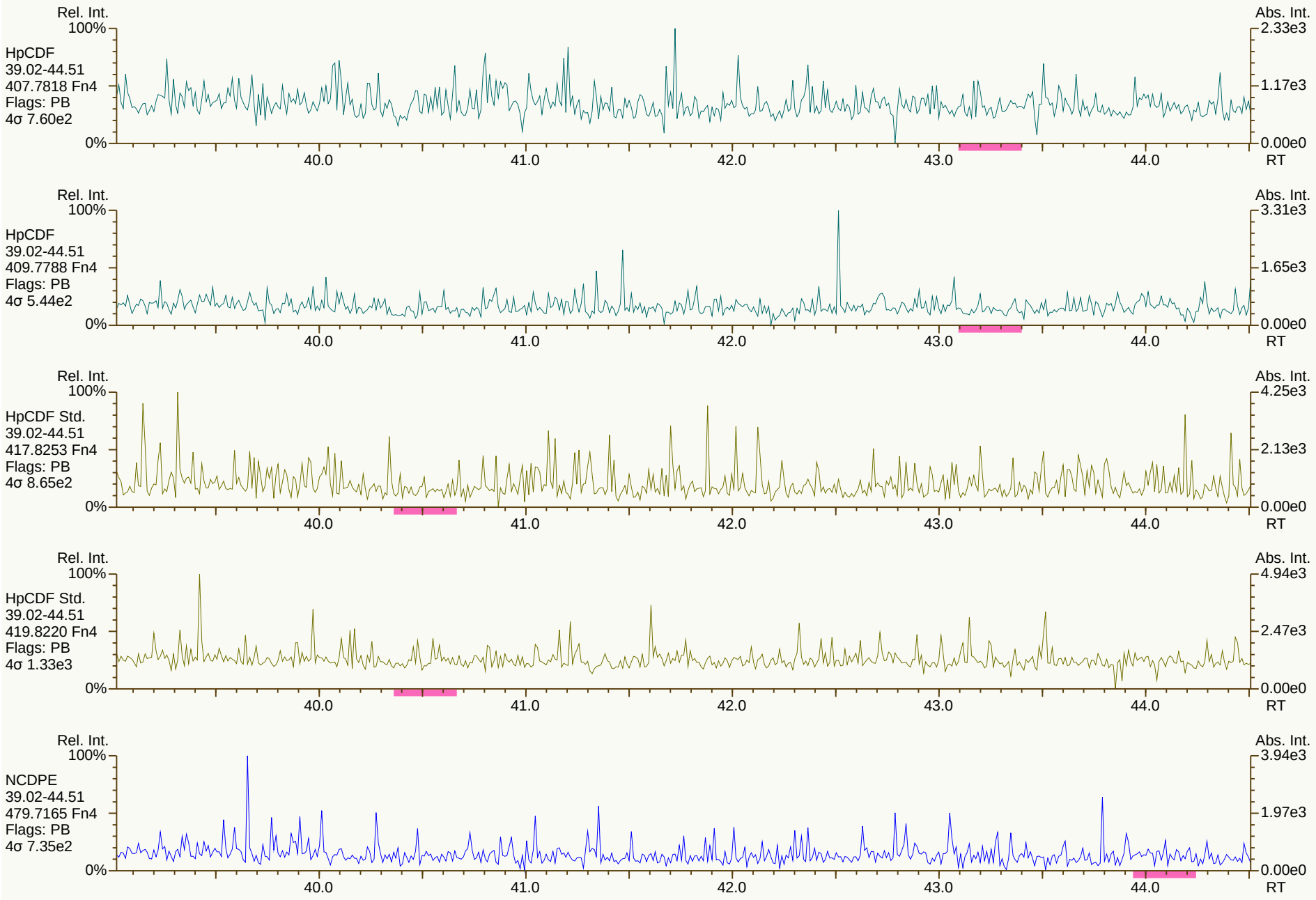
SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

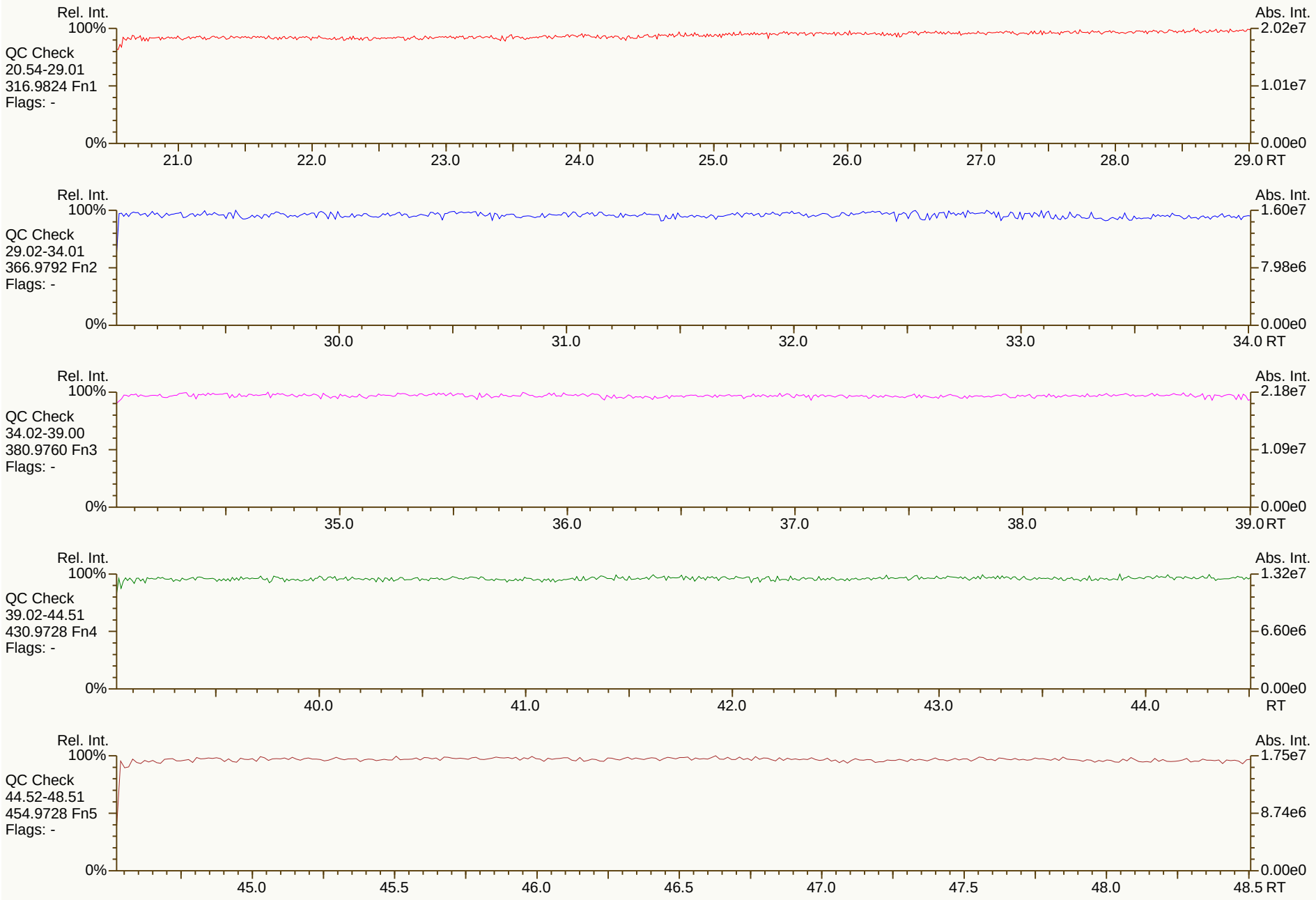
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5768, 9243, 5081 scc: 379-626 *Revised: 18-Sep-2014 14:41 (ACC) Printed: 19-Sep-2014 12:33 Page 11 of 12*

SGS ID: SBS_140918_DF_PA **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 14:00:01**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P05**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PA.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 5468, 5230, 7227 scc: 379-626 *Revised: 18-Sep-2014 14:41 (ACC) Printed: 19-Sep-2014 12:33 Page 12 of 12*

SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PB.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PB.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 9455, 8664, 1389 scc: 634-542 *Revised: 19-Sep-2014 10:02 (AJP) Printed: 19-Sep-2014 12:35 Page 2 of 12*

SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PB.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 1553, 6681 scc: 634-542 *PKD: 19-Sep-2014 10:02 Printed: 19-Sep-2014 12:35 Page 3 of 12*

SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PB.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PB.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PB.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



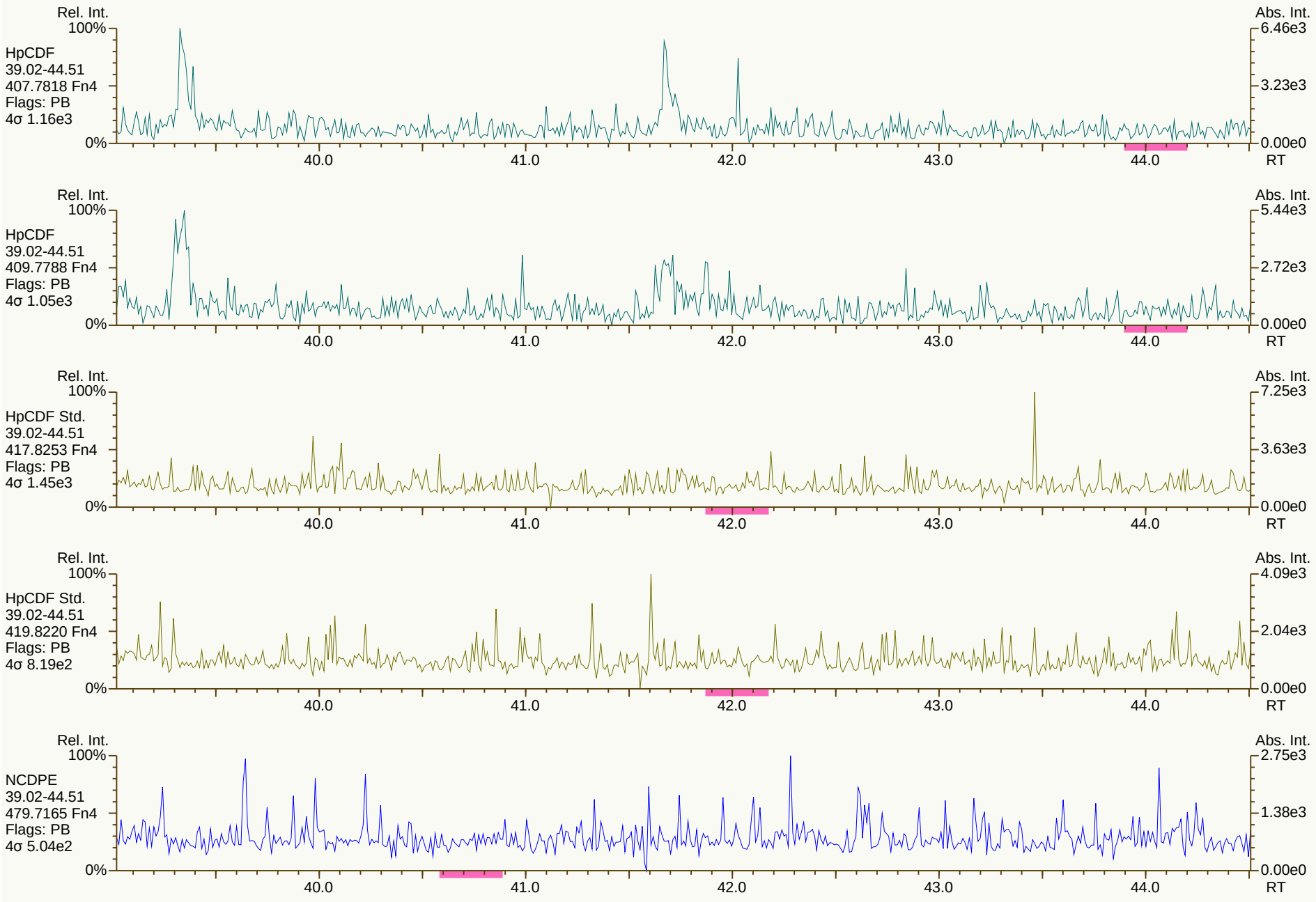
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SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



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SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



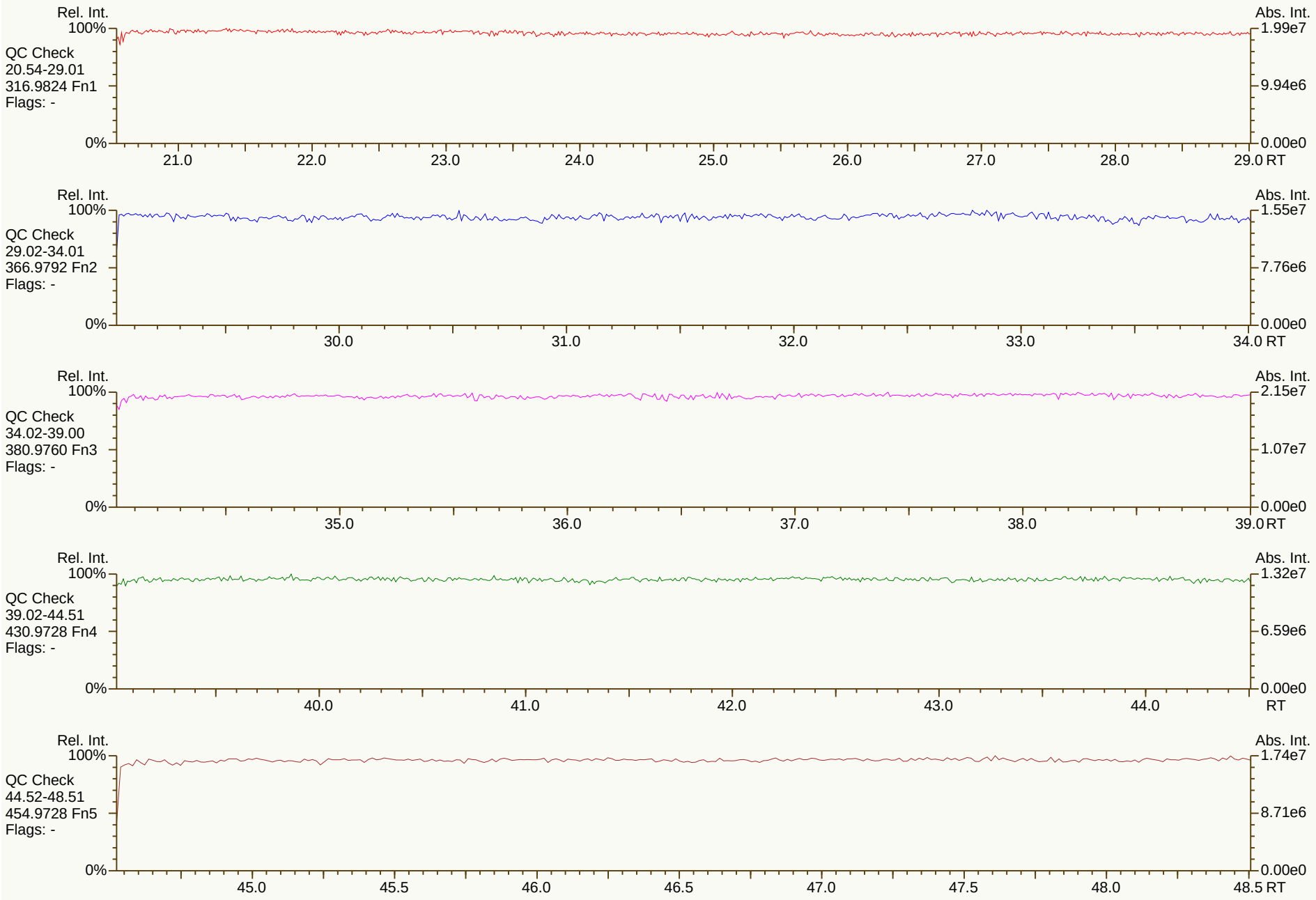
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SGS ID: SBS_140918_DF_PB **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:02:52**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P13**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PB.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PC.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



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SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PC.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*
SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 2459, 5812 scc: 835-329 *Revised: 19-Sep-2014 10:09 (AJP) Printed: 19-Sep-2014 12:36 Page 5 of 12*

SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PC.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



Results: T:\UltraTracePro\ICAL results\MM1_DF_01172014_18SEP2014\Resouces\SBS_140918_DF_PC.utp_res, saved 19-Sep-2014 12:32 (AJP) *Peak annotation: Areas, Centroids*

SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
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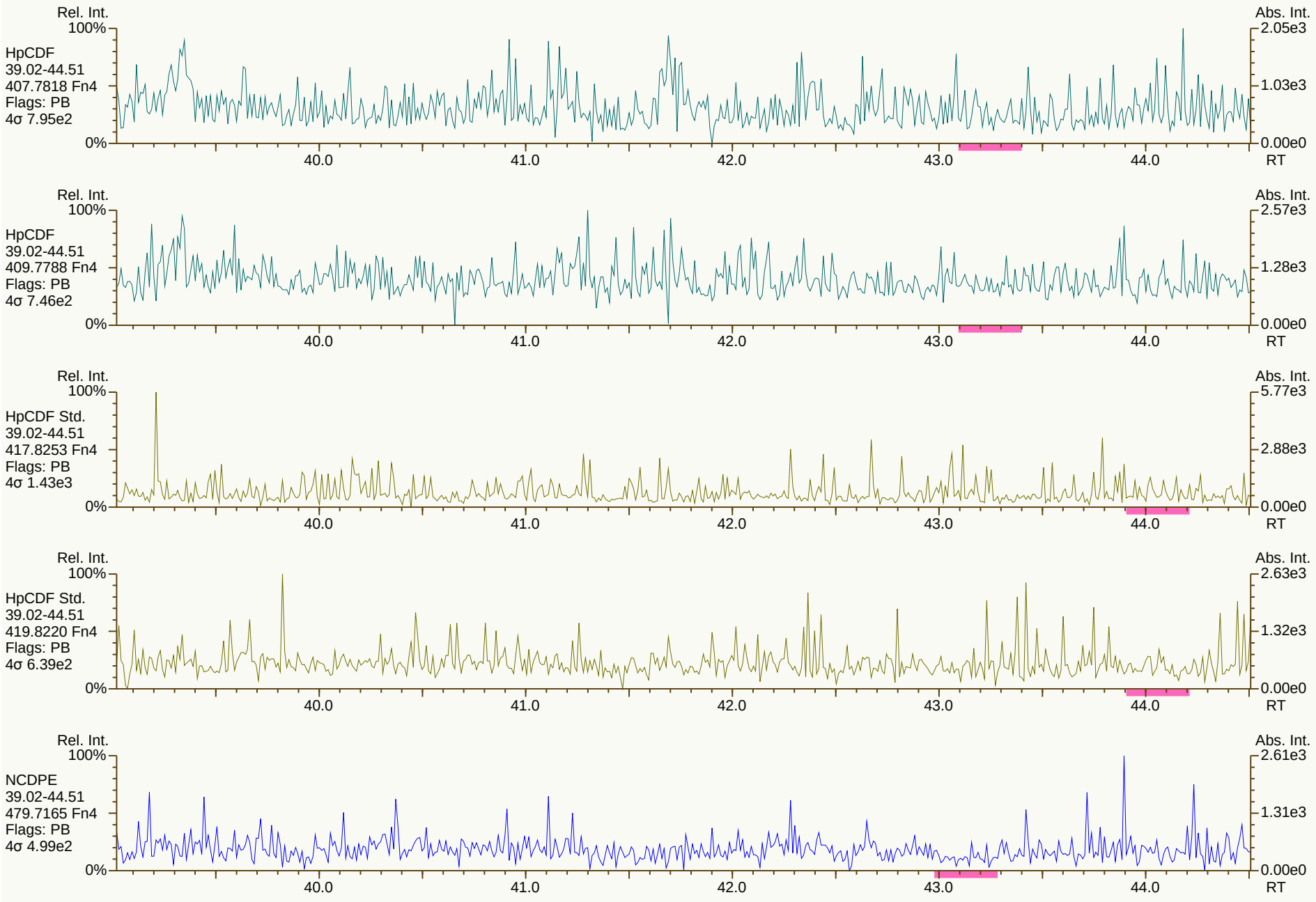
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SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
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SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
Instr: [ILM] AutoSpec-Ultima MM1 **VSIR EI+ Expt: df_cl4-8 GC: zb5-ms_60m Vial: 2** **User: ACC Datafile: 140918P14**



SGS ID: SBS_140918_DF_PC **Sample ID: SIL 12-70-1** **Acq: 18-Sep-2014 21:56:08**
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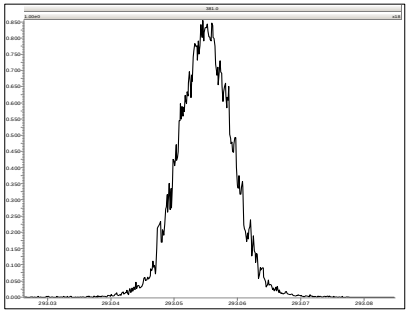
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SGS UltraTrace-Pro V4.82 User/System: AJP/US0007951 cc: 6252, 1379, 2097 scc: 835-329 *Revised: 19-Sep-2014 10:09 (AJP) Printed: 19-Sep-2014 12:36 Page 12 of 12*

Experiment Calibration Report **MassLynx 4.1 SCN640** Page 1 of 1

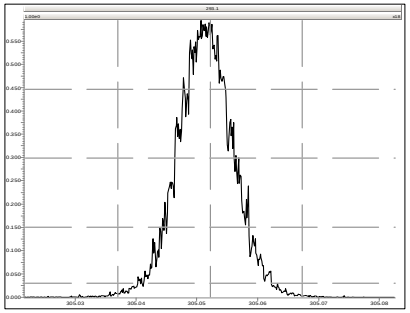
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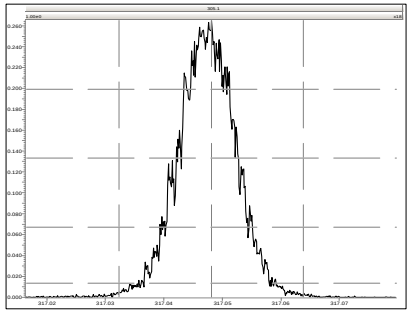
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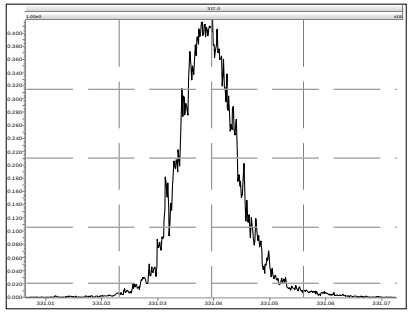
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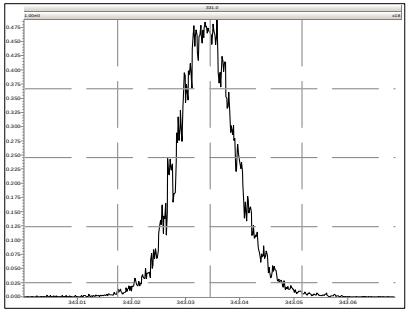
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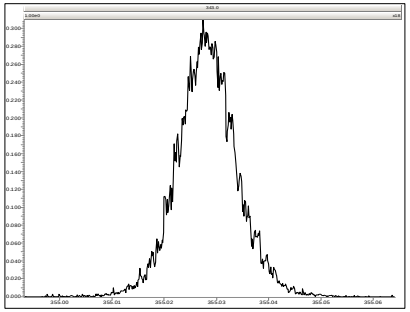
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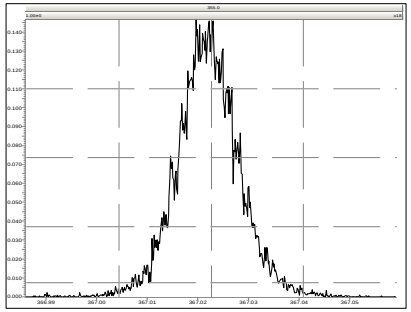
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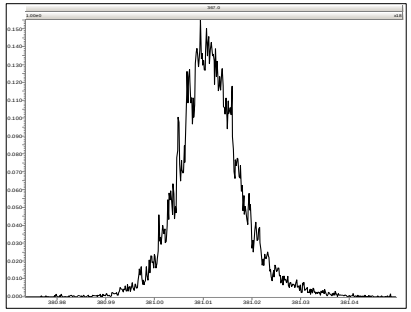
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M 366.9792 R 12955



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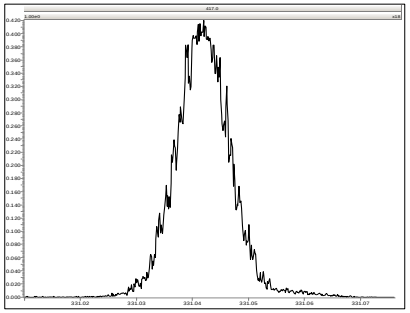


Experiment Calibration Report **MassLynx 4.1 SCN640** Page 1 of 1

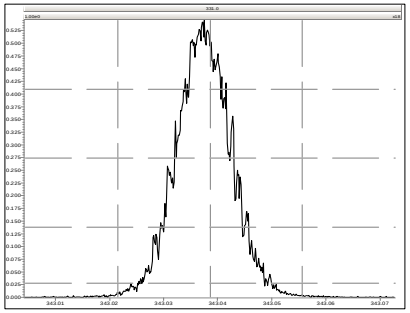
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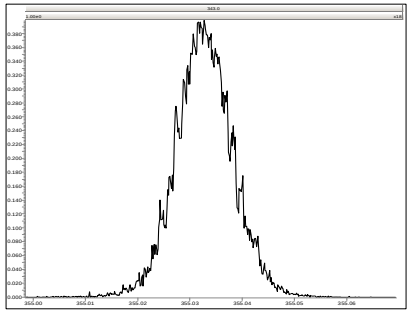
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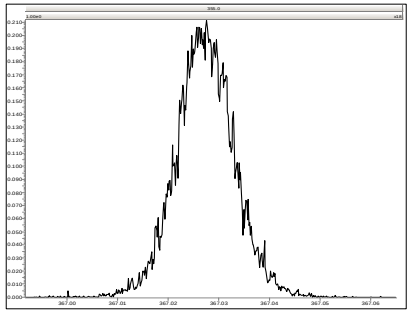
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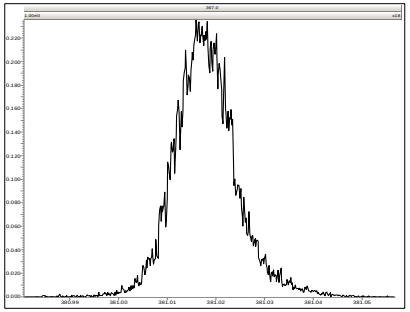
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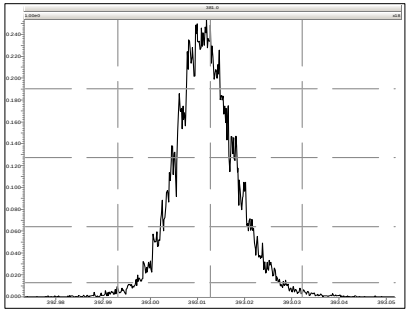
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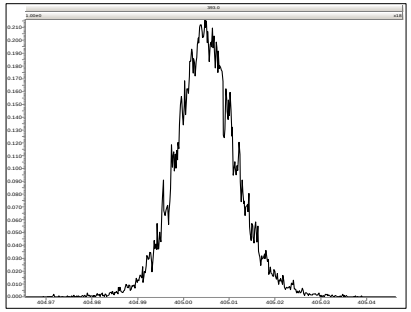
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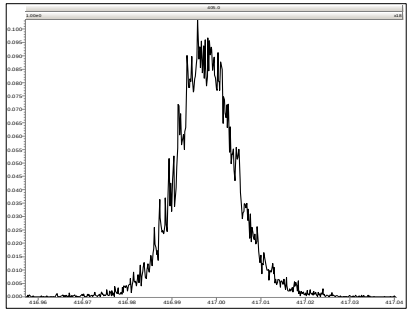
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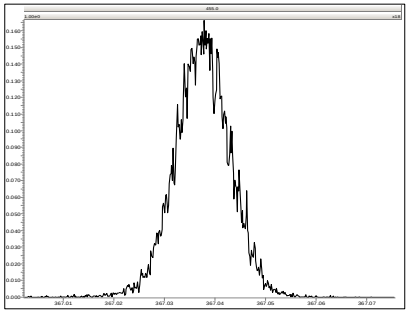


Experiment Calibration Report **MassLynx 4.1 SCN640** Page 1 of 1

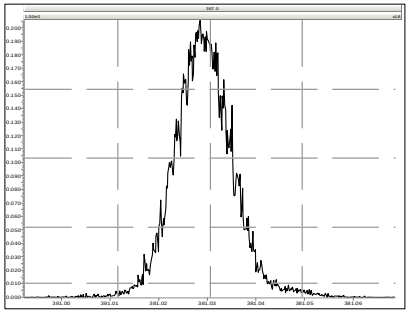
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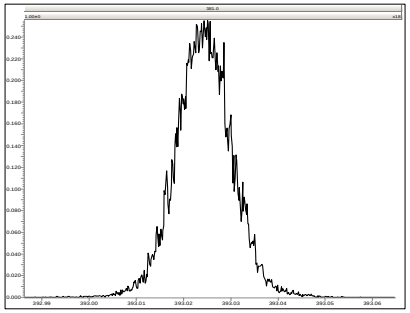
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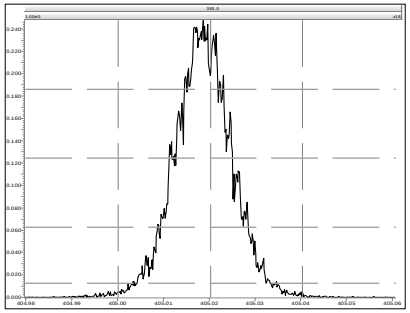
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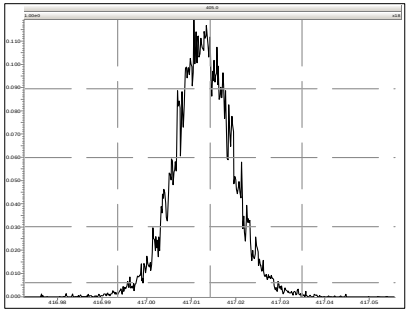
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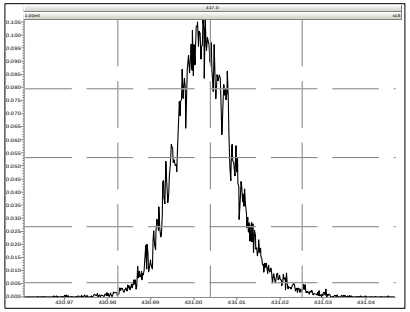
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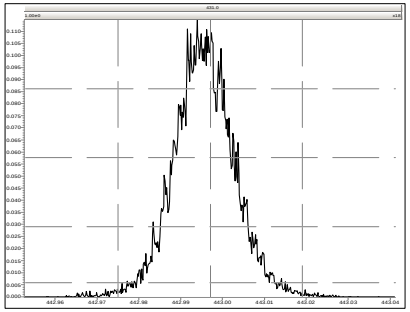
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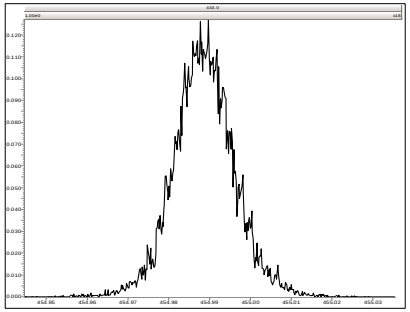
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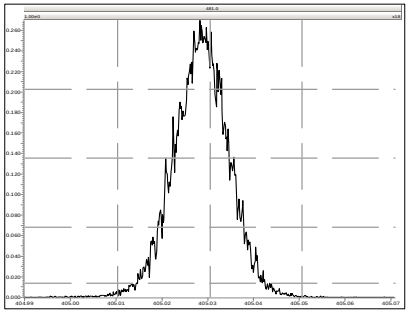


