

(724)850-5600



September 15, 2020

Theodore E. Rahon CoPhysics Corporation 1 Commercial Drive, Sutie 1 Florida, NY 10921

RE: Project: Lot-A

Pace Project No.: 30377832

#### Dear Theodore Rahon:

Enclosed are the analytical results for sample(s) received by the laboratory on August 14, 2020. 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 - Greensburg

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

Sincerely,

Jacquelyn Collins@pace

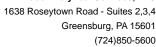
jacquelyn.collins@pacelabs.com

Sugnelylellins

(724)850-5612 Project Manager

Enclosures







#### **CERTIFICATIONS**

Project: Lot-A
Pace Project No.: 30377832

#### Pace Analytical Services Pennsylvania

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 Florida: Cert E871149 SEKS WET

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

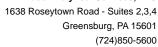
Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

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

Texas/TNI Certification #: T104704188-17-3

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L

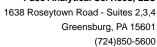




# **SAMPLE SUMMARY**

Project: Lot-A
Pace Project No.: 30377832

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30377832001	Lot A-1	Solid	08/07/20 12:00	08/14/20 10:00
30377832002	Lot A-2	Solid	08/07/20 12:00	08/14/20 10:00
30377832003	Lot A-3	Solid	08/07/20 12:00	08/14/20 10:00
30377832004	Lot A-4	Solid	08/07/20 12:00	08/14/20 10:00
30377832005	Lot A-5	Solid	08/07/20 12:00	08/14/20 10:00



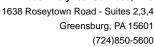


# **SAMPLE ANALYTE COUNT**

Project: Lot-A
Pace Project No.: 30377832

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30377832001	Lot A-1	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	CLA	2	PASI-PA
		HSL-300	LAL	1	PASI-PA
30377832002	Lot A-2	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	CLA	2	PASI-PA
		HSL-300	LAL	1	PASI-PA
30377832003	Lot A-3	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	CLA	2	PASI-PA
		HSL-300	LAL	1	PASI-PA
30377832004	Lot A-4	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	CLA	2	PASI-PA
		HSL-300	LAL	1	PASI-PA
30377832005	Lot A-5	EPA 901.1	MAH	2	PASI-PA
		EPA 9310	CLA	2	PASI-PA
		HSL-300	LAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg





#### **PROJECT NARRATIVE**

Project: Lot-A
Pace Project No.: 30377832

Method: EPA 901.1

Description: 901.1 Gamma Spec INGROWTH

Client: CoPhysics Corporation

Date: September 15, 2020

#### **General Information:**

5 samples were analyzed for EPA 901.1 by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

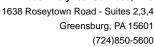
# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:





#### **PROJECT NARRATIVE**

Project: Lot-A
Pace Project No.: 30377832

Method: EPA 9310

Description:9310 Gross Alpha/BetaClient:CoPhysics CorporationDate:September 15, 2020

#### **General Information:**

5 samples were analyzed for EPA 9310 by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

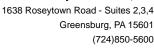
# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:





#### **PROJECT NARRATIVE**

Project: Lot-A
Pace Project No.: 30377832

Method: HSL-300

Description: HSL300(AS) Actinides
Client: CoPhysics Corporation
Date: September 15, 2020

#### **General Information:**

5 samples were analyzed for HSL-300 by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

# **Additional Comments:**

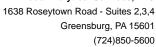
**Analyte Comments:** 

QC Batch: 410900

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- BLANK (Lab ID: 1988093)
  - Thorium-230
- Lot A-1 (Lab ID: 30377832001)
  - Thorium-230
- Lot A-2 (Lab ID: 30377832002)
  - Thorium-230
- Lot A-3 (Lab ID: 30377832003)
  - Thorium-230
- Lot A-4 (Lab ID: 30377832004)
  - Thorium-230
- Lot A-5 (Lab ID: 30377832005)
  - Thorium-230

This data package has been reviewed for quality and completeness and is approved for release.





