



February 14, 2025

Glenn Walker  
Brunswick County Water Systems  
PO Box 249  
Bolivia, NC 28422

RE: Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35935589

Dear Glenn Walker:

Enclosed are the analytical results for sample(s) received by the laboratory on February 07, 2025. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Ormond Beach

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Todd Baumgartner  
todd.baumgartner@pacelabs.com  
(386)672-5668  
Project Manager

Enclosures

cc: Billy Benton, Brunswick County Public Utilities



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: 1,4-Dx-522 (Weekly)

Pace Project No.: 35935589

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### Pace Analytical Services Ormond Beach

8 East Tower Circle, Ormond Beach, FL 32174

Alaska DEC- CS/UST/LUST

Alabama Certification #: 41320

California Certification# 3096

Colorado Certification: FL NELAC Reciprocity

Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

DoD-ANAB #:ADE-3199

Florida Certification #: E83079

Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity

Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Kentucky Certification #: 90050

Louisiana Certification #: FL NELAC Reciprocity

Louisiana Environmental Certificate #: 05007

Maine Certification #: FL01264

Maryland Certification: #346

Massachusetts Certification #: M-FL1264

Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236

Montana Certification #: Cert 0074

Nebraska Certification: NE-OS-28-14

Nevada Certification: FL NELAC Reciprocity

New Hampshire Certification #: 2958

New Jersey Certification #: FL022

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710

North Dakota Certification #: R-216

Ohio DEP 87780

Oklahoma Certification #: D9947

Pennsylvania Certification #: 68-00547

Puerto Rico Certification #: FL01264

South Carolina Certification: #96042001

Tennessee Certification #: TN02974

Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity

Utah

Utah FL NELAC Reciprocity

Virginia Environmental Certification #: 460165

West Virginia Certification #: 9962C

Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

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### SAMPLE SUMMARY

Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35935589

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35935589001	020625-S01	Water	02/06/25 07:50	02/07/25 11:00
35935589002	020625-E01	Drinking Water	02/06/25 07:50	02/07/25 11:00

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### SAMPLE ANALYTE COUNT

Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35935589

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35935589001	020625-S01	EPA 522	TCF	2	PASI-O
35935589002	020625-E01	EPA 522	TCF	2	PASI-O

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PASI-O = Pace Analytical Services - Ormond Beach

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### ANALYTICAL RESULTS

Project: 1,4-Dx-522 (Weekly)

Pace Project No.: 35935589

Sample: 020625-S01      Lab ID: 35935589001      Collected: 02/06/25 07:50      Received: 02/07/25 11:00      Matrix: Water									
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>522 MSS 1,4 Dioxane</b>									
Analytical Method: EPA 522    Preparation Method: EPA 522 Pace Analytical Services - Ormond Beach									
1,4-Dioxane (p-Dioxane)	<b>0.67</b>	ug/L	0.20	0.12	1	02/12/25 09:59	02/13/25 12:42	123-91-1	
<b>Surrogates</b>									
1,4-Dioxane-d8 (S)	91	%	70-130		1	02/12/25 09:59	02/13/25 12:42		

Sample: 020625-E01      Lab ID: 35935589002      Collected: 02/06/25 07:50      Received: 02/07/25 11:00      Matrix: Drinking Water									
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>522 MSS 1,4 Dioxane</b>									
Analytical Method: EPA 522    Preparation Method: EPA 522 Pace Analytical Services - Ormond Beach									
1,4-Dioxane (p-Dioxane)	<b>0.44</b>	ug/L	0.20	0.12	1	02/12/25 09:59	02/13/25 13:00	123-91-1	
<b>Surrogates</b>									
1,4-Dioxane-d8 (S)	93	%	70-130		1	02/12/25 09:59	02/13/25 13:00		

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**QUALITY CONTROL DATA**

Project: 1,4-Dx-522 (Weekly)

Pace Project No.: 35935589

QC Batch:	1076277	Analysis Method:	EPA 522
QC Batch Method:	EPA 522	Analysis Description:	522 MSS 1,4 Dioxane
		Laboratory:	Pace Analytical Services - Ormond Beach

Associated Lab Samples: 35935589001, 35935589002

METHOD BLANK: 5909026 Matrix: Water

Associated Lab Samples: 35935589001, 35935589002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.12 U	0.20	0.12	02/13/25 10:23	
1,4-Dioxane-d8 (S)	%	96	70-130		02/13/25 10:23	