Experiment Calibration Report **MassLynx 4.1 SCN640** Page 1 of 1

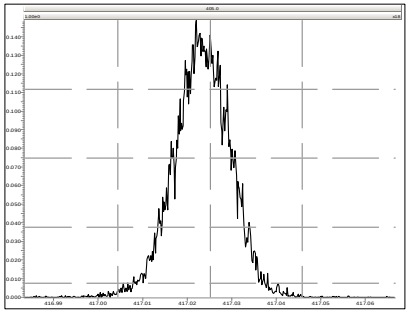
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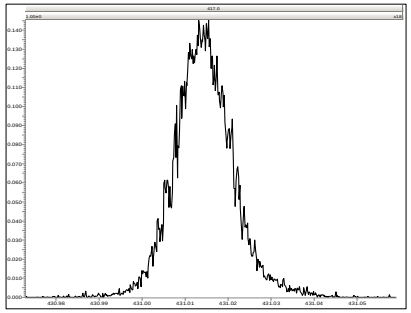
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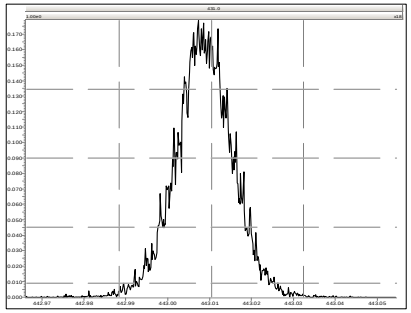
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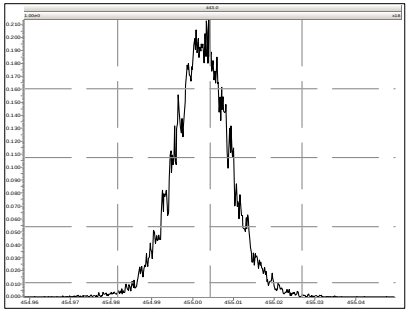
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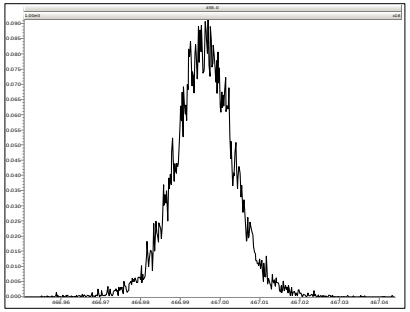
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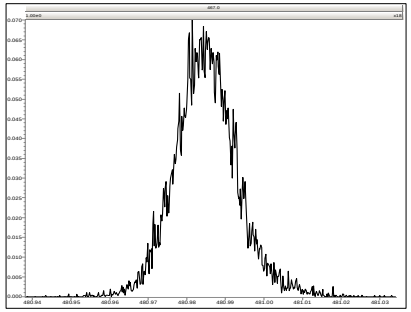
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M 466.9728 R 13022



M 480.9696 R 12887

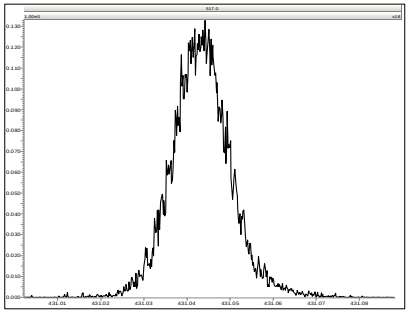


Experiment Calibration Report **MassLynx 4.1 SCN640** Page 1 of 1

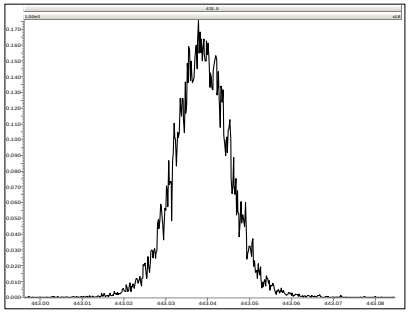
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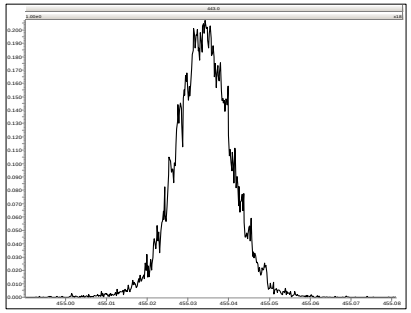
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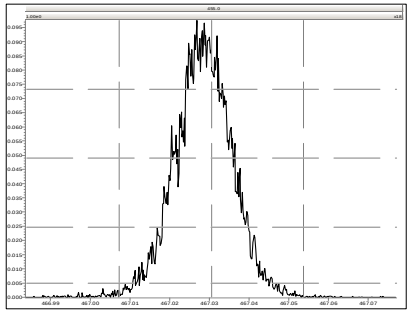
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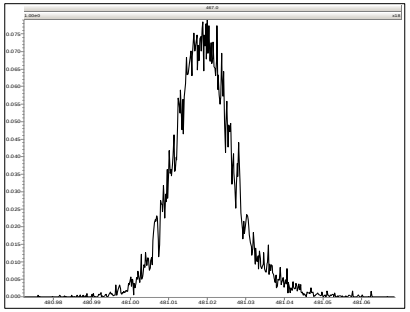
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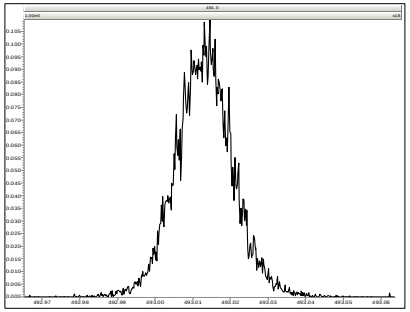
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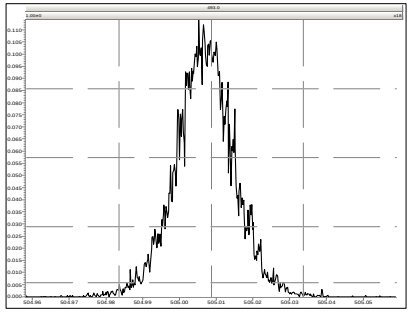
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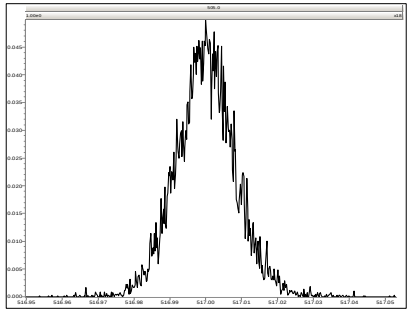
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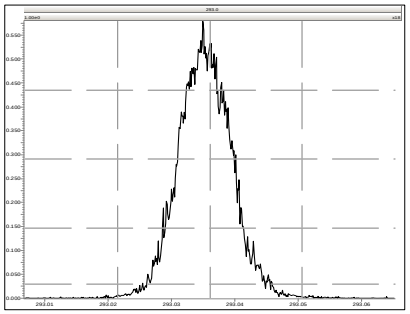
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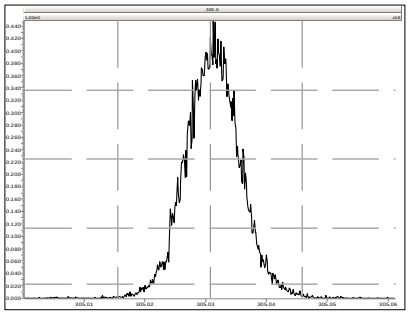
Resolution Check Report **MassLynx 4.1 SCN640**

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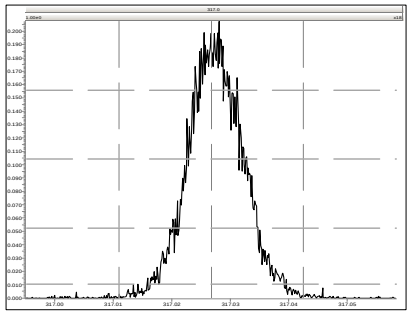
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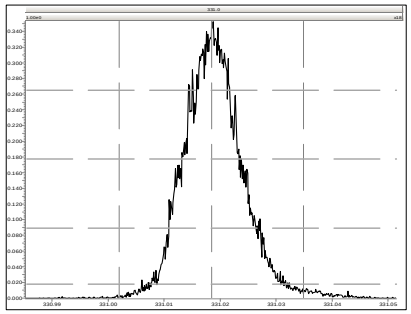
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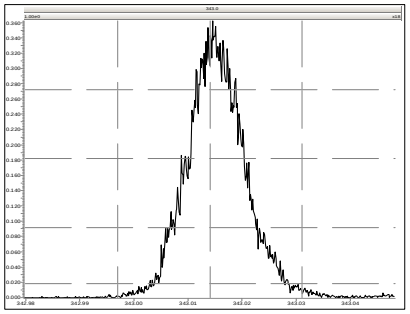
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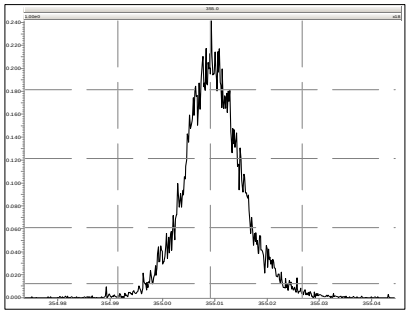
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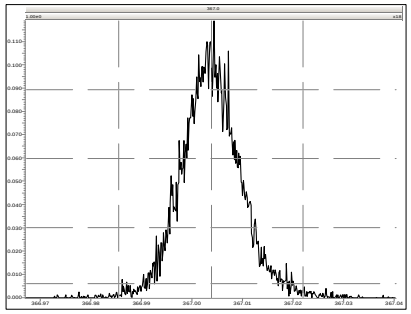
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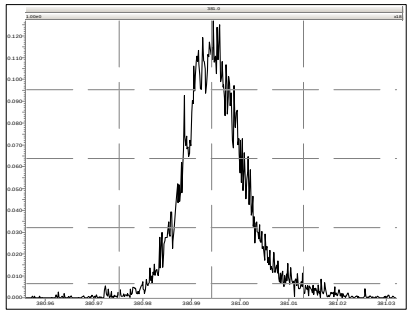
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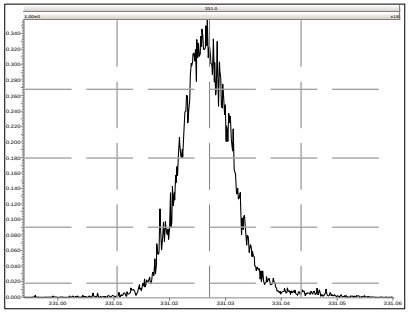
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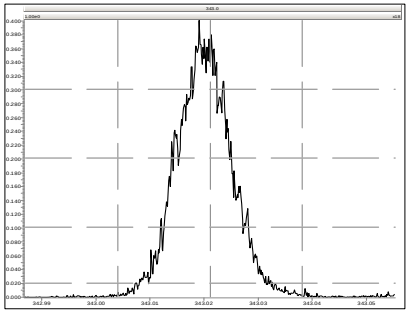
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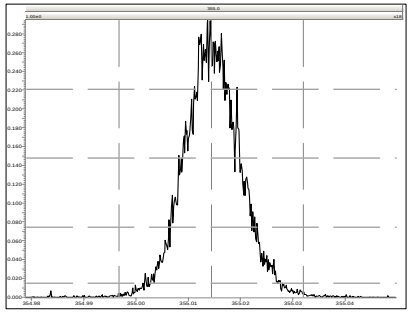
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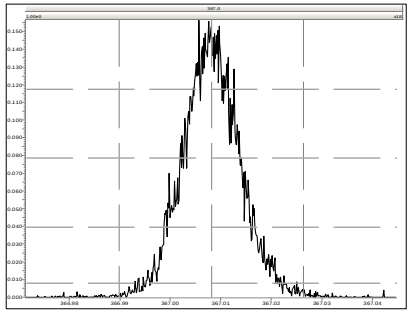
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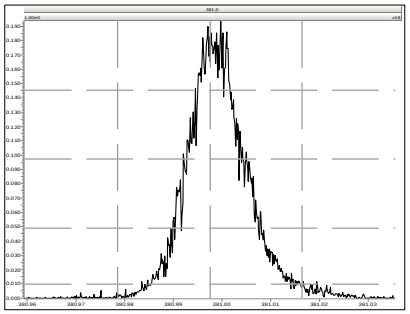


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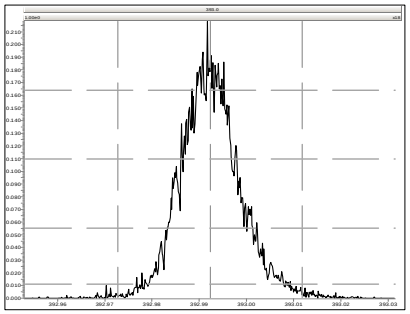


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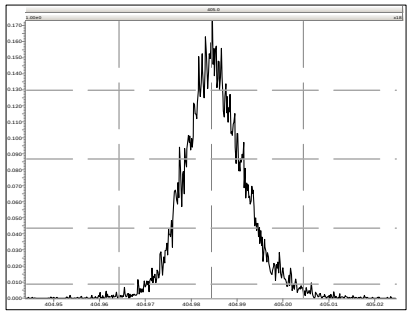
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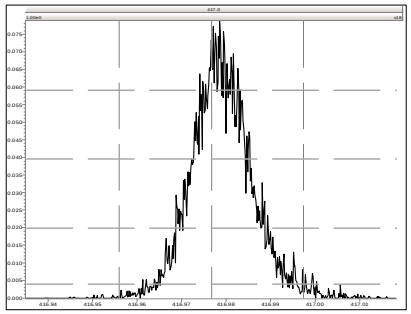
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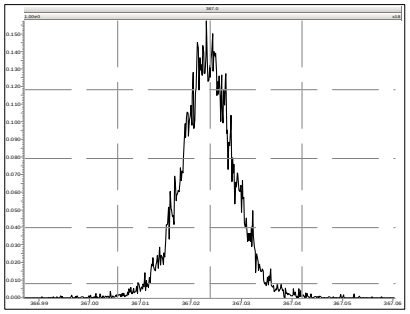
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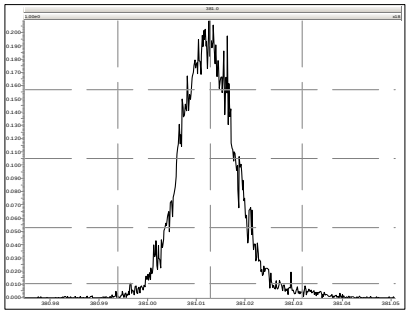
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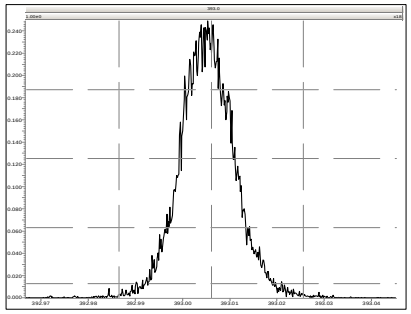
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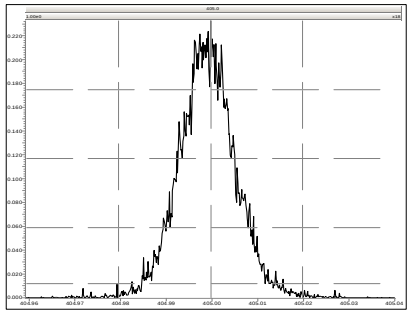
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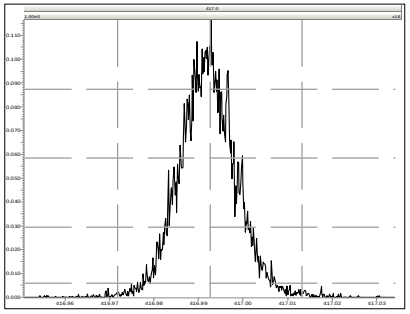
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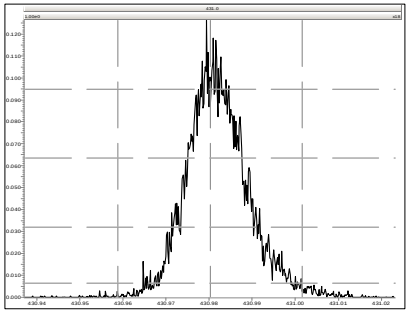
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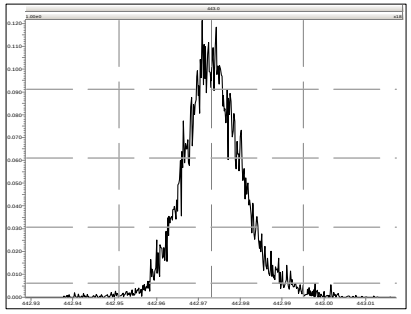
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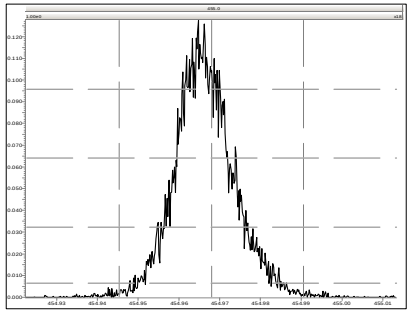
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M 442.9728 R 13895

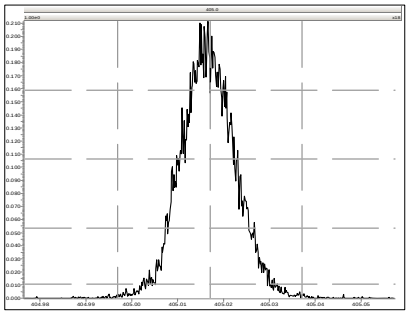


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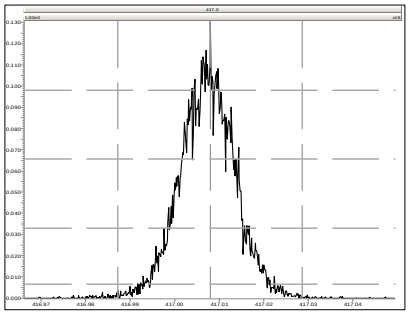


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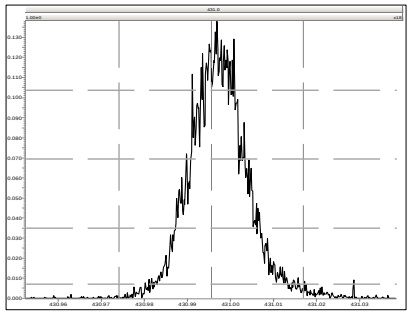
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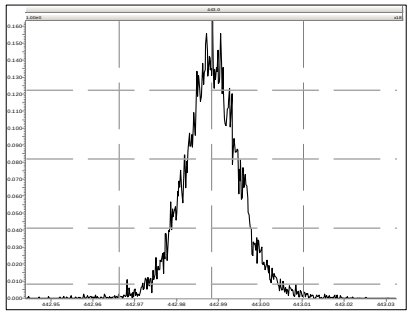
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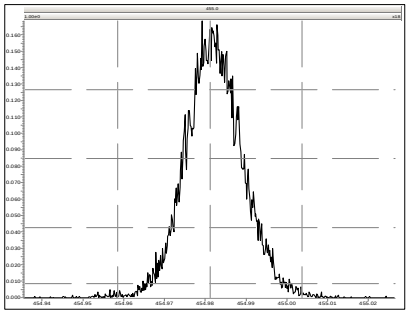
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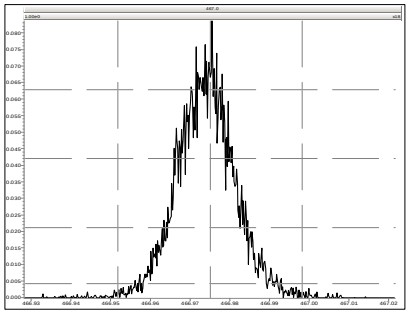
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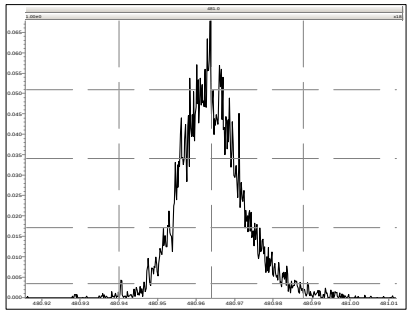
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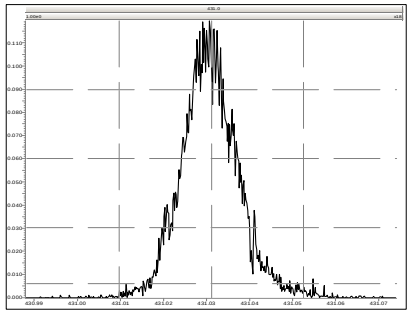
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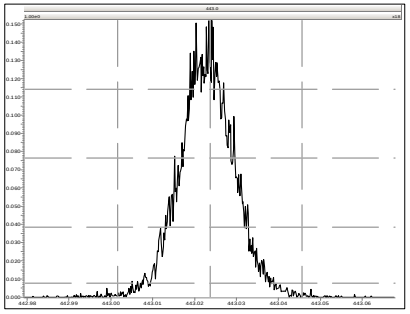
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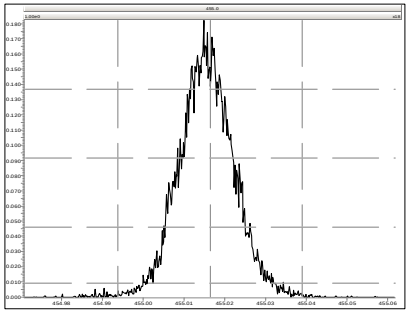
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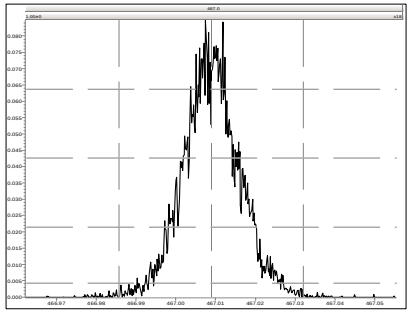
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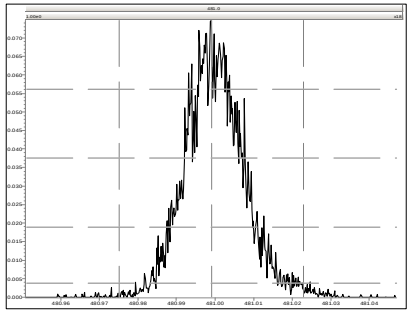
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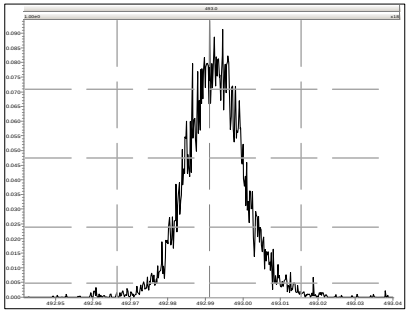


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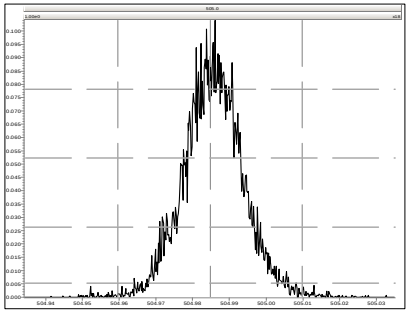


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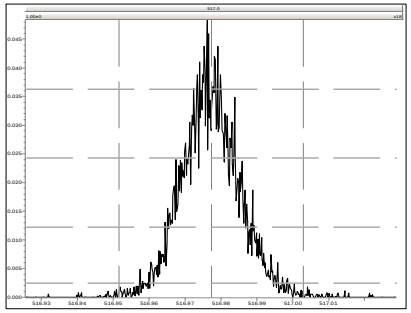
M 492.9696 R 15346



M 504.9696 R 14536



M 516.9697 R 15203



Concentrations in pg / µL	CS0	CS1	CS2	CS3	CS4	CS5	CS6
Unlabeled Analytes							
2,3,7,8-TCDD	0.25	0.5	2	10	40	200	500
2,3,7,8-TCDF	0.25	0.5	2	10	40	200	500
1,2,3,7,8-PeCDD	1.25	2.5	10	50	200	1000	2500
1,2,3,7,8-PeCDF	1.25	2.5	10	50	200	1000	2500
2,3,4,7,8-PeCDF	1.25	2.5	10	50	200	1000	2500
1,2,3,4,7,8-HxCDD	1.25	2.5	10	50	200	1000	2500
1,2,3,6,7,8-HxCDD	1.25	2.5	10	50	200	1000	2500
1,2,3,7,8,9-HxCDD	1.25	2.5	10	50	200	1000	2500
1,2,3,4,7,8-HxCDF	1.25	2.5	10	50	200	1000	2500
1,2,3,6,7,8-HxCDF	1.25	2.5	10	50	200	1000	2500
1,2,3,7,8,9-HxCDF	1.25	2.5	10	50	200	1000	2500
2,3,4,6,7,8-HxCDF	1.25	2.5	10	50	200	1000	2500
1,2,3,4,6,7,8-HpCDD	1.25	2.5	10	50	200	1000	2500
1,2,3,4,6,7,8-HpCDF	1.25	2.5	10	50	200	1000	2500
1,2,3,4,7,8,9-HpCDF	1.25	2.5	10	50	200	1000	2500
OCDD	2.5	5	20	100	400	2000	5000
OCDF	2.5	5	20	100	400	2000	5000
Extraction Standards							
$^{13}C_{12}$-2,3,7,8-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,7,8-TCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-OCDD	200	200	200	200	200	200	200
$^{13}C_{12}$-OCDF	200	200	200	200	200	200	200
Cleanup/Sampling Standards							
$^{37}Cl_4$-2,3,7,8-TCDD	-	0.5	2	10	40	200	-
$^{13}C_{12}$-1,2,3,4,7-PeCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,9-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,8,9-HpCDF	100	100	100	100	100	100	100
Injection Standards							
$^{13}C_{12}$-1,2,3,4-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4-TCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7-HxCDD	100	100	100	100	100	100	100

M8290/1613 PCDD/F Spike Profile

Analyte	Cleanup Standards Amount Spiked (ng)
$^{37}Cl_4$-2,3,7,8-TCDD	0.8
$^{13}C_{12}$-1,2,3,4,7-PeCDD	2
$^{13}C_{12}$-1,2,3,4,6-PeCDF	2
$^{13}C_{12}$-1,2,3,4,6,9-HxCDF	2
$^{13}C_{12}$-1,2,3,4,6,8,9-HpCDF	2

Compound	Injection Standards Amount Spiked ng
$^{13}C_{12}$–1,2,3,4-TCDD	2
$^{13}C_{12}$-1,2,3,4-TCDF	2
$^{13}C_{12}$-1,2,3,4,6,7-HxCDD	1

Compound	Alternate Standard Amount Spiked ng
$^{13}C_{12}$–1,3,6,8-TCDD	2
$^{13}C_{12}$-1,3,6,8-TCDF	2

Compound	Extraction Standards Amount Spiked ng
$^{13}C_{12}$-2,3,7,8-TCDD	2
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2
$^{13}C_{12}$-OCDD	4
$^{13}C_{12}$-2,3,7,8-TCDF	2
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2
$^{13}C_{12}$-OCDF	4

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APPENDIX D

EQUIPMENT CALIBRATIONS

QUALITY ASSURANCE AND EQUIPMENT CALIBRATION PROCEDURES

General. Field or laboratory test equipment purchased or fabricated by Civil and Environmental Consultants, Inc. (CEC) is assigned a unique, permanent identification number. New items for which calibration is required are calibrated before initial field use. Equipment whose calibration status may change with use or with time is inspected in the field before testing begins, and again upon return from field use. When an item of equipment is found to be out of calibration, it is adjusted and recalibrated or retired from service. CEC's equipment is periodically recalibrated, regardless of the outcome of these regular inspections.

Calibrations are conducted in accordance with United States Environmental Protection Agency (US EPA) specifications. CEC follows the calibration procedures outlined in EPA Reference Methods found in the Code of Federal Regulations (Volume 40, Part 60) and those recommended in the Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III (EPA/600/R-94/038c). When the Reference Methods do not detail procedures, CEC uses methods such as those prescribed by the American Society for Testing and Materials (ASTM).

Data obtained during calibrations are recorded on standardized forms, which are verified for completeness and accuracy by the Quality Assurance Manager. Data reduction and subsequent calculations are performed using CEC's Air Quality Data System. Calibration calculations are performed by an environmental scientist, independently audited by the Project Manager, and reviewed by the Quality Assurance Manger for verification of data. Copies of calibration data are included in the test or project report.

Inspection and Maintenance. An effective preventative program is necessary to ensure equipment performance quality prior to, during, and following the source test. Equipment returning from the field is inspected before it is returned to storage. During the course of these inspections, items are cleaned, repaired, reconditioned, and recalibrated when necessary.

Equipment that is transported to the field for a test project is inspected again prior to being packed. CEC performs these quality assurance checks prior to departure for the project site to detect equipment problems, which may occur during periods of storage. CEC transports adequate back-up equipment to the project site so as to minimize delays in the test schedule.

Calibration. Source sampling equipment that requires calibration includes nozzles, pitot tubes, thermometers, flow meters, dry gas meters, and barometers. The following sections briefly describe the calibration procedures followed by CEC.

Nozzles. Probe nozzles are uniquely and permanently identified at the time of purchase or fabrication; with the exception for glass nozzles. (Glass nozzles are not uniquely identified due to their fragile status.) Nozzles are calibrated before initial field use and prior to the source test. The inside diameter of the nozzle is measured to the nearest 0.001 inch precision micrometer. Three measurements are made using different

diameters. If the difference between the high and the low measurements do not exceed 0.004 inch, the average of the three measurements is used. If the difference exceeds this amount, or when the nozzle becomes nicked, dented, or corroded, the nozzle is reshaped, sharpened, and recalibrated. Regardless of usage, nozzles are inspected on a yearly basis.

Pitot Tubes. CEC Type S Pitot tubes have been constructed and calibrated using those recommendations in accordance with EPA Reference Method 2, Section 10.1. CEC Type S Pitot tubes C_p coefficients have been determined according to Method 2, Section 10.1. CEC standard Pitot tubes have been assigned a C_p coefficient of 0.99 according to Calibration Procedure 2. Pitot tubes are visually inspected prior to field use. If the inspection indicates damage, the calibration is rechecked. Regardless of usage, CEC Pitot tubes are inspected and recalibrated on a yearly basis.

Dry Gas Meter and Orifice. Console metering systems receive a full calibration at the time of purchase and annually, thereafter. Post-test calibrations are performed after the source test. Approved Alternative Method 5 Post-Test Calibration (ALT-009) may be used to determine a post-test calibration on the console metering systems instead of reference post-test method. If the calibration factor, γ (gamma), deviates by more than five percent per the reference post-test method, the meter is recalibrated and the meter coefficient (initial or recalibrated) that yields the lowest sample volume for the test runs is used. Standard practice at CEC is to recalibrate the dry gas meter when the γ is found to be outside the range of $\gamma \pm 3\%$.

Barometer. Field barometers are compared to a reference mercury barometer and are deemed acceptable when they agree to within ± 0.1 inches Hg. This barometric pressure is corrected for pressure and temperature. Prior to and following the sampling program, the field barometer is verified against the referenced barometer.