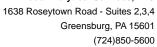
Project: Lot-A
Pace Project No.: 30377832

Sample: Lot A-1 Lab ID: 30377832001 Collected: 08/07/20 12:00 Received: 08/14/20 10:00 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qua
	Pace Analytical	Services - Greensburg		•		
Radium-226	EPA 901.1	0.785 ± 0.201 (0.155) C:NA T:NA	pCi/g	09/10/20 15:24	13982-63-3	Ra
Radium-228	EPA 901.1	1.402 ± 0.370 (0.241) C:NA T:NA	pCi/g	09/10/20 15:24	15262-20-1	
	Pace Analytical	Services - Greensburg				
Gross Alpha	EPA 9310	12.7 ± 5.78 (5.38) C:NA T:NA	pCi/g	08/21/20 07:29	12587-46-1	
Gross Beta	EPA 9310	16.3 ± 4.11 (3.69) C:NA T:NA	pCi/g	08/21/20 07:29	12587-47-2	
	Pace Analytical	Services - Greensburg				
Thorium-230	HSL-300	0.339 ± 0.221 (0.162) C:NA T:54%	pCi/g	08/31/20 12:51	14269-63-7	N2





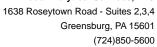
Project: Lot-A
Pace Project No.: 30377832

Sample: Lot A-2 Lab ID: 30377832002 Collected: 08/07/20 12:00 Received: 08/14/20 10:00 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg		•		
Radium-226	EPA 901.1	0.714 ± 0.256 (0.412) C:NA T:NA	pCi/g	09/10/20 15:23	13982-63-3	Ra
Radium-228	EPA 901.1	1.358 ± 0.439 (0.559) C:NA T:NA	pCi/g	09/10/20 15:23	15262-20-1	
	Pace Analytical	Services - Greensburg				
Gross Alpha	EPA 9310	20.0 ± 8.68 (11.5) C:NA T:NA	pCi/g	08/21/20 07:50	12587-46-1	
Gross Beta	EPA 9310	18.3 ± 5.16 (5.10) C:NA T:NA	pCi/g	08/21/20 07:50	12587-47-2	
	Pace Analytical	Services - Greensburg				
Thorium-230	HSL-300	0.841 ± 0.364 (0.165) C:NA T:52%	pCi/g	08/31/20 12:51	14269-63-7	N2





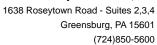
Project: Lot-A
Pace Project No.: 30377832

Sample: Lot A-3 Lab ID: 30377832003 Collected: 08/07/20 12:00 Received: 08/14/20 10:00 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg		•		
Radium-226	EPA 901.1	1.267 ± 0.396 (0.305) C:NA T:NA	pCi/g	09/09/20 09:19	13982-63-3	Ra
Radium-228	EPA 901.1	0.841 ± 0.342 (0.306) C:NA T:NA	pCi/g	09/09/20 09:19	15262-20-1	
	Pace Analytical	Services - Greensburg				
Gross Alpha	EPA 9310	17.7 ± 6.93 (6.40) C:NA T:NA	pCi/g	08/21/20 07:30	12587-46-1	
Gross Beta	EPA 9310	12.7 ± 3.61 (3.42) C:NA T:NA	pCi/g	08/21/20 07:30	12587-47-2	
	Pace Analytical	Services - Greensburg				
Thorium-230	HSL-300	0.924 ± 0.347 (0.151) C:NA T:68%	pCi/g	08/31/20 12:51	14269-63-7	N2





Project: Lot-A
Pace Project No.: 30377832

Sample: Lot A-4 Lab ID: 30377832004 Collected: 08/07/20 12:00 Received: 08/14/20 10:00 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg		•		
Radium-226	EPA 901.1	0.705 ± 0.200 (0.235) C:NA T:NA	pCi/g	09/10/20 15:40	13982-63-3	Ra
Radium-228	EPA 901.1	0.676 ± 0.560 (0.594) C:NA T:NA	pCi/g	09/10/20 15:40	15262-20-1	
	Pace Analytical	Services - Greensburg				
Gross Alpha	EPA 9310	9.49 ± 5.09 (6.80) C:NA T:NA	pCi/g	08/21/20 07:49	12587-46-1	
Gross Beta	EPA 9310	18.9 ± 4.48 (3.03) C:NA T:NA	pCi/g	08/21/20 07:49	12587-47-2	
	Pace Analytical	Services - Greensburg				
Thorium-230	HSL-300	0.597 ± 0.280 (0.141) C:NA T:58%	pCi/g	08/31/20 12:51	14269-63-7	N2