LABORATORY CONTROL SAMPLE: 5909027

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	16.4	82	70-130	
1,4-Dioxane-d8 (S)	%			97	70-130	

LABORATORY CONTROL SAMPLE: 5909028

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	0.2	0.15 I	75	50-150	
1,4-Dioxane-d8 (S)	%			95	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 5909034 5909035

Parameter	Units	5909034		5909035		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,4-Dioxane (p-Dioxane)	ug/L	0.12 U	19.7	19.7	16.3	16.5	83	84	70-130	1	20
1,4-Dioxane-d8 (S)	%						98	96	70-130		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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## QUALIFIERS

Project: 1,4-Dx-522 (Weekly)

Pace Project No.: 35935589

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U Compound was analyzed for but not detected.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1,4-Dx-522 (Weekly)  
Pace Project No.: 35935589

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35935589001	020625-S01	EPA 522	1076277	EPA 522	1076676
35935589002	020625-E01	EPA 522	1076277	EPA 522	1076676

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WO#: 35935589



CHAIN-O  
The Chain-of-C

ent  
pleted accurately.

**Section A**

**Required Client Information:**  
 Company: Brunswick County Water Systems  
 Address: PO Box 249  
 Bolivia, NC 28422  
 Email To: Glenn Walker  
 Phone: 910-371-3490 Fax  
 Requested Due Date: W007

**Section B**

**Required Project Information:**  
 Report To: Glenn Walker  
 Copy To:  
 Purchase Order #: 1,4-Dx-522 (Weekly)  
 Project Name: Lisa Harvey  
 Project #: 9551-1 (SO1) , -2 (EO1)

**Invoice Information:**  
 Attention: Accounts Payable  
 Company Name: See Section A  
 Address:  
 Pace Project Manager: Lisa Harvey  
 Pace Profile #: 9551-1 (SO1) , -2 (EO1)

Regulatory Agency: NC  
 State / Location: NC

Page: 1 Of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample IDs must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATIVES	ANALYSES TEST	Y/N	TEMP in C	Received on	Custody	Sealed	Cooler	Intact	
				START DATE	END DATE													DATE
1	020625-S01			WT G	02/06/25 0745	02/06/25 0750		1	Unpreserved	H2SO4 HNO3 HCl NaOH Na2S2O3 Methanol								
2	020625-E01			DW G	02/06/25 0745	02/06/25 0750		1		522 - 1,4 - Dioxane								
3																		
4																		
5																		
6																		

**ADDITIONAL COMMENTS**

RELINQUISHED BY / AFFILIATION: Phil McCulloch  
 DATE: 02/06/2025  
 TIME: 1400

ACCEPTED BY / AFFILIATION: *WDS Pace*  
 DATE: 4/17/25  
 TIME: 1100

SAMPLER NAME AND SIGNATURE: *Phil McCulloch*  
 PRINT Name of SAMPLER: Phillip McCulloch  
 SIGNATURE of SAMPLER: *[Signature]*  
 DATE Signed: 02/06/2025

# Pace Container Order #1185890

Addresses	Ship To :	Return To:
<b>Order By :</b> Company Brunswick County Water System Contact - Bottles, Glenn Email glenn.walker@brunswickcountync.gov Address 3954 Clearwell Dr. NE Address 2 _____ City Leland State NC Zip 28451 Phone 910-371-3490	<b>Ship To :</b> Company Brunswick County Water System Contact - Bottles, Glenn Email glenn.walker@brunswickcountync.gov Address 3954 Clearwell Dr. NE Address 2 _____ City Leland State NC Zip 28451 Phone 910-371-3490	<b>Return To:</b> Company Pace Analytical Ormond Beach Contact , Email shelby.sharpe@pacelabs.com Address 8 East Tower Circle Address 2 _____ City Ormond Beach State FL Zip 32174 Phone (386)672-5668

Info			
Project Name 1,4-Dx-522	Due Date 12/27/2024	Profile 9551-1	Quote _____
Project Manager Baumgartner, Todd	Return Date _____	Carrier FedEx Standard Overnight	Location NC