Thermometers. New thermometers, pyrometers and thermocouples purchased or fabricated by CEC are calibrated using the procedures described by US EPA Test Protocol. Calibration tolerance limits are as follow:

Impinger Temperature Gauge	± 1°C or 2°F
Dry Gas Meter Temperature Gauge	± 3°C or 5.4°F
Stack Thermocouples	± 1.5% of absolute temperature

Thermometers and thermocouples are inspected and calibrated prior to and following the field test. Regardless of usage, CEC thermometers and thermocouples are inspected and recalibrated on a yearly basis.

Laboratory Equipment. CEC, Inc. has a written quality assurance document that covers calibration and maintenance of laboratory equipment. This includes calibration of the analytical balance against Class S weights. Calibration of thermometers, barometers, and wet test meters are traceable to NIST. A copy of our quality assurance document may be obtained by written request.

142-644

PRE-TEST / POST-TEST CALIBRATION DATA FORM

Client Eastman City/State Kingsport TN

Pre-test Date 9-25-14 Calibrator GG DZ3 Post-test Date 10/03/14 Calibrator KMD

Reference Thermometer ~~100.122, 123.123~~ SN 130638286 Reference Barometer CLT Airport

	Pre-test			Post-test		
	Temp., °F	Ref. Temp., °F	Inspection	Temp., °F	Ref. Temp., °F	Inspection
Omega DB/WB # 100.127	72.0	72.4		74	75	
Omega DB/WB # 111.060	73.4	72.4		74	75	
Omega DB/WB #						
Omega DB/WB #						
			Positive Leak Check			Poistive Leak Check
Dry Gas Meter #300.392 [A]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300.321 [B]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300.035 [C]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300.388 [D] α	72	71	☒ Yes ☐ No @ 7.7	75	75	☒ Yes ☐ No @ 7.5
Dry Gas Meter #300.310 [E]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300.045 [F]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300-390 [G] α	72	71	☒ Yes ☐ No @ 8.2			☐ Yes ☐ No @
Dry Gas Meter #300.241 [H]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300.214 [I]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300.067 [J]			☐ Yes ☐ No @			☐ Yes ☐ No @
Dry Gas Meter #300.200 [K]			☐ Yes ☐ No @			☐ Yes ☐ No @
Umbilical Adaptor # A #300.	71.6	72.9				
Umbilical Adaptor # B #300.	71.8	72.9				
Umbilical Adaptor # F #300.	71.5	72.9				
Umbilical Adaptor # #300.						
Umbilical Adaptor # #300.						
Umbilical Adaptor # #300.						
			Visual Inspection			Visual Inspection
Probe #200. 118 5'	71.8	72.9	☐ Yes ☐ No @	72.9	72	☐ Yes ☐ No @
Probe #200. 120 5'	71.4	72.9	☐ Yes ☐ No @	73.1	72	☐ Yes ☐ No @
Probe #200. 121 5'	71.6	72.9	☐ Yes ☐ No @	73.1	72	☐ Yes ☐ No @
Probe #200.			☐ Yes ☐ No @			☐ Yes ☐ No @
Probe #200.			☐ Yes ☐ No @			☐ Yes ☐ No @
Probe #200.			☐ Yes ☐ No @			☐ Yes ☐ No @
Probe #200.			☐ Yes ☐ No @			☐ Yes ☐ No @
Probe #200.			☐ Yes ☐ No @			☐ Yes ☐ No @
Pitot #200. 711 5'	71.5	72.9	☐ Yes ☐ No @	74.9	75	☐ Yes ☐ No @
Pitot #200.			☐ Yes ☐ No @			☐ Yes ☐ No @
Pitot #200.			☐ Yes ☐ No @			☐ Yes ☐ No @
	Field Baro, in. Hg	Ref. Baro, in Hg		Field Baro, in. Hg	Ref. Baro, in. Hg	
Barometer # 600.041	29.53	29.57		29.47	~~29.57~~ 29.47	
Barometer #						
Barometer #						

Were safety checks performed during the pre-site reviews? ☒ Yes ☐ No

Were post-test calibrations withi the EPA Quality Assurance criteria? ☒ Yes ☐ No

Civil & Environmental Consultants, Inc.

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

ACCREDITED
Calibration
Certificate No. 1750.01

Cert. No.: 4371-5460733

Traceable® Certificate of Calibration for Lollipop Thermometer

Manufactured for and distributed by: Thomas Scientific, Box 99, 99 High Hill Road, Swedeboro, NJ 08085-0099 U.S.A.

Instrument Identification:

Model: 1235D23 S/N: 130638163 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC-179	A45240		
Thermistor Module	A17118	2/13/14	1000332071
Temperature Probe	128	2/20/14	6-B48Z9-30-1
PRT Temperature Probe	02022	8/14/15	B3812004
Digital Thermometer	B16815	8/12/14	1000341967
Temperature Calibration Bath TC-218	A73332		

Certificate Information:

Technician: 68 Procedure: CAL-03 Cal Date: 10/23/13 **Cal Due: 10/23/15**

Test Conditions: 21.5°C 47.0 %RH 1020 mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C		N.A.		0.000	0.0	Y	-1.0	1.0	0.100	>4:1
°C		N.A.		100.000	99.7	Y	99.0	101.0	0.059	>4:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez, Quality Manager

Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Lollipop Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Lollipop Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2006-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

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Calibration
Certificate No. 1750.01

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 4371-5461451

Traceable® Certificate of Calibration for Lollipop Thermometer

Manufactured for and distributed by: Thomas Scientific, Box 99, 99 High Hill Road, Swedeboro, NJ 08085-0099 U.S.A.

Instrument Identification:

Model: 1235D23 S/N: 130638286 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
PRT Temperature Probe	02022	8/14/15	B3812004
Digital Thermometer	B16815	8/12/14	1000341967
Temperature Calibration Bath TC-218	A73332		
Temperature Calibration Bath TC-179	A45240		
Thermistor Module	A17118	2/13/14	1000332071
Temperature Probe	128	2/20/14	6-B48Z9-30-1

Certificate Information:

Technician: 68 Procedure: CAL-03 Cal Date: 10/23/13 **Cal Due: 10/23/15**

Test Conditions: 21.5°C 47.0 %RH 1020 mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C		N.A.		0.000	-0.2	Y	-1.0	1.0	0.100	>4:1
°C		N.A.		100.000	99.4	Y	99.0	101.0	0.059	>4:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

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Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
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International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

Traceable® is a registered trademark of Control Company

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METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES



1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in outlined boxes below, other columns are automatically calculated.

DATE: 9/18/2014 METER SERIAL #: 977111

METER PART #: 300.388 D CRITICAL ORIFICE SET SERIAL #: 1374

BAROMETRIC PRESSURE (in Hg):	INITIAL	FINAL	AVG (P_{bar})
	29.35	29.35	29.35

IF Y VARIATION EXCEEDS 2.00%, ORIFICE SHOULD BE RECALIBRATED

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) θ	DGM ΔH ($in\ H_2O$)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y VARIATION (%)	$\Delta H_@$
# 48	1	0.8138	13	589.0	595.270	6.270	71	73	73	73	73	73	6.00	3.35	6.1451	6.2209	1.0123		1.7180
SS	2	0.8138	13	595.270	601.550	6.280	71	74	74	74	74	74	6.00	3.35	6.1434	6.2209	1.0126		1.7148
	3	0.8138	13	601.550	612.0	10.450	71	74	75	74	75	74.5	10.00	3.35	10.2131	10.3682	1.0152		1.7132
																AVG =	1.0134	-0.82	
# 51	1	0.6704	15	616.40	624.20	7.80	71	75	75	75	75	75	9.00	2.3	7.5962	7.6871	1.0120		1.7271
SS	2	0.6704	15	624.20	632.050	7.850	71	75	75	75	75	75	9.00	2.3	7.6449	7.6871	1.0055		1.7271
	3	0.6704	15	632.050	639.810	7.760	71	74	74	74	74	74	9.00	2.3	7.5714	7.6871	1.0153		1.7303
																AVG =	1.0109	-1.06	
# 52	1	0.6069	15	640.80	647.830	7.030	70	70	71	70	71	70.5	9.00	2	6.8992	6.9656	1.0096		1.8432
SS	2	0.6069	15	647.830	655.670	7.840	70	71	72	71	72	71.5	10.00	2	7.6797	7.7395	1.0078		1.8397
	3	0.6069	15	655.670	663.480	7.810	70	72	72	72	72	72	10.00	2	7.6431	7.7395	1.0126		1.8380
																AVG =	1.010	-1.15	
# 54	1	0.4269	17	664.0	670.070	6.070	71	73	74	73	74	73.5	11.00	0.97	5.9084	5.9828	1.0126		1.7953
SS	2	0.4269	17	670.70	676.660	5.960	71	74	74	74	74	74	12.00	0.97	5.7959	6.5267	1.1261		1.7937
	3	0.4269	17	676.660	682.170	5.510	71	74	74	74	74	74	10.00	0.97	5.3583	5.4389	1.0151		1.7937
																AVG =	1.0513	2.88	
# 56	1	0.2882	19	686.0	691.920	5.920	71	74	74	74	74	74	16.00	0.46	5.7496	5.8749	1.0218		1.8640
SS	2	0.2882	19	691.920	698.20	6.280	71	74	74	74	74	74	17.00	0.46	6.0993	6.2421	1.0234		1.8640
	3	0.2882	19	698.20	704.470	6.270	71	74	74	74	74	74	17.00	0.46	6.0896	6.2421	1.0251		1.8640
																AVG =	1.0234	0.16	

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 1.0218

AVERAGE $\Delta H_@$ = 1.788

(1) $V_m\ (std) = K_1\ V_m \dfrac{P_{bar} + (\Delta H/13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)

T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr}\ (std) = K' \sqrt{\dfrac{P_{bar}\,\theta}{T_{amb}}}$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)

K' = Average K' factor from Critical Orifice Calibration

(3) $Y = \dfrac{V_{cr}\ (std)}{V_m\ (std)}$ = DGM calibration factor

$\Delta H_@ = \left(\dfrac{0.75\,\theta}{V_{cr}(std)}\right)^2 \Delta H \left(\dfrac{V_m(std)}{V_m}\right)$

Meterbox	300.388 D				
Temperature	Stack	Probe	Filter	Exit	Aux
0	1	1	1	1	1
50	49	49	49	49	49
75	74	74	74	74	74
100	99	99	99	99	99
200	200	200	200		200
500	499	499	499		499
1000	1003				
1500	1506				
1900	1908				

			TYPE "S" PITOT TUBE CALIBRATION FORM											
Date:	6.13.14		Specifications:											
Calibrator:	jj, KD		A.) Pitot tube assembly must be level.											
			B.) If pitot tube is damaged explain under comments section.											
			C.) Z = A Sin g (<0.125) and W = A Sin q (<0.03125)											
			D.) a <10° and b <5°											
Pitot Tubes Attached to Probes														
I.D. Length	**a1°**	**a2°**	**b1°**	**b2°**	**y°**	**q°**	**A, in.**	**Z, in.**	**W, in.**	**PA, in.**	**PB, in.**	**Dt, in.**	**Pass/Fail**	Cal. Date
200.021 2'	1.0	3.0	1.0	3.0	3.0	0.0	0.928	0.049	0.00000	0.464	0.464	0.382	Pass	6.13.14
200.063 2'	2.0	2.0	1.0	1.0	2.0	0.0	0.890	0.031	0.00000	0.445	0.445	0.383	Pass	6.13.14
200.064 2'	1.0	2.0	1.0	3.0	2.0	0.0	0.868	0.030	0.00000	0.434	0.434	0.383	Pass	6.13.14
200.300 3'	0.0	1.0	1.0	1.0	1.0	0.0	0.943	0.016	0.00000	0.472	0.472	0.394	Pass	6.13.14
200.301 3'	0.0	0.0	2.0	1.0	0.0	0.0	0.927	0.000	0.00000	0.464	0.464	0.386	Pass	6.13.14
200.302 3'	0.0	0.0	2.0	3.0	1.0	0.0	0.945	0.016	0.00000	0.473	0.473	0.383	Pass	6.13.14
200.303 3'	2.0	2.0	3.0	4.0	1.0	0.0	0.985	0.017	0.00000	0.493	0.493	0.374	Pass	6.13.14
200.706	0.0	1.0	1.0	0.0	1.0	0.0	0.998	0.017	0.00000	0.499	0.499	0.385	Pass	6.13.14
200.708	1.0	1.0	1.0	1.0	0.0	0.0	0.924	0.000	0.00000	0.462	0.462	0.389	Pass	6.13.14
200.711	1.0	0.0	1.0	0.0	0.0	0.0	0.931	0.000	0.00000	0.466	0.466	0.381	Pass	6.13.14
Comments: Pitot Tubes Required Only Minor Maintenance & Reconditioning														

			TYPE "S" PITOT TUBE CALIBRATION FORM											
Date:	1/4/14		Specifications:											
Calibrator:	JJ		A.) Pitot tube assembly must be level.											
			B.) If pitot tube is damaged explain under comments section.											
			C.) Z = A Sin g (<0.125) and W = A Sin q (<0.03125)											
			D.) a <10° and b <5°											
Pitot Tubes Attached to Probes														
I.D. Length	**a1°**	**a2°**	**b1°**	**b2°**	**y°**	**q°**	**A, in.**	**Z, in.**	**W, in.**	**PA, in.**	**PB, in.**	**Dt, in.**	**Pass/Fail**	Cal. Date
Individual Pitot Tubes														
I.D. Length	**a1°**	**a2°**	**b1°**	**b2°**	**y°**	**o°**	**A, in.**	**Z, in.**	**W, in.**	**PA, in.**	**PB, in.**	**Dt, in.**	**Pass/Fail**	
200.304 3'	1.0	1.0	0.0	0.0	0.0	0.0	0.950	0.000	0.00000	0.475	0.475	0.381	Pass	1/4/14
200.305 3'	0.0	0.0	1.0	2.0	1.0	0.0	0.947	0.017	0.00000	0.474	0.474	0.384	Pass	1/4/14
200.706 3'	0.0	0.0	1.0	0.0	1.0	0.0	0.844	0.015	0.00000	0.422	0.422	0.383	Pass	1/4/14
200.708 3'	0.0	0.0	0.0	0.0	2.0	0.0	0.840	0.029	0.00000	0.420	0.420	0.385	Pass	1/4/14
200.701 5'	1.0	1.0	0.0	0.0	0.0	1.0	0.900	0.000	0.01571	0.450	0.450	0.385	Pass	1/4/14
200.711 5'	1.0	0.0	0.0	1.0	1.0	0.0	0.913	0.016	0.00000	0.457	0.457	0.381	Pass	1/4/14
200.704 7'	0.0	0.0	0.0	1.0	1.0	0.0	0.831	0.015	0.00000	0.416	0.416	0.386	Pass	1/4/14
CLT-T-7-1/ p-825	1.0	1.0	1.0	1.0	1.0	0.0	0.953	0.017	0.00000	0.477	0.477	0.395	Pass	1/4/14
200.796 (s/n/p)	1.0	0.0	0.0	0.0	0.0	1.0	0.914	0.000	0.01595	0.457	0.457	0.393	Pass	1/4/14
200.255i 7'	0.0	0.0	1.0	1.0	2.0	0.0	0.850	0.030	0.00000	0.425	0.425	0.382	Pass	1/4/14
200.712 8'	0.0	1.0	0.0	0.0	1.0	0.0	0.931	0.016	0.00000	0.466	0.466	0.390	Pass	1/4/14
CLT.T.10.1	1.0	0.0	0.0	0.0	0.0	0.0	0.945	0.000	0.00000	0.473	0.473	0.382	Pass	1/4/14
CLT.T.10.2	1.0	0.0	0.0	0.0	1.0	1.0	0.919	0.016	0.01604	0.460	0.460	0.391	Pass	1/4/14
200.707	1.0	1.0	0.0	0.0	0.0	2.0	0.833	0.000	0.02907	0.417	0.417	0.382	Pass	1/4/14
Comments: Pitot Tubes Required Only Minor Maintenance & Reconditioning														
pitot ends														
1	1	0	0	0	0	0	0.938	0.000	0.00000	0.469	0.469	0.388		12/27/13

			TYPE "S" PITOT TUBE CALIBRATION FORM											
Date:	I/4/14		Specifications:											
Calibrator:	JJ		A.) Pitot tube assembly must be level.											
			B.) If pitot tube is damaged explain under comments section.											
			C.) Z = A Sin g (<0.125) and W = A Sin q (<0.03125)											
			D.) a <10° and b <5°											
Pitot Tubes Attached to Probes														
I.D. Length	**a1°**	**a2°**	**b1°**	**b2°**	**y°**	**q°**	**A, in.**	**Z, in.**	**W, in.**	**PA, in.**	**PB, in.**	**Dt, in.**	**Pass/Fail**	Cal. Date
200.051 11'	0.0	2.0	1.0	1.0	0.0	1.3	0.981	0.000	0.02226	0.491	0.491	0.386	Pass	1/4/14
200.052 11'	0.0	1.0	2.0	1.0	1.0	1.1	0.925	0.016	0.01776	0.463	0.463	0.383	Pass	1/4/14
200.053 11'	0.0	3.0	0.0	1.1	0.0	0.7	0.962	0.000	0.01175	0.481	0.481	0.379	Pass	1/4/14
200.098 14'	0.0	1.0	2.0	0.0	2.0	1.0	0.942	0.033	0.01644	0.471	0.471	0.394	Pass	1/4/14
200.099 14'	1.0	2.0	1.0	0.0	0.0	1.0	0.929	0.000	0.01621	0.465	0.465	0.407	Pass	1/4/14
200.111 15'	2.0	2.0	1.0	1.0	0.0	1.0	0.930	0.000	0.01623	0.465	0.465	0.381	Pass	1/4/14
200.110 15'	0.0	2.0	2.0	1.0	1.0	1.0	0.929	0.016	0.01621	0.465	0.465	0.378	Pass	1/4/14
200.091 16'	0.0	2.0	0.0	0.0	0.0	1.0	0.981	0.000	0.01712	0.491	0.491	0.389	Pass	1/4/14
Comments: Pitot Tubes Required Only Minor Maintenance & Reconditioning														

			TYPE "S" PITOT TUBE CALIBRATION FORM											
Date:	1/4/14		Specifications:											
Calibrator:	JJ		A.) Pitot tube assembly must be level.											
			B.) If pitot tube is damaged explain under comments section.											
			C.) Z = A Sin g (<0.125) and W = A Sin q (<0.03125)											
			D.) a <10° and b <5°											
Pitot Tubes Attached to Probes														
I.D. Length	**a1°**	**a2°**	**b1°**	**b2°**	**y°**	**q°**	**A, in.**	**Z, in.**	**W, in.**	**PA, in.**	**PB, in.**	**Dt, in.**	**Pass/Fail**	Cal. Date
200.021 2'	0.0	0.0	0.0	0.0	1.0	0.0	0.907	0.016	0.00000	0.454	0.454	0.380	Pass	1/4/14
200.063 2'	0.0	0.0	0.0	0.0	1.0	0.0	0.869	0.015	0.00000	0.435	0.435	0.380	Pass	1/4/14
200.064 2'	0.0	0.0	0.0	0.0	0.0	0.0	0.953	0.000	0.00000	0.477	0.477	0.379	Pass	1/4/14
200.005 3'	0.0	2.0	1.0	1.0	0.0	0.0	0.934	0.000	0.00000	0.467	0.467	0.382	Pass	1/4/14
200.015 3'	0.0	1.0	0.0	0.0	0.0	0.0	0.932	0.000	0.00000	0.466	0.466	0.393	Pass	1/4/14
200.016 3'	0.0	0.0	0.0	1.0	0.0	0.0	0.936	0.000	0.00000	0.468	0.468	0.372	Pass	1/4/14
200.017 3'	0.0	0.0	0.0	0.0	0.0	0.0	0.935	0.000	0.00000	0.468	0.468	0.385	Pass	1/4/14
200.076 3'	1.0	0.0	0.0	2.0	2.0	0.0	0.930	0.032	0.00000	0.465	0.465	0.396	Pass	1/4/14
200.077 3'	0.0	0.0	1.0	0.0	0.0	0.0	0.921	0.000	0.00000	0.461	0.461	0.378	Pass	1/4/14
200.079 3'	0.0	1.0	0.0	0.0	0.0	0.0	0.934	0.000	0.00000	0.467	0.467	0.384	Pass	1/4/14
200.080 3'	1.0	0.0	0.0	2.0	1.0	0.0	0.972	0.017	0.00000	0.486	0.486	0.377	Pass	1/4/14
200.300 3'	0.0	1.0	0.0	0.0	1.0	0.0	0.942	0.016	0.00000	0.471	0.471	0.379	Pass	1/4/14
200.301 3'	1.0	0.0	0.0	0.0	0.0	0.0	0.919	0.000	0.00000	0.460	0.460	0.384	Pass	1/4/14
200.302 3'	0.0	0.0	0.0	0.0	1.0	0.0	0.941	0.016	0.00000	0.471	0.471	0.377	Pass	1/4/14
200.303 3'	0.0	0.0	2.0	0.0	0.0	0.0	0.980	0.000	0.00000	0.490	0.490	0.380	Pass	1/4/14
200.008 5'	0.0	0.0	0.0	0.0	0.0	0.0	0.980	0.000	0.00000	0.490	0.490	0.375	Pass	1/4/14
200.105 5'	0.0	1.0	0.0	0.0	1.0	0.0	0.921	0.016	0.00000	0.461	0.461	0.383	Pass	1/4/14
200.118 5'	1.0	0.0	0.0	0.0	0.0	0.0	0.966	0.000	0.00000	0.483	0.483	0.383	Pass	1/4/14
200.119 5'	0.0	0.0	0.0	4.0	0.0	0.0	1.022	0.000	0.00000	0.511	0.511	0.377	Pass	1/4/14
200.120 5'	0.0	0.0	0.0	0.0	0.0	0.0	0.929	0.000	0.00000	0.465	0.465	0.390	Pass	1/4/14
200.121 5'	1.0	0.0	0.0	1.0	0.0	0.0	0.929	0.000	0.00000	0.465	0.465	0.376	Pass	1/4/14
200.093 7'	0.0	0.0	0.0	0.0	1.0	0.0	0.928	0.016	0.00000	0.464	0.464	0.390	Pass	1/4/14
200.094 7'	0.0	3.0	0.0	0.0	0.0	0.0	0.934	0.000	0.00000	0.467	0.467	0.382	Pass	1/4/14
200.112 7'	0.0	0.0	1.0	0.0	0.0	0.0	0.939	0.000	0.00000	0.470	0.470	0.388	Pass	1/4/14
200.310 7'	0.0	0.0	0.0	0.0	1.0	0.0	1.013	0.018	0.00000	0.507	0.507	0.380	Pass	1/4/14
200.041 8'	0.0	0.0	0.0	1.0	1.0	0.0	0.887	0.015	0.00000	0.444	0.444	0.386	Pass	1/4/14
200.045 8'	0.0	0.0	2.0	2.0	0.0	0.0	0.999	0.000	0.00000	0.500	0.500	0.375	Pass	1/4/14
200.108 8'	0.0	0.0	0.0	0.0	0.0	0.0	0.922	0.000	0.00000	0.461	0.461	0.382	Pass	1/4/14
200.109 8'	0.0	0.0	2.0	0.0	0.0	0.0	1.012	0.000	0.00000	0.506	0.506	0.374	Pass	1/4/14
200.705 8'	1.0	0.0	0.0	0.0	0.0	0.0	0.872	0.000	0.00000	0.436	0.436	0.384	Pass	1/4/14
200.709 8'	0.0	1.0	0.0	2.0	1.0	0.0	0.966	0.017	0.00000	0.483	0.483	0.378	Pass	1/4/14
200.013 10'	1.0	1.0	1.1	0.0	0.6	0.5	0.967	0.010	0.00844	0.484	0.484	0.380	Pass	1/4/14
200.014 10'	1.0	1.0	1.1	0.0	0.6	0.5	0.967	0.010	0.00844	0.484	0.484	0.380	Pass	1/4/14
200.050 11'	0.0	1.0	2.0	1.0	0.0	0.0	0.966	0.000	0.00000	0.483	0.483	0.373	Pass	1/4/14

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Date:	6.13.14
Barometric Pressure, In. Hg:	

Reference Thermometer:	130638163
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	130638163
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	130638163
Tegam NIST Calibrator Serial No.:	100.122

Asset Number		Cal. By	Temp. One	Reference Temp. One	Percent Difference	Passed	Temp. Two	Reference Temp. Two	Percent Difference	Passed	Temp. Three	Reference Temp. Three	Percent Difference	Passed
PROBES														
200.021	2	jj	77.0	78.0	0.2%	Yes	120.0	122.0	0.3%	Yes				
200.063	2	jj	77.0	78.0	0.2%	Yes	121.0	122.0	0.2%	Yes				
200.064	2	jj	75.0	78.0	0.6%	Yes	119.0	122.0	0.5%	Yes				
200.076	3	jj	77.0	78.0	0.2%	Yes	121.0	122.0	0.2%	Yes				
200.077	3	jj	76.0	78.0	0.4%	Yes	120.0	122.0	0.3%	Yes				
200.079	3	jj	77.0	78.0	0.2%	Yes	120.0	122.0	0.3%	Yes				
200.080	3	jj	78.0	78.0	0.0%	Yes	119.0	122.0	0.5%	Yes				
200.300	3	jj	78.0	78.0	0.0%	Yes	122.0	122.0	0.0%	Yes				
200.301	3	jj	76.0	78.0	0.4%	Yes	119.0	122.0	0.5%	Yes				
200.302	3	jj	77.0	78.0	0.2%	Yes	118.0	122.0	0.7%	Yes				
200.303	3	jj	75.0	78.0	0.6%	Yes	120.0	122.0	0.3%	Yes				
200.119	5	jj	64.9	78.0	2.4%	No	120.0	122.0	0.3%	Yes				
200.120	5	jj	65.0	78.0	2.4%	No	121.0	122.0	0.2%	Yes				
200.121	5	jj	65.0	78.0	2.4%	No	121.0	122.0	0.2%	Yes				

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Date:	6.13.14
Barometric Pressure, In. Hg:	

Reference Thermometer:	130638163
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	130638163
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	130638163
Tegam NIST Calibrator Serial No.:	100.122

Asset Number	Cal. By	Temp. One	Reference Temp. One	Percent Difference	Passed	Temp. Two	Reference Temp. Two	Percent Difference	Passed	Temp. Three	Reference Temp. Three	Percent Difference	Passed
200.706	KD	65.2	65.0	0.0%	Yes	122.0	122.0	0.0%	Yes				
200.708	KD	65.2	65.0	0.0%	Yes	122.0	122.0	0.0%	Yes				
200.711	jj	65.2	65.0	0.0%	Yes	124.0	122.0	-0.3%	Yes				
200.704	jj	64.0	65.0	0.2%	Yes	122.0	122.0	0.0%	Yes				

Ref. Temp. Deg. F + 460

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Date:	01/04/14
Barometric Pressure, In. Hg:	29.44

Reference Thermometer:	3075
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	3075
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	3075
Tegam NIST Calibrator Serial No.:	100.122

Asset Number		Cal. By	Temp. One	Reference Temp. One	Percent Difference	Passed	Temp. Two	Reference Temp. Two	Percent Difference	Passed	Temp. Three	Reference Temp. Three	Percent Difference	Passed
PROBES														
200.021	2	JJ	67.0	66.0	-0.2%	Yes	220.0	221.0	0.1%	Yes	450.0	445.0	-0.6%	Yes
200.063	2	JJ	65.0	66.0	0.2%	Yes	219.0	214.0	-0.7%	Yes	442.0	443.0	0.1%	Yes
200.064	2	JJ	65.0	66.0	0.2%	Yes	211.0	216.0	0.7%	Yes	434.0	442.0	0.9%	Yes
200.005	3	JJ	66.0	66.0	0.0%	Yes	225.0	228.0	0.4%	Yes	445.0	445.0	0.0%	Yes
200.015	3	JJ	64.0	66.0	0.4%	Yes	227.0	229.0	0.3%	Yes	444.0	448.0	0.4%	Yes
200.016	3	JJ	64.0	66.0	0.4%	Yes	234.0	231.0	-0.4%	Yes	442.0	444.0	0.2%	Yes
200.017	3	JJ	66.0	66.0	0.0%	Yes	217.0	223.0	0.9%	Yes	440.0	443.0	0.3%	Yes
200.076	3	JJ	65.0	66.0	0.2%	Yes	219.0	223.0	0.6%	Yes	450.0	443.0	-0.8%	Yes
200.077	3	JJ	64.0	66.0	0.4%	Yes	227.0	231.0	0.6%	Yes	438.0	445.0	0.8%	Yes
200.079	3	JJ	65.0	66.0	0.2%	Yes	216.0	219.0	0.4%	Yes	454.0	443.0	-1.2%	Yes
200.080	3	JJ	65.0	66.0	0.2%	Yes	215.0	221.0	0.9%	Yes	440.0	441.0	0.1%	Yes
200.300	3	JJ	67.0	66.0	-0.2%	Yes	211.0	218.0	1.0%	Yes	433.0	434.0	0.1%	Yes
200.301	3	JJ	66.0	66.0	0.0%	Yes	226.0	230.0	0.6%	Yes	435.0	437.0	0.2%	Yes
200.302	3	JJ	67.0	66.0	-0.2%	Yes	234.0	240.0	0.9%	Yes	428.0	432.0	0.4%	Yes
200.303	3	JJ	65.0	66.0	0.2%	Yes	218.0	221.0	0.4%	Yes	432.0	435.0	0.3%	Yes
200.008	5	JJ	64.0	66.0	0.4%	Yes	234.0	231.0	-0.4%	Yes	440.0	439.0	-0.1%	Yes
200.105	5	JJ	65.0	66.0	0.2%	Yes	225.0	226.0	0.1%	Yes	435.0	439.0	0.4%	Yes
200.118	5	JJ	65.0	66.0	0.2%	Yes	220.0	218.0	-0.3%	Yes	436.0	434.0	-0.2%	Yes
200.119	5	JJ	66.0	66.0	0.0%	Yes	219.0	221.0	0.3%	Yes	437.0	433.0	-0.4%	Yes
200.120	5	JJ	66.0	66.0	0.0%	Yes	231.0	231.0	0.0%	Yes	432.0	440.0	0.9%	Yes
200.121	5	JJ	65.0	66.0	0.2%	Yes	225.0	227.0	0.3%	Yes	428.0	432.0	0.4%	Yes
200.093 7'		JJ	65.0	65.0	0.0%	Yes	216.0	217.0	0.1%	Yes	428.0	429.0	0.1%	Yes
200.094 7'		JJ	65.0	65.0	0.0%	Yes	217.0	219.0	0.3%	Yes	432.0	432.0	0.0%	Yes
200.310 7'		JJ	64.0	65.0	0.2%	Yes	219.0	221.0	0.3%	Yes	428.0	424.0	-0.5%	Yes
200.112 7'		JJ	66.0	65.0	-0.2%	Yes	226.0	227.0	0.1%	Yes	427.0	432.0	0.6%	Yes
200.709 8'		JJ	66.0	65.0	-0.2%	Yes	231.0	234.0	0.4%	Yes	442.0	441.0	-0.1%	Yes
200.705 8'		JJ	65.0	65.0	0.0%	Yes	227.0	229.0	0.3%	Yes	435.0	434.0	-0.1%	Yes
200.041 8'		JJ	65.0	65.0	0.0%	Yes	219.0	221.0	0.3%	Yes	436.0	441.0	0.6%	Yes
200.108 8'		JJ	66.0	65.0	-0.2%	Yes	216.0	218.0	0.3%	Yes	427.0	434.0	0.8%	Yes
200.109 8'		JJ	65.0	65.0	0.0%	Yes	230.0	231.0	0.1%	Yes	442.0	434.0	-0.9%	Yes
200.045 8'		JJ	65.0	65.0	0.0%	Yes	224.0	228.0	0.6%	Yes	433.0	435.0	0.2%	Yes
200.050 11'		JJ	65.0	67.0	0.4%	Yes	242.0	245.0	0.4%	Yes	421.0	429.0	0.9%	Yes
200.051 11'		JJ	66.0	67.0	0.2%	Yes	257.0	250.0	-1.0%	Yes	431.0	431.0	0.0%	Yes
200.052 11'		JJ	66.0	67.0	0.2%	Yes	248.0	249.0	0.1%	Yes	437.0	445.0	0.9%	Yes
200.053 11'		JJ	65.0	67.0	0.4%	Yes	245.0	248.0	0.4%	Yes	444.0	451.0	0.8%	Yes
200.098 14'		JJ	66.0	67.0	0.2%	Yes	246.0	245.0	-0.1%	Yes	431.0	439.0	0.9%	Yes
200.099 14'		JJ	67.0	66.0	-0.2%	Yes	247.0	249.0	0.3%	Yes	430.0	436.0	0.7%	Yes
200.111 15'		JJ	66.0	67.0	0.2%	Yes	251.0	250.0	-0.1%	Yes	442.0	435.0	-0.8%	Yes
200.110 15'		JJ	66.0	67.0	0.2%	Yes	250.0	251.0	0.1%	Yes	439.0	442.0	0.3%	Yes
200.091 16'		JJ	67.0	67.0	0.0%	Yes	249.0	255.0	0.8%	Yes	436.0	427.0	-1.0%	Yes

