

August 31, 2018

John Z. French  
LDHH-OPH-Engineering Services  
628 N. Fourth Street  
Baton Rouge, LA 70821

RE: Project: LDH/OPH/Engineering R7 Ph2/5  
Pace Project No.: 35410884

Dear John French:

Enclosed are the analytical results for sample(s) received by the laboratory on August 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



Bo Garcia  
bo.garcia@pacelabs.com  
(386)672-5668  
Project Manager

Enclosures

cc: Parker Allen  
Jeremy Harris  
Spencer Hillyard  
Sean Nolan  
Brandon Taylor



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

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### Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174  
Alabama Certification #: 41320  
Connecticut Certification #: PH-0216  
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  
Maryland Certification #: #346  
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  
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  
Virginia Environmental Certification #: 460165  
Wyoming Certification: FL NELAC Reciprocity  
West Virginia Certification #: 9962C  
Wisconsin Certification #: 399079670  
Wyoming (EPA Region 8): FL NELAC Reciprocity

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35410884001	LA1031006 7EAH 1031006-001	Drinking Water	08/08/18 11:50	08/13/18 14:58
35410884002	LA1031006 7EGJ 1031006-002	Drinking Water	08/08/18 11:38	08/13/18 14:58

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35410884001	LA1031006 7EAH 1031006-001	EPA 200.7	SC1	11	PASI-O
		EPA 200.8	FDV	8	PASI-O
		EPA 245.1	CS2	1	PASI-O
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
35410884002	LA1031006 7EGJ 1031006-002	EPA 200.7	SC1	11	PASI-O
		EPA 200.8	FDV	8	PASI-O
		EPA 245.1	CS2	1	PASI-O
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

**Sample:** LA1031006 7EAH 1031006-001    **Lab ID:** 35410884001    Collected: 08/08/18 11:50    Received: 08/13/18 14:58    Matrix: Drinking Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 MET ICP, Drinking Water</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	0.017	mg/L	0.010	0.0023	1	08/15/18 22:17	08/16/18 08:16	7440-39-3	
Beryllium	<0.00051	mg/L	0.0016	0.00051	1	08/15/18 22:17	08/16/18 08:16	7440-41-7	
Cadmium	<0.00096	mg/L	0.0030	0.00096	1	08/15/18 22:17	08/16/18 08:16	7440-43-9	
Chromium	<0.00081	mg/L	0.0060	0.00081	1	08/15/18 22:17	08/16/18 08:16	7440-47-3	
Iron	<0.039	mg/L	0.12	0.039	1	08/15/18 22:17	08/16/18 08:16	7439-89-6	
Manganese	0.0084	mg/L	0.0050	0.0012	1	08/15/18 22:17	08/16/18 08:16	7439-96-5	
Nickel	<0.0020	mg/L	0.0080	0.0020	1	08/15/18 22:17	08/16/18 08:16	7440-02-0	
Potassium	0.95J	mg/L	1.0	0.27	1	08/15/18 22:17	08/16/18 08:16	7440-09-7	
Silver	<0.0015	mg/L	0.0050	0.0015	1	08/15/18 22:17	08/16/18 08:16	7440-22-4	
Sodium	141	mg/L	2.2	0.59	1	08/15/18 22:17	08/16/18 08:16	7440-23-5	
Zinc	<0.015	mg/L	0.050	0.015	1	08/15/18 22:17	08/16/18 08:16	7440-66-6	
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Aluminum	<0.0072	mg/L	0.010	0.0072	1	08/15/18 22:16	08/16/18 14:10	7429-90-5	
Antimony	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:10	7440-36-0	
Arsenic	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:10	7440-38-2	
Copper	0.0056	mg/L	0.0010	0.00093	1	08/15/18 22:16	08/16/18 14:10	7440-50-8	
Lead	0.0013	mg/L	0.0010	0.00064	1	08/15/18 22:16	08/16/18 14:10	7439-92-1	
Selenium	<0.00083	mg/L	0.0010	0.00083	1	08/15/18 22:16	08/16/18 14:10	7782-49-2	
Thallium	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:10	7440-28-0	
Uranium	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:10	7440-61-1	
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.10	ug/L	0.20	0.10	1	08/29/18 18:00	08/31/18 12:19	7439-97-6	

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## ANALYTICAL RESULTS

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

**Sample:** LA1031006 7EGJ 1031006-002    **Lab ID:** 35410884002    Collected: 08/08/18 11:38    Received: 08/13/18 14:58    Matrix: Drinking Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 MET ICP, Drinking Water</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	0.012	mg/L	0.010	0.0023	1	08/15/18 22:17	08/16/18 08:25	7440-39-3	
Beryllium	<0.00051	mg/L	0.0016	0.00051	1	08/15/18 22:17	08/16/18 08:25	7440-41-7	
Cadmium	<0.00096	mg/L	0.0030	0.00096	1	08/15/18 22:17	08/16/18 08:25	7440-43-9	
Chromium	<0.00081	mg/L	0.0060	0.00081	1	08/15/18 22:17	08/16/18 08:25	7440-47-3	
Iron	<0.039	mg/L	0.12	0.039	1	08/15/18 22:17	08/16/18 08:25	7439-89-6	
Manganese	0.0077	mg/L	0.0050	0.0012	1	08/15/18 22:17	08/16/18 08:25	7439-96-5	
Nickel	<0.0020	mg/L	0.0080	0.0020	1	08/15/18 22:17	08/16/18 08:25	7440-02-0	
Potassium	0.94J	mg/L	1.0	0.27	1	08/15/18 22:17	08/16/18 08:25	7440-09-7	
Silver	<0.0015	mg/L	0.0050	0.0015	1	08/15/18 22:17	08/16/18 08:25	7440-22-4	
Sodium	134	mg/L	2.2	0.59	1	08/15/18 22:17	08/16/18 08:25	7440-23-5	
Zinc	<0.015	mg/L	0.050	0.015	1	08/15/18 22:17	08/16/18 08:25	7440-66-6	
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Aluminum	<0.0072	mg/L	0.010	0.0072	1	08/15/18 22:16	08/16/18 14:12	7429-90-5	
Antimony	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:12	7440-36-0	
Arsenic	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:12	7440-38-2	
Copper	0.0011	mg/L	0.0010	0.00093	1	08/15/18 22:16	08/16/18 14:12	7440-50-8	
Lead	<0.00064	mg/L	0.0010	0.00064	1	08/15/18 22:16	08/16/18 14:12	7439-92-1	
Selenium	<0.00083	mg/L	0.0010	0.00083	1	08/15/18 22:16	08/16/18 14:12	7782-49-2	
Thallium	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:12	7440-28-0	
Uranium	<0.00050	mg/L	0.0010	0.00050	1	08/15/18 22:16	08/16/18 14:12	7440-61-1	
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.10	ug/L	0.20	0.10	1	08/29/18 18:00	08/31/18 12:25	7439-97-6	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: LDH/OPH/Engineering R7 Ph2/5  
Pace Project No.: 35410884

QC Batch: 473292 Analysis Method: EPA 245.1  
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury  
Associated Lab Samples: 35410884001, 35410884002

METHOD BLANK: 2559642 Matrix: Water  
Associated Lab Samples: 35410884001, 35410884002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.10	0.20	0.10	08/31/18 12:10	

LABORATORY CONTROL SAMPLE: 2559643

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2	2.0	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2559644 2559645

Parameter	Units	35410884001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Mercury	ug/L	<0.10	2	2	2.1	2.0	103	100	70-130	3	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2559646 2559647

Parameter	Units	35412931008		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Mercury	ug/L	0.10U	2	2	2.2	2.1	106	102	70-130	5	20		

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### QUALITY CONTROL DATA

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

QC Batch: 469728 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Drinking Water  
 Associated Lab Samples: 35410884001, 35410884002

METHOD BLANK: 2539515 Matrix: Water

Associated Lab Samples: 35410884001, 35410884002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	mg/L	<0.00084	0.010	0.00084	08/16/18 08:02	
Beryllium	mg/L	<0.0016	0.0050	0.0016	08/16/18 08:02	
Cadmium	mg/L	<0.00033	0.0030	0.00033	08/16/18 08:02	
Chromium	mg/L	<0.0017	0.0050	0.0017	08/16/18 08:02	
Iron	mg/L	<0.0092	0.040	0.0092	08/16/18 08:02	
Manganese	mg/L	<0.00042	0.0050	0.00042	08/16/18 08:02	
Nickel	mg/L	<0.0021	0.0070	0.0021	08/16/18 08:02	
Potassium	mg/L	<0.15	1.0	0.15	08/16/18 08:02	
Silver	mg/L	<0.0010	0.0050	0.0010	08/16/18 08:02	
Sodium	mg/L	<0.27	1.0	0.27	08/16/18 08:02	
Zinc	mg/L	<0.011	0.035	0.011	08/16/18 08:02	

LABORATORY CONTROL SAMPLE: 2539516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	.25	0.25	99	85-115	
Beryllium	mg/L	.025	0.024	97	85-115	
Cadmium	mg/L	.025	0.025	100	85-115	
Chromium	mg/L	.25	0.25	99	85-115	
Iron	mg/L	2.5	2.5	99	85-115	
Manganese	mg/L	.25	0.25	101	85-115	
Nickel	mg/L	.25	0.25	99	85-115	
Potassium	mg/L	12.5	11.8	95	85-115	
Silver	mg/L	.025	0.024	98	85-115	
Sodium	mg/L	12.5	12.3	99	85-115	
Zinc	mg/L	1.2	1.3	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2539517 2539518

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35410884001 Result	Spike Conc.	Spike Conc.	Result							
Barium	mg/L	0.017	.25	.25	0.27	0.27	100	101	70-130	1	20	
Beryllium	mg/L	<0.00051	.025	.025	0.025	0.025	98	98	70-130	0	20	
Cadmium	mg/L	<0.00096	.025	.025	0.025	0.025	100	100	70-130	0	20	
Chromium	mg/L	<0.00081	.25	.25	0.25	0.25	100	100	70-130	0	20	
Iron	mg/L	<0.039	2.5	2.5	2.5	2.5	100	100	70-130	0	20	
Manganese	mg/L	0.0084	.25	.25	0.26	0.26	101	101	70-130	0	20	
Nickel	mg/L	<0.0020	.25	.25	0.25	0.25	101	101	70-130	0	20	

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### QUALITY CONTROL DATA

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

Parameter	Units	2539517		2539518		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		35410884001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Potassium	mg/L	0.95J	12.5	12.5	13.7	13.7	102	102	70-130	0	20	
Silver	mg/L	<0.0015	.025	.025	0.025	0.025	99	99	70-130	0	20	
Sodium	mg/L	141	12.5	12.5	154	154	110	105	70-130	0	20	
Zinc	mg/L	<0.015	1.2	1.2	1.3	1.3	102	102	70-130	0	20	

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### QUALITY CONTROL DATA

Project: LDH/OPH/Engineering R7 Ph2/5  
Pace Project No.: 35410884

QC Batch: 469730 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Drinking Water  
Associated Lab Samples: 35410884001, 35410884002

METHOD BLANK: 2539519 Matrix: Water  
Associated Lab Samples: 35410884001, 35410884002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum	mg/L	<0.0072	0.010	0.0072	08/16/18 08:38	
Antimony	mg/L	<0.00050	0.0010	0.00050	08/16/18 08:38	
Arsenic	mg/L	<0.00050	0.0010	0.00050	08/16/18 08:38	
Copper	mg/L	<0.00093	0.0010	0.00093	08/16/18 08:38	
Lead	mg/L	<0.00064	0.0010	0.00064	08/16/18 08:38	
Selenium	mg/L	<0.00083	0.0010	0.00083	08/16/18 08:38	
Thallium	mg/L	<0.00050	0.0010	0.00050	08/16/18 08:38	
Uranium	mg/L	<0.00050	0.0010	0.00050	08/16/18 08:38	

LABORATORY CONTROL SAMPLE: 2539520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/L	.5	0.52	105	85-115	
Antimony	mg/L	.05	0.051	102	85-115	
Arsenic	mg/L	.05	0.051	103	85-115	
Copper	mg/L	.05	0.051	102	85-115	
Lead	mg/L	.05	0.052	104	85-115	
Selenium	mg/L	.05	0.051	101	85-115	
Thallium	mg/L	.05	0.052	103	85-115	
Uranium	mg/L	.05	0.054	109	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2539521 2539522

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Spike Conc.	Result	Spike Conc.	Result							
Aluminum	mg/L	0.0072U	.5	.5	0.51	0.52	102	104	70-130	2	20	
Antimony	mg/L	0.00082J	.05	.05	0.053	0.054	104	106	70-130	2	20	
Arsenic	mg/L	0.0035	.05	.05	0.055	0.055	103	104	70-130	1	20	
Copper	mg/L	0.0091	.05	.05	0.057	0.058	97	99	70-130	2	20	
Lead	mg/L	0.0027	.05	.05	0.056	0.057	106	109	70-130	3	20	
Selenium	mg/L	0.00083U	.05	.05	0.050	0.052	100	102	70-130	2	20	
Thallium	mg/L	0.0012	.05	.05	0.054	0.056	106	109	70-130	2	20	
Uranium	mg/L	0.0018	.05	.05	0.059	0.061	114	118	70-130	3		

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### QUALITY CONTROL DATA

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

Parameter	Units	2539523		2539524		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		35410989004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Aluminum	mg/L	<0.0072	.5	.5	0.40	0.48	79	96	70-130	20	20	
Antimony	mg/L	<0.00050	.05	.05	0.043	0.052	85	103	70-130	19	20	
Arsenic	mg/L	<0.00050	.05	.05	0.042	0.050	84	100	70-130	17	20	
Copper	mg/L	0.0021	.05	.05	0.041	0.048	77	92	70-130	17	20	
Lead	mg/L	<0.00064	.05	.05	0.041	0.050	81	99	70-130	19	20	
Selenium	mg/L	<0.00083	.05	.05	0.040	0.048	80	96	70-130	18	20	
Thallium	mg/L	<0.00050	.05	.05	0.044	0.055	88	109	70-130	21	20	R1
Uranium	mg/L	<0.00050	.05	.05	0.045	0.057	91	114	70-130	23		