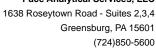
Project: Lot-A
Pace Project No.: 30377832

Sample: Lot A-5 Lab ID: 30377832005 Collected: 08/07/20 12:00 Received: 08/14/20 10:00 Matrix: Solid

PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical	Services - Greensburg		•		
Radium-226	EPA 901.1	0.624 ± 0.148 (0.202) C:NA T:NA	pCi/g	09/10/20 15:41	13982-63-3	Ra
Radium-228	EPA 901.1	0.714 ± 0.319 (0.239) C:NA T:NA	pCi/g	09/10/20 15:41	15262-20-1	
	Pace Analytical	Services - Greensburg				
Gross Alpha	EPA 9310	8.86 ± 5.19 (7.40) C:NA T:NA	pCi/g	08/21/20 07:30	12587-46-1	
Gross Beta	EPA 9310	13.4 ± 4.17 (4.85) C:NA T:NA	pCi/g	08/21/20 07:30	12587-47-2	
	Pace Analytical	Services - Greensburg				
Thorium-230	HSL-300	0.263 ± 0.175 (0.150) C:NA T:70%	pCi/g	08/31/20 12:51	14269-63-7	N2





Project: Lot-A
Pace Project No.: 30377832

QC Batch: 410034 Analysis Method: EPA 9310

QC Batch Method: EPA 9310 Analysis Description: 9310 Gross Alpha/Beta

Laboratory: Pace Analytical Services - Greensburg

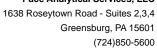
Associated Lab Samples: 30377832001, 30377832002, 30377832003, 30377832004, 30377832005

METHOD BLANK: 1984339 Matrix: Solid

Associated Lab Samples: 30377832001, 30377832002, 30377832003, 30377832004, 30377832005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.030 ± 0.0725 (0.168) C:NA T:NA	pCi/g	08/21/20 07:30	
Gross Beta	0.079 ± 0.102 (0.216) C:NA T:NA	pCi/g	08/21/20 07:30	

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.





Project: Lot-A
Pace Project No.: 30377832

QC Batch: 410900 Analysis Method: HSL-300

QC Batch Method: HSL-300 Analysis Description: HSL300(AS) Actinides

Laboratory: Pace Analytical Services - Greensburg

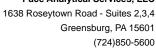
Associated Lab Samples: 30377832001, 30377832002, 30377832003, 30377832004, 30377832005

METHOD BLANK: 1988093 Matrix: Solid

Associated Lab Samples: 30377832001, 30377832002, 30377832003, 30377832004, 30377832005

ParameterAct  $\pm$  Unc (MDC) Carr TracUnitsAnalyzedQualifiersThorium-2300.020  $\pm$  0.070 (0.054) C:NA T:86%pCi/g08/31/20 12:51N2

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.





Project: Lot-A
Pace Project No.: 30377832

QC Batch: 411878 Analysis Method: EPA 901.1

QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec Ingrowth

Laboratory: Pace Analytical Services - Greensburg

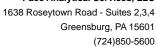
Associated Lab Samples: 30377832001, 30377832002, 30377832004, 30377832005

METHOD BLANK: 1992354 Matrix: Solid

Associated Lab Samples: 30377832001, 30377832002, 30377832004, 30377832005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed Qua	lifiers
Radium-226	0.000 ± 0.190 (0.229) C:NA T:NA	pCi/g	09/01/20 15:20 Ra	
Radium-228	0.120 ± 0.105 (0.249) C:NA T:NA	pCi/g	09/01/20 15:20	

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.