☑ Black &

Date:	01/04/14
Barometric Pressure, In. Hg:	29.44

Reference Thermometer:	3075
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	3075
Tegam NIST Calibrator Serial No.:	100.122

Reference Thermometer:	3075
Tegam NIST Calibrator Serial No.:	100.122

Asset Number	Cal. By	Temp. One	Reference Temp. One	Percent Difference	Passed	Temp. Two	Reference Temp. Two	Percent Difference	Passed	Temp. Three	Reference Temp. Three	Percent Difference	Passed
pitots													
200.304	JJ	67.0	66.0	-0.2%	Yes	237.0	242.0	0.7%	Yes	339.0	350.0	1.4%	Yes
200.305	JJ	67.0	66.0	-0.2%	Yes	241.0	242.0	0.1%	Yes	347.0	350.0	0.4%	Yes
200.706	JJ	67.0	66.0	-0.2%	Yes	254.0	256.0	0.3%	Yes	345.0	350.0	0.6%	Yes
200.708	JJ	67.0	66.0	-0.2%	Yes	265.0	267.0	0.3%	Yes	349.0	350.0	0.1%	Yes
200.701	jj	67.0	66.0	-0.2%	Yes	259.0	265.0	0.8%	Yes	350.0	355.0	0.6%	Yes
200.711	JJ	67.0	66.0	-0.2%	Yes	257.0	260.0	0.4%	Yes	345.0	350.0	0.6%	Yes
200.704	JJ	67.0	66.0	-0.2%	Yes	270.0	265.0	-0.7%	Yes	353.0	347.0	-0.7%	Yes
CLT.T.7.1	jj	67.0	67.0	0.0%	Yes	271.0	270.0	-0.1%	Yes	349.0	347.0	-0.2%	Yes
200.769 s/np	JJ	66.0	66.0	0.0%	Yes	267.0	270.0	0.4%	Yes	341.0	347.0	0.7%	Yes
200.255i	JJ	66.0	66.0	0.0%	Yes	255.0	261.0	0.8%	Yes	343.0	347.0	0.5%	Yes
200.712	JJ	66.0	66.0	0.0%	Yes	251.0	254.0	0.4%	Yes	345.0	347.0	0.2%	Yes
CLT.T.10.1	jj	66.0	67.0	0.2%	Yes	259.0	260.0	0.1%	Yes	349.0	355.0	0.7%	Yes
CLT.T.10.2	jj	66.0	67.0	0.2%	Yes	255.0	260.0	0.7%	Yes	350.0	355.0	0.6%	Yes
200.707	JJ	65.0	66.0	0.2%	Yes	263.0	266.0	0.4%	Yes	348.0	347.0	-0.1%	Yes

Ref. Temp. Deg. F + 460

Umbilical Adaptors Temperature Calibration

☑ Black &

Calibrated By: KD	Date: 6.13.14	Reference Thermometer: 130638163	Tegam NIST Calibrator Serial No.: 100.122	Barometric Pressure,In. Hg: #

Asset Number	Id Letter	Ambient	Reference Ambient	Percent Difference	Passed	Ice Bath	Reference Ice Bath	Percent Difference	Passed	Heat Bath	Reference Heat Bath	Percent Difference	Passed
300.030	A	73	74	0.2%	Yes	35	36	0.2%	Yes	120	120	0.0%	Yes
300.318	B	73	74	0.2%	Yes	35	36	0.2%	Yes	119	120	0.2%	Yes
300.355	C	73	74	0.2%	Yes	36	36	0.0%	Yes	119	120	0.2%	Yes
300.032	D	73	74	0.2%	Yes	35	36	0.2%	Yes	119	120	0.2%	Yes
300.043	E	73	74	0.2%	Yes	35	36	0.2%	Yes	121	120	-0.2%	Yes
300.319	F	73	74	0.2%	Yes	36	36	0.0%	Yes	120	120	0.0%	Yes
300.317	G	74	74	0.0%	Yes	35	36	0.2%	Yes	119	120	0.2%	Yes
300.042	H	74	74	0.0%	Yes	36	36	0.0%	Yes	119	120	0.2%	Yes
300.345	I	74	74	0.0%	Yes	36	36	0.0%	Yes	120	120	0.0%	Yes
300.044	J	73	74	0.2%	Yes	36	36	0.0%	Yes	119	120	0.2%	Yes
300.031	K	74	74	0.0%	Yes	36	36	0.0%	Yes	121	120	-0.2%	Yes
300.216	L	73	74	0.2%	Yes	36	36	0.0%	Yes	120	120	0.0%	Yes
300.320	M	73	74	0.2%	Yes	36	36	0.0%	Yes	119	120	0.2%	Yes
300.346	N	74	74	0.0%	Yes	36	36	0.0%	Yes	120	120	0.0%	Yes
300.295	O	74	74	0.0%	Yes	36	36	0.0%	Yes	120	120	0.0%	Yes

Temperature Difference Calculation:

$$\frac{\text{(Ref. Temp. Deg. F + 460) - (Test Temp. Deg. F + 460)}}{\text{Ref. Temp. Deg. F + 460}} \times 100 = <1.5\%$$

Hotbox Thermocouple Temperature Calibration

☑ Black &

Calibrated By: KD | Date: 6.13.14 | Reference Thermometer: NIST 130638163 | Tegam NIST Calibrator Serial No.: 100.122 | Barometric Pressure,In. Hg: # 29.12

#

Asset Number	Id Letter	Ambient	Reference Ambient	Percent Difference	Passed	MID. Temp.	Reference Temp.	Percent Difference	Passed	HIGH Temp.	Reference Temp.	Percent Difference	Passed
Hotbox	B												
Hotbox	C CLT.H.3	61.1	63	0.4%	Yes	198	200	0.3%	Yes				
Hotbox	J CLT.H.1	61	63	0.4%	Yes	195	200	0.8%	Yes				
Hotbox	L CLT.H.2	61.4	63	0.3%	Yes	201	200	-0.2%	Yes				
Hotbox	M CLT.H.4	61.1	63	0.4%	Yes	197	200	0.5%	Yes				

Temperature Difference Calculation:

$$\frac{\text{(Ref. Temp. Deg. F + 460) - (Test Temp. Deg. F + 460)}}{\text{Ref. Temp. Deg. F + 460}} \times 100 = <1.5\%$$

Hotbox Thermocouple Temperature Calibration

☑ Black &

Calibrated By:	JJ	Date:	1/4/2014	Reference Thermometer:	NIST	Tegam NIST Calibrator Serial No.:	Barometric Pressure,In. Hg: #	29.47

Asset Number	Id Letter	Ambient	Reference Ambient	Percent Difference	Passed	MID. Temp.	Reference Temp.	Percent Difference	Passed	HIGH Temp.	Reference Temp.	Percent Difference	Passed
Hotbox	B	62	63	0.2%	Yes								
Hotbox	C CLT.H.3	62	63	0.2%	Yes								
Hotbox	D CLT.H.6	62	63	0.2%	Yes								
Hotbox	E CLT.H.5	62	63	0.2%	Yes								
Hotbox	F	62	63	0.2%	Yes								
Hotbox	G CLT.H.7	62	61	-0.2%	Yes								
Hotbox	I	62	63	0.2%	Yes								
Hotbox	J CLT.H.1	62	63	0.2%	Yes								
Hotbox	L CLT.H.2	62	63	0.2%	Yes								
Hotbox	M CLT.H.4	62	63	0.2%	Yes								
Hotbox	N	62	63	0.2%	Yes								
Hotbox	Q1 CLT.H.8	62	62	0.0%	Yes								
Hotbox	Q2 CLT.H.9	62	62	0.0%	Yes								
Hotbox	K	decom.											
Hotbox	B2	decom.											
	P	decom.											
	H	decom.											
	A	decom.											

Temperature Difference Calculation:

$$\frac{(\text{Ref. Temp. Deg. F} + 460) - (\text{Test Temp. Deg. F} + 460)}{\text{Ref. Temp. Deg. F} + 460} \times 100 = <1.5\%$$

Precision Weighing

1949 Evans Road
Cary, North Carolina 27513
Phone: (919) 678-0077 * Fax: (919) 678-0075
Email: pweighing@aol.com

Weight Set Verification Certificate

Client: Civil

Contact:

Department: Lab

Description: Stainless Steel

Weight ID#: 22934

Verification Data

Serial Number	Nominal Value	Reading on Balance
22934	200 grams	200.000
22934	300 grams	299.999
22934	500 grams	500.000

Verification Date:	28-Jan-14	Verification Due Date:	January 2015

Calibration SOP: Metrology 2190

TEST STANDARD(S) INFORMATION:

Standard(s) Used	ID	Expiration Date
P 926	2092269	January 2015
LC 1200 S	30101459	January 2015

Comments:
Readings of weight(s) taken on balance(s) listed after balance(s) calibrated with NIST traceable weight set(s) noted.

Technician: Stanley R. Hall

Customer:

Precision Weighing

1949 Evans Road
Cary, North Carolina 27513
Phone: (919) 678-0077 * Fax: (919) 678-0075
Email: pweighing@aol.com

Weight Set Verification Certificate

Client:	Contact:	Department:
Civil		Lab

Description:	Weight ID#:
Stainless Steel	35766

Verification Data

Serial Number	Nominal Value	Reading on Balance
35766	200 grams	199.999
35766	300 grams	300.000
35766	500 grams	499.998

Verification Date:	28-Jan-14	Verification Due Date:	January 2015

Calibration SOP: **Metrology 2190**

TEST STANDARD(S) INFORMATION:

Standard(s) Used	ID	Expiration Date
P 926	2092269	Janunary 2015
LC 1200 S	30101459	January 2015

Comments:

Readings of weight(s) taken on balance(s) listed after balance(s) calibrated with NIST traceable weight set(s) noted.

Technician: Stanley R. Hall

Customer:

Global Calibration Gases
Palmetto, FL

GLOBAL CALIBRATION GASES LLC

Accreditation No. 69191

PGVP Vendor ID.. N12012

EPA Protocol Gas Mixture

Customer:	Roberts Oxygen	Reference#.	062413SY
CGA:	590	Certification Date:	7/09/2013
Customer PO#:	431412	Expiration Date:	7/09/2021
Cylinder #:	EB0049430	Pressure, psig:	2000

Method: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, Procedure G1 (September 1997).

Analyzed Cylinder-

Components	Certified Concentration	Total Uncertainty
Carbon Dioxide	9.99%	0.2%
Oxygen	12.47%	0.3%
Nitrogen	Balance	-

Reference Standard-

Type/SRM Sample	Cylinder #	Concentration
Carbon Dioxide/GMIS	EB0039749	17.95%
Oxygen/GMIS	EB0000798	9.98%

Instrument-

Instrument/ Model	Serial Number	Last Date Calibrated	Analytical Method
Micro GC/MTI M200	170612	7/9/2013	TCD

These mixtures were prepared gravimetrically using a high load high sensitivity electronic scale. Prior to filling the scale is verified for accuracy throughout the target mass range against applicable NIST traceable weights.

We certify that the weights are calibrated to ASTM E617-97 Class 1 tolerances. This calibration is referenced by serial # 7210-1, Certificate # 511635 and NIST Inst # 822/272103-06.

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, Global Calibration Gases LLC shall have no liability in excess of the established charge for this service. Assayed at Global Calibration Gases LLC, Sarasota, Florida.

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025-2005.

*Do not use this standard when cylinder pressure is below 150 psig.

Produced by:

GLOBAL CALIBRATION GASES LLC

Global Calibration Gases LLC.
1090 Commerce Blvd N.
Sarasota, Florida 34243 USA
Accreditation No.: 69191
PGVP Vendor ID.: N12012

Principal Analyst: _____ **Date:** 7/9/2013

Principal Reviewer: _____ **Date:** 7/9/2013

SPECIALTY GASES OF AMERICA, INC.
AMERICAN INDUSTRIAL GASES, INC.
AMERICAN RARE GASES, INC.

6055 BRENT DR. TOLEDO, OH 43611
419-729-7732 FAX 419-729-2411

THE AMERICAN GAS GROUP

www.americangasgroup.com

ANALYTICAL REPORT

Certificate ID: 060812014 **Date:** 6/8/2012

Customer Name: Roberts Oxygen, Gaithersburg

Customer Address: 17011 Railroad Street

Gaithersburg MD 20877

Purchase Order: 395883 **Work Order:** 422370-03

Lot Number: 0529HE12 **Product Name:** 3-Component Mixture, EPA Protocol

Size: A31 **Pressure:** 2120 psig @ 78 Deg F

Content: Ven ID# C12012

Serial #: EB0020402

Analysis Date: 6/5/2012

Shelf Life: 36 months **Expiration Date:** 6/5/2015

Component	Nominal	Actual	Accuracy	Method
Oxygen	21.0%	21.1%	+/- 1% rel	Paramagnetic
Carbon Dioxide	18.0%	17.9%	+/- 1% rel	FTIR
Nitrogen	Balance	Balance		

REFERENCE STANDARD	Std Type	Std #	Cyl #	Concentration	Exp Date
	GMIS	0318XA11	EB0028214	20.9700	3/18/2013
	GMIS	0625HE10	EB0023062	19.8500	6/28/2012

INSTRUMENTATION	Instrument / ID	Component
	Servomex 5200	O2
	MKS 2031	CO2

Note: * ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS - SEPTEMBER 1997:G1
* DO NOT USE STANDARD WHEN PRESSURE IS BELOW 150 PSIG

Protocal
Specialty Gases of America, Inc

Issued by: Josh Jones

APPENDIX E

PROCESS OXYGEN DATA

	13.87	% O2 Run 1 average						
14-0361 LCD CfPT CEMS %O2	Run 1		14-0361 LCD CfPT CEMS %O2	Run 1		14-0361 LCD CfPT CEMS %O2	Run 1	
Date & Time	%O2	Comment	Date & Time	%O2	Comment	Date & Time	%O2	Comment
30-Sep-14 09:12	13.94	Start Port 1 sampling	30-Sep-14 10:15	13.80		30-Sep-14 11:18	13.77	
30-Sep-14 09:13	13.94		30-Sep-14 10:16	13.78		30-Sep-14 11:19	13.72	
30-Sep-14 09:14	13.93		30-Sep-14 10:17	13.78		30-Sep-14 11:20	13.73	
30-Sep-14 09:15	13.93		30-Sep-14 10:18	13.90		30-Sep-14 11:21	13.74	
30-Sep-14 09:16	13.93		30-Sep-14 10:19	13.92		30-Sep-14 11:22	13.75	
30-Sep-14 09:17	13.92		30-Sep-14 10:20	13.92		30-Sep-14 11:23	13.77	
30-Sep-14 09:18	13.94		30-Sep-14 10:21	13.92		30-Sep-14 11:24	13.78	
30-Sep-14 09:19	13.97		30-Sep-14 10:22	13.92		30-Sep-14 11:25	13.79	
30-Sep-14 09:20	14.01		30-Sep-14 10:23	13.84		30-Sep-14 11:26	13.80	
30-Sep-14 09:21	14.00		30-Sep-14 10:24	13.80		30-Sep-14 11:27	13.82	
30-Sep-14 09:22	13.90		30-Sep-14 10:25	13.96		30-Sep-14 11:28	13.83	
30-Sep-14 09:23	13.90		30-Sep-14 10:26	13.91		30-Sep-14 11:29	13.84	
30-Sep-14 09:24	13.91		30-Sep-14 10:27	13.78		30-Sep-14 11:30	13.88	
30-Sep-14 09:25	13.89		30-Sep-14 10:28	13.77		30-Sep-14 11:31	13.92	
30-Sep-14 09:26	13.89		30-Sep-14 10:29	13.92		30-Sep-14 11:32	13.95	
30-Sep-14 09:27	13.90		30-Sep-14 10:30	14.06		30-Sep-14 11:33	13.93	
30-Sep-14 09:28	13.91		30-Sep-14 10:31	13.52		30-Sep-14 11:34	13.81	
30-Sep-14 09:29	13.92		30-Sep-14 10:32	13.48		30-Sep-14 11:35	13.75	
30-Sep-14 09:30	13.93		30-Sep-14 10:33	13.89		30-Sep-14 11:36	13.84	
30-Sep-14 09:31	13.93		30-Sep-14 10:34	13.89		30-Sep-14 11:37	14.00	
30-Sep-14 09:32	13.92		30-Sep-14 10:35	13.75		30-Sep-14 11:38	13.97	
30-Sep-14 09:33	13.92		30-Sep-14 10:36	13.83		30-Sep-14 11:39	13.94	
30-Sep-14 09:34	13.91		30-Sep-14 10:37	13.91		30-Sep-14 11:40	13.92	
30-Sep-14 09:35	13.91		30-Sep-14 10:38	13.98		30-Sep-14 11:41	13.89	
30-Sep-14 09:36	13.90		30-Sep-14 10:39	13.73		30-Sep-14 11:42	13.86	
30-Sep-14 09:37	13.90		30-Sep-14 10:40	13.76		30-Sep-14 11:43	13.84	
30-Sep-14 09:38	13.89		30-Sep-14 10:41	13.91	End Port 1 sampling	30-Sep-14 11:44	13.84	
30-Sep-14 09:39	13.95		30-Sep-14 10:42	13.91		30-Sep-14 11:45	13.84	
30-Sep-14 09:40	14.02		30-Sep-14 10:43	13.72		30-Sep-14 11:46	13.84	
30-Sep-14 09:41	14.00		30-Sep-14 10:44	13.76		30-Sep-14 11:47	13.85	
30-Sep-14 09:42	13.87		30-Sep-14 10:45	13.80		30-Sep-14 11:48	13.85	
30-Sep-14 09:43	13.92		30-Sep-14 10:46	13.84		30-Sep-14 11:49	13.85	
30-Sep-14 09:44	13.97		30-Sep-14 10:47	13.87		30-Sep-14 11:50	13.85	
30-Sep-14 09:45	14.01		30-Sep-14 10:48	13.88		30-Sep-14 11:51	13.85	
30-Sep-14 09:46	14.04		30-Sep-14 10:49	13.89		30-Sep-14 11:52	13.86	
30-Sep-14 09:47	13.75		30-Sep-14 10:50	13.89		30-Sep-14 11:53	13.86	
30-Sep-14 09:48	13.74		30-Sep-14 10:51	13.89	Start Port 2 sampling	30-Sep-14 11:54	13.86	
30-Sep-14 09:49	13.83		30-Sep-14 10:52	13.88		30-Sep-14 11:55	13.86	
30-Sep-14 09:50	13.87		30-Sep-14 10:53	13.88		30-Sep-14 11:56	13.87	
30-Sep-14 09:51	13.87		30-Sep-14 10:54	13.88		30-Sep-14 11:57	13.87	
30-Sep-14 09:52	13.87		30-Sep-14 10:55	13.88		30-Sep-14 11:58	13.87	
30-Sep-14 09:53	13.88		30-Sep-14 10:56	13.87		30-Sep-14 11:59	13.87	
30-Sep-14 09:54	13.88		30-Sep-14 10:57	13.87		30-Sep-14 12:00	13.87	
30-Sep-14 09:55	13.88		30-Sep-14 10:58	13.87		30-Sep-14 12:01	13.88	
30-Sep-14 09:56	13.88		30-Sep-14 10:59	13.87		30-Sep-14 12:02	13.88	
30-Sep-14 09:57	13.88		30-Sep-14 11:00	13.86		30-Sep-14 12:03	13.88	
30-Sep-14 09:58	13.89		30-Sep-14 11:01	13.86		30-Sep-14 12:04	13.88	
30-Sep-14 09:59	13.89		30-Sep-14 11:02	13.86		30-Sep-14 12:05	13.88	
30-Sep-14 10:00	13.89		30-Sep-14 11:03	13.86		30-Sep-14 12:06	13.89	
30-Sep-14 10:01	13.89		30-Sep-14 11:04	13.85		30-Sep-14 12:07	13.89	
30-Sep-14 10:02	13.90		30-Sep-14 11:05	13.85		30-Sep-14 12:08	13.89	
30-Sep-14 10:03	13.90		30-Sep-14 11:06	13.85		30-Sep-14 12:09	13.89	
30-Sep-14 10:04	13.90		30-Sep-14 11:07	13.85		30-Sep-14 12:10	13.87	
30-Sep-14 10:05	13.90		30-Sep-14 11:08	14.17		30-Sep-14 12:11	13.85	
30-Sep-14 10:06	13.90		30-Sep-14 11:09	14.07		30-Sep-14 12:12	13.77	
30-Sep-14 10:07	13.91		30-Sep-14 11:10	13.90		30-Sep-14 12:13	13.73	
30-Sep-14 10:08	13.90		30-Sep-14 11:11	13.93		30-Sep-14 12:14	13.73	
30-Sep-14 10:09	13.90		30-Sep-14 11:12	13.95		30-Sep-14 12:15	13.74	
30-Sep-14 10:10	13.89		30-Sep-14 11:13	13.98		30-Sep-14 12:16	13.74	
30-Sep-14 10:11	13.88		30-Sep-14 11:14	13.94		30-Sep-14 12:17	13.74	
30-Sep-14 10:12	13.88		30-Sep-14 11:15	13.74		30-Sep-14 12:18	13.74	
30-Sep-14 10:13	13.86		30-Sep-14 11:16	13.59		30-Sep-14 12:19	13.74	
30-Sep-14 10:14	13.83		30-Sep-14 11:17	13.81		30-Sep-14 12:20	13.74	End Port 2 Sampling

	13.77	% O2 Run 2 average

14-0361 LCD CfPT CEMS %O2	Run 2		14-0361 LCD CfPT CEMS %O2	Run 2		14-0361 LCD CfPT CEMS %O2	Run 2	
Date & Time	%O2	Comment	Date & Time	%O2	Comment	Date & Time	%O2	Comment
30-Sep-14 12:43	13.91	Start Port 1 sampling	30-Sep-14 13:46	13.77		30-Sep-14 14:49	13.76	
30-Sep-14 12:44	13.98		30-Sep-14 13:47	13.77		30-Sep-14 14:50	13.75	
30-Sep-14 12:45	14.07		30-Sep-14 13:48	13.77		30-Sep-14 14:51	13.75	
30-Sep-14 12:46	13.82		30-Sep-14 13:49	13.78		30-Sep-14 14:52	13.75	
30-Sep-14 12:47	13.58		30-Sep-14 13:50	13.78		30-Sep-14 14:53	13.75	
30-Sep-14 12:48	13.40		30-Sep-14 13:51	13.78		30-Sep-14 14:54	13.75	
30-Sep-14 12:49	13.55		30-Sep-14 13:52	13.78		30-Sep-14 14:55	13.75	
30-Sep-14 12:50	13.68		30-Sep-14 13:53	13.78		30-Sep-14 14:56	13.75	
30-Sep-14 12:51	13.77		30-Sep-14 13:54	13.78		30-Sep-14 14:57	13.75	
30-Sep-14 12:52	13.85		30-Sep-14 13:55	13.78		30-Sep-14 14:58	13.74	
30-Sep-14 12:53	13.88		30-Sep-14 13:56	13.78		30-Sep-14 14:59	13.74	
30-Sep-14 12:54	13.87		30-Sep-14 13:57	13.78		30-Sep-14 15:00	13.74	
30-Sep-14 12:55	13.86		30-Sep-14 13:58	13.79		30-Sep-14 15:01	13.74	
30-Sep-14 12:56	13.85		30-Sep-14 13:59	13.79		30-Sep-14 15:02	13.74	
30-Sep-14 12:57	13.84		30-Sep-14 14:00	13.79		30-Sep-14 15:03	13.73	
30-Sep-14 12:58	13.84		30-Sep-14 14:01	13.79		30-Sep-14 15:04	13.72	
30-Sep-14 12:59	13.83		30-Sep-14 14:02	13.80		30-Sep-14 15:05	13.71	
30-Sep-14 13:00	13.82		30-Sep-14 14:03	13.80		30-Sep-14 15:06	13.70	
30-Sep-14 13:01	13.81		30-Sep-14 14:04	13.80		30-Sep-14 15:07	13.69	
30-Sep-14 13:02	13.80		30-Sep-14 14:05	13.80		30-Sep-14 15:08	13.68	
30-Sep-14 13:03	13.79		30-Sep-14 14:06	13.80		30-Sep-14 15:09	13.69	
30-Sep-14 13:04	13.79		30-Sep-14 14:07	13.81		30-Sep-14 15:10	13.70	
30-Sep-14 13:05	13.78		30-Sep-14 14:08	13.81		30-Sep-14 15:11	13.71	
30-Sep-14 13:06	13.77		30-Sep-14 14:09	13.81		30-Sep-14 15:12	13.72	
30-Sep-14 13:07	13.77		30-Sep-14 14:10	13.81		30-Sep-14 15:13	13.73	
30-Sep-14 13:08	13.77		30-Sep-14 14:11	13.81		30-Sep-14 15:14	13.73	
30-Sep-14 13:09	13.78		30-Sep-14 14:12	13.80	End Port 1 sampling	30-Sep-14 15:15	13.73	
30-Sep-14 13:10	13.78		30-Sep-14 14:13	13.70		30-Sep-14 15:16	13.73	
30-Sep-14 13:11	13.79		30-Sep-14 14:14	13.70		30-Sep-14 15:17	13.73	
30-Sep-14 13:12	13.79		30-Sep-14 14:15	13.71		30-Sep-14 15:18	13.73	
30-Sep-14 13:13	13.79		30-Sep-14 14:16	13.71		30-Sep-14 15:19	13.74	
30-Sep-14 13:14	13.80		30-Sep-14 14:17	13.71		30-Sep-14 15:20	13.74	
30-Sep-14 13:15	13.80		30-Sep-14 14:18	13.72		30-Sep-14 15:21	13.74	
30-Sep-14 13:16	13.81		30-Sep-14 14:19	13.72		30-Sep-14 15:22	13.74	
30-Sep-14 13:17	13.81		30-Sep-14 14:20	13.72	Start Port 2 sampling	30-Sep-14 15:23	13.74	
30-Sep-14 13:18	13.81		30-Sep-14 14:21	13.72		30-Sep-14 15:24	13.74	
30-Sep-14 13:19	13.82		30-Sep-14 14:22	13.73		30-Sep-14 15:25	13.76	
30-Sep-14 13:20	13.82		30-Sep-14 14:23	13.73		30-Sep-14 15:26	13.77	
30-Sep-14 13:21	13.83		30-Sep-14 14:24	13.73		30-Sep-14 15:27	13.78	
30-Sep-14 13:22	13.83		30-Sep-14 14:25	13.73		30-Sep-14 15:28	13.79	
30-Sep-14 13:23	13.94		30-Sep-14 14:26	13.74		30-Sep-14 15:29	13.79	
30-Sep-14 13:24	13.52		30-Sep-14 14:27	13.74		30-Sep-14 15:30	13.79	
30-Sep-14 13:25	13.39		30-Sep-14 14:28	13.74		30-Sep-14 15:31	13.80	
30-Sep-14 13:26	13.64		30-Sep-14 14:29	13.75		30-Sep-14 15:32	13.80	
30-Sep-14 13:27	13.75		30-Sep-14 14:30	13.75		30-Sep-14 15:33	13.80	
30-Sep-14 13:28	13.79		30-Sep-14 14:31	13.75		30-Sep-14 15:34	13.81	
30-Sep-14 13:29	13.83		30-Sep-14 14:32	13.75		30-Sep-14 15:35	13.81	
30-Sep-14 13:30	13.88		30-Sep-14 14:33	13.76		30-Sep-14 15:36	13.81	
30-Sep-14 13:31	13.90		30-Sep-14 14:34	13.76		30-Sep-14 15:37	13.80	
30-Sep-14 13:32	13.88		30-Sep-14 14:35	13.76		30-Sep-14 15:38	13.79	
30-Sep-14 13:33	13.85		30-Sep-14 14:36	13.77		30-Sep-14 15:39	13.77	
30-Sep-14 13:34	13.83		30-Sep-14 14:37	13.77		30-Sep-14 15:40	13.76	
30-Sep-14 13:35	13.81		30-Sep-14 14:38	13.77		30-Sep-14 15:41	13.74	
30-Sep-14 13:36	13.78		30-Sep-14 14:39	13.77		30-Sep-14 15:42	13.73	
30-Sep-14 13:37	13.77		30-Sep-14 14:40	13.77		30-Sep-14 15:43	13.71	
30-Sep-14 13:38	13.77		30-Sep-14 14:41	13.77		30-Sep-14 15:44	13.70	
30-Sep-14 13:39	13.77		30-Sep-14 14:42	13.76		30-Sep-14 15:45	13.69	
30-Sep-14 13:40	13.77		30-Sep-14 14:43	13.76		30-Sep-14 15:46	13.67	
30-Sep-14 13:41	13.77		30-Sep-14 14:44	13.76		30-Sep-14 15:47	13.66	
30-Sep-14 13:42	13.77		30-Sep-14 14:45	13.76		30-Sep-14 15:48	13.67	
30-Sep-14 13:43	13.77		30-Sep-14 14:46	13.76		30-Sep-14 15:49	13.68	End Port 2 Sampling
30-Sep-14 13:44	13.77		30-Sep-14 14:47	13.76				
30-Sep-14 13:45	13.77		30-Sep-14 14:48	13.76				

	13.82	% O2 Run 3 average

14-0361 LCD CfPT CEMS %O2	Run 3	
Date & Time	%O2	Comment
30-Sep-14 16:07	13.72	Start Port 1 sampling
30-Sep-14 16:08	13.70	
30-Sep-14 16:09	13.71	
30-Sep-14 16:10	13.72	
30-Sep-14 16:11	13.73	
30-Sep-14 16:12	13.74	
30-Sep-14 16:13	13.75	
30-Sep-14 16:14	13.76	
30-Sep-14 16:15	13.77	
30-Sep-14 16:16	13.78	
30-Sep-14 16:17	13.79	
30-Sep-14 16:18	13.80	
30-Sep-14 16:19	13.81	
30-Sep-14 16:20	13.82	
30-Sep-14 16:21	13.82	
30-Sep-14 16:22	13.83	
30-Sep-14 16:23	13.83	
30-Sep-14 16:24	13.84	
30-Sep-14 16:25	13.84	
30-Sep-14 16:26	13.85	
30-Sep-14 16:27	13.86	
30-Sep-14 16:28	13.87	
30-Sep-14 16:29	13.87	
30-Sep-14 16:30	13.87	
30-Sep-14 16:31	13.96	
30-Sep-14 16:32	14.10	
30-Sep-14 16:33	14.02	
30-Sep-14 16:34	13.94	
30-Sep-14 16:35	13.85	
30-Sep-14 16:36	13.81	
30-Sep-14 16:37	13.81	
30-Sep-14 16:38	13.81	
30-Sep-14 16:39	13.81	
30-Sep-14 16:40	13.81	
30-Sep-14 16:41	13.81	
30-Sep-14 16:42	13.81	
30-Sep-14 16:43	13.80	
30-Sep-14 16:44	13.80	
30-Sep-14 16:45	13.80	
30-Sep-14 16:46	13.80	
30-Sep-14 16:47	13.80	
30-Sep-14 16:48	13.80	
30-Sep-14 16:49	13.79	
30-Sep-14 16:50	13.79	
30-Sep-14 16:51	13.79	
30-Sep-14 16:52	13.78	
30-Sep-14 16:53	13.77	
30-Sep-14 16:54	13.76	
30-Sep-14 16:55	13.74	
30-Sep-14 16:56	13.74	
30-Sep-14 16:57	13.75	
30-Sep-14 16:58	13.75	
30-Sep-14 16:59	13.75	
30-Sep-14 17:00	13.76	
30-Sep-14 17:01	13.76	
30-Sep-14 17:02	13.76	
30-Sep-14 17:03	13.77	
30-Sep-14 17:04	13.77	
30-Sep-14 17:05	13.78	
30-Sep-14 17:06	13.78	
30-Sep-14 17:07	13.78	
30-Sep-14 17:08	13.79	
30-Sep-14 17:09	13.79	