**Trip Blanks**

Include Trip Blanks

**Bottle Labels**

Blank

Pre-Printed No Sample IDs

Pre-Printed With Sample IDs

**Bottles**

Boxed Cases

Individually Wrapped

Grouped By Sample ID/Matrix

**Return Shipping Labels**

No Shipper

With Shipper

**Misc**

Sampling Instructions

Custody Seal

Temp. Blanks

Coolers

Syringes

Extra Bubble Wrap

Short Hold/Rush Stickers

DI Water

USDA Regulated Soils

**COC Options**

Number of Blanks

Pre-Printed

# of Samples	Matrix	Test	Container	Total	# of QC	Lot #	Notes
2	WT	1,4-dioxane, method 522	1-1L Amber Glass, Sodium sulfite & Na bisulfate	2	0	061024-1CEO/061724-3DII	

**Hazard Shipping Placard In Place : NO**

- \*Sample receiving hours are Mon-Fri 8:00am-6:00pm and Sat 10:00am-6:00pm unless special arrangements are made with your project manager.
- \*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.
- \*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage/disposal.
- \*Payment term are net 30 days.
- \*Please include the proposal number on the chain of custody to ensure proper billing.

**Sample Notes :**

weekly sampling; 2-locations per week; ; Special COC attached; ;

**LAB USE:**

Ship Date : 12/21/2024

Prepared By: KWT

Verified By: \_\_\_\_\_

Tracking Num: \_\_\_\_\_

**CLIENT USE (Optional):**

Date Rec'd: \_\_\_\_\_

Received By: \_\_\_\_\_

Verified By: \_\_\_\_\_



**WO#: 35935589** JR)  
**PM: TAB** Due Date: 02/19/25  
**CLIENT: BRUNCOWS**

Project #  
 Project Manager:  
 Client:

Date and Initials of person:  
 Examining contents: ATES  
 Verifying pH: J  
 Initials: Zdy

Thermometer Used: T-400 Date: 2/1/25 Time: 1133

State of Origin: \_\_\_\_\_  For WW projects, all containers verified to ≤6 °C

Cooler #1 Temp. °C 2.4 (Visual) -0.1 (Correction Factor) 2.5 (Actual)  
 Cooler #2 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
 Cooler #3 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
 Cooler #4 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
 Cooler #5 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
 Cooler #6 Temp. °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)  
 Recheck for OOT °C \_\_\_\_\_ (Visual) \_\_\_\_\_ (Correction Factor) \_\_\_\_\_ (Actual)

Samples on ice, cooling process has begun.  
 Time: \_\_\_\_\_ Initials: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other: \_\_\_\_\_  
 Shipping Method:  Standard Overnight  First Overnight  Priority Overnight  Ground  International Priority  Other: \_\_\_\_\_  
 Billing:  Recipient  Sender  Third Party  Credit Card  Unknown

Tracking # 2851 7531 0726

Custody Seal Present:  Yes  No Seal properly placed and intact:  Yes  No  
 Ice:  Wet  Blue  Dry  None  Melted

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_

Samples shorted to lab:  Yes  No (If yes, complete the following)  
 Shorted Date: \_\_\_\_\_ Shorted Time: \_\_\_\_\_  
 Bottle Quantity / Type: \_\_\_\_\_

Chain of Custody:	Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   Filled Out: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampler Name: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A								
	Relinquished To Pace: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampling Date(s): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Sampling Time(s): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A								
Samples Arrived within Hold Time.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments: _____								
Rush Turnaround Requested on COC.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A   Comments: _____								
Sufficient Volume.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments: _____								
Correct Containers Used.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments: _____								
Containers Intact.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments: _____								
Sample Labels Match COC (Sample ID, Date/Time of Collection).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A   Comments: _____								
All containers needing acid / base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A								
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A								
Exceptions: Vials, Microbiology, O&G, PFAS									
Headspace in Volatile Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A								
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A								
<table border="1"> <tr> <td colspan="2">Preservation Information</td> </tr> <tr> <td>Preservative: _____</td> <td>Date: _____</td> </tr> <tr> <td>Lot / Trace: _____</td> <td>Time: _____</td> </tr> <tr> <td>Amount added (mL): _____</td> <td>Initials: _____</td> </tr> </table>		Preservation Information		Preservative: _____	Date: _____	Lot / Trace: _____	Time: _____	Amount added (mL): _____	Initials: _____
Preservation Information									
Preservative: _____	Date: _____								
Lot / Trace: _____	Time: _____								
Amount added (mL): _____	Initials: _____								

Comments / Resolutions (use back for additional comments):  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Labeled by: PMH Reviewed by: ZRB Delivered by: ZRB