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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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

---

Sample: **LA1031006 7EAH 1031006-001** Lab ID: **35410884001** Collected: 08/08/18 11:50 Received: 08/13/18 14:58 Matrix: Drinking Water

PWS: Site ID: Sample Type:

Parameters	Method	Act $\pm$ Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>2.94U <math>\pm</math> 1.27 (2.94)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-46-1	
Gross Beta	EPA 900.0	<b>1.31U <math>\pm</math> 0.676 (1.31)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-47-2	
Radium-226	EPA 903.1	<b>0.463U <math>\pm</math> 0.270 (0.463)</b> C:NA T:90%	pCi/L	08/27/18 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.804U <math>\pm</math> 0.391 (0.804)</b> C:69% T:85%	pCi/L	08/27/18 15:04	15262-20-1	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

**Sample:** LA1031006 7EGJ 1031006-002     **Lab ID:** 35410884002     Collected: 08/08/18 11:38     Received: 08/13/18 14:58     Matrix: Drinking Water

PWS:     Site ID:     Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>2.97U ± 1.39 (2.97)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-46-1	
Gross Beta	EPA 900.0	<b>1.65U ± 0.822 (1.65)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-47-2	
Radium-226	EPA 903.1	<b>0.918 ± 0.450 (0.155)</b> C:NA T:83%	pCi/L	08/27/18 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.891U ± 0.420 (0.891)</b> C:67% T:83%	pCi/L	08/27/18 13:02	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

QC Batch: 310330

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 35410884001

METHOD BLANK: 1516042

Matrix: Water

Associated Lab Samples: 35410884001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.998 ± 0.462 (0.773) C:77% T:74%	pCi/L	08/27/18 14:57	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

QC Batch: 310316

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 35410884001, 35410884002

METHOD BLANK: 1516023

Matrix: Water

Associated Lab Samples: 35410884001, 35410884002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.224 ± 0.497 (1.61) C:NA T:NA	pCi/L	08/27/18 08:58	
Gross Beta	0.421 ± 0.768 (1.76) C:NA T:NA	pCi/L	08/27/18 08:58	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

QC Batch: 310325

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 35410884001, 35410884002

METHOD BLANK: 1516034

Matrix: Water

Associated Lab Samples: 35410884001, 35410884002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.514 ± 0.452 (0.616) C:NA T:97%	pCi/L	08/27/18 11:44	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

QC Batch: 310331

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 35410884002

METHOD BLANK: 1516044

Matrix: Water

Associated Lab Samples: 35410884002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.961 ± 0.499 (0.879) C:69% T:74%	pCi/L	08/27/18 13:02	

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

---

### 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

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

### LABORATORIES

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LDH/OPH/Engineering R7 Ph2/5

Pace Project No.: 35410884

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35410884001	LA1031006 7EAH 1031006-001	EPA 200.7	469728	EPA 200.7	469753
35410884002	LA1031006 7EGJ 1031006-002	EPA 200.7	469728	EPA 200.7	469753
35410884001	LA1031006 7EAH 1031006-001	EPA 200.8	469730	EPA 200.8	469754
35410884002	LA1031006 7EGJ 1031006-002	EPA 200.8	469730	EPA 200.8	469754
35410884001	LA1031006 7EAH 1031006-001	EPA 245.1	473292	EPA 245.1	473492
35410884002	LA1031006 7EGJ 1031006-002	EPA 245.1	473292	EPA 245.1	473492
35410884001	LA1031006 7EAH 1031006-001	EPA 900.0	310316		
35410884002	LA1031006 7EGJ 1031006-002	EPA 900.0	310316		
35410884001	LA1031006 7EAH 1031006-001	EPA 903.1	310325		
35410884002	LA1031006 7EGJ 1031006-002	EPA 903.1	310325		
35410884001	LA1031006 7EAH 1031006-001	EPA 904.0	310330		
35410884002	LA1031006 7EGJ 1031006-002	EPA 904.0	310331		

### REPORT OF LABORATORY ANALYSIS

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WO#: 35410884

**CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately

**Section A: Originator**

LDH/OPH/Engineering R7  
1525 Fairfield Ave., Rm 569  
Shreveport LA 71101  
John.French@LA.gov