14-0361 LCD CfPT CEMS %O2	Run 3	
Date & Time	%O2	Comment
30-Sep-14 17:10	13.80	
30-Sep-14 17:11	13.80	
30-Sep-14 17:12	13.80	
30-Sep-14 17:13	13.81	
30-Sep-14 17:14	13.80	
30-Sep-14 17:15	13.80	
30-Sep-14 17:16	13.80	
30-Sep-14 17:17	13.80	
30-Sep-14 17:18	13.79	
30-Sep-14 17:19	13.80	
30-Sep-14 17:20	13.81	
30-Sep-14 17:21	13.81	
30-Sep-14 17:22	13.82	
30-Sep-14 17:23	13.82	
30-Sep-14 17:24	13.83	
30-Sep-14 17:25	13.84	
30-Sep-14 17:26	13.84	
30-Sep-14 17:27	13.84	
30-Sep-14 17:28	13.84	
30-Sep-14 17:29	13.84	
30-Sep-14 17:30	13.84	
30-Sep-14 17:31	13.84	
30-Sep-14 17:32	13.84	
30-Sep-14 17:33	13.84	
30-Sep-14 17:34	13.84	
30-Sep-14 17:35	13.84	
30-Sep-14 17:36	13.85	End Port 1 sampling
30-Sep-14 17:37	13.85	
30-Sep-14 17:38	13.84	
30-Sep-14 17:39	13.84	
30-Sep-14 17:40	13.83	
30-Sep-14 17:41	13.83	
30-Sep-14 17:42	13.83	
30-Sep-14 17:43	13.82	Start Port 2 sampling
30-Sep-14 17:44	13.82	
30-Sep-14 17:45	13.82	
30-Sep-14 17:46	13.82	
30-Sep-14 17:47	13.82	
30-Sep-14 17:48	13.82	
30-Sep-14 17:49	13.82	
30-Sep-14 17:50	13.82	
30-Sep-14 17:51	13.82	
30-Sep-14 17:52	13.83	
30-Sep-14 17:53	13.84	
30-Sep-14 17:54	13.85	
30-Sep-14 17:55	13.86	
30-Sep-14 17:56	13.87	
30-Sep-14 17:57	13.88	
30-Sep-14 17:58	13.89	
30-Sep-14 17:59	13.87	
30-Sep-14 18:00	13.85	
30-Sep-14 18:01	13.83	
30-Sep-14 18:02	13.81	
30-Sep-14 18:03	13.78	
30-Sep-14 18:04	13.75	
30-Sep-14 18:05	13.72	
30-Sep-14 18:06	13.73	
30-Sep-14 18:07	13.79	
30-Sep-14 18:08	13.80	
30-Sep-14 18:09	13.79	
30-Sep-14 18:10	13.79	
30-Sep-14 18:11	13.79	
30-Sep-14 18:12	13.81	

14-0361 LCD CfPT CEMS %O2	Run 3	
Date & Time	%O2	Comment
30-Sep-14 18:13	13.83	
30-Sep-14 18:14	13.84	
30-Sep-14 18:15	13.86	
30-Sep-14 18:16	13.88	
30-Sep-14 18:17	13.78	
30-Sep-14 18:18	13.86	
30-Sep-14 18:19	13.93	
30-Sep-14 18:20	13.95	
30-Sep-14 18:21	13.90	
30-Sep-14 18:22	13.81	
30-Sep-14 18:23	13.77	
30-Sep-14 18:24	13.78	
30-Sep-14 18:25	13.78	
30-Sep-14 18:26	13.79	
30-Sep-14 18:27	13.80	
30-Sep-14 18:28	13.80	
30-Sep-14 18:29	13.81	
30-Sep-14 18:30	13.81	
30-Sep-14 18:31	13.82	
30-Sep-14 18:32	13.82	
30-Sep-14 18:33	13.82	
30-Sep-14 18:34	13.82	
30-Sep-14 18:35	13.82	
30-Sep-14 18:36	13.82	
30-Sep-14 18:37	13.82	
30-Sep-14 18:38	13.82	
30-Sep-14 18:39	13.82	
30-Sep-14 18:40	13.82	
30-Sep-14 18:41	13.82	
30-Sep-14 18:42	13.82	
30-Sep-14 18:43	13.82	
30-Sep-14 18:44	13.82	
30-Sep-14 18:45	13.82	
30-Sep-14 18:46	13.82	
30-Sep-14 18:47	13.82	
30-Sep-14 18:48	13.82	
30-Sep-14 18:49	13.82	
30-Sep-14 18:50	13.82	
30-Sep-14 18:51	13.82	
30-Sep-14 18:52	13.82	
30-Sep-14 18:53	13.82	
30-Sep-14 18:54	13.83	
30-Sep-14 18:55	13.88	
30-Sep-14 18:56	13.98	
30-Sep-14 18:57	13.87	
30-Sep-14 18:58	13.86	
30-Sep-14 18:59	13.86	
30-Sep-14 19:00	13.85	
30-Sep-14 19:01	13.85	
30-Sep-14 19:02	13.87	
30-Sep-14 19:03	13.86	
30-Sep-14 19:04	13.86	
30-Sep-14 19:05	13.85	
30-Sep-14 19:06	13.84	
30-Sep-14 19:07	13.84	
30-Sep-14 19:08	13.83	
30-Sep-14 19:09	13.83	
30-Sep-14 19:10	13.82	
30-Sep-14 19:11	13.82	
30-Sep-14 19:12	13.81	End Port 2 Sampling

APPENDIX II

PROCESS INSTRUMENTATION AND CEMS CALIBRATION DATA

Calibrations for 2014 LWCI Confirmatory Performance Test

Tag Name	Measured Parameter(s)	Instrument	Calibration Prior to Performance Testing	Calibration Procedure #	Date	Signature
TI-3105, 3104 & 3566	Combustion chamber exit temperature	Type K Metal Thermocouples	Compare DCS reading to calibrated simulation device	TEMS-5123	9-16-14	
TI-3528	Stack gas temperature	Resistance Temperature Detector	Compare DCS reading to calibrated simulation device	TEMS-5039	9-16-14	
FI-3552	Stack gas flowrate	McCrometer V-Cone® Gas Flowmeter /Differential Pressure Transmitter	- Field comparison to pitot measurements	DCS values compared to EPA Method 2 results	9-16-14	
			- Calibrate differential pressure transmitter	TEMS-5013	9-16-14	
PI-3529	Stack gas pressure	Rosemount Model 3051 Pressure Sensor	- Zero transmitter - Calibrate transmitter by comparing readings to supplied input pressures	TEMS-5013	9-16-14	
FIC-3076, 3091, & 3083	Feedrates of wastes	Micro Motion DL-100 Flowmeter, or equivalent	- Zero flowmeter	TEMS-5116	9-16-14	
			- Perform flow test	TEMS-5117	9-16-14	

Incinerator Gas RATA Data Entry Sheet

Date: 9/11/2014
Source: Destructor B-248
Operators: C. Ashworth, F. Fillers, R. Zimmerman

			RM Uncorrected Values	RM Corrected Values	CEMS Concentrations	O_2 zero SSBC		O_2 upscale SSBC	
Run	Start Time	End Time	O_2 (%)	O_2 (%)	O_2 (%)	pre	post	pre	post
1	8:34	8:54	12.34	12.61	12.48	-0.06	-0.06	9.77	9.77
2	9:08	9:28	12.69	12.98	12.85	-0.06	-0.06	9.77	9.76
3	9:45	10:05	11.49	11.76	11.69	-0.06	-0.06	9.76	9.77
4	10:20	10:40	11.69	11.95	11.89	-0.06	-0.06	9.77	9.77
5	10:59	11:19	11.80	12.07	12.02	-0.06	-0.06	9.77	9.77
6	11:34	11:54	12.52	12.80	12.68	-0.06	-0.06	9.77	9.76
7	12:09	12:29	12.91	13.21	13.05	-0.06	-0.06	9.76	9.76
8	12:44	13:04	12.74	13.03	12.93	-0.06	-0.06	9.76	9.76
9	13:21	13:41	12.76	13.05	12.98	-0.06	-0.06	9.76	9.76
10	13:56	14:16	12.77	13.07	13.04	-0.06	-0.06	9.76	9.75
11						-0.06		9.75	
12						0		0	
13						0		0	
14						0		0	
15						0		0	
16						0		0	

Incinerator Relative Accuracy Test Audit Results

RATA for: O_2

Source: Destructor B-248

Units: %

Reference Methods: Method 3A for O_2

Date: 9/11/2014

Applicable Regulation: 40 CFR Part 60 Performance Specification 3

Operators: C. Ashworth, F. Fillers, R. Zimmerman

	Run	RM	CEMS	Difference[a]
OK	1	12.61	12.48	0.13
OK	2	12.98	12.85	0.13
OK	3	11.76	11.69	0.07
OK	4	11.95	11.89	0.06
OK	5	12.07	12.02	0.04
OK	6	12.80	12.68	0.13
OK	7	13.21	13.05	0.16
OK	8	13.03	12.93	0.11
OK	9	13.05	12.98	0.08
OK	10	13.07	13.04	0.04
	11			
	12			
	13			
	14			
	15			
	16			
Average		**12.65**	**12.56**	**0.093**

Test Statistics	
Standard Deviation (S_a)[c]:	0.042
t-value($t_{0.975}$):	2.262
Confidence Coefficient (cc)[c]:	0.030

Relative Accuracy (RA)[e]:	%	Accept. Criteria
Based Upon Absolute Difference:	0.1	<=1

Total Valid Runs (OK): 10
Total Void Runs (Void): 0

Comments:

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[a] *Average Difference* ($\bar{d}$):

$$d = \frac{1}{n}\sum_{i=1}^{n} d_i$$

d = *Difference* (*RM* − *CEMS*)
n = *Number of valid runs*

[b] *Standard Deviation* (S_d):

$$S_d^2 = \frac{\sum_{i=1}^{n} d_i^2 - \frac{(\sum_{i=1}^{n} d_i)^2}{n}}{n-1}$$

[c] *Confidence Coefficient* (cc):

$$cc = t_{0.975}\frac{S_d}{n^{1/2}}$$

$t_{0.975}$ = *t − value for* 2.5% *error*

[d] *Relative Accuracy* (RA):

$$RA = \frac{|\bar{d}| + |cc|}{RM_{avg}} \times 100$$

$$or \quad RA = |\bar{d}| + |cc|$$

$|\bar{d}|$ = *Absolute value of average difference*
$|cc|$ = *Absolute value of confidence coefficient*
RM_{avg} = *Average value of reference method or applicable sta*

V-Cone Flow Data Entry Sheet

Date: 9/10/2014
Source: Destructor B-248
Personnel: F. Fillers, S. Grace, B. Hoss, R. Zimmerman
Barometric Pressure (in Hg): 28.60

Series	Load	Run	Run Times		Reference Method Data				V-Cone Data			
			Start	End	Static Pressure (in H_2O)	Stack Temp (°F)	Flow (acfm)	Flow (dscfm)	Differential Pressure (in H_2O)[1]	Temp (°F)[2]	Flow (acfm)[3]	Flow (dscfm)[4]
1	Low	1	9:26	9:34	-0.16	114	15361	12108	-4.7	116.0	15319	10281
		2	9:35	9:42	-0.16	114	15259	12025	-4.9	116.0	15295	10205
		3	9:43	9:49	-0.16	114	15322	12069	-4.7	116.0	15311	10219
			Averages		**-0.16**	**114.0**	**15314**	**12067**	**-4.8**	**116.0**	**15308**	**10235**
2	Mid	1	10:39	10:45	-0.21	118	18747	14646	-9.9	116.6	18950	12786
		2	10:46	10:52	-0.21	118	18507	14448	-10.1	116.8	18927	12771
		3	10:53	11:00	-0.21	119	18552	14477	-10.0	116.7	18938	12769
			Averages		**-0.21**	**118.3**	**18602**	**14524**	**-10.0**	**116.7**	**18939**	**12776**
3	High	1	11:39	11:46	-0.32	124	22972	17687	-17.6	116.9	23077	15523
		2	11:47	11:54	-0.32	124	23050	17740	-17.8	116.6	23067	15530
		3	11:55	12:02	-0.32	124	22782	17534	-17.6	116.2	23058	15576
			Averages		**-0.32**	**124.0**	**22935**	**17654**	**-17.6**	**116.6**	**23067**	**15543**

[1] V-Cone stack gas pressure from Destructor DCS tag KPT3529.

[2] V-Cone stack gas temperature from Destructor DCS tag KTE3528.

[3] V-Cone acfm stack flow from Destructor DCS tag KFT3552.

[4] V-Cone dscfm combustion gas flow from Destructor DCS tag KFT3552A.
Contributions to stack flow totaling 1600 dscfm from air flow through the wet electrostatic precipitators are not included in KFT3552A.

V-Cone Certification Summary Sheet

Date: 9/10/2014
Source: Destructor B-248
Personnel: F. Fillers, S. Grace, B. Hoss, R. Zimmerman

Load	Start Time	End Time	V-Cone flow (acfm)	Corrected RM flow (acfm)[1]	Percent difference	V-Cone flow (dscfm)[2]	RM flow (dscfm)	Percent difference	Abs Stack Temp (°R)	Abs Stack Press (in Hg)	Abs V-Cone Temp (°R)	Abs V-Cone Press (in Hg)
Low	9:26	9:49	15308	15552	1.6	11835	12067	1.9	574.0	28.59	576.0	28.25
Mid	10:39	11:00	18939	19028	0.5	14376	14524	1.0	578.3	28.58	576.7	27.87
High	11:39	12:02	23067	23699	2.7	17143	17654	2.9	584.0	28.58	576.6	27.30
Certification Acceptance: <= 10%			**ACFM Status: Pass**			**DSCFM Status: Pass**						

[1] RM acfm stack flow is corrected to match V-Cone absolute temperature and pressure.

[2] V-Cone dscfm stack flow is combustion gas flow from Destructor DCS tag KFT3552A plus contributions to stack flow totaling 1600 dscfm, from air flow through the wet electrostatic precipitators not included in KFT3552A, i.e., V-Cone dscfm stack flow = KFT3552A + 1600.

Seven Day Calibration Drift Determination for MACT or RCRA CEMS

Date:	9/12/2014	**Reason for Test:**	Other
Source:	Destructor	**Reason for Test:**	
Building:	B-248		

Monitor:	O2	**Span:**	25	%	
Primary Analyzer:	Servomex 1440	01440DIVO2/3593	**Alternate Analyzer:**		

Performed By:	Kevin Murdock

Cylinder Number	Concentration	Units	Expiration Date	Check Exp.
Nitrogen	0	%		
CC21613	14.94	%	2/8/2021	OK
CC105113	15.01	%	7/18/2021	OK
		%		

	Day	Date	Time	Reference Values %	Actual Values %	Absolute Difference %	Percent of Span
ZERO (LOW LEVEL)	1	9/6/2014	5:06	0	0.0	0.0	0.0%
	2	9/7/2014	5:06	0	0.0	0.0	0.0%
	3	9/8/2014	5:06	0	0.0	0.0	0.0%
	4	9/9/2014	5:06	0	0.0	0.0	0.0%
	5	9/10/2014	5:06	0	0.0	0.0	0.0%
	6	9/11/2014	5:06	0	0.0	0.0	0.0%
	7	9/12/2014	5:06	0	0.0	0.0	0.0%
					Maximum	0.0	0.0%
					Limit <= 0.5% Difference	PASS	
HIGH LEVEL	1	9/6/2014	5:06	14.9	14.9	0.0	0.0%
	2	9/7/2014	5:06	14.9	14.9	0.0	0.0%
	3	9/8/2014	5:06	14.9	14.9	0.0	0.0%
	4	9/9/2014	5:06	15.0	14.9	0.1	0.4%
	5	9/10/2014	5:06	15.0	14.9	0.1	0.4%
	6	9/11/2014	5:06	15.0	15.0	0.0	0.0%
	7	9/12/2014	5:06	15.0	15.1	0.1	0.4%
					Maximum	0.1	0.4%
					Limit <= 0.5% Difference	PASS	

Comments: Explain "Reason for Test," e.g., cite the maintenance event, if "Diagnostic."	This test was conducted as part of the CEMS Performance Evaluaiton Test prior to the Confirmatory Performance Test on the Destructor. Cylinder CC21613 was removed from service after the daily cal check on 9/8/2014, and cylinder CC105113 was put in service before the daily cal check on 9/9/2014. After the daily calibration check on 9/10/2014, a calibration adjustment was made to the THC anlayzer, followed by another CEMS calibration check to verify the adjustment. No adjustments were made to the O2 anlayzer during the 7-day test period.

Reviewed By:	GH, RZ

Calibration Error Determination for MACT O_2

Date:	9/11/2014		**Reason for Test:**	Other	
Source:	Destructor		**Reason for Test:**		
Building:	B-248		**Test Aborted:**	No	
Primary Analyzer:	Servomex 1440	01440DIVO2/3593	**Alternate Analyzer:**		

Performed By:	MTR

Monitor:	**O_2**		**Span:**	25	%
Level	**Cylinder Number**	**Concentration**	**Units**	**Expiration Date**	**Check**
Low	Nitrogen	0	%		
Mid	CC100377	9.027	%	5/6/2021	OK: 8-10
High	CC105113	15.01	%	7/18/2021	OK: 14-16
Start Time:	5:17		**Finish Time:**	5:53	
Run Number	**Reference Value %**	**Actual Value %**	**Difference**		
			Low %	**Mid %**	**High %**
Low - 1	0	0.0	0.0	——	——
Mid - 1	9.027	9.0	——	0.0	——
High - 1	15.01	15.0	——	——	0.0
Low -2	0	0.0	0.0	——	——
Mid - 2	9.027	9.0	——	0.0	——
High - 2	15.01	15.0	——	——	0.0
Low - 3	0	0.0	0.0	——	——
Mid - 3	9.027	9.0	——	0.0	——
High - 3	15.01	15.0	——	——	0.0
		Calibration Error	0.0	0.0	0.0
		Limit <= 0.5%	PASS	PASS	PASS

Comments: Explain "Reason for Test," e.g., cite the maintenance event, if "Diagnostic."	This test was conducted as part of the CEMS Performance Evaluaiton Test prior to the Confirmatory Performance Test on the Destructor. It was conducted during the Calibration Drift Test Period.

Reviewed By:	GW, RZ

Response Time Determination for MACT CO or O2

Date:	9/11/2014	**Reason for Test:**	Other	
Source:	Destructor	**Reason for Test:**		
Building:	B-248			
Monitor:	CO		O2	
Primary Analyzer:	N/A	N/A	Servomex 1440	01440DIVO2/3593
Alternate Analyzer:				

Performed By:	C. Davenport/ A. Brown

Level	**Cylinder Number**	**CO (ppm)**	**O2 (%)**	**Expiration Date**	**Check Exp.**
Zero:	Nitrogen	0	0	N/A	N/A
High Span:	CC105113		15.01	7/18/2021	OK
Low Span (CO only):					

Run	**Description**	**CO High Range**	**CO Low Range**	**O2**
	95%			**14.3**
	5%			**0.8**
	Start Time(s) (hr:min)			14:38
Upscale Run 1	zero to high (sec)			34
Downscale Run 1	high to zero (sec)			38
Upscale Run 2	zero to high (sec)			36
Downscale Run 2	high to zero (sec)			40
Upscale Run 3	zero to high (sec)			38
Downscale Run 3	high to zero (sec)			38
	End Time(s) (hr:min)			14:57
Average Upscale Response Time (min)				0.6
Average Downscale Response Time (min)				0.6
Limit <= 2 min (for both)				PASS

Comments: Explain "Reason for Test," e.g., cite the maintenance event, if "Diagnostic."	This test was conducted as part of the CEMS Performance Evaluaiton Test prior to the Confirmatory Performance Test on the Destructor. It was conducted during the Calibration Drift Test Period.

Reviewed By:	GW, RZ

Seven Day Calibration Drift Determination for MACT or RCRA CEMS

Date:	9/17/2014	**Reason for Test:**	Initial Certification
Source:	Destructor	**Reason for Test:**	Other
Building:	B-248		

Monitor:	THC	**Span:**	100	ppmv
Primary Analyzer:	CAI 600 HFID	B05031	**Alternate Analyzer:**	

Performed By:	Kevin Murdock

Cylinder Number	Concentration	Units	Expiration Date	Check Exp.
Nitrogen	0	ppmv		
CC105113	76.92	ppmv	7/18/2021	OK
		ppmv		
		ppmv		

	Day	Date	Time	Reference Values ppmv	Actual Values ppmv	Absolute Difference ppmv	Percent of Span
ZERO (LOW LEVEL)	1	9/11/2014	5:06	0	0.0	0.0	0.0%
	2	9/12/2014	5:06	0	0.0	0.0	0.0%
	3	9/13/2014	5:06	0	0.0	0.0	0.0%
	4	9/14/2014	5:06	0	0.0	0.0	0.0%
	5	9/15/2014	5:06	0	0.0	0.0	0.0%
	6	9/16/2014	5:06	0	0.0	0.0	0.0%
	7	9/17/2014	5:06	0	0.0	0.0	0.0%
					Maximum	0.0	0.0%
					Limit <= 3% of Span		PASS
HIGH LEVEL	1	9/11/2014	5:06	76.9	77.0	0.1	0.1%
	2	9/12/2014	5:06	76.9	76.9	0.0	0.0%
	3	9/13/2014	5:06	76.9	75.2	1.7	1.7%
	4	9/14/2014	5:06	76.9	77.1	0.2	0.2%
	5	9/15/2014	5:06	76.9	76.3	0.6	0.6%
	6	9/16/2014	5:06	76.9	76.7	0.2	0.2%
	7	9/17/2014	5:06	76.9	76.4	0.5	0.5%
					Maximum	1.7	1.7%
					Limit <= 3% of Span		PASS

Comments: Explain "Reason for Test," e.g., cite the maintenance event, if "Diagnostic."	This test was performed for Initial Certification for the new THC analyzer, model # CAI 600 HFID & serial # B05031. It was also part of the CEMS Performance Evaluaiton Test prior to the Confirmatory Performance Test on the Destructor. No adjustments were made to the THC anlayzer during the 7-day test period.

Reviewed By:	GH, RZ

Calibration Error Determination for MACT CO or THC

Date:	9/11/2014		**Reason for Test:**	Initial Certification	
Source:	Destructor		**Reason for Test:**	Other	
Building:	B-248		**Test Aborted:**	No	
Primary Analyzer:	CAI 600 HFID	B05031	**Alternate Analyzer:**		

Performed By:	MTR

Low Span

Monitor:	THC		**Span:**	100	ppmv
Level	**Cylinder Number**	**Concentration**	**Units**	**Expiration Date**	**Check**
Low	Nitrogen	0	ppmv		
Mid	CC100377	34.90	ppmv	5/6/2021	OK: 30-40
High	CC105113	76.92	ppmv	7/18/2021	OK: 70-80
Start Time:	5:17		**Finish Time:**	5:53	

Run	**Reference Value** ppmv	**Actual Value** ppmv	**Difference**		
			Low ppmv	**Mid** ppmv	**High** ppmv
Low - 1	0	0.0	0.0	——	——
Mid - 1	34.90	35.8	——	0.9	——
High - 1	76.92	77.6	——	——	0.7
Low -2	0	0.0	0.0	——	——
Mid - 2	34.90	34.4	——	-0.5	——
High - 2	76.92	76.8	——	——	-0.1
Low - 3	0	0.0	0.0	——	——
Mid - 3	34.90	34.6	——	-0.3	——
High - 3	76.92	76.9	——	——	0.0
		Mean Difference	0.0	0.0	0.2
		Calibration Error (Percent of Span)	0.0%	0.0%	0.2%
		Limit <= 5% of Span	PASS	PASS	PASS

High Span (CO only)

Monitor:			**Span:**		ppmv
Level	**Cylinder Number**	**Concentration**	**Units**	**Expiration Date**	**Check**
Low	Nitrogen	0	ppmv		
Mid			ppmv		
High			ppmv		
Start Time:			**Finish Time:**		

Run	**Reference Value** ppmv	**Actual Value** ppmv	**Difference**		
			Low ppmv	**Mid** ppmv	**High** ppmv
Low - 1	0			——	——
Mid - 1			——		——
High - 1			——	——	
Low -2	0			——	——
Mid - 2			——		——
High - 2			——	——	
Low - 3	0			——	——
Mid - 3			——		——
High - 3			——	——	
		Mean Difference			
		Calibration Error (Percent of Span)			
		Limit <= 5% of Span			

Comments: Explain "Reason for Test," e.g., cite the maintenance event, if "Diagnostic."	This test was performed for Initial Certification for the new THC analyzer, model # CAI 600 HFID & serial # B05031. It was also part of the CEMS Performance Evaluaiton Test prior to the Confirmatory Performance Test on the Destructor. It was conducted during the Calibration Drift Test Period.

Reviewed By:	GW, RZ

Response Time Determination for MACT THC

Date:	9/11/2014	**Reason for Test:**	Initial Certification
Source:	Destructor	**Reason for Test:**	Other
Building:	B-248		
Monitor:	THC		
Primary Analyzer:	CAI 600 HFID	B05031	
Alternate Analyzer:			

Performed By:	C. Davenport/ A. Brown

Level	Cylinder Number	Concentration	Units	Expiration Date	Check Exp.
Zero:	Nitrogen	0	ppmv		
Span:	CC105113	76.92	ppmv	7/18/2021	OK

Run	Description	Response Time Data
	Start Time(s) (hr:min)	14:04
Upscale Run 1	stack to zero	——
	zero to stack (sec)	30
Downscale Run 1	stack to high	——
	high to stack (sec)	30
Upscale Run 2	stack to zero	——
	zero to stack (sec)	30
Downscale Run 2	stack to high	——
	high to stack (sec)	30
Upscale Run 3	stack to zero	——
	zero to stack (sec)	30
Downscale Run 3	stack to high	——
	high to stack (sec)	30
	End Time(s) (hr:min)	14:35
Average Upscale Response Time (min)		0.5
Average Downscale Response Time (min)		0.5
Limit <= 2 min (for both)		PASS

Comments: Explain "Reason for Test," e.g., cite the maintenance event, if "Diagnostic."	This test was performed for Initial Certification for the new THC analyzer, model # CAI 600 HFID & serial # B05031. It was also part of the CEMS Performance Evaluaiton Test prior to the Confirmatory Performance Test on the Destructor. It was conducted during the Calibration Drift Test Period.

Reviewed By:	GW, RZ

APPENDIX III

OPERATING PARAMETER DATA

		Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
		KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
	Maximum	1,746.86	15,411.14	31.82	10.15	25.81
Run 1	Average	1,735.54	15,301.44	25.53	9.93	24.56
	Minimum	1,726.20	15,183.21	22.30	9.64	23.81
	Maximum	1,751.28	15,372.05	28.35	10.35	24.83
Run 2	Average	1,742.62	15,162.30	25.66	9.99	24.54
	Minimum	1,724.38	15,084.71	19.37	9.58	24.34
	Maximum	1,753.21	15,393.56	26.09	11.29	28.20
Run 3	Average	1,739.56	15,255.14	24.91	10.70	24.68
	Minimum	1,733.43	15,006.59	21.24	9.53	23.86
Start Run 1	30-Sep-14 09:11:00	1,734.83	15,360.96	25.08	10.06	24.41
	30-Sep-14 09:12:00	1,734.76	15,357.67	25.63	10.11	24.48
	30-Sep-14 09:13:00	1,734.52	15,377.75	25.05	10.13	24.51
	30-Sep-14 09:14:00	1,734.85	15,399.99	24.75	10.06	24.54
	30-Sep-14 09:15:00	1,734.62	15,380.92	24.89	10.04	24.87
	30-Sep-14 09:16:00	1,735.23	15,393.22	24.36	10.05	24.80
	30-Sep-14 09:17:00	1,735.38	15,400.74	25.54	10.07	24.65
	30-Sep-14 09:18:00	1,734.54	15,386.02	24.76	10.06	24.80
	30-Sep-14 09:19:00	1,735.11	15,377.62	24.17	10.11	24.60
	30-Sep-14 09:20:00	1,736.25	15,378.55	25.21	10.13	24.62
	30-Sep-14 09:21:00	1,734.85	15,364.26	25.56	10.09	24.66
	30-Sep-14 09:22:00	1,734.37	15,377.54	24.47	10.06	24.72
	30-Sep-14 09:23:00	1,735.50	15,374.20	25.15	10.03	24.71
	30-Sep-14 09:24:00	1,736.06	15,351.93	25.04	10.03	24.58
	30-Sep-14 09:25:00	1,736.07	15,372.89	25.51	10.02	24.60
	30-Sep-14 09:26:00	1,735.51	15,352.63	25.17	10.06	24.67
	30-Sep-14 09:27:00	1,735.76	15,362.34	25.31	9.98	24.71
	30-Sep-14 09:28:00	1,735.96	15,375.67	25.04	9.99	24.63
	30-Sep-14 09:29:00	1,735.78	15,381.59	24.48	10.02	24.55
	30-Sep-14 09:30:00	1,735.28	15,385.46	25.54	10.06	24.64
	30-Sep-14 09:31:00	1,734.05	15,384.80	25.22	10.01	24.57
	30-Sep-14 09:32:00	1,733.71	15,400.03	24.91	10.04	24.54
	30-Sep-14 09:33:00	1,732.37	15,396.78	24.72	10.02	24.54
	30-Sep-14 09:34:00	1,731.78	15,387.57	24.51	10.02	24.57
	30-Sep-14 09:35:00	1,732.11	15,374.77	24.87	9.96	24.55
	30-Sep-14 09:36:00	1,731.62	15,374.20	24.64	10.00	24.44
	30-Sep-14 09:37:00	1,730.75	15,400.64	25.13	10.02	24.53
	30-Sep-14 09:38:00	1,730.63	15,361.86	25.44	10.02	24.44
	30-Sep-14 09:39:00	1,731.92	15,374.61	24.01	9.99	24.44
	30-Sep-14 09:40:00	1,732.93	15,365.29	24.52	9.97	24.46
	30-Sep-14 09:41:00	1,732.37	15,382.07	25.60	9.92	24.44
	30-Sep-14 09:42:00	1,729.81	15,352.64	24.98	9.98	24.38
	30-Sep-14 09:43:00	1,729.48	15,379.88	25.03	9.72	24.46
	30-Sep-14 09:44:00	1,729.73	15,402.30	24.51	9.88	24.40
	30-Sep-14 09:45:00	1,730.22	15,411.14	22.45	9.93	24.62
	30-Sep-14 09:46:00	1,729.05	15,383.72	25.25	9.87	24.51

	Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
	KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
30-Sep-14 09:47:00	1,729.55	15,375.40	25.94	9.96	24.51
30-Sep-14 09:48:00	1,731.65	15,347.75	25.49	9.97	24.57
30-Sep-14 09:49:00	1,734.53	15,372.68	25.58	9.99	24.68
30-Sep-14 09:50:00	1,735.64	15,374.17	25.67	9.94	24.67
30-Sep-14 09:51:00	1,735.71	15,371.27	25.69	9.92	24.62
30-Sep-14 09:52:00	1,735.16	15,386.10	25.62	9.89	24.80
30-Sep-14 09:53:00	1,735.75	15,383.68	25.67	9.91	24.79
30-Sep-14 09:54:00	1,736.21	15,376.53	25.66	9.92	24.73
30-Sep-14 09:55:00	1,737.31	15,359.05	25.73	9.83	24.66
30-Sep-14 09:56:00	1,737.13	15,338.55	25.72	9.76	24.71
30-Sep-14 09:57:00	1,736.70	15,352.93	25.60	9.97	24.68
30-Sep-14 09:58:00	1,736.74	15,354.96	25.57	9.90	24.71
30-Sep-14 09:59:00	1,737.23	15,362.80	25.54	10.01	24.73
30-Sep-14 10:00:00	1,737.05	15,381.32	25.41	9.73	24.71
30-Sep-14 10:01:00	1,735.98	15,373.23	25.59	9.94	24.74
30-Sep-14 10:02:00	1,734.75	15,374.59	25.63	9.89	24.71
30-Sep-14 10:03:00	1,735.27	15,379.85	25.52	9.92	24.58
30-Sep-14 10:04:00	1,735.32	15,381.17	25.63	9.88	24.55
30-Sep-14 10:05:00	1,734.94	15,363.07	26.30	9.99	24.53
30-Sep-14 10:06:00	1,734.58	15,368.63	25.63	9.91	24.67
30-Sep-14 10:07:00	1,735.72	15,352.54	25.49	9.89	24.76
30-Sep-14 10:08:00	1,735.85	15,389.48	25.48	9.79	24.73
30-Sep-14 10:09:00	1,734.92	15,330.50	25.34	10.02	24.66
30-Sep-14 10:10:00	1,732.32	15,338.20	25.87	9.99	24.66
30-Sep-14 10:11:00	1,732.09	15,325.41	25.53	9.97	24.73
30-Sep-14 10:12:00	1,733.95	15,340.42	24.95	10.01	24.78
30-Sep-14 10:13:00	1,734.98	15,322.16	25.89	9.97	24.77
30-Sep-14 10:14:00	1,734.98	15,332.30	25.65	9.99	24.71
30-Sep-14 10:15:00	1,734.95	15,313.83	26.38	9.94	24.54
30-Sep-14 10:16:00	1,734.86	15,316.45	26.05	9.97	24.62
30-Sep-14 10:17:00	1,737.29	15,292.38	25.13	9.86	24.73
30-Sep-14 10:18:00	1,740.95	15,345.57	25.42	9.99	24.63
30-Sep-14 10:19:00	1,740.83	15,327.37	25.58	10.05	24.56
30-Sep-14 10:20:00	1,739.85	15,308.85	25.25	10.06	24.53
30-Sep-14 10:21:00	1,739.18	15,337.90	24.63	9.97	24.71
30-Sep-14 10:22:00	1,737.59	15,340.06	27.09	9.98	24.63
30-Sep-14 10:23:00	1,735.30	15,335.31	26.48	10.06	24.50
30-Sep-14 10:24:00	1,734.96	15,334.60	25.40	9.98	24.72
30-Sep-14 10:25:00	1,737.01	15,361.17	25.35	9.99	24.71
30-Sep-14 10:26:00	1,739.15	15,351.83	26.28	9.99	24.51
30-Sep-14 10:27:00	1,737.57	15,305.13	26.31	10.10	24.59
30-Sep-14 10:28:00	1,737.12	15,311.78	25.82	10.06	24.66
30-Sep-14 10:29:00	1,739.31	15,324.75	25.07	9.94	24.61
30-Sep-14 10:30:00	1,742.99	15,337.86	24.21	10.06	24.39
30-Sep-14 10:31:00	1,742.58	15,331.49	28.88	10.06	24.60
30-Sep-14 10:32:00	1,739.32	15,300.96	26.04	10.06	24.39
30-Sep-14 10:33:00	1,743.70	15,305.50	24.55	9.98	24.51
30-Sep-14 10:34:00	1,746.86	15,341.42	26.45	9.92	24.44

		Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
		KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
	30-Sep-14 10:35:00	1,744.26	15,299.57	25.40	10.04	24.40
	30-Sep-14 10:36:00	1,742.79	15,306.49	25.48	9.94	24.57
	30-Sep-14 10:37:00	1,742.30	15,326.40	25.26	9.93	24.44
	30-Sep-14 10:38:00	1,740.99	15,338.72	26.27	10.01	24.47
	30-Sep-14 10:39:00	1,739.87	15,327.73	25.91	10.04	24.44
	30-Sep-14 10:40:00	1,738.04	15,310.63	25.43	9.94	24.55
Pause for Port	30-Sep-14 10:41:00	1,738.77	15,288.35	25.31	10.06	24.41
	30-Sep-14 10:42:00	1,737.29	15,317.97	27.37	9.98	24.48
	30-Sep-14 10:43:00	1,736.09	15,295.88	25.70	10.04	24.52
	30-Sep-14 10:44:00	1,738.10	15,273.63	25.71	9.98	24.41
	30-Sep-14 10:45:00	1,740.72	15,276.93	25.76	9.88	24.30
	30-Sep-14 10:46:00	1,741.77	15,302.01	25.83	9.89	24.57
	30-Sep-14 10:47:00	1,741.12	15,315.25	24.68	9.93	24.62
	30-Sep-14 10:48:00	1,739.71	15,334.39	25.39	10.02	24.47
	30-Sep-14 10:49:00	1,738.78	15,290.36	25.61	9.91	24.36
Resume	30-Sep-14 10:50:00	1,736.90	15,275.97	25.55	9.90	24.34
	30-Sep-14 10:51:00	1,737.53	15,250.97	25.95	9.64	24.61
	30-Sep-14 10:52:00	1,738.21	15,299.67	25.55	9.92	24.62
	30-Sep-14 10:53:00	1,738.78	15,248.41	25.30	9.88	24.44
	30-Sep-14 10:54:00	1,738.73	15,292.97	25.65	9.92	24.57
	30-Sep-14 10:55:00	1,738.57	15,250.35	25.63	9.94	24.51
	30-Sep-14 10:56:00	1,738.27	15,271.21	25.73	9.83	24.48
	30-Sep-14 10:57:00	1,738.03	15,245.24	25.77	9.98	24.42
	30-Sep-14 10:58:00	1,737.22	15,287.09	25.81	9.94	24.40
	30-Sep-14 10:59:00	1,736.58	15,271.05	25.72	9.88	24.44
	30-Sep-14 11:00:00	1,736.31	15,263.83	25.99	10.06	24.45
	30-Sep-14 11:01:00	1,736.32	15,255.53	25.96	9.85	24.52
	30-Sep-14 11:02:00	1,737.10	15,242.95	25.67	9.98	24.46
	30-Sep-14 11:03:00	1,739.59	15,238.08	25.63	10.15	24.48
	30-Sep-14 11:04:00	1,740.06	15,245.21	25.62	10.07	24.26
	30-Sep-14 11:05:00	1,739.36	15,277.50	25.54	10.04	24.57
	30-Sep-14 11:06:00	1,738.77	15,270.39	25.58	10.11	24.60
	30-Sep-14 11:07:00	1,737.46	15,265.15	22.30	10.11	24.46
	30-Sep-14 11:08:00	1,736.63	15,280.20	24.79	9.84	24.61
	30-Sep-14 11:09:00	1,732.04	15,301.00	25.44	9.97	24.56
	30-Sep-14 11:10:00	1,727.32	15,270.66	25.69	9.97	24.55
	30-Sep-14 11:11:00	1,726.20	15,303.85	25.63	9.82	24.43
	30-Sep-14 11:12:00	1,727.58	15,267.12	25.61	9.83	24.53
	30-Sep-14 11:13:00	1,729.76	15,267.12	24.21	9.87	24.44
	30-Sep-14 11:14:00	1,731.29	15,255.60	31.82	9.97	24.33
	30-Sep-14 11:15:00	1,731.53	15,310.15	27.22	9.83	24.43
	30-Sep-14 11:16:00	1,732.63	15,236.89	26.00	9.79	24.54
	30-Sep-14 11:17:00	1,738.32	15,264.47	25.77	9.88	24.39
	30-Sep-14 11:18:00	1,741.55	15,267.57	25.93	9.89	24.57
	30-Sep-14 11:19:00	1,742.04	15,214.02	26.21	9.73	24.52
	30-Sep-14 11:20:00	1,742.05	15,251.87	25.74	10.04	24.54
	30-Sep-14 11:21:00	1,742.37	15,257.02	25.72	9.92	24.60
	30-Sep-14 11:22:00	1,742.08	15,221.21	25.72	9.83	24.40

	Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
	KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
30-Sep-14 11:23:00	1,741.38	15,238.34	25.58	9.73	24.57
30-Sep-14 11:24:00	1,741.13	15,242.20	25.68	10.11	24.60
30-Sep-14 11:25:00	1,740.48	15,224.19	25.54	10.00	24.59
30-Sep-14 11:26:00	1,738.77	15,252.60	25.59	10.02	24.32
30-Sep-14 11:27:00	1,738.21	15,269.62	25.65	9.92	24.56
30-Sep-14 11:28:00	1,738.81	15,269.37	25.64	9.84	24.63
30-Sep-14 11:29:00	1,738.21	15,262.72	25.67	9.97	24.62
30-Sep-14 11:30:00	1,737.60	15,247.36	25.59	9.85	24.62
30-Sep-14 11:31:00	1,736.73	15,246.67	23.69	9.83	24.44
30-Sep-14 11:32:00	1,736.80	15,253.81	25.11	9.85	24.54
30-Sep-14 11:33:00	1,734.96	15,262.93	25.65	9.70	24.53
30-Sep-14 11:34:00	1,731.42	15,229.66	27.74	9.70	24.46
30-Sep-14 11:35:00	1,729.55	15,254.57	26.16	9.82	24.48
30-Sep-14 11:36:00	1,732.89	15,258.25	23.86	9.83	24.45
30-Sep-14 11:37:00	1,735.86	15,233.86	25.22	9.81	24.47
30-Sep-14 11:38:00	1,735.43	15,262.27	25.46	9.79	24.57
30-Sep-14 11:39:00	1,733.35	15,234.22	25.73	9.95	24.61
30-Sep-14 11:40:00	1,733.34	15,232.84	25.81	9.95	24.53
30-Sep-14 11:41:00	1,734.27	15,225.73	25.72	9.85	24.53
30-Sep-14 11:42:00	1,734.62	15,239.56	25.66	9.96	24.54
30-Sep-14 11:43:00	1,735.24	15,237.01	25.66	9.86	24.53
30-Sep-14 11:44:00	1,735.59	15,259.20	25.63	9.70	24.56
30-Sep-14 11:45:00	1,734.41	15,274.12	25.59	9.88	24.55
30-Sep-14 11:46:00	1,733.43	15,239.99	25.60	9.84	24.53
30-Sep-14 11:47:00	1,734.00	15,240.15	25.63	9.72	24.31
30-Sep-14 11:48:00	1,735.30	15,255.02	25.63	9.80	24.46
30-Sep-14 11:49:00	1,735.09	15,247.96	25.67	9.83	24.44
30-Sep-14 11:50:00	1,733.72	15,237.56	25.66	9.81	24.44
30-Sep-14 11:51:00	1,733.05	15,252.92	25.63	9.73	24.48
30-Sep-14 11:52:00	1,734.31	15,244.22	25.62	9.88	24.39
30-Sep-14 11:53:00	1,734.87	15,216.90	25.58	9.77	24.49
30-Sep-14 11:54:00	1,735.05	15,242.04	25.59	10.02	24.48
30-Sep-14 11:55:00	1,734.91	15,251.34	25.59	9.89	24.61
30-Sep-14 11:56:00	1,733.31	15,272.39	25.66	9.91	24.44
30-Sep-14 11:57:00	1,733.69	15,222.48	25.66	9.98	24.53
30-Sep-14 11:58:00	1,734.93	15,215.76	25.71	9.75	24.53
30-Sep-14 11:59:00	1,735.36	15,226.97	25.68	9.97	24.44
30-Sep-14 12:00:00	1,735.01	15,212.35	25.69	9.92	24.48
30-Sep-14 12:01:00	1,734.27	15,214.56	25.67	9.90	24.26
30-Sep-14 12:02:00	1,732.13	15,228.75	25.72	9.83	24.56
30-Sep-14 12:03:00	1,732.47	15,205.04	26.00	9.88	24.48
30-Sep-14 12:04:00	1,732.42	15,233.51	25.88	9.95	24.45
30-Sep-14 12:05:00	1,731.88	15,231.54	26.04	9.90	24.53
30-Sep-14 12:06:00	1,732.73	15,238.08	25.76	9.88	24.51
30-Sep-14 12:07:00	1,733.00	15,243.87	25.63	9.90	24.55
30-Sep-14 12:08:00	1,733.08	15,211.54	25.27	9.81	24.57
30-Sep-14 12:09:00	1,733.60	15,252.36	25.47	9.71	23.81
30-Sep-14 12:10:00	1,733.00	15,224.40	25.38	9.79	24.05

		Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
		KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
	30-Sep-14 12:11:00	1,731.06	15,238.79	25.87	9.94	25.81
	30-Sep-14 12:12:00	1,729.62	15,235.81	25.81	9.92	24.94
	30-Sep-14 12:13:00	1,730.22	15,250.79	25.81	9.93	24.75
	30-Sep-14 12:14:00	1,731.79	15,198.77	25.81	9.96	24.58
	30-Sep-14 12:15:00	1,732.85	15,183.21	25.85	9.78	24.66
	30-Sep-14 12:16:00	1,734.02	15,191.01	25.81	9.85	24.74
	30-Sep-14 12:17:00	1,734.24	15,219.71	25.81	9.83	24.66
	30-Sep-14 12:18:00	1,734.61	15,211.40	25.76	9.94	24.76
	30-Sep-14 12:19:00	1,735.98	15,214.87	25.81	9.83	24.83
End Run 1	30-Sep-14 12:20:00	1,736.20	15,183.71	25.76	9.80	24.69
	30-Sep-14 12:21:00	1,735.89	15,205.04	25.98	9.92	24.58
	30-Sep-14 12:22:00	1,734.29	15,195.84	25.85	9.88	24.60
	30-Sep-14 12:23:00	1,732.68	15,217.60	26.17	9.70	24.64
	30-Sep-14 12:24:00	1,732.08	15,183.62	25.81	9.90	24.55
	30-Sep-14 12:25:00	1,732.74	15,229.02	25.74	9.91	24.57
	30-Sep-14 12:26:00	1,735.58	15,195.53	25.73	9.88	24.42
	30-Sep-14 12:27:00	1,736.37	15,197.53	25.76	9.87	24.36
	30-Sep-14 12:28:00	1,736.87	15,232.41	25.78	9.83	24.36
	30-Sep-14 12:29:00	1,738.17	15,232.50	25.76	9.78	24.66
	30-Sep-14 12:30:00	1,738.24	15,215.42	25.76	9.72	24.68
	30-Sep-14 12:31:00	1,737.40	15,200.33	25.94	9.91	24.71
	30-Sep-14 12:32:00	1,736.82	15,218.26	25.81	9.96	24.80
	30-Sep-14 12:33:00	1,736.67	15,185.34	25.58	9.92	24.62
	30-Sep-14 12:34:00	1,735.90	15,217.70	25.58	9.88	24.64
	30-Sep-14 12:35:00	1,734.97	15,209.45	25.60	9.96	24.66
	30-Sep-14 12:36:00	1,735.37	15,191.59	25.63	9.90	24.57
	30-Sep-14 12:37:00	1,735.09	15,207.36	25.59	9.83	24.63
	30-Sep-14 12:38:00	1,735.47	15,222.78	25.66	9.81	24.76
	30-Sep-14 12:39:00	1,736.07	15,198.78	25.63	9.79	24.66
	30-Sep-14 12:40:00	1,736.46	15,188.22	25.41	9.89	24.67
	30-Sep-14 12:41:00	1,735.12	15,190.55	25.58	9.88	24.87
Start Run 2	30-Sep-14 12:42:00	1,734.88	15,235.25	25.59	9.75	24.75
	30-Sep-14 12:43:00	1,734.32	15,209.89	19.37	9.72	24.76
	30-Sep-14 12:44:00	1,734.86	15,206.32	24.14	9.79	24.78
	30-Sep-14 12:45:00	1,725.56	15,225.51	25.20	9.83	24.60
	30-Sep-14 12:46:00	1,724.38	15,209.91	26.05	9.92	24.71
	30-Sep-14 12:47:00	1,724.38	15,228.79	28.35	9.92	24.67
	30-Sep-14 12:48:00	1,739.30	15,202.30	26.94	9.91	24.71
	30-Sep-14 12:49:00	1,739.30	15,209.58	26.52	9.89	24.77
	30-Sep-14 12:50:00	1,746.11	15,184.74	26.36	9.97	24.76
	30-Sep-14 12:51:00	1,749.71	15,178.40	25.91	9.90	24.79
	30-Sep-14 12:52:00	1,751.28	15,157.68	24.89	9.77	24.83
	30-Sep-14 12:53:00	1,749.48	15,182.80	25.45	9.84	24.71
	30-Sep-14 12:54:00	1,745.51	15,200.61	25.59	9.83	24.76
	30-Sep-14 12:55:00	1,743.09	15,187.30	25.58	9.90	24.73
	30-Sep-14 12:56:00	1,741.99	15,188.00	25.63	9.92	24.67
	30-Sep-14 12:57:00	1,740.66	15,208.30	25.63	9.88	24.62
	30-Sep-14 12:58:00	1,740.66	15,205.60	25.62	9.89	24.69

	Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
	KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
30-Sep-14 12:59:00	1,738.69	15,170.27	25.63	9.87	24.57
30-Sep-14 13:00:00	1,737.35	15,152.77	25.65	9.75	24.56
30-Sep-14 13:01:00	1,736.33	15,207.47	25.58	9.84	24.51
30-Sep-14 13:02:00	1,736.27	15,188.27	25.63	9.99	24.34
30-Sep-14 13:03:00	1,737.18	15,159.50	25.59	9.93	24.49
30-Sep-14 13:04:00	1,736.95	15,192.09	26.22	9.92	24.53
30-Sep-14 13:05:00	1,735.48	15,169.57	26.00	9.88	24.59
30-Sep-14 13:06:00	1,735.37	15,202.20	25.62	9.95	24.56
30-Sep-14 13:07:00	1,737.90	15,155.96	25.60	9.93	24.53
30-Sep-14 13:08:00	1,740.62	15,167.86	25.63	10.07	24.52
30-Sep-14 13:09:00	1,741.44	15,171.30	25.85	10.13	24.50
30-Sep-14 13:10:00	1,740.29	15,166.10	25.66	10.18	24.39
30-Sep-14 13:11:00	1,740.70	15,178.45	25.63	10.19	24.57
30-Sep-14 13:12:00	1,739.82	15,162.58	25.63	10.10	24.48
30-Sep-14 13:13:00	1,739.36	15,152.82	25.66	10.14	24.50
30-Sep-14 13:14:00	1,740.24	15,158.95	25.63	10.11	24.57
30-Sep-14 13:15:00	1,740.63	15,190.20	25.78	10.11	24.54
30-Sep-14 13:16:00	1,739.44	15,150.92	25.82	10.11	24.46
30-Sep-14 13:17:00	1,738.80	15,163.17	25.85	10.06	24.48
30-Sep-14 13:18:00	1,740.86	15,170.19	25.87	10.15	24.49
30-Sep-14 13:19:00	1,742.80	15,161.53	25.81	10.11	24.57
30-Sep-14 13:20:00	1,744.60	15,139.46	25.74	10.07	24.56
30-Sep-14 13:21:00	1,745.55	15,152.84	25.83	10.06	24.62
30-Sep-14 13:22:00	1,745.37	15,123.88	22.85	10.00	24.57
30-Sep-14 13:23:00	1,743.50	15,174.55	25.07	10.15	24.60
30-Sep-14 13:24:00	1,738.94	15,180.28	27.98	10.09	24.58
30-Sep-14 13:25:00	1,735.22	15,145.84	26.29	10.06	24.57
30-Sep-14 13:26:00	1,741.32	15,186.15	25.83	10.12	24.57
30-Sep-14 13:27:00	1,746.00	15,155.38	25.57	10.09	24.59
30-Sep-14 13:28:00	1,745.89	15,196.36	25.80	10.15	24.57
30-Sep-14 13:29:00	1,743.95	15,185.21	25.80	10.15	24.49
30-Sep-14 13:30:00	1,743.79	15,151.07	24.67	10.08	24.62
30-Sep-14 13:31:00	1,743.99	15,170.48	25.61	10.11	24.62
30-Sep-14 13:32:00	1,742.34	15,148.36	25.83	10.10	24.57
30-Sep-14 13:33:00	1,741.08	15,156.16	25.72	10.03	24.51
30-Sep-14 13:34:00	1,740.09	15,164.34	25.73	10.11	24.62
30-Sep-14 13:35:00	1,741.08	15,174.54	26.14	10.06	24.52
30-Sep-14 13:36:00	1,740.97	15,182.11	25.85	10.05	24.57
30-Sep-14 13:37:00	1,741.48	15,212.04	25.67	10.11	24.57
30-Sep-14 13:38:00	1,741.47	15,197.67	25.66	10.00	24.42
30-Sep-14 13:39:00	1,742.18	15,195.21	25.65	9.97	24.57
30-Sep-14 13:40:00	1,743.62	15,171.05	25.90	9.97	24.59
30-Sep-14 13:41:00	1,743.32	15,182.57	25.79	9.89	24.57
30-Sep-14 13:42:00	1,742.42	15,135.76	25.74	9.97	24.44
30-Sep-14 13:43:00	1,743.89	15,178.51	25.63	9.97	24.47
30-Sep-14 13:44:00	1,744.34	15,140.56	25.72	9.92	24.44
30-Sep-14 13:45:00	1,744.41	15,133.83	25.69	9.93	24.53
30-Sep-14 13:46:00	1,742.55	15,122.25	25.67	10.01	24.62

		Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
		KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
	30-Sep-14 13:47:00	1,740.83	15,162.51	25.53	9.92	24.57
	30-Sep-14 13:48:00	1,740.84	15,209.88	25.49	9.89	24.39
	30-Sep-14 13:49:00	1,740.88	15,187.41	25.47	9.58	24.35
	30-Sep-14 13:50:00	1,739.50	15,159.04	25.33	9.87	24.40
	30-Sep-14 13:51:00	1,738.76	15,185.97	25.50	9.86	24.60
	30-Sep-14 13:52:00	1,737.83	15,181.38	25.84	9.82	24.54
	30-Sep-14 13:53:00	1,737.91	15,191.21	26.03	9.83	24.48
	30-Sep-14 13:54:00	1,737.31	15,165.23	25.68	9.79	24.53
	30-Sep-14 13:55:00	1,738.21	15,165.57	25.93	9.79	24.53
	30-Sep-14 13:56:00	1,740.88	15,155.00	25.92	9.92	24.47
	30-Sep-14 13:57:00	1,742.79	15,209.55	25.91	9.79	24.57
	30-Sep-14 13:58:00	1,742.91	15,175.46	25.89	9.88	24.54
	30-Sep-14 13:59:00	1,742.92	15,206.25	25.95	9.91	24.44
	30-Sep-14 14:00:00	1,742.32	15,195.95	25.72	9.85	24.57
	30-Sep-14 14:01:00	1,741.56	15,158.39	25.67	9.90	24.47
	30-Sep-14 14:02:00	1,740.98	15,153.79	25.72	9.79	24.42
	30-Sep-14 14:03:00	1,741.64	15,171.00	25.65	9.77	24.53
	30-Sep-14 14:04:00	1,741.59	15,195.26	25.61	9.97	24.57
	30-Sep-14 14:05:00	1,740.41	15,185.02	25.58	9.96	24.61
	30-Sep-14 14:06:00	1,739.96	15,190.61	25.51	10.04	24.44
	30-Sep-14 14:07:00	1,739.94	15,196.70	25.63	10.02	24.44
	30-Sep-14 14:08:00	1,739.81	15,372.05	25.40	10.13	24.56
	30-Sep-14 14:09:00	1,737.96	15,333.29	25.72	10.08	24.47
	30-Sep-14 14:10:00	1,737.64	15,339.79	25.50	9.98	24.44
	30-Sep-14 14:11:00	1,737.97	15,269.99	25.42	10.02	24.53
Pause for Port	30-Sep-14 14:12:00	1,738.57	15,170.48	27.13	9.95	24.53
	30-Sep-14 14:13:00	1,739.09	15,137.71	25.99	10.02	24.57
	30-Sep-14 14:14:00	1,738.61	15,149.23	25.81	9.91	24.62
	30-Sep-14 14:15:00	1,740.83	15,174.50	25.79	10.04	24.49
	30-Sep-14 14:16:00	1,741.61	15,155.51	25.89	9.92	24.57
	30-Sep-14 14:17:00	1,741.70	15,149.93	25.63	9.81	24.62
	30-Sep-14 14:18:00	1,742.59	15,144.37	25.70	9.83	24.44
Resume	30-Sep-14 14:19:00	1,742.67	15,170.70	25.76	9.88	24.51
	30-Sep-14 14:20:00	1,741.57	15,158.57	25.72	9.88	24.48
	30-Sep-14 14:21:00	1,740.41	15,143.86	25.85	9.75	24.62
	30-Sep-14 14:22:00	1,740.09	15,127.39	25.74	10.13	24.49
	30-Sep-14 14:23:00	1,741.59	15,156.44	25.64	10.10	24.40
	30-Sep-14 14:24:00	1,742.52	15,147.33	25.63	10.10	24.57
	30-Sep-14 14:25:00	1,742.68	15,174.92	25.53	10.11	24.48
	30-Sep-14 14:26:00	1,742.89	15,171.74	25.54	10.00	24.48
	30-Sep-14 14:27:00	1,743.27	15,164.48	25.58	10.02	24.44
	30-Sep-14 14:28:00	1,741.72	15,134.86	25.49	10.02	24.53
	30-Sep-14 14:29:00	1,741.15	15,138.21	25.35	9.97	24.47
	30-Sep-14 14:30:00	1,740.22	15,167.46	25.53	9.98	24.44
	30-Sep-14 14:31:00	1,740.36	15,148.25	25.53	10.03	24.47
	30-Sep-14 14:32:00	1,740.26	15,135.30	25.53	10.02	24.53
	30-Sep-14 14:33:00	1,739.92	15,158.54	25.49	9.92	24.53
	30-Sep-14 14:34:00	1,740.36	15,161.38	25.28	10.02	24.51

	Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
	KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
30-Sep-14 14:35:00	1,741.14	15,166.71	25.35	9.96	24.49
30-Sep-14 14:36:00	1,740.07	15,176.63	25.56	9.94	24.41
30-Sep-14 14:37:00	1,738.41	15,154.05	25.74	9.99	24.60
30-Sep-14 14:38:00	1,739.13	15,149.47	25.81	10.07	24.65
30-Sep-14 14:39:00	1,740.52	15,167.22	25.80	10.06	24.48
30-Sep-14 14:40:00	1,740.35	15,141.59	25.48	9.94	24.57
30-Sep-14 14:41:00	1,739.66	15,149.71	26.05	9.96	24.57
30-Sep-14 14:42:00	1,740.19	15,149.41	25.66	9.97	24.53
30-Sep-14 14:43:00	1,741.75	15,164.81	25.93	9.99	24.48
30-Sep-14 14:44:00	1,743.70	15,169.13	25.95	9.99	24.57
30-Sep-14 14:45:00	1,745.40	15,133.27	25.63	10.00	24.48
30-Sep-14 14:46:00	1,746.00	15,122.27	26.00	9.97	24.44
30-Sep-14 14:47:00	1,745.88	15,174.52	25.81	9.98	24.48
30-Sep-14 14:48:00	1,746.85	15,155.31	25.89	9.92	24.50
30-Sep-14 14:49:00	1,746.64	15,139.00	25.67	10.08	24.49
30-Sep-14 14:50:00	1,745.88	15,127.65	25.58	9.87	24.46
30-Sep-14 14:51:00	1,745.43	15,141.87	25.59	9.85	24.42
30-Sep-14 14:52:00	1,745.29	15,138.67	25.40	9.96	24.53
30-Sep-14 14:53:00	1,744.30	15,169.29	25.36	9.83	24.57
30-Sep-14 14:54:00	1,742.56	15,170.30	25.58	9.84	24.59
30-Sep-14 14:55:00	1,741.86	15,133.85	25.54	9.91	24.53
30-Sep-14 14:56:00	1,741.46	15,166.97	25.57	10.07	24.62
30-Sep-14 14:57:00	1,741.37	15,129.67	25.53	10.02	24.45
30-Sep-14 14:58:00	1,741.45	15,149.09	25.45	9.83	24.62
30-Sep-14 14:59:00	1,743.14	15,126.79	25.61	9.74	24.56
30-Sep-14 15:00:00	1,743.93	15,149.51	25.53	9.70	24.48
30-Sep-14 15:01:00	1,744.81	15,150.32	25.76	9.86	24.59
30-Sep-14 15:02:00	1,744.78	15,136.06	25.67	9.79	24.55
30-Sep-14 15:03:00	1,744.02	15,130.31	25.61	9.98	24.61
30-Sep-14 15:04:00	1,744.22	15,150.92	25.78	10.07	24.59
30-Sep-14 15:05:00	1,744.55	15,194.83	25.63	10.11	24.55
30-Sep-14 15:06:00	1,744.69	15,152.47	25.80	10.08	24.59
30-Sep-14 15:07:00	1,745.67	15,140.08	25.85	10.06	24.53
30-Sep-14 15:08:00	1,745.14	15,094.17	25.75	10.09	24.59
30-Sep-14 15:09:00	1,743.74	15,130.27	25.81	10.03	24.55
30-Sep-14 15:10:00	1,744.52	15,129.11	25.49	10.11	24.53
30-Sep-14 15:11:00	1,745.84	15,147.59	25.60	10.35	24.48
30-Sep-14 15:12:00	1,745.15	15,137.11	25.64	10.21	24.59
30-Sep-14 15:13:00	1,745.73	15,113.78	26.00	10.11	24.62
30-Sep-14 15:14:00	1,747.45	15,144.02	25.54	10.02	24.66
30-Sep-14 15:15:00	1,747.15	15,125.47	25.52	10.14	24.57
30-Sep-14 15:16:00	1,746.04	15,111.46	25.58	10.15	24.55
30-Sep-14 15:17:00	1,747.00	15,122.22	25.44	10.12	24.62
30-Sep-14 15:18:00	1,748.26	15,105.38	25.52	10.10	24.40
30-Sep-14 15:19:00	1,748.57	15,114.78	25.38	9.98	24.42
30-Sep-14 15:20:00	1,748.37	15,168.74	25.58	9.96	24.56
30-Sep-14 15:21:00	1,747.50	15,164.40	25.56	10.11	24.44
30-Sep-14 15:22:00	1,747.18	15,158.25	25.59	10.01	24.48

		Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
		KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
	30-Sep-14 15:23:00	1,748.04	15,149.20	26.08	10.15	24.46
	30-Sep-14 15:24:00	1,747.87	15,149.20	25.88	10.04	24.53
	30-Sep-14 15:25:00	1,746.81	15,139.49	26.06	10.10	24.52
	30-Sep-14 15:26:00	1,747.20	15,101.30	25.71	10.13	24.48
	30-Sep-14 15:27:00	1,748.71	15,105.71	25.74	10.09	24.51
	30-Sep-14 15:28:00	1,750.56	15,129.28	25.70	10.06	24.44
	30-Sep-14 15:29:00	1,750.25	15,141.44	25.66	10.01	24.43
	30-Sep-14 15:30:00	1,750.53	15,109.78	25.67	10.08	24.55
	30-Sep-14 15:31:00	1,749.58	15,130.79	25.61	10.06	24.57
	30-Sep-14 15:32:00	1,748.57	15,129.62	25.61	9.99	24.48
	30-Sep-14 15:33:00	1,747.97	15,158.10	25.67	10.13	24.44
	30-Sep-14 15:34:00	1,747.52	15,155.05	25.67	9.93	24.44
	30-Sep-14 15:35:00	1,746.51	15,169.73	25.34	10.06	24.44
	30-Sep-14 15:36:00	1,746.40	15,150.75	25.42	10.02	24.44
	30-Sep-14 15:37:00	1,746.35	15,133.89	25.49	10.02	24.44
	30-Sep-14 15:38:00	1,744.93	15,135.57	25.72	10.02	24.48
	30-Sep-14 15:39:00	1,744.23	15,124.04	25.67	10.02	24.44
	30-Sep-14 15:40:00	1,744.54	15,128.88	25.70	10.10	24.44
	30-Sep-14 15:41:00	1,744.96	15,106.95	25.73	10.06	24.62
	30-Sep-14 15:42:00	1,746.38	15,093.40	25.65	10.15	24.48
	30-Sep-14 15:43:00	1,747.48	15,089.36	25.49	10.25	24.63
	30-Sep-14 15:44:00	1,747.98	15,084.71	25.49	9.99	24.69
	30-Sep-14 15:45:00	1,748.53	15,102.72	25.36	10.13	24.67
	30-Sep-14 15:46:00	1,748.53	15,124.39	25.97	10.05	24.76
	30-Sep-14 15:47:00	1,748.54	15,134.63	25.89	10.06	24.78
	30-Sep-14 15:48:00	1,749.25	15,149.51	25.76	10.09	24.66
End Run 2	30-Sep-14 15:49:00	1,749.92	15,138.88	25.99	10.06	24.48
	30-Sep-14 15:50:00	1,749.58	15,128.81	25.61	10.04	24.66
	30-Sep-14 15:51:00	1,750.34	15,106.31	25.53	10.14	24.48
	30-Sep-14 15:52:00	1,750.26	15,123.75	25.51	10.12	24.48
	30-Sep-14 15:53:00	1,750.37	15,104.90	25.51	10.03	24.59
	30-Sep-14 15:54:00	1,749.84	15,121.82	25.44	10.04	24.39
	30-Sep-14 15:55:00	1,748.16	15,105.71	25.19	10.07	24.48
	30-Sep-14 15:56:00	1,747.47	15,105.06	25.95	10.38	24.44
	30-Sep-14 15:57:00	1,747.48	15,098.99	25.87	10.07	24.48
	30-Sep-14 15:58:00	1,748.43	15,105.60	25.81	10.22	24.46
	30-Sep-14 15:59:00	1,749.04	15,066.31	25.83	10.19	24.49
	30-Sep-14 16:00:00	1,750.59	15,069.93	25.87	10.28	24.48
	30-Sep-14 16:01:00	1,752.44	15,047.95	25.80	10.14	24.46
	30-Sep-14 16:02:00	1,753.09	15,022.69	25.78	10.11	24.43
	30-Sep-14 16:03:00	1,753.04	15,051.86	25.74	10.11	24.39
	30-Sep-14 16:04:00	1,753.83	15,052.14	25.82	10.12	24.42
	30-Sep-14 16:05:00	1,753.51	15,039.28	25.76	10.10	24.44
Start Run 3	30-Sep-14 16:06:00	1,752.25	15,016.26	24.64	10.03	24.39
	30-Sep-14 16:07:00	1,753.13	15,027.88	26.05	9.99	24.44
	30-Sep-14 16:08:00	1,753.21	15,008.21	25.39	10.16	24.42
	30-Sep-14 16:09:00	1,752.65	15,042.49	25.20	10.15	24.56
	30-Sep-14 16:10:00	1,752.62	15,006.59	24.97	10.02	24.34

	Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
	KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
30-Sep-14 16:11:00	1,750.83	15,011.11	25.08	9.91	24.56
30-Sep-14 16:12:00	1,748.56	15,035.61	24.98	10.00	24.55
30-Sep-14 16:13:00	1,748.14	15,037.92	25.08	9.87	24.57
30-Sep-14 16:14:00	1,747.73	15,027.05	25.03	9.94	24.47
30-Sep-14 16:15:00	1,747.21	15,033.07	25.17	9.87	24.51
30-Sep-14 16:16:00	1,745.99	15,022.46	24.98	9.80	24.64
30-Sep-14 16:17:00	1,745.50	15,031.05	25.06	9.88	24.53
30-Sep-14 16:18:00	1,745.48	15,028.93	24.99	9.83	24.53
30-Sep-14 16:19:00	1,744.45	15,016.17	24.94	9.72	24.62
30-Sep-14 16:20:00	1,742.12	15,007.82	24.92	9.79	24.66
30-Sep-14 16:21:00	1,740.51	15,061.49	24.82	9.89	24.70
30-Sep-14 16:22:00	1,739.98	15,027.72	24.48	9.53	24.62
30-Sep-14 16:23:00	1,741.13	15,051.00	24.57	9.86	24.70
30-Sep-14 16:24:00	1,739.91	15,029.40	24.72	9.75	24.69
30-Sep-14 16:25:00	1,738.24	15,034.60	24.90	9.68	24.71
30-Sep-14 16:26:00	1,736.90	15,133.22	24.88	10.02	24.77
30-Sep-14 16:27:00	1,735.73	15,225.80	24.92	10.73	24.69
30-Sep-14 16:28:00	1,736.70	15,223.91	24.98	10.75	24.72
30-Sep-14 16:29:00	1,738.24	15,209.46	25.03	10.85	24.67
30-Sep-14 16:30:00	1,739.27	15,203.21	25.01	10.78	23.86
30-Sep-14 16:31:00	1,741.06	15,256.79	21.24	10.79	28.20
30-Sep-14 16:32:00	1,742.32	15,270.37	23.54	10.77	25.45
30-Sep-14 16:33:00	1,740.78	15,246.32	24.51	10.65	24.95
30-Sep-14 16:34:00	1,736.53	15,267.83	24.73	10.68	24.74
30-Sep-14 16:35:00	1,735.09	15,235.28	24.75	10.61	24.66
30-Sep-14 16:36:00	1,734.62	15,223.33	24.85	10.72	24.71
30-Sep-14 16:37:00	1,735.90	15,224.17	24.87	10.75	24.71
30-Sep-14 16:38:00	1,737.29	15,241.07	24.77	10.71	24.76
30-Sep-14 16:39:00	1,739.61	15,242.75	24.80	10.83	24.74
30-Sep-14 16:40:00	1,740.22	15,244.59	24.79	10.45	24.75
30-Sep-14 16:41:00	1,740.05	15,204.49	24.80	10.77	24.76
30-Sep-14 16:42:00	1,739.19	15,198.59	24.80	10.70	24.78
30-Sep-14 16:43:00	1,739.74	15,237.97	24.85	10.78	24.77
30-Sep-14 16:44:00	1,739.91	15,258.64	24.81	10.79	24.75
30-Sep-14 16:45:00	1,739.63	15,250.03	24.79	10.78	24.76
30-Sep-14 16:46:00	1,739.06	15,235.78	24.85	10.69	24.74
30-Sep-14 16:47:00	1,739.31	15,250.88	24.78	10.60	24.71
30-Sep-14 16:48:00	1,740.35	15,242.33	24.78	10.59	24.66
30-Sep-14 16:49:00	1,740.85	15,224.17	24.77	10.38	24.71
30-Sep-14 16:50:00	1,740.85	15,248.58	25.21	10.58	24.77
30-Sep-14 16:51:00	1,740.43	15,211.67	24.86	10.48	24.75
30-Sep-14 16:52:00	1,740.77	15,224.01	24.88	10.80	24.77
30-Sep-14 16:53:00	1,740.43	15,234.58	24.98	10.77	24.82
30-Sep-14 16:54:00	1,739.18	15,244.73	25.23	10.77	24.84
30-Sep-14 16:55:00	1,738.98	15,285.22	25.37	10.89	24.66
30-Sep-14 16:56:00	1,739.37	15,245.50	25.08	10.79	24.64
30-Sep-14 16:57:00	1,740.69	15,258.91	24.84	10.86	24.72
30-Sep-14 16:58:00	1,742.72	15,254.89	24.85	10.77	24.70

		Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
		KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
	30-Sep-14 16:59:00	1,741.96	15,247.05	24.86	10.76	24.65
	30-Sep-14 17:00:00	1,741.46	15,244.57	24.94	10.96	24.59
	30-Sep-14 17:01:00	1,740.82	15,236.65	24.97	10.84	24.66
	30-Sep-14 17:02:00	1,739.95	15,263.69	24.94	10.82	24.58
	30-Sep-14 17:03:00	1,740.62	15,279.26	24.90	10.84	24.60
	30-Sep-14 17:04:00	1,740.34	15,262.80	24.90	10.83	24.57
	30-Sep-14 17:05:00	1,739.31	15,266.14	24.96	10.85	24.58
	30-Sep-14 17:06:00	1,739.64	15,221.54	24.90	10.72	24.65
	30-Sep-14 17:07:00	1,739.58	15,287.42	24.93	10.73	24.62
	30-Sep-14 17:08:00	1,739.42	15,260.55	24.88	10.89	24.66
	30-Sep-14 17:09:00	1,738.88	15,258.49	24.85	10.85	24.66
	30-Sep-14 17:10:00	1,739.25	15,266.97	24.97	10.84	24.62
	30-Sep-14 17:11:00	1,741.37	15,230.41	24.89	10.96	24.58
	30-Sep-14 17:12:00	1,741.68	15,248.37	24.96	10.96	24.57
	30-Sep-14 17:13:00	1,741.20	15,247.97	24.94	10.89	24.60
	30-Sep-14 17:14:00	1,741.40	15,255.51	24.89	10.97	24.59
	30-Sep-14 17:15:00	1,740.81	15,270.28	24.80	10.89	24.62
	30-Sep-14 17:16:00	1,739.98	15,234.17	24.79	10.92	24.62
	30-Sep-14 17:17:00	1,740.70	15,266.01	24.85	10.93	24.60
	30-Sep-14 17:18:00	1,740.54	15,260.03	24.84	10.83	24.54
	30-Sep-14 17:19:00	1,740.04	15,232.65	24.82	11.09	24.53
	30-Sep-14 17:20:00	1,740.04	15,274.29	24.78	10.89	24.63
	30-Sep-14 17:21:00	1,739.81	15,270.45	24.85	10.93	24.63
	30-Sep-14 17:22:00	1,739.79	15,301.78	24.83	10.78	24.58
	30-Sep-14 17:23:00	1,739.14	15,251.53	24.54	10.89	24.63
	30-Sep-14 17:24:00	1,738.61	15,273.17	24.75	10.98	24.60
	30-Sep-14 17:25:00	1,738.44	15,245.69	25.09	10.96	24.62
	30-Sep-14 17:26:00	1,737.63	15,272.36	25.08	10.89	24.62
	30-Sep-14 17:27:00	1,737.80	15,260.96	25.11	10.87	24.59
	30-Sep-14 17:28:00	1,739.40	15,248.31	25.12	10.89	24.59
	30-Sep-14 17:29:00	1,740.09	15,280.01	25.12	10.90	24.62
	30-Sep-14 17:30:00	1,739.90	15,305.57	25.15	10.75	24.53
	30-Sep-14 17:31:00	1,740.12	15,284.28	25.08	10.79	24.57
	30-Sep-14 17:32:00	1,740.99	15,256.06	25.11	10.91	24.59
	30-Sep-14 17:33:00	1,741.55	15,260.04	25.14	10.81	24.61
	30-Sep-14 17:34:00	1,742.11	15,264.62	25.11	10.84	24.57
	30-Sep-14 17:35:00	1,742.78	15,253.70	24.98	10.90	24.66
Pause for Port	30-Sep-14 17:36:00	1,743.03	15,297.97	25.01	10.76	24.53
	30-Sep-14 17:37:00	1,742.38	15,327.59	24.85	10.75	24.58
	30-Sep-14 17:38:00	1,742.67	15,262.34	24.84	11.00	24.69
	30-Sep-14 17:39:00	1,742.22	15,304.00	24.80	10.84	24.65
	30-Sep-14 17:40:00	1,742.17	15,251.82	24.48	10.97	24.62
	30-Sep-14 17:41:00	1,741.61	15,218.42	24.48	10.89	24.79
Resume	30-Sep-14 17:42:00	1,741.47	15,262.10	24.75	10.76	24.71
	30-Sep-14 17:43:00	1,740.55	15,262.30	24.77	10.74	24.76
	30-Sep-14 17:44:00	1,739.35	15,266.07	24.80	10.84	24.61
	30-Sep-14 17:45:00	1,738.99	15,221.66	24.71	11.21	24.57
	30-Sep-14 17:46:00	1,739.14	15,251.83	24.65	10.84	24.64

	Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
	KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
30-Sep-14 17:47:00	1,739.22	15,252.32	24.85	10.92	24.66
30-Sep-14 17:48:00	1,738.95	15,291.87	24.89	10.84	24.66
30-Sep-14 17:49:00	1,739.11	15,283.82	24.76	10.92	24.69
30-Sep-14 17:50:00	1,739.14	15,268.50	25.25	10.87	24.67
30-Sep-14 17:51:00	1,738.31	15,276.91	25.48	10.84	24.70
30-Sep-14 17:52:00	1,737.75	15,273.37	25.14	10.88	24.69
30-Sep-14 17:53:00	1,738.43	15,264.05	25.12	10.86	24.69
30-Sep-14 17:54:00	1,739.30	15,299.56	25.12	10.82	24.67
30-Sep-14 17:55:00	1,739.89	15,270.46	25.10	10.88	24.71
30-Sep-14 17:56:00	1,740.67	15,280.46	25.05	10.87	24.78
30-Sep-14 17:57:00	1,741.37	15,253.26	25.03	10.89	24.66
30-Sep-14 17:58:00	1,741.56	15,261.49	24.70	10.87	24.64
30-Sep-14 17:59:00	1,741.45	15,303.80	24.78	10.97	24.62
30-Sep-14 18:00:00	1,740.47	15,269.57	24.95	10.93	24.66
30-Sep-14 18:01:00	1,739.39	15,256.23	25.00	10.83	24.62
30-Sep-14 18:02:00	1,739.25	15,282.33	24.94	10.92	24.74
30-Sep-14 18:03:00	1,740.36	15,281.12	24.98	10.84	24.74
30-Sep-14 18:04:00	1,741.26	15,270.90	24.98	10.90	24.67
30-Sep-14 18:05:00	1,741.50	15,288.24	25.98	10.88	24.75
30-Sep-14 18:06:00	1,742.29	15,266.79	25.07	11.01	24.66
30-Sep-14 18:07:00	1,743.32	15,252.47	25.06	10.91	24.66
30-Sep-14 18:08:00	1,743.96	15,239.02	25.00	11.29	24.66
30-Sep-14 18:09:00	1,743.79	15,265.85	24.64	10.92	24.68
30-Sep-14 18:10:00	1,742.93	15,278.60	25.17	10.87	24.68
30-Sep-14 18:11:00	1,742.82	15,271.33	25.31	10.92	24.66
30-Sep-14 18:12:00	1,743.32	15,294.79	25.17	11.03	24.70
30-Sep-14 18:13:00	1,743.54	15,243.95	25.07	10.85	24.66
30-Sep-14 18:14:00	1,743.48	15,283.46	24.98	10.86	24.70
30-Sep-14 18:15:00	1,742.79	15,273.37	25.00	10.77	24.75
30-Sep-14 18:16:00	1,741.36	15,310.17	26.09	10.76	24.72
30-Sep-14 18:17:00	1,740.52	15,270.49	24.33	10.78	24.66
30-Sep-14 18:18:00	1,738.30	15,327.17	24.44	10.79	24.66
30-Sep-14 18:19:00	1,738.68	15,296.69	24.76	10.75	24.62
30-Sep-14 18:20:00	1,738.77	15,259.07	24.09	10.71	24.71
30-Sep-14 18:21:00	1,738.44	15,268.72	25.56	10.73	24.71
30-Sep-14 18:22:00	1,737.83	15,285.17	25.08	10.73	24.67
30-Sep-14 18:23:00	1,737.26	15,283.13	24.94	10.80	24.71
30-Sep-14 18:24:00	1,738.29	15,316.44	24.93	10.68	24.71
30-Sep-14 18:25:00	1,738.90	15,316.50	24.92	10.75	24.71
30-Sep-14 18:26:00	1,739.04	15,303.29	24.58	10.75	24.79
30-Sep-14 18:27:00	1,738.99	15,302.46	24.54	10.77	24.76
30-Sep-14 18:28:00	1,738.37	15,337.51	24.73	10.77	24.70
30-Sep-14 18:29:00	1,736.56	15,328.38	24.67	10.83	24.71
30-Sep-14 18:30:00	1,735.77	15,319.09	24.71	10.65	24.79
30-Sep-14 18:31:00	1,734.74	15,325.92	24.80	10.57	24.70
30-Sep-14 18:32:00	1,734.13	15,290.33	24.98	10.50	24.66
30-Sep-14 18:33:00	1,734.35	15,317.25	24.90	10.57	24.63
30-Sep-14 18:34:00	1,735.63	15,281.08	24.91	10.48	24.73

		Combustion Chamber Temperature	Combustion Gas Flowrate	Mixed Solvent Waste Feedrate	Spike Feedrate	Waste EDA Feedrate
		KTY3104m ° F	KFT3552m dscfm	KFT3083c lb/min	KFT3091c lb/min	KFT3076c lb/min
	30-Sep-14 18:35:00	1,736.58	15,346.90	25.03	10.68	24.64
	30-Sep-14 18:36:00	1,736.18	15,336.14	24.98	10.54	24.67
	30-Sep-14 18:37:00	1,735.54	15,344.59	25.21	10.70	24.74
	30-Sep-14 18:38:00	1,736.26	15,331.42	25.23	10.62	24.66
	30-Sep-14 18:39:00	1,736.65	15,294.84	25.08	10.47	24.62
	30-Sep-14 18:40:00	1,737.40	15,312.25	25.07	10.73	24.79
	30-Sep-14 18:41:00	1,736.17	15,318.38	25.08	10.69	24.80
	30-Sep-14 18:42:00	1,735.95	15,304.11	24.94	10.73	24.74
	30-Sep-14 18:43:00	1,736.28	15,335.84	24.98	10.78	24.71
	30-Sep-14 18:44:00	1,736.73	15,358.65	24.98	10.55	24.71
	30-Sep-14 18:45:00	1,736.06	15,305.99	24.94	10.46	24.71
	30-Sep-14 18:46:00	1,735.80	15,327.10	24.98	10.64	24.71
	30-Sep-14 18:47:00	1,735.52	15,295.65	24.98	10.52	24.69
	30-Sep-14 18:48:00	1,735.91	15,340.19	24.97	10.50	24.73
	30-Sep-14 18:49:00	1,735.41	15,336.48	24.94	10.45	24.79
	30-Sep-14 18:50:00	1,734.32	15,336.58	24.91	10.66	24.76
	30-Sep-14 18:51:00	1,735.07	15,342.62	24.94	10.35	24.76
	30-Sep-14 18:52:00	1,735.43	15,317.08	25.08	10.74	24.77
	30-Sep-14 18:53:00	1,734.68	15,350.29	25.47	10.87	24.71
	30-Sep-14 18:54:00	1,734.76	15,352.86	25.15	10.97	24.67
	30-Sep-14 18:55:00	1,736.99	15,346.69	24.50	10.87	24.64
	30-Sep-14 18:56:00	1,738.22	15,365.92	25.33	10.86	24.60
	30-Sep-14 18:57:00	1,737.05	15,328.37	25.37	10.77	24.62
	30-Sep-14 18:58:00	1,735.64	15,352.60	25.01	10.71	24.54
	30-Sep-14 18:59:00	1,736.00	15,373.34	21.92	10.90	24.53
	30-Sep-14 19:00:00	1,736.66	15,331.21	25.06	10.76	24.61
	30-Sep-14 19:01:00	1,735.93	15,356.20	25.04	10.84	24.57
	30-Sep-14 19:02:00	1,734.31	15,355.41	25.12	10.83	24.60
	30-Sep-14 19:03:00	1,733.43	15,359.71	25.06	10.84	24.56
	30-Sep-14 19:04:00	1,734.81	15,368.65	25.04	10.83	24.62
	30-Sep-14 19:05:00	1,735.31	15,360.60	24.98	10.84	24.57
	30-Sep-14 19:06:00	1,735.58	15,375.56	24.98	10.82	24.54
	30-Sep-14 19:07:00	1,736.09	15,338.52	24.53	10.85	24.49
	30-Sep-14 19:08:00	1,736.20	15,360.58	24.76	11.22	24.54
	30-Sep-14 19:09:00	1,735.03	15,393.56	24.83	10.97	24.55
	30-Sep-14 19:10:00	1,734.64	15,362.35	25.01	11.09	24.55
	30-Sep-14 19:11:00	1,735.00	15,370.24	25.02	10.97	24.49
End Run 3	30-Sep-14 19:12:00	1,734.92	15,357.87	25.03	10.88	24.48

		Fuel Feedrate	THC	THC, HRA	Oxygen
		KFT3062c	KAT3271m	*Calculated*	CEMS
		lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
	Maximum	0.00	0.00	0.00	14.17
Run 1	Average	0.00	0.00	0.00	13.87
	Minimum	0.00	0.00	0.00	13.48
	Maximum	0.00	0.00	0.00	14.07
Run 2	Average	0.00	0.00	0.00	13.77
	Minimum	0.00	0.00	0.00	13.39
	Maximum	0.00	0.00	0.00	14.10
Run 3	Average	0.00	0.00	0.00	13.82
	Minimum	0.00	0.00	0.00	13.70
Start Run 1	30-Sep-14 09:11:00	0.00	0.00		
	30-Sep-14 09:12:00	0.00	0.00		13.94
	30-Sep-14 09:13:00	0.00	0.00		13.94
	30-Sep-14 09:14:00	0.00	0.00		13.93
	30-Sep-14 09:15:00	0.00	0.00		13.93
	30-Sep-14 09:16:00	0.00	0.00		13.93
	30-Sep-14 09:17:00	0.00	0.00		13.92
	30-Sep-14 09:18:00	0.00	0.00		13.94
	30-Sep-14 09:19:00	0.00	0.00		13.97
	30-Sep-14 09:20:00	0.00	0.00		14.01
	30-Sep-14 09:21:00	0.00	0.00		14.00
	30-Sep-14 09:22:00	0.00	0.00		13.90
	30-Sep-14 09:23:00	0.00	0.00		13.90
	30-Sep-14 09:24:00	0.00	0.00		13.91
	30-Sep-14 09:25:00	0.00	0.00		13.89
	30-Sep-14 09:26:00	0.00	0.00		13.89
	30-Sep-14 09:27:00	0.00	0.00		13.90
	30-Sep-14 09:28:00	0.00	0.00		13.91
	30-Sep-14 09:29:00	0.00	0.00		13.92
	30-Sep-14 09:30:00	0.00	0.00		13.93
	30-Sep-14 09:31:00	0.00	0.00		13.93
	30-Sep-14 09:32:00	0.00	0.00		13.92
	30-Sep-14 09:33:00	0.00	0.00		13.92
	30-Sep-14 09:34:00	0.00	0.00		13.91
	30-Sep-14 09:35:00	0.00	0.00		13.91
	30-Sep-14 09:36:00	0.00	0.00		13.90
	30-Sep-14 09:37:00	0.00	0.00		13.90
	30-Sep-14 09:38:00	0.00	0.00		13.89
	30-Sep-14 09:39:00	0.00	0.00		13.95
	30-Sep-14 09:40:00	0.00	0.00		14.02
	30-Sep-14 09:41:00	0.00	0.00		14.00
	30-Sep-14 09:42:00	0.00	0.00		13.87
	30-Sep-14 09:43:00	0.00	0.00		13.92
	30-Sep-14 09:44:00	0.00	0.00		13.97
	30-Sep-14 09:45:00	0.00	0.00		14.01
	30-Sep-14 09:46:00	0.00	0.00		14.04

	Fuel Feedrate	THC	THC, HRA	Oxygen
	KFT3062c	KAT3271m	*Calculated*	CEMS
	lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
30-Sep-14 09:47:00	0.00	0.00		13.75
30-Sep-14 09:48:00	0.00	0.00		13.74
30-Sep-14 09:49:00	0.00	0.00		13.83
30-Sep-14 09:50:00	0.00	0.00		13.87
30-Sep-14 09:51:00	0.00	0.00		13.87
30-Sep-14 09:52:00	0.00	0.00		13.87
30-Sep-14 09:53:00	0.00	0.00		13.88
30-Sep-14 09:54:00	0.00	0.00		13.88
30-Sep-14 09:55:00	0.00	0.00		13.88
30-Sep-14 09:56:00	0.00	0.00		13.88
30-Sep-14 09:57:00	0.00	0.00		13.88
30-Sep-14 09:58:00	0.00	0.00		13.89
30-Sep-14 09:59:00	0.00	0.00		13.89
30-Sep-14 10:00:00	0.00	0.00		13.89
30-Sep-14 10:01:00	0.00	0.00		13.89
30-Sep-14 10:02:00	0.00	0.00		13.90
30-Sep-14 10:03:00	0.00	0.00		13.90
30-Sep-14 10:04:00	0.00	0.00		13.90
30-Sep-14 10:05:00	0.00	0.00		13.90
30-Sep-14 10:06:00	0.00	0.00		13.90
30-Sep-14 10:07:00	0.00	0.00		13.91
30-Sep-14 10:08:00	0.00	0.00		13.90
30-Sep-14 10:09:00	0.00	0.00		13.90
30-Sep-14 10:10:00	0.00	0.00		13.89
30-Sep-14 10:11:00	0.00	0.00	0.00	13.88
30-Sep-14 10:12:00	0.00	0.00	0.00	13.88
30-Sep-14 10:13:00	0.00	0.00	0.00	13.86
30-Sep-14 10:14:00	0.00	0.00	0.00	13.83
30-Sep-14 10:15:00	0.00	0.00	0.00	13.80
30-Sep-14 10:16:00	0.00	0.00	0.00	13.78
30-Sep-14 10:17:00	0.00	0.00	0.00	13.78
30-Sep-14 10:18:00	0.00	0.00	0.00	13.90
30-Sep-14 10:19:00	0.00	0.00	0.00	13.92
30-Sep-14 10:20:00	0.00	0.00	0.00	13.92
30-Sep-14 10:21:00	0.00	0.00	0.00	13.92
30-Sep-14 10:22:00	0.00	0.00	0.00	13.92
30-Sep-14 10:23:00	0.00	0.00	0.00	13.84
30-Sep-14 10:24:00	0.00	0.00	0.00	13.80
30-Sep-14 10:25:00	0.00	0.00	0.00	13.96
30-Sep-14 10:26:00	0.00	0.00	0.00	13.91
30-Sep-14 10:27:00	0.00	0.00	0.00	13.78
30-Sep-14 10:28:00	0.00	0.00	0.00	13.77
30-Sep-14 10:29:00	0.00	0.00	0.00	13.92
30-Sep-14 10:30:00	0.00	0.00	0.00	14.06
30-Sep-14 10:31:00	0.00	0.00	0.00	13.52
30-Sep-14 10:32:00	0.00	0.00	0.00	13.48
30-Sep-14 10:33:00	0.00	0.00	0.00	13.89
30-Sep-14 10:34:00	0.00	0.00	0.00	13.89

		Fuel Feedrate	THC	THC, HRA	Oxygen
		KFT3062c	KAT3271m	*Calculated*	CEMS
		lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
	30-Sep-14 10:35:00	0.00	0.00	0.00	13.75
	30-Sep-14 10:36:00	0.00	0.00	0.00	13.83
	30-Sep-14 10:37:00	0.00	0.00	0.00	13.91
	30-Sep-14 10:38:00	0.00	0.00	0.00	13.98
	30-Sep-14 10:39:00	0.00	0.00	0.00	13.73
	30-Sep-14 10:40:00	0.00	0.00	0.00	13.76
Pause for Port	30-Sep-14 10:41:00	0.00	0.00	0.00	13.91
	30-Sep-14 10:42:00	0.00	0.00	0.00	13.91
	30-Sep-14 10:43:00	0.00	0.00	0.00	13.72
	30-Sep-14 10:44:00	0.00	0.00	0.00	13.76
	30-Sep-14 10:45:00	0.00	0.00	0.00	13.80
	30-Sep-14 10:46:00	0.00	0.00	0.00	13.84
	30-Sep-14 10:47:00	0.00	0.00	0.00	13.87
	30-Sep-14 10:48:00	0.00	0.00	0.00	13.88
	30-Sep-14 10:49:00	0.00	0.00	0.00	13.89
Resume	30-Sep-14 10:50:00	0.00	0.00	0.00	13.89
	30-Sep-14 10:51:00	0.00	0.00	0.00	13.89
	30-Sep-14 10:52:00	0.00	0.00	0.00	13.88
	30-Sep-14 10:53:00	0.00	0.00	0.00	13.88
	30-Sep-14 10:54:00	0.00	0.00	0.00	13.88
	30-Sep-14 10:55:00	0.00	0.00	0.00	13.88
	30-Sep-14 10:56:00	0.00	0.00	0.00	13.87
	30-Sep-14 10:57:00	0.00	0.00	0.00	13.87
	30-Sep-14 10:58:00	0.00	0.00	0.00	13.87
	30-Sep-14 10:59:00	0.00	0.00	0.00	13.87
	30-Sep-14 11:00:00	0.00	0.00	0.00	13.86
	30-Sep-14 11:01:00	0.00	0.00	0.00	13.86
	30-Sep-14 11:02:00	0.00	0.00	0.00	13.86
	30-Sep-14 11:03:00	0.00	0.00	0.00	13.86
	30-Sep-14 11:04:00	0.00	0.00	0.00	13.85
	30-Sep-14 11:05:00	0.00	0.00	0.00	13.85
	30-Sep-14 11:06:00	0.00	0.00	0.00	13.85
	30-Sep-14 11:07:00	0.00	0.00	0.00	13.85
	30-Sep-14 11:08:00	0.00	0.00	0.00	14.17
	30-Sep-14 11:09:00	0.00	0.00	0.00	14.07
	30-Sep-14 11:10:00	0.00	0.00	0.00	13.90
	30-Sep-14 11:11:00	0.00	0.00	0.00	13.93
	30-Sep-14 11:12:00	0.00	0.00	0.00	13.95
	30-Sep-14 11:13:00	0.00	0.00	0.00	13.98
	30-Sep-14 11:14:00	0.00	0.00	0.00	13.94
	30-Sep-14 11:15:00	0.00	0.00	0.00	13.74
	30-Sep-14 11:16:00	0.00	0.00	0.00	13.59
	30-Sep-14 11:17:00	0.00	0.00	0.00	13.81
	30-Sep-14 11:18:00	0.00	0.00	0.00	13.77
	30-Sep-14 11:19:00	0.00	0.00	0.00	13.72
	30-Sep-14 11:20:00	0.00	0.00	0.00	13.73
	30-Sep-14 11:21:00	0.00	0.00	0.00	13.74
	30-Sep-14 11:22:00	0.00	0.00	0.00	13.75

