DMR Copy of Record

Permit					
Permit #:	**MD0067482**	**Permittee:**	NASA - GODDARD SPACE FLIGHT CENTER	**Facility:**	NASA GODDARD FLIGHT CENTER
Major:	No	**Permittee Address:**	8800 GREENBELT ROAD, CODE 250 GREENBELT, MD 20771	**Facility Location:**	GREENBELT ROAD GREENBELT, MD 20771
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 08-DP-3156		
Report Dates & Status					
Monitoring Period:	**From 04/01/19 to 06/30/19**	**DMR Due Date:**	**07/28/19**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
Principal Executive Officer					
First Name:	Kimberly	**Title:**	Chief, Medical and Envir Mngt Division	**Telephone:**	301-286-4230
Last Name:	Finch				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration						# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00011	Temperature, water deg. fahrenheit	1 - Effluent Gross	0	--	Sample										=	74.3	15 - deg F		01/30 - Monthly	IT - Immersion Stabilization
					Permit Req.										<=	90 DAILY MX	15 - deg F		01/30 - Monthly	IT - Immersion Stabilization
					Value NODI															
00400	pH	1 - Effluent Gross	0	--	Sample						=	6.8			=	8	12 - SU		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	8.5 DAILY MX	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Sample								=	0.7			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Sample	=	398.2			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.		Req Mon QRTR AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Sample								=	0.7			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample								<	0.1			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Sample								=	0.094			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	1	--	Sample	=	53.19			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.		Req Mon QRTR AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Sample								=	66	=	70	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.									Req Mon QRTR AVG		Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample								=	0.0045	=	0.005	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.									Req Mon QRTR AVG		Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Sample								=	0.0054	=	0.006	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.								<=	.009 QRTR AVG	<=	.013 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
50060	Chlorine, total residual	1 - Effluent Gross	0	--	Sample								<	0.1	<	0.1	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.								<=	.1 QRTR AVG	<=	.1 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
74076	Flow	1 - Effluent Gross	0	--	Sample	=	749042	=	750985	07 - gal/d									01/90 - Quarterly	MS - MEASRD
					Permit Req.		Req Mon QRTR AVG		Req Mon DAILY MX	07 - gal/d									01/90 - Quarterly	MS - MEASRD
					Value NODI															
82220	Flow, total	1 - Effluent Gross	2	--	Sample			=	68.16	8I - Mgal/qtr									01/90 - Quarterly	MS - MEASRD
					Permit Req.				Req Mon QRTRTOTAL	8I - Mgal/qtr									01/90 - Quarterly	MS - MEASRD
					Value NODI															

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

As required by General Condition (A-2) of the National Pollutant Discharge Elimination System (NPDES) Permit MD0067482 (state discharge number 08DP3156A), NASAs Goddard Space Flight Center (GSFC) is submitting a second quarter 2019 Discharge Monitoring Report (DMR) for its discharge of non-contact cooling water and boiler blowdown from Outfall 001. The reported flow is the sum of effluent discharges and stormwater flow estimates. Duplicate nutrient samples were collected in April for this quarter. The analytical results for this quarter have been provided with this DMR as attachments. For questions/concerns please contact Ms. Janine Pollack at Janine.N.Pollack@nasa.gov or (301)286-0509.

Attachments

Name	Type	Size
20190501.pdf	pdf	386775
20190507.pdf	pdf	387038
20190604.pdf	pdf	350843
201904021.pdf	pdf	345288
20190410.pdf	pdf	386059
20190411.pdf	pdf	864155

Report Last Saved By

NASA - GODDARD SPACE FLIGHT CENTER

User:	janine.pollack@nasa.gov
Name:	Janine Pollack
E-Mail:	janine.pollack@nasa.gov
Date/Time:	2019-07-08 14:19 (Time Zone: -04:00)

Report Last Signed By

User:	TJMEYER59
Name:	Theodore Meyer
E-Mail:	theodore.j.meyer@nasa.gov
Date/Time:	2019-07-08 15:56 (Time Zone: -04:00)

DMR Copy of Record

Permit					
Permit #:	**MD0067482**	**Permittee:**	NASA - GODDARD SPACE FLIGHT CENTER	**Facility:**	NASA GODDARD FLIGHT CENTER
Major:	No	**Permittee Address:**	8800 GREENBELT ROAD, CODE 250 GREENBELT, MD 20771	**Facility Location:**	GREENBELT ROAD GREENBELT, MD 20771
Permitted Feature:	004 External Outfall	**Discharge:**	**004-A** 08-DP-3156		
Report Dates & Status					
Monitoring Period:	**From 04/01/19 to 06/30/19**	**DMR Due Date:**	**07/28/19**	**Status:**	**NetDMR Validated**
Considerations for Form Completion					
Principal Executive Officer					
First Name:	Kimberly	**Title:**	Chief, Medical and Envir Mngt Division	**Telephone:**	301-286-4230
Last Name:	Finch				
No Data Indicator (NODI)					
Form NODI:	--				