**Section B: Project Information**

Report To: John Z. French, PE  
John.French@LA.gov

PO #: 2000338900

Interim Analysis for LDH/OPH/BR Lab

**Section C: Ship to Destination**

Pace Analytical Services - Florida

Attn: Bo Garcia

8 East Tower Circle

Ormond Beach, FL 32174

386-676-4810

Bo.Garcia@pacelabs.com

Shreveport LA 71101  
John.French@LA.gov



35410884

ITEM #	SAMPLE ID	Section D Required Client Information		COLLECTED		# OF CONTAINERS	Pace Project Number Lab I.D.																																																											
		MATRIX CODE	SAMPLE TYPE G+GRAB C=COMP	COMPOSITE START DATE TIME	COMPOSITE END OR GRAB DATE TIME																																																													
1	LA10310067EAH 1031006-001 GRAND CANE WATER SYSTEM	DW	G	8/8/2018 11:50	8/8/2018 11:50	Ph2/5 Set WELL #1																																																												
2	LA10310067EGJ 1031006-002 GRAND CANE WATER SYSTEM	DW	G	8/8/2018 11:38	8/8/2018 11:38	Ph2/5 Set WELL #2																																																												
3		DW	G																																																															
4		DW	G																																																															
5		DW	G																																																															
6		DW	G																																																															
7		DW	G																																																															
8		DW	G																																																															
9		DW	G																																																															
10		DW	G																																																															
<table border="1"> <thead> <tr> <th colspan="2">RELEASED BY / AFFILIATION</th> <th>DATE</th> <th>TIME</th> <th>ACCEPTED BY / AFFILIATION</th> <th>DATE</th> <th>TIME</th> <th colspan="2">SAMPLE CONDITIONS</th> </tr> </thead> <tbody> <tr> <td colspan="2">TIFFANY ROBERSON/LDH</td> <td>10-Aug</td> <td>12:30</td> <td>A. Brooks/Pace</td> <td>8/13/18</td> <td>1458</td> <td>197</td> <td>Y/N</td> <td>Y/N</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>7338</td> <td>Y/N</td> <td>Y/N</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Y/N</td> <td>Y/N</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Y/N</td> <td>Y/N</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Y/N</td> <td>Y/N</td> </tr> </tbody> </table>								RELEASED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		TIFFANY ROBERSON/LDH		10-Aug	12:30	A. Brooks/Pace	8/13/18	1458	197	Y/N	Y/N								7338	Y/N	Y/N									Y/N	Y/N									Y/N	Y/N									Y/N	Y/N
RELEASED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS																																																											
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							7338	Y/N	Y/N																																																									
								Y/N	Y/N																																																									
								Y/N	Y/N																																																									
								Y/N	Y/N																																																									
<p><b># of Ice Chests in this Shipment</b> 2</p> <p>Ice Chest (No. of _)</p>								Received on	Temp in °C	Received on Ice	Custody	Sealed Cooler	Samples Intact																																																					

Additional Comments:

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: TIFFANY ROBERSON  
 SIGNATURE of SAMPLER: *Tiffany Roberson*  
 DATE Signed (MM/DD/YYYY) 8/10/2018



Document Name:  
Sample Condition Upon Receipt Form  
Document No.:  
F-FL-C-007 rev. 13

Document Revised:  
May 30, 2018  
Issuing Authority:  
Pace Florida Quality Office

**WO#: 35410884** **SCUR)**

**Project #** PM: VEG **Due Date:** 09/04/18  
**Project Manager:** CLIENT: LDHOPH  
**Client:**

**Date and Initials of person:**  
**Examining contents:** mm  
**Label:** \_\_\_\_\_  
**Deliver:** \_\_\_\_\_  
**pH:** \_\_\_\_\_

Thermometer Used: T338 Date: 8/13/18 Time: 1458 Initials: SBR

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

Cooler #1 Temp. °C <u>19.6</u> (Visual) <u>0</u> (Correction Factor) <u>19.6</u> (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #2 Temp. °C <u>19.7</u> (Visual) <u>0</u> (Correction Factor) <u>19.7</u> (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other \_\_\_\_\_  
Shipping Method:  First Overnight  Priority Overnight  Standard Overnight  Ground  International Priority  
 Other \_\_\_\_\_

Billing:  Recipient  Sender  Third Party  Credit Card  Unknown

Tracking # MASTER # BM DABA / 7729 4141 9024

Custody Seal on Cooler/Box Present:  Yes  No Seals intact:  Yes  No Ice: Wet Blue Dry None

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

Samples shorted to lab (If Yes, complete) Shorted Date: \_\_\_\_\_ Shorted Time: \_\_\_\_\_ Qty: \_\_\_\_\_

**Comments:**

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<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	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA 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	

**Client Notification/ Resolution:**  
Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

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

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_

August 28, 2018

Bo Garcia  
Pace Analytical Services, Inc.  
8 East Tower Circle  
Ormond Beach, FL 32174

RE: Project: 35410884  
Pace Project No.: 30262589

Dear Bo Garcia:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



Carin Ferris  
carin.ferris@pacelabs.com  
724-850-5615  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 35410884  
Pace Project No.: 30262589

### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
ANAB DOD-ELAP Rad Accreditation #: L2417  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California Certification #: 04222CA  
Colorado Certification #: PA01547  
Connecticut Certification #: PH-0694  
Delaware Certification  
EPA Region 4 DW Rad  
Florida/TNI Certification #: E87683  
Georgia Certification #: C040  
Guam Certification  
Hawaii Certification  
Idaho Certification  
Illinois Certification  
Indiana Certification  
Iowa Certification #: 391  
Kansas/TNI Certification #: E-10358  
Kentucky Certification #: KY90133  
KY WW Permit #: KY0098221  
KY WW Permit #: KY0000221  
Louisiana DHH/TNI Certification #: LA180012  
Louisiana DEQ/TNI Certification #: 4086  
Maine Certification #: 2017020  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457  
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235  
Montana Certification #: Cert0082  
Nebraska Certification #: NE-OS-29-14  
Nevada Certification #: PA014572018-1  
New Hampshire/TNI Certification #: 297617  
New Jersey/TNI Certification #: PA051  
New Mexico Certification #: PA01457  
New York/TNI Certification #: 10888  
North Carolina Certification #: 42706  
North Dakota Certification #: R-190  
Ohio EPA Rad Approval: #41249  
Oregon/TNI Certification #: PA200002-010  
Pennsylvania/TNI Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
Rhode Island Certification #: 65-00282  
South Dakota Certification  
Tennessee Certification #: 02867  
Texas/TNI Certification #: T104704188-17-3  
Utah/TNI Certification #: PA014572017-9  
USDA Soil Permit #: P330-17-00091  
Vermont Dept. of Health: ID# VT-0282  
Virgin Island/PADEP Certification  
Virginia/VELAP Certification #: 9526  
Washington Certification #: C868  
West Virginia DEP Certification #: 143  
West Virginia DHHR Certification #: 9964C  
Wisconsin Approve List for Rad  
Wyoming Certification #: 8TMS-L

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 35410884

Pace Project No.: 30262589

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35410884001	LA1031006 7EAH 1031006-001	Drinking Water	08/08/18 11:50	08/17/18 09:30
35410884002	LA1031006 7EGJ 1031006-002	Drinking Water	08/08/18 11:38	08/17/18 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 35410884

Pace Project No.: 30262589

Lab ID	Sample ID	Method	Analysts	Analytes Reported
35410884001	LA1031006 7EAH 1031006-001	EPA 900.0	NEG	2
		EPA 903.1	MK1	1
		EPA 904.0	JLW	1
35410884002	LA1031006 7EGJ 1031006-002	EPA 900.0	NEG	2
		EPA 903.1	MK1	1
		EPA 904.0	JLW	1

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 35410884

Pace Project No.: 30262589

**Sample:** LA1031006 7EAH 1031006-001 **Lab ID:** 35410884001 Collected: 08/08/18 11:50 Received: 08/17/18 09:30 Matrix: Drinking Water

PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>2.94U ± 1.27 (2.94)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-46-1	
Gross Beta	EPA 900.0	<b>1.31U ± 0.676 (1.31)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-47-2	
Radium-226	EPA 903.1	<b>0.463U ± 0.270 (0.463)</b> C:NA T:90%	pCi/L	08/27/18 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.804U ± 0.391 (0.804)</b> C:69% T:85%	pCi/L	08/27/18 15:04	15262-20-1	

**Sample:** LA1031006 7EGJ 1031006-002 **Lab ID:** 35410884002 Collected: 08/08/18 11:38 Received: 08/17/18 09:30 Matrix: Drinking Water

PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>2.97U ± 1.39 (2.97)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-46-1	
Gross Beta	EPA 900.0	<b>1.65U ± 0.822 (1.65)</b> C:NA T:NA	pCi/L	08/27/18 09:01	12587-47-2	
Radium-226	EPA 903.1	<b>0.918 ± 0.450 (0.155)</b> C:NA T:83%	pCi/L	08/27/18 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.891U ± 0.420 (0.891)</b> C:67% T:83%	pCi/L	08/27/18 13:02	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 35410884

Pace Project No.: 30262589

QC Batch: 310330

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 35410884001

METHOD BLANK: 1516042

Matrix: Water

Associated Lab Samples: 35410884001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.998 ± 0.462 (0.773) C:77% T:74%	pCi/L	08/27/18 14:57	

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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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 35410884

Pace Project No.: 30262589

QC Batch: 310316

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 35410884001, 35410884002

METHOD BLANK: 1516023

Matrix: Water

Associated Lab Samples: 35410884001, 35410884002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.224 ± 0.497 (1.61) C:NA T:NA	pCi/L	08/27/18 08:58	
Gross Beta	0.421 ± 0.768 (1.76) C:NA T:NA	pCi/L	08/27/18 08:58	