Project: Lot-A
Pace Project No.: 30377832

QC Batch: 410646 Analysis Method: EPA 901.1

QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec Ingrowth

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30377832003

METHOD BLANK: 1987253 Matrix: Solid

Associated Lab Samples: 30377832003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.072 ± 0.073 (0.173) C:NA T:NA	pCi/g	09/08/20 14:25 F	Ra
Radium-228	0.011 ± 0.107 (0.208) C:NA T:NA	pCi/g	09/08/20 14:25	

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.





#### **QUALIFIERS**

Project: Lot-A Pace Project No.: 30377832

#### **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.

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.

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(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.

#### **ANALYTE QUALIFIERS**

Date: 09/15/2020 04:38 PM

The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A N2 complete list of accreditations/certifications is available upon request.

The reported Ra-226 results were determined by hermetically sealing the dried, processed sample in an appropriate-Ra sized can. Each sample was stored for a minimum of 21 days to ensure that equilibrium between Ra-226 and daughters Bi-214 and Pb-214 was achieved. Reported Ra-226 results were inferred from gamma peaks attributable to Bi-214 and Pb-214.

Cooler 1 Therm Corr. Factor: 0C Cooler 1 Temp Upon Receipt: \_\_\_\_\_oC Temp Blank Received: Y TW NA Page: Lab Sample Temperature Info: TSP 4 Cooler 1 Corrected Temp: Trip Blank Received: Y HCL MeOH TSP \*\* Preservative Types: (1) nitric acid. (2) sulfuric acid. (3) hydrochloric acid. (4) sodium hydroxdide. (5) zinc acetate, (6) methanol. (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide. (D) TSP, (U) Unpreserved, (O) Other ser or Non Conformance(s): YES / NO 1001 Lead Acetate Strips: Therm ID#: Sample pr Acceptable Sulfide Present LAB USE ONIX-Lab Sample # WO#: 30377832 MIJL LAB USE ONLY SHORT HOLDS PRESENT (<72 hours): , YAN / N/A Courier emplate: cctnum: Table # ?relogin; PB: ž 30377832 Clent 8 Samples received via: Date/Time: Lab Tracking #: Container LAB USE 7 # of Ctrs State; County/City: Time Zone Collected: None Received by/Company: (Signature) 図のパングででのの Received by/Company: (Signature) (eceived by/Company: (Signature) CHAIN-OF-CUSTODY Analytical Request Document ភ្លឺ ប Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields Teld Filtered (if applicable) mmediately Packed on Ice. die de Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Compliance Monitoring? [女 Yes [ ] No Wet Blue Dry No I Radchem sample(s) screened (<500 cpm): Product (P), Soil/Soiid (SL), Oll (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT) N DW Location Code: Time Composite End DW PWS ID #: Date ] Yes Analysis: Site Collection Info/Address: Packing Material Used [ ]2 Day [ ]3 Day [ ]4 Day [ ]5 Day Date/Time: 3PM Composite Start) Time 7.1 type of Ice Used: Billing Information: Email To: Lec Collected (or 54.M.C [ ] Same Day [ ] Next Day Date (Expedite Charges Apply) Date/Time: Jate/Time: Turnaround Date Required: Comp/ Grab Customer Remarks / Special Conditions / Possible Hazards: NORMAL) Measurements show Purchase Order #: Quote #: なな。 Site/Facility ID #: 124615 0 つるな Matrix \* 940 Z Rush Relinquished by/Company: (Signature) Relinquished by/Company: (Signature) linguished by/Company: (Signature) ] Dispose as appropriate [ ] Return Phone: 245 183 462 Address Com mercia Customer Project Name/Number: elevated Face Analytical\* needove MONTH 4500 Rosolno Valle7 collected By (signature): Customer Sample ID Collected By (print) Sample Disposal: 10 70 7 oth Ţ ] Archive: 10 70 ا م Email: