

Chemical Analysis Report

SO-DIST-2021-11-23-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **2021 SMP: Continuous Imperial**

Request ID: **RQ-2021-11-15-44**

Customer: **SO-DIST**

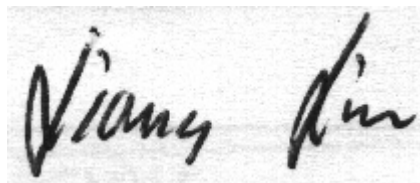
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: William Mullen

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 13-DEC-2021 15:05

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical group are included in this report: Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Imperial River @ Orr Rd.

Collection Date/Time: 11/22/2021 11:25

Field ID: G1SD0105

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2291080	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P406721	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P407154	
		Sulfate	3.4		mg SO4/L	P407157	
	SM 2120 B-2011	Color (true)	77		PCU	P406717	
	SM 2320 B-2011	Total Alkalinity	144		mg CaCO3/L	P406784	
	SM 2540 C-2011	TDS	214		mg/L	P407014	
	SM 2540 D-2011	TSS	3	I	mg/L	P407051	
	SM 4500 F-C-2011	Fluoride	0.086	I	mg F/L	P406787	
2291081	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P407082	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P406869	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P406742	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P406703	
	SM 5310 B-2011	Organic Carbon	18		mg C/L	P406794	
2291082	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P406712	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P406721

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407154

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407157

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407082

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406869

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406742

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406703

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406712

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B-2011
Batch ID: P406717

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P406784

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P407014

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P407051

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P406787

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P406794

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407154

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407157

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407082

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406869

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406742

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406703

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406712

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	100		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P406717

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P406784

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P406787

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P406794

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	105		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407154

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2290802	Chloride	99.5		P	90 - 110
2291021	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407157

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2290802	Sulfate	95.8		P	90 - 110
2291021	Sulfate	94.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407082

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291244	Ammonia-N	98.2	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291002	Kjeldahl Nitrogen	88.0	90.8	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406742

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291055	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291095	Total-P	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406712

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2291082	O-Phosphate-P	98.5	97.2	P/P	90 - 110

Reference Method: SM 5310 B-2011
Batch ID: P406794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2290925	Organic Carbon	99.4		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P406721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291039	Turbidity	7.53	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407154

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2290802	Chloride	0.273	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P407157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2290802	Sulfate	0.173	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P407082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291244	Ammonia-N	0.613	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291002	Kjeldahl Nitrogen	2.58	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291055	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291095	Total-P	1.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291082	O-Phosphate-P	1.20	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P406717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291054	Color (true)	1.12	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P406784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2290766	Total Alkalinity	0.818	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P407014

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2291024	TDS	4.88	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P406787

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2290766	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P406794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2290925	Organic Carbon	5.03	Sample	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A109057

Included Lab Sample IDs: 2291082

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	100	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A109061

Included Lab Sample IDs: 2291080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A109065

Included Lab Sample IDs: 2291080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A109078

Included Lab Sample IDs: 2291081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A109109

Included Lab Sample IDs: 2291080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	97.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A109109

Included Lab Sample IDs: 2291080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	101	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A109117

Included Lab Sample IDs: 2291081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A109171

Included Lab Sample IDs: 2291081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A109193

Included Lab Sample IDs: 2291081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.2	91.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A109228

Included Lab Sample IDs: 2291081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.0	98.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A109256

Included Lab Sample IDs: 2291080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					7.53	
EPA 300.0 Rev. 2.1	Chloride	99.8	99.5	97.9		0.273	
	Sulfate	98.4	95.8	94.2		0.173	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	98.2	99.0			0.613
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	88.0	90.8			2.58
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	101	101			0.0
EPA 365.1 Rev. 2.0	Total-P	102	100	102			1.03
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	98.5	97.2			1.20
SM 2120 B-2011	Color (true)	99.8				1.12	
SM 2320 B-2011	Total Alkalinity	102				0.818	
SM 2540 C-2011	TDS					4.88	
SM 4500 F-C-2011	Fluoride	99.0					0.0
SM 5310 B-2011	Organic Carbon	105	99.4			5.03	

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2291080
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2291080
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2291080
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2291081
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2291081
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2291081
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2291081
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2291082
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2291080
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2291080
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2291080
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2291080
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2291080
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2291081

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	11/23/2021			11/23/2021 16:13	Khloe J Berg	2291080
EPA 300.0 Rev. 2.1	11/23/2021			12/07/2021 03:58	James L Waggeberby	2291080
EPA 350.1 Rev. 2.0	11/23/2021			12/06/2021 15:29	Ping Hua	2291081
EPA 351.2 Rev. 2.0	11/23/2021	12/01/2021 11:50	Benjamin T. Nordmann	12/03/2021 11:35	Alexandra J Mattheus	2291081
EPA 353.2 Rev. 2.0	11/23/2021			11/24/2021 10:02	Beverly Y. Sanders	2291081
EPA 365.1 Rev. 2.0	11/23/2021	11/24/2021 15:46	Simonne.V. Calhoun	12/02/2021 12:23	Shengyu Ding	2291081
EPA 365.1 Rev. 2.0 dissolved	11/23/2021			11/23/2021 14:43	James L Waggeberby	2291082
SM 2120 B-2011	11/23/2021			11/23/2021 15:42	Blanca Fach	2291080
SM 2320 B-2011	11/23/2021			11/25/2021 00:25	Dale L. Simmons	2291080
SM 2540 C-2011	11/23/2021			11/24/2021 14:26	Yijie Li	2291080
SM 2540 D-2011	11/23/2021			11/24/2021 14:26	Yijie Li	2291080
SM 4500 F-C-2011	11/23/2021			11/25/2021 00:25	Dale L. Simmons	2291080
SM 5310 B-2011	11/23/2021			11/27/2021 10:42	Touraj Touran	2291081