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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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 35410884

Pace Project No.: 30262589

QC Batch: 310325

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 35410884001, 35410884002

METHOD BLANK: 1516034

Matrix: Water

Associated Lab Samples: 35410884001, 35410884002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.514 ± 0.452 (0.616) C:NA T:97%	pCi/L	08/27/18 11:44	

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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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 35410884

Pace Project No.: 30262589

QC Batch: 310331

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 35410884002

METHOD BLANK: 1516044

Matrix: Water

Associated Lab Samples: 35410884002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.961 ± 0.499 (0.879) C:69% T:74%	pCi/L	08/27/18 13:02	

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: 35410884  
Pace Project No.: 30262589

### 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

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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# Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: LA



Workorder: 35410884

Workorder Name: LDH/OPH/Engineering R7 Ph2/5

Owner Received Date: 8/13/2018 Results Requested By: 9/4/2018

Report To:  Subcontract To:

Bo Garcia  
Pace Analytical Ormond Beach  
8 East Tower Circle  
Ormond Beach, FL 32174  
Phone (386)672-5668

Pace Analytical Pittsburgh  
1638 Roseytown Road  
Suites 2, 3, & 4  
Greensburg, PA 15601  
Phone (724)850-5600

Requested Analysis

Gross Alpha / rad 438  
Subbed work within PASI RAD

**WO# : 30262589**

**30262589**

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		LAB USE ONLY	
						HNO3			
1	LA1031006 7EAH 1031006-001	PS	8/8/2018 11:50	35410884001	Drinking	3		X	001
2	LA1031006 7EGJ 1031006-002	PS	8/8/2018 11:38	35410884002	Drinking	3		X	002
3									
4									
5									

Transfers		Released By	Date/Time	Received By	Date/Time	Received on Ice	Y or N	Samples Intact	Y or N
1		<i>[Signature]</i>	8-15-18 17:00	<i>[Signature]</i>	8-17-18 09:30		N	Y	N
2									
3									

Cooler Temperature on Receipt *61A* °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.





Document Name:  
Sample Condition Upon Receipt Form  
Document No.:  
F-FL-C-007 rev. 13

Document Revised:  
May 30, 2018  
Issuing Authority:  
Pace Florida Quality Office

**WO#: 35410884** **SCUR)**

**Project #** PM: VEG **Due Date:** 09/04/18  
**Project Manager:** CLIENT: LDHOPH  
**Client:**

**Date and Initials of person:**  
**Examining contents:** mm  
**Label:** \_\_\_\_\_  
**Deliver:** \_\_\_\_\_  
**pH:** \_\_\_\_\_

30262589

**Thermometer Used:** T338 **Date:** 8/13/18 **Time:** 1458 **Initials:** SBR

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

**Cooler #1 Temp. °C:** 19.6 (Visual) 0 (Correction Factor) 19.6 (Actual)  
**Cooler #2 Temp. °C:** 19.7 (Visual) 0 (Correction Factor) 19.7 (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)

Samples on ice, cooling process has begun  
 Samples on ice, cooling process has begun  
 Samples on ice, cooling process has begun  
 Samples on ice, cooling process has begun  
 Samples on ice, cooling process has begun  
 Samples on ice, cooling process has begun

**Courier:**  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other \_\_\_\_\_  
**Shipping Method:**  First Overnight  Priority Overnight  Standard Overnight  Ground  International Priority  
 Other \_\_\_\_\_

**Billing:**  Recipient  Sender  Third Party  Credit Card  Unknown

**Tracking #** MASTER # BM DABA / 7729 4141 9024

**Custody Seal on Cooler/Box Present:**  Yes  No **Seals intact:**  Yes  No **Ice:** Wet Blue Dry None

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

**Samples shorted to lab (if Yes, complete)** **Shorted Date:** \_\_\_\_\_ **Shorted Time:** \_\_\_\_\_ **Qty:** \_\_\_\_\_

**Comments:**

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<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	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<b>Preservation Information:</b> <b>Preservative:</b> _____ <b>Lot #/Trace #:</b> _____ <b>Date:</b> _____ <b>Time:</b> _____ <b>Initials:</b> _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA 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	

**Client Notification/ Resolution:**  
**Person Contacted:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

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

**Project Manager Review:** \_\_\_\_\_ **Date:** \_\_\_\_\_

NO#: 35410884

**CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately

**Section A: Originator**  
 LDH/OPH/Engineering R7  
 1525 Fairfield Ave., Rm 569  
 Shreveport LA 71101  
 John.French@LA.gov