	Fuel Feedrate	THC	THC, HRA	Oxygen
	KFT3062c	KAT3271m	*Calculated*	CEMS
	lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
30-Sep-14 11:23:00	0.00	0.00	0.00	13.77
30-Sep-14 11:24:00	0.00	0.00	0.00	13.78
30-Sep-14 11:25:00	0.00	0.00	0.00	13.79
30-Sep-14 11:26:00	0.00	0.00	0.00	13.80
30-Sep-14 11:27:00	0.00	0.00	0.00	13.82
30-Sep-14 11:28:00	0.00	0.00	0.00	13.83
30-Sep-14 11:29:00	0.00	0.00	0.00	13.84
30-Sep-14 11:30:00	0.00	0.00	0.00	13.88
30-Sep-14 11:31:00	0.00	0.00	0.00	13.92
30-Sep-14 11:32:00	0.00	0.00	0.00	13.95
30-Sep-14 11:33:00	0.00	0.00	0.00	13.93
30-Sep-14 11:34:00	0.00	0.00	0.00	13.81
30-Sep-14 11:35:00	0.00	0.00	0.00	13.75
30-Sep-14 11:36:00	0.00	0.00	0.00	13.84
30-Sep-14 11:37:00	0.00	0.00	0.00	14.00
30-Sep-14 11:38:00	0.00	0.00	0.00	13.97
30-Sep-14 11:39:00	0.00	0.00	0.00	13.94
30-Sep-14 11:40:00	0.00	0.00	0.00	13.92
30-Sep-14 11:41:00	0.00	0.00	0.00	13.89
30-Sep-14 11:42:00	0.00	0.00	0.00	13.86
30-Sep-14 11:43:00	0.00	0.00	0.00	13.84
30-Sep-14 11:44:00	0.00	0.00	0.00	13.84
30-Sep-14 11:45:00	0.00	0.00	0.00	13.84
30-Sep-14 11:46:00	0.00	0.00	0.00	13.84
30-Sep-14 11:47:00	0.00	0.00	0.00	13.85
30-Sep-14 11:48:00	0.00	0.00	0.00	13.85
30-Sep-14 11:49:00	0.00	0.00	0.00	13.85
30-Sep-14 11:50:00	0.00	0.00	0.00	13.85
30-Sep-14 11:51:00	0.00	0.00	0.00	13.85
30-Sep-14 11:52:00	0.00	0.00	0.00	13.86
30-Sep-14 11:53:00	0.00	0.00	0.00	13.86
30-Sep-14 11:54:00	0.00	0.00	0.00	13.86
30-Sep-14 11:55:00	0.00	0.00	0.00	13.86
30-Sep-14 11:56:00	0.00	0.00	0.00	13.87
30-Sep-14 11:57:00	0.00	0.00	0.00	13.87
30-Sep-14 11:58:00	0.00	0.00	0.00	13.87
30-Sep-14 11:59:00	0.00	0.00	0.00	13.87
30-Sep-14 12:00:00	0.00	0.00	0.00	13.87
30-Sep-14 12:01:00	0.00	0.00	0.00	13.88
30-Sep-14 12:02:00	0.00	0.00	0.00	13.88
30-Sep-14 12:03:00	0.00	0.00	0.00	13.88
30-Sep-14 12:04:00	0.00	0.00	0.00	13.88
30-Sep-14 12:05:00	0.00	0.00	0.00	13.88
30-Sep-14 12:06:00	0.00	0.00	0.00	13.89
30-Sep-14 12:07:00	0.00	0.00	0.00	13.89
30-Sep-14 12:08:00	0.00	0.00	0.00	13.89
30-Sep-14 12:09:00	0.00	0.00	0.00	13.89
30-Sep-14 12:10:00	0.00	0.00	0.00	13.87

		Fuel Feedrate	THC	THC, HRA	Oxygen
		KFT3062c	KAT3271m	*Calculated*	CEMS
		lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
	30-Sep-14 12:11:00	0.00	0.00	0.00	13.85
	30-Sep-14 12:12:00	0.00	0.00	0.00	13.77
	30-Sep-14 12:13:00	0.00	0.00	0.00	13.73
	30-Sep-14 12:14:00	0.00	0.00	0.00	13.73
	30-Sep-14 12:15:00	0.00	0.00	0.00	13.74
	30-Sep-14 12:16:00	0.00	0.00	0.00	13.74
	30-Sep-14 12:17:00	0.00	0.00	0.00	13.74
	30-Sep-14 12:18:00	0.00	0.00	0.00	13.74
	30-Sep-14 12:19:00	0.00	0.00	0.00	13.74
End Run 1	30-Sep-14 12:20:00	0.00	0.00	0.00	13.74
	30-Sep-14 12:21:00	0.00	0.00		
	30-Sep-14 12:22:00	0.00	0.00		
	30-Sep-14 12:23:00	0.00	0.00		
	30-Sep-14 12:24:00	0.00	0.00		
	30-Sep-14 12:25:00	0.00	0.00		
	30-Sep-14 12:26:00	0.00	0.00		
	30-Sep-14 12:27:00	0.00	0.00		
	30-Sep-14 12:28:00	0.00	0.00		
	30-Sep-14 12:29:00	0.00	0.00		
	30-Sep-14 12:30:00	0.00	0.00		
	30-Sep-14 12:31:00	0.00	0.00		
	30-Sep-14 12:32:00	0.00	0.00		
	30-Sep-14 12:33:00	0.00	0.00		
	30-Sep-14 12:34:00	0.00	0.00		
	30-Sep-14 12:35:00	0.00	0.00		
	30-Sep-14 12:36:00	0.00	0.00		
	30-Sep-14 12:37:00	0.00	0.00		
	30-Sep-14 12:38:00	0.00	0.00		
	30-Sep-14 12:39:00	0.00	0.00		
	30-Sep-14 12:40:00	0.00	0.00		
	30-Sep-14 12:41:00	0.00	0.00		
Start Run 2	30-Sep-14 12:42:00	0.00	0.00		
	30-Sep-14 12:43:00	0.00	0.00		13.91
	30-Sep-14 12:44:00	0.00	0.00		13.98
	30-Sep-14 12:45:00	0.00	0.00		14.07
	30-Sep-14 12:46:00	0.00	0.00		13.82
	30-Sep-14 12:47:00	0.00	0.00		13.58
	30-Sep-14 12:48:00	0.00	0.00		13.40
	30-Sep-14 12:49:00	0.00	0.00		13.55
	30-Sep-14 12:50:00	0.00	0.00		13.68
	30-Sep-14 12:51:00	0.00	0.00		13.77
	30-Sep-14 12:52:00	0.00	0.00		13.85
	30-Sep-14 12:53:00	0.00	0.00		13.88
	30-Sep-14 12:54:00	0.00	0.00		13.87
	30-Sep-14 12:55:00	0.00	0.00		13.86
	30-Sep-14 12:56:00	0.00	0.00		13.85
	30-Sep-14 12:57:00	0.00	0.00		13.84
	30-Sep-14 12:58:00	0.00	0.00		13.84

	Fuel Feedrate	**THC**	**THC, HRA**	**Oxygen**
	KFT3062c	KAT3271m	*Calculated*	CEMS
	lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
30-Sep-14 12:59:00	0.00	0.00		13.83
30-Sep-14 13:00:00	0.00	0.00		13.82
30-Sep-14 13:01:00	0.00	0.00		13.81
30-Sep-14 13:02:00	0.00	0.00		13.80
30-Sep-14 13:03:00	0.00	0.00		13.79
30-Sep-14 13:04:00	0.00	0.00		13.79
30-Sep-14 13:05:00	0.00	0.00		13.78
30-Sep-14 13:06:00	0.00	0.00		13.77
30-Sep-14 13:07:00	0.00	0.00		13.77
30-Sep-14 13:08:00	0.00	0.00		13.77
30-Sep-14 13:09:00	0.00	0.00		13.78
30-Sep-14 13:10:00	0.00	0.00		13.78
30-Sep-14 13:11:00	0.00	0.00		13.79
30-Sep-14 13:12:00	0.00	0.00		13.79
30-Sep-14 13:13:00	0.00	0.00		13.79
30-Sep-14 13:14:00	0.00	0.00		13.80
30-Sep-14 13:15:00	0.00	0.00		13.80
30-Sep-14 13:16:00	0.00	0.00		13.81
30-Sep-14 13:17:00	0.00	0.00		13.81
30-Sep-14 13:18:00	0.00	0.00		13.81
30-Sep-14 13:19:00	0.00	0.00		13.82
30-Sep-14 13:20:00	0.00	0.00		13.82
30-Sep-14 13:21:00	0.00	0.00		13.83
30-Sep-14 13:22:00	0.00	0.00		13.83
30-Sep-14 13:23:00	0.00	0.00		13.94
30-Sep-14 13:24:00	0.00	0.00		13.52
30-Sep-14 13:25:00	0.00	0.00		13.39
30-Sep-14 13:26:00	0.00	0.00		13.64
30-Sep-14 13:27:00	0.00	0.00		13.75
30-Sep-14 13:28:00	0.00	0.00		13.79
30-Sep-14 13:29:00	0.00	0.00		13.83
30-Sep-14 13:30:00	0.00	0.00		13.88
30-Sep-14 13:31:00	0.00	0.00		13.90
30-Sep-14 13:32:00	0.00	0.00		13.88
30-Sep-14 13:33:00	0.00	0.00		13.85
30-Sep-14 13:34:00	0.00	0.00		13.83
30-Sep-14 13:35:00	0.00	0.00		13.81
30-Sep-14 13:36:00	0.00	0.00		13.78
30-Sep-14 13:37:00	0.00	0.00		13.77
30-Sep-14 13:38:00	0.00	0.00		13.77
30-Sep-14 13:39:00	0.00	0.00		13.77
30-Sep-14 13:40:00	0.00	0.00		13.77
30-Sep-14 13:41:00	0.00	0.00		13.77
30-Sep-14 13:42:00	0.00	0.00	0.00	13.77
30-Sep-14 13:43:00	0.00	0.00	0.00	13.77
30-Sep-14 13:44:00	0.00	0.00	0.00	13.77
30-Sep-14 13:45:00	0.00	0.00	0.00	13.77
30-Sep-14 13:46:00	0.00	0.00	0.00	13.77

		Fuel Feedrate	THC	THC, HRA	Oxygen
		KFT3062c	KAT3271m	*Calculated*	CEMS
		lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
	30-Sep-14 13:47:00	0.00	0.00	0.00	13.77
	30-Sep-14 13:48:00	0.00	0.00	0.00	13.77
	30-Sep-14 13:49:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:50:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:51:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:52:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:53:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:54:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:55:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:56:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:57:00	0.00	0.00	0.00	13.78
	30-Sep-14 13:58:00	0.00	0.00	0.00	13.79
	30-Sep-14 13:59:00	0.00	0.00	0.00	13.79
	30-Sep-14 14:00:00	0.00	0.00	0.00	13.79
	30-Sep-14 14:01:00	0.00	0.00	0.00	13.79
	30-Sep-14 14:02:00	0.00	0.00	0.00	13.80
	30-Sep-14 14:03:00	0.00	0.00	0.00	13.80
	30-Sep-14 14:04:00	0.00	0.00	0.00	13.80
	30-Sep-14 14:05:00	0.00	0.00	0.00	13.80
	30-Sep-14 14:06:00	0.00	0.00	0.00	13.80
	30-Sep-14 14:07:00	0.00	0.00	0.00	13.81
	30-Sep-14 14:08:00	0.00	0.00	0.00	13.81
	30-Sep-14 14:09:00	0.00	0.00	0.00	13.81
	30-Sep-14 14:10:00	0.00	0.00	0.00	13.81
	30-Sep-14 14:11:00	0.00	0.00	0.00	13.81
Pause for Port	30-Sep-14 14:12:00	0.00	0.00	0.00	13.80
	30-Sep-14 14:13:00	0.00	0.00	0.00	13.70
	30-Sep-14 14:14:00	0.00	0.00	0.00	13.70
	30-Sep-14 14:15:00	0.00	0.00	0.00	13.71
	30-Sep-14 14:16:00	0.00	0.00	0.00	13.71
	30-Sep-14 14:17:00	0.00	0.00	0.00	13.71
	30-Sep-14 14:18:00	0.00	0.00	0.00	13.72
Resume	30-Sep-14 14:19:00	0.00	0.00	0.00	13.72
	30-Sep-14 14:20:00	0.00	0.00	0.00	13.72
	30-Sep-14 14:21:00	0.00	0.00	0.00	13.72
	30-Sep-14 14:22:00	0.00	0.00	0.00	13.73
	30-Sep-14 14:23:00	0.00	0.00	0.00	13.73
	30-Sep-14 14:24:00	0.00	0.00	0.00	13.73
	30-Sep-14 14:25:00	0.00	0.00	0.00	13.73
	30-Sep-14 14:26:00	0.00	0.00	0.00	13.74
	30-Sep-14 14:27:00	0.00	0.00	0.00	13.74
	30-Sep-14 14:28:00	0.00	0.00	0.00	13.74
	30-Sep-14 14:29:00	0.00	0.00	0.00	13.75
	30-Sep-14 14:30:00	0.00	0.00	0.00	13.75
	30-Sep-14 14:31:00	0.00	0.00	0.00	13.75
	30-Sep-14 14:32:00	0.00	0.00	0.00	13.75
	30-Sep-14 14:33:00	0.00	0.00	0.00	13.76
	30-Sep-14 14:34:00	0.00	0.00	0.00	13.76

	Fuel Feedrate	**THC**	**THC, HRA**	**Oxygen**
	KFT3062c	KAT3271m	*Calculated*	CEMS
	lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
30-Sep-14 14:35:00	0.00	0.00	0.00	13.76
30-Sep-14 14:36:00	0.00	0.00	0.00	13.77
30-Sep-14 14:37:00	0.00	0.00	0.00	13.77
30-Sep-14 14:38:00	0.00	0.00	0.00	13.77
30-Sep-14 14:39:00	0.00	0.00	0.00	13.77
30-Sep-14 14:40:00	0.00	0.00	0.00	13.77
30-Sep-14 14:41:00	0.00	0.00	0.00	13.77
30-Sep-14 14:42:00	0.00	0.00	0.00	13.76
30-Sep-14 14:43:00	0.00	0.00	0.00	13.76
30-Sep-14 14:44:00	0.00	0.00	0.00	13.76
30-Sep-14 14:45:00	0.00	0.00	0.00	13.76
30-Sep-14 14:46:00	0.00	0.00	0.00	13.76
30-Sep-14 14:47:00	0.00	0.00	0.00	13.76
30-Sep-14 14:48:00	0.00	0.00	0.00	13.76
30-Sep-14 14:49:00	0.00	0.00	0.00	13.76
30-Sep-14 14:50:00	0.00	0.00	0.00	13.75
30-Sep-14 14:51:00	0.00	0.00	0.00	13.75
30-Sep-14 14:52:00	0.00	0.00	0.00	13.75
30-Sep-14 14:53:00	0.00	0.00	0.00	13.75
30-Sep-14 14:54:00	0.00	0.00	0.00	13.75
30-Sep-14 14:55:00	0.00	0.00	0.00	13.75
30-Sep-14 14:56:00	0.00	0.00	0.00	13.75
30-Sep-14 14:57:00	0.00	0.00	0.00	13.75
30-Sep-14 14:58:00	0.00	0.00	0.00	13.74
30-Sep-14 14:59:00	0.00	0.00	0.00	13.74
30-Sep-14 15:00:00	0.00	0.00	0.00	13.74
30-Sep-14 15:01:00	0.00	0.00	0.00	13.74
30-Sep-14 15:02:00	0.00	0.00	0.00	13.74
30-Sep-14 15:03:00	0.00	0.00	0.00	13.73
30-Sep-14 15:04:00	0.00	0.00	0.00	13.72
30-Sep-14 15:05:00	0.00	0.00	0.00	13.71
30-Sep-14 15:06:00	0.00	0.00	0.00	13.70
30-Sep-14 15:07:00	0.00	0.00	0.00	13.69
30-Sep-14 15:08:00	0.00	0.00	0.00	13.68
30-Sep-14 15:09:00	0.00	0.00	0.00	13.69
30-Sep-14 15:10:00	0.00	0.00	0.00	13.70
30-Sep-14 15:11:00	0.00	0.00	0.00	13.71
30-Sep-14 15:12:00	0.00	0.00	0.00	13.72
30-Sep-14 15:13:00	0.00	0.00	0.00	13.73
30-Sep-14 15:14:00	0.00	0.00	0.00	13.73
30-Sep-14 15:15:00	0.00	0.00	0.00	13.73
30-Sep-14 15:16:00	0.00	0.00	0.00	13.73
30-Sep-14 15:17:00	0.00	0.00	0.00	13.73
30-Sep-14 15:18:00	0.00	0.00	0.00	13.73
30-Sep-14 15:19:00	0.00	0.00	0.00	13.74
30-Sep-14 15:20:00	0.00	0.00	0.00	13.74
30-Sep-14 15:21:00	0.00	0.00	0.00	13.74
30-Sep-14 15:22:00	0.00	0.00	0.00	13.74

		Fuel Feedrate	THC	THC, HRA	Oxygen
		KFT3062c	KAT3271m	*Calculated*	CEMS
		lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
	30-Sep-14 15:23:00	0.00	0.00	0.00	13.74
	30-Sep-14 15:24:00	0.00	0.00	0.00	13.74
	30-Sep-14 15:25:00	0.00	0.00	0.00	13.76
	30-Sep-14 15:26:00	0.00	0.00	0.00	13.77
	30-Sep-14 15:27:00	0.00	0.00	0.00	13.78
	30-Sep-14 15:28:00	0.00	0.00	0.00	13.79
	30-Sep-14 15:29:00	0.00	0.00	0.00	13.79
	30-Sep-14 15:30:00	0.00	0.00	0.00	13.79
	30-Sep-14 15:31:00	0.00	0.00	0.00	13.80
	30-Sep-14 15:32:00	0.00	0.00	0.00	13.80
	30-Sep-14 15:33:00	0.00	0.00	0.00	13.80
	30-Sep-14 15:34:00	0.00	0.00	0.00	13.81
	30-Sep-14 15:35:00	0.00	0.00	0.00	13.81
	30-Sep-14 15:36:00	0.00	0.00	0.00	13.81
	30-Sep-14 15:37:00	0.00	0.00	0.00	13.80
	30-Sep-14 15:38:00	0.00	0.00	0.00	13.79
	30-Sep-14 15:39:00	0.00	0.00	0.00	13.77
	30-Sep-14 15:40:00	0.00	0.00	0.00	13.76
	30-Sep-14 15:41:00	0.00	0.00	0.00	13.74
	30-Sep-14 15:42:00	0.00	0.00	0.00	13.73
	30-Sep-14 15:43:00	0.00	0.00	0.00	13.71
	30-Sep-14 15:44:00	0.00	0.00	0.00	13.70
	30-Sep-14 15:45:00	0.00	0.00	0.00	13.69
	30-Sep-14 15:46:00	0.00	0.00	0.00	13.67
	30-Sep-14 15:47:00	0.00	0.00	0.00	13.66
	30-Sep-14 15:48:00	0.00	0.00	0.00	13.67
End Run 2	30-Sep-14 15:49:00	0.00	0.00	0.00	13.68
	30-Sep-14 15:50:00	0.00	0.00		
	30-Sep-14 15:51:00	0.00	0.00		
	30-Sep-14 15:52:00	0.00	0.00		
	30-Sep-14 15:53:00	0.00	0.00		
	30-Sep-14 15:54:00	0.00	0.00		
	30-Sep-14 15:55:00	0.00	0.00		
	30-Sep-14 15:56:00	0.00	0.00		
	30-Sep-14 15:57:00	0.00	0.00		
	30-Sep-14 15:58:00	0.00	0.00		
	30-Sep-14 15:59:00	0.00	0.00		
	30-Sep-14 16:00:00	0.00	0.00		
	30-Sep-14 16:01:00	0.00	0.00		
	30-Sep-14 16:02:00	0.00	0.00		
	30-Sep-14 16:03:00	0.00	0.00		
	30-Sep-14 16:04:00	0.00	0.00		
	30-Sep-14 16:05:00	0.00	0.00		
Start Run 3	30-Sep-14 16:06:00	0.00	0.00		
	30-Sep-14 16:07:00	0.00	0.00		13.72
	30-Sep-14 16:08:00	0.00	0.00		13.70
	30-Sep-14 16:09:00	0.00	0.00		13.71
	30-Sep-14 16:10:00	0.00	0.00		13.72

	Fuel Feedrate	**THC**	**THC, HRA**	**Oxygen**
	KFT3062c	KAT3271m	*Calculated*	CEMS
	lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
30-Sep-14 16:11:00	0.00	0.00		13.73
30-Sep-14 16:12:00	0.00	0.00		13.74
30-Sep-14 16:13:00	0.00	0.00		13.75
30-Sep-14 16:14:00	0.00	0.00		13.76
30-Sep-14 16:15:00	0.00	0.00		13.77
30-Sep-14 16:16:00	0.00	0.00		13.78
30-Sep-14 16:17:00	0.00	0.00		13.79
30-Sep-14 16:18:00	0.00	0.00		13.80
30-Sep-14 16:19:00	0.00	0.00		13.81
30-Sep-14 16:20:00	0.00	0.00		13.82
30-Sep-14 16:21:00	0.00	0.00		13.82
30-Sep-14 16:22:00	0.00	0.00		13.83
30-Sep-14 16:23:00	0.00	0.00		13.83
30-Sep-14 16:24:00	0.00	0.00		13.84
30-Sep-14 16:25:00	0.00	0.00		13.84
30-Sep-14 16:26:00	0.00	0.00		13.85
30-Sep-14 16:27:00	0.00	0.00		13.86
30-Sep-14 16:28:00	0.00	0.00		13.87
30-Sep-14 16:29:00	0.00	0.00		13.87
30-Sep-14 16:30:00	0.00	0.00		13.87
30-Sep-14 16:31:00	0.00	0.00		13.96
30-Sep-14 16:32:00	0.00	0.00		14.10
30-Sep-14 16:33:00	0.00	0.00		14.02
30-Sep-14 16:34:00	0.00	0.00		13.94
30-Sep-14 16:35:00	0.00	0.00		13.85
30-Sep-14 16:36:00	0.00	0.00		13.81
30-Sep-14 16:37:00	0.00	0.00		13.81
30-Sep-14 16:38:00	0.00	0.00		13.81
30-Sep-14 16:39:00	0.00	0.00		13.81
30-Sep-14 16:40:00	0.00	0.00		13.81
30-Sep-14 16:41:00	0.00	0.00		13.81
30-Sep-14 16:42:00	0.00	0.00		13.81
30-Sep-14 16:43:00	0.00	0.00		13.80
30-Sep-14 16:44:00	0.00	0.00		13.80
30-Sep-14 16:45:00	0.00	0.00		13.80
30-Sep-14 16:46:00	0.00	0.00		13.80
30-Sep-14 16:47:00	0.00	0.00		13.80
30-Sep-14 16:48:00	0.00	0.00		13.80
30-Sep-14 16:49:00	0.00	0.00		13.79
30-Sep-14 16:50:00	0.00	0.00		13.79
30-Sep-14 16:51:00	0.00	0.00		13.79
30-Sep-14 16:52:00	0.00	0.00		13.78
30-Sep-14 16:53:00	0.00	0.00		13.77
30-Sep-14 16:54:00	0.00	0.00		13.76
30-Sep-14 16:55:00	0.00	0.00		13.74
30-Sep-14 16:56:00	0.00	0.00		13.74
30-Sep-14 16:57:00	0.00	0.00		13.75
30-Sep-14 16:58:00	0.00	0.00		13.75

		Fuel Feedrate	THC	THC, HRA	Oxygen
		KFT3062c	KAT3271m	*Calculated*	CEMS
		lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
	30-Sep-14 16:59:00	0.00	0.00		13.75
	30-Sep-14 17:00:00	0.00	0.00		13.76
	30-Sep-14 17:01:00	0.00	0.00		13.76
	30-Sep-14 17:02:00	0.00	0.00		13.76
	30-Sep-14 17:03:00	0.00	0.00		13.77
	30-Sep-14 17:04:00	0.00	0.00		13.77
	30-Sep-14 17:05:00	0.00	0.00		13.78
	30-Sep-14 17:06:00	0.00	0.00	0.00	13.78
	30-Sep-14 17:07:00	0.00	0.00	0.00	13.78
	30-Sep-14 17:08:00	0.00	0.00	0.00	13.79
	30-Sep-14 17:09:00	0.00	0.00	0.00	13.79
	30-Sep-14 17:10:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:11:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:12:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:13:00	0.00	0.00	0.00	13.81
	30-Sep-14 17:14:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:15:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:16:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:17:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:18:00	0.00	0.00	0.00	13.79
	30-Sep-14 17:19:00	0.00	0.00	0.00	13.80
	30-Sep-14 17:20:00	0.00	0.00	0.00	13.81
	30-Sep-14 17:21:00	0.00	0.00	0.00	13.81
	30-Sep-14 17:22:00	0.00	0.00	0.00	13.82
	30-Sep-14 17:23:00	0.00	0.00	0.00	13.82
	30-Sep-14 17:24:00	0.00	0.00	0.00	13.83
	30-Sep-14 17:25:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:26:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:27:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:28:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:29:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:30:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:31:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:32:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:33:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:34:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:35:00	0.00	0.00	0.00	13.84
Pause for Port	30-Sep-14 17:36:00	0.00	0.00	0.00	13.85
	30-Sep-14 17:37:00	0.00	0.00	0.00	13.85
	30-Sep-14 17:38:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:39:00	0.00	0.00	0.00	13.84
	30-Sep-14 17:40:00	0.00	0.00	0.00	13.83
	30-Sep-14 17:41:00	0.00	0.00	0.00	13.83
Resume	30-Sep-14 17:42:00	0.00	0.00	0.00	13.83
	30-Sep-14 17:43:00	0.00	0.00	0.00	13.82
	30-Sep-14 17:44:00	0.00	0.00	0.00	13.82
	30-Sep-14 17:45:00	0.00	0.00	0.00	13.82
	30-Sep-14 17:46:00	0.00	0.00	0.00	13.82

	Fuel Feedrate	**THC**	**THC, HRA**	**Oxygen**
	KFT3062c	KAT3271m	*Calculated*	CEMS
	lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
30-Sep-14 17:47:00	0.00	0.00	0.00	13.82
30-Sep-14 17:48:00	0.00	0.00	0.00	13.82
30-Sep-14 17:49:00	0.00	0.00	0.00	13.82
30-Sep-14 17:50:00	0.00	0.00	0.00	13.82
30-Sep-14 17:51:00	0.00	0.00	0.00	13.82
30-Sep-14 17:52:00	0.00	0.00	0.00	13.83
30-Sep-14 17:53:00	0.00	0.00	0.00	13.84
30-Sep-14 17:54:00	0.00	0.00	0.00	13.85
30-Sep-14 17:55:00	0.00	0.00	0.00	13.86
30-Sep-14 17:56:00	0.00	0.00	0.00	13.87
30-Sep-14 17:57:00	0.00	0.00	0.00	13.88
30-Sep-14 17:58:00	0.00	0.00	0.00	13.89
30-Sep-14 17:59:00	0.00	0.00	0.00	13.87
30-Sep-14 18:00:00	0.00	0.00	0.00	13.85
30-Sep-14 18:01:00	0.00	0.00	0.00	13.83
30-Sep-14 18:02:00	0.00	0.00	0.00	13.81
30-Sep-14 18:03:00	0.00	0.00	0.00	13.78
30-Sep-14 18:04:00	0.00	0.00	0.00	13.75
30-Sep-14 18:05:00	0.00	0.00	0.00	13.72
30-Sep-14 18:06:00	0.00	0.00	0.00	13.73
30-Sep-14 18:07:00	0.00	0.00	0.00	13.79
30-Sep-14 18:08:00	0.00	0.00	0.00	13.80
30-Sep-14 18:09:00	0.00	0.00	0.00	13.79
30-Sep-14 18:10:00	0.00	0.00	0.00	13.79
30-Sep-14 18:11:00	0.00	0.00	0.00	13.79
30-Sep-14 18:12:00	0.00	0.00	0.00	13.81
30-Sep-14 18:13:00	0.00	0.00	0.00	13.83
30-Sep-14 18:14:00	0.00	0.00	0.00	13.84
30-Sep-14 18:15:00	0.00	0.00	0.00	13.86
30-Sep-14 18:16:00	0.00	0.00	0.00	13.88
30-Sep-14 18:17:00	0.00	0.00	0.00	13.78
30-Sep-14 18:18:00	0.00	0.00	0.00	13.86
30-Sep-14 18:19:00	0.00	0.00	0.00	13.93
30-Sep-14 18:20:00	0.00	0.00	0.00	13.95
30-Sep-14 18:21:00	0.00	0.00	0.00	13.90
30-Sep-14 18:22:00	0.00	0.00	0.00	13.81
30-Sep-14 18:23:00	0.00	0.00	0.00	13.77
30-Sep-14 18:24:00	0.00	0.00	0.00	13.78
30-Sep-14 18:25:00	0.00	0.00	0.00	13.78
30-Sep-14 18:26:00	0.00	0.00	0.00	13.79
30-Sep-14 18:27:00	0.00	0.00	0.00	13.80
30-Sep-14 18:28:00	0.00	0.00	0.00	13.80
30-Sep-14 18:29:00	0.00	0.00	0.00	13.81
30-Sep-14 18:30:00	0.00	0.00	0.00	13.81
30-Sep-14 18:31:00	0.00	0.00	0.00	13.82
30-Sep-14 18:32:00	0.00	0.00	0.00	13.82
30-Sep-14 18:33:00	0.00	0.00	0.00	13.82
30-Sep-14 18:34:00	0.00	0.00	0.00	13.82

		Fuel Feedrate	THC	THC, HRA	Oxygen
		KFT3062c	KAT3271m	*Calculated*	CEMS
		lb/min	ppmdv @ 7% O2	ppmdv @ 7% O2	% O2
	30-Sep-14 18:35:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:36:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:37:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:38:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:39:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:40:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:41:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:42:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:43:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:44:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:45:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:46:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:47:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:48:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:49:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:50:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:51:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:52:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:53:00	0.00	0.00	0.00	13.82
	30-Sep-14 18:54:00	0.00	0.00	0.00	13.83
	30-Sep-14 18:55:00	0.00	0.00	0.00	13.88
	30-Sep-14 18:56:00	0.00	0.00	0.00	13.98
	30-Sep-14 18:57:00	0.00	0.00	0.00	13.87
	30-Sep-14 18:58:00	0.00	0.00	0.00	13.86
	30-Sep-14 18:59:00	0.00	0.00	0.00	13.86
	30-Sep-14 19:00:00	0.00	0.00	0.00	13.85
	30-Sep-14 19:01:00	0.00	0.00	0.00	13.85
	30-Sep-14 19:02:00	0.00	0.00	0.00	13.87
	30-Sep-14 19:03:00	0.00	0.00	0.00	13.86
	30-Sep-14 19:04:00	0.00	0.00	0.00	13.86
	30-Sep-14 19:05:00	0.00	0.00	0.00	13.85
	30-Sep-14 19:06:00	0.00	0.00	0.00	13.84
	30-Sep-14 19:07:00	0.00	0.00	0.00	13.84
	30-Sep-14 19:08:00	0.00	0.00	0.00	13.83
	30-Sep-14 19:09:00	0.00	0.00	0.00	13.83
	30-Sep-14 19:10:00	0.00	0.00	0.00	13.82
	30-Sep-14 19:11:00	0.00	0.00	0.00	13.82
End Run 3	30-Sep-14 19:12:00	0.00	0.00	0.00	13.81

APPENDIX IV

CERTIFICATION OF FORMULATION FOR CHLORINE SPIKE

Eastman Chemical Company
Tennessee Operations

Certificate of Formulation

The following materials and quantities were used for the formulation of the Chlorine Spike (GMN P3079300) to be used for testing of the RKI, Bldg 248D.

Test Burn Batch TS140001 & TS140002

Compound	CAS No.	Eastman PM No.	Purity from Manufacturer	Quantity in Blend	% by Weight
Perchloroethylene (Tetrachloroethene)	127-18-4	7018	99.985 to 99.995%	300 lbs	2.0
Methanol	67-56-1	12	99.98%	14,494 lbs	98.0

Loaded

PM 7018 Batch L094886278	300 lbs; (150 lbs per batch)
PM 12 Batch TSBulk	14,494 lbs (2200 gal); (1100 gal/batch)
Total	14794 lbs

Nadine S. McMackin
Signature

9/25/2014
Date

Nadine McMackin
Print Name

Eastman Chemical Company
Tennessee Operations