**Section B: Project Information**  
 Report To: John Z. French, PE  
 John.French@LA.gov  
 PO #: 200038900  
 Interim Analysis for LDH/OPH/BR Lab

**Section C: Ship to Destination**  
 Pace Analytical Services - Florida  
 Attn: Bo Garcia  
 8 East Tower Circle  
 Ormond Beach, FL 32174  
 386-676-4810  
 Bo.Garcia@pacelabs.com

**Section D**  
 Required Client Information

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G+GRAB C-COMP	COLLECTED		# OF CONTAINERS	Pace Project Number Lab ID.																																	
				COMPOSITE START DATE TIME	COMPOSITE END OR GRAB TIME																																			
1	LA1031006 7EAH - 1031006-001 GRAND CANE WATER SYSTEM	DW	G	8/8/2018 11:50	11:50	Ph2/5 Set WELL #1																																		
2	LA1031006 7EGJ - 1031006-002 GRAND CANE WATER SYSTEM	DW	G	8/8/2018 11:38	11:38	Ph2/5 Set WELL #2																																		
3		DW	G																																					
4		DW	G																																					
5		DW	G																																					
6		DW	G																																					
7		DW	G																																					
8		DW	G																																					
9		DW	G																																					
10		DW	G																																					
<table border="1"> <thead> <tr> <th>RELEASED BY / AFFILIATION</th> <th>DATE</th> <th>TIME</th> <th>ACCEPTED BY / AFFILIATION</th> <th>DATE</th> <th>TIME</th> <th>RECEIVED ON</th> <th>Temp In °C</th> <th>Received on Ice</th> <th>Custody Sealed Cooler</th> <th>Samples Intact</th> </tr> </thead> <tbody> <tr> <td>TIFFANY ROBERSON/LDH</td> <td>10-Aug</td> <td>12:30</td> <td>T. Roberson/Pace</td> <td>8/13/18</td> <td>1458</td> <td>197-000</td> <td></td> <td>Y/N</td> <td>Y/N</td> <td>Y/N</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1338</td> <td></td> <td>Y/N</td> <td>Y/N</td> <td>Y/N</td> </tr> </tbody> </table>								RELEASED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	RECEIVED ON	Temp In °C	Received on Ice	Custody Sealed Cooler	Samples Intact	TIFFANY ROBERSON/LDH	10-Aug	12:30	T. Roberson/Pace	8/13/18	1458	197-000		Y/N	Y/N	Y/N							1338		Y/N	Y/N	Y/N
RELEASED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	RECEIVED ON	Temp In °C	Received on Ice	Custody Sealed Cooler	Samples Intact																														
TIFFANY ROBERSON/LDH	10-Aug	12:30	T. Roberson/Pace	8/13/18	1458	197-000		Y/N	Y/N	Y/N																														
						1338		Y/N	Y/N	Y/N																														
<b>Additional Comments:</b> # of Ice Chests in this Shipment <u>2</u> Ice Chest (No. of _)																																								

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: TIFFANY ROBERSON  
 SIGNATURE of SAMPLER: *Tiffany Roberson*  
 DATE Signed (MM/DD/YYYY): 8/10/2018

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: PACE FL

Project # 30262589

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 4525 3215 6415

Label	<u>BMH</u>
LIMS Login	<u>BMH</u>

Custody Seal on Cooler/Box Present:  yes  no      Seals intact:  yes  no

Thermometer Used N/A      Type of Ice: Wet Blue  None

Cooler Temperature Observed Temp \_\_\_\_\_ °C      Correction Factor: \_\_\_\_\_ °C      Final Temp: \_\_\_\_\_ °C  
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>ET 8-17-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/	/		1. <u>10D3671</u>
Chain of Custody Filled Out:	/	/		2.
Chain of Custody Relinquished:	/	/		3.
Sampler Name & Signature on COC:	/	/		4.
Sample Labels match COC:	/	/		5.
-Includes date/time/ID      Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/	/		6.
Short Hold Time Analysis (<72hr remaining):	/	/		7.
Rush Turn Around Time Requested:	/	/		8.
Sufficient Volume:	/	/		9.
Correct Containers Used:	/	/		10.
-Pace Containers Used:	/	/		
Containers Intact:	/	/		11.
Orthophosphate field filtered	/	/		12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	/	/		13.
Organic Samples checked for dechlorination:	/	/		14.
Filtered volume received for Dissolved tests	/	/		15.
All containers have been checked for preservation.	/	/		16. <u>PHL2</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/	/		
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ET</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	/	/		17.
Trip Blank Present:	/	/		18.
Trip Blank Custody Seals Present	/	/		
Rad Aqueous Samples Screened > 0.5 mrem/hr	/	/		Initial when completed: <u>ET</u> Date: <u>8-17-18</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_  
Comments/ Resolution: \_\_\_\_\_

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

\*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.