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00011	Temperature, water deg. fahrenheit	1 - Effluent Gross	0	--	Sample										=	75	15 - deg F		01/30 - Monthly	IT - Immersion Stabiliza ion
					Permit Req.										<=	90 DAILY MX	15 - deg F		01/30 - Monthly	IT - Immersion Stabiliza ion
					Value NODI															
00400	pH	1 - Effluent Gross	0	--	Sample						=	6.57			=	7.13	12 - SU		01/30 - Monthly	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	8.5 DAILY MX	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Sample								=	0.8			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Sample	=	71.28			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.		Req Mon QRTR AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
00600	Nitrogen, total [as N]	2 - Effluent Net	2	--	Sample															
					Permit Req.				Req Mon ANNL MAX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI				9 - Conditional Monitoring - Not Required This Period											
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Sample								=	0.8			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Sample								<	0.1			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Sample								=	0.12			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
00665	Phosphorus, total [as P]	1 - Effluent Gross	1	--	Sample	=	10.93			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.		Req Mon QRTR AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
00665	Phosphorus, total [as P]	2 - Effluent Net	2	--	Sample															
					Permit Req.				Req Mon ANNL MAX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI				9 - Conditional Monitoring - Not Required This Period											
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Sample								=	49.3	=	55	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.									Req Mon QRTR AVG		Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Sample								=	0.0042	=	0.0057	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.									Req Mon QRTR AVG		Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Sample								=	0.0055	=	0.0068	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.								<=	.009 QRTR AVG	<=	.013 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
50060	Chlorine, total residual	1 - Effluent Gross	0	--	Sample								<	0.1	<	0.1	19 - mg/L		01/30 - Monthly	GR - GRAB
					Permit Req.								<=	.1 QRTR AVG	<=	.1 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
74076	Flow	1 - Effluent Gross	0	--	Sample	=	125146	=	125679	07 - gal/d									01/30 - Monthly	MS - MEASRD
					Permit Req.		Req Mon QRTR AVG		Req Mon DAILY MX	07 - gal/d									01/30 - Monthly	MS - MEASRD
					Value NODI															
82220	Flow, total	1 - Effluent Gross	2	--	Sample			=	11.39	8I - Mgal/qtr									01/90 - Quarterly	CA - CALCTD
					Permit Req.				Req Mon QTRTOTAL	8I - Mgal/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

As required by General Condition (A-2) of the National Pollutant Discharge Elimination System (NPDES) Permit MD0067482 (state discharge number 08DP3156A), NASAs Goddard Space Flight Center (GSFC) is submitting a second quarter 2019 Discharge Monitoring Report (DMR) for its discharge of non-contact cooling water from Outfall 004. The reported flow is the sum of effluent discharges and stormwater flow estimates. Duplicate nutrient samples were collected in April for this quarter. All analytical results for this permitted feature have been attached to permitted feature [MD006782] 001. For questions/concerns please contact Ms. Janine Pollack at Janine.N.Pollack@nasa.gov or (301)286-0509.

Attachments

No attachments.

Report Last Saved By

NASA - GODDARD SPACE FLIGHT CENTER

User:	janine.pollack@nasa.gov
Name:	Janine Pollack
E-Mail:	janine.pollack@nasa.gov
Date/Time:	2019-07-08 14:58 (Time Zone: -04:00)

Report Last Signed By

User:	TJMEYER59
Name:	Theodore Meyer
E-Mail:	theodore.j.meyer@nasa.gov
Date/Time:	2019-07-08 15:57 (Time Zone: -04:00)

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19041016

Project Manager: Ian Cherok
Project Name : NPDES
Project Location: Outfall 004

April 17, 2019

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
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410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

April 17, 2019

Ian Cherok
DDC-4C
70 West King Street
Chambersburg, PA 17201

Reference: PSS Work Order(s) No: **19041016**
Project Name: NPDES
Project Location: Outfall 004

Dear Ian Cherok :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19041016**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on May 15, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary
Client Name: DDC-4C
Project Name: NPDES

Work Order Number(s): 19041016

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/10/2019 at 01:15 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19041016-001	20190410-004	SURFACE WATER	04/10/19 08:40

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19041016

DDC-4C, Chambersburg, PA

April 17, 2019

Project Name: NPDES

Project Location: Outfall 004

Sample ID: 20190410-004 **Date/Time Sampled: 04/10/2019 08:40** **PSS Sample ID: 19041016-001**

Matrix: SURFACE WATER **Date/Time Received: 04/10/2019 13:15**

Dissolved Copper — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**5.7**	ug/L	1.0		1	04/10/19	04/10/19 19:48	1051

Total Copper plus Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

Qualifier(s): See Batch 163312 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**15,700**	ug/L	5,000		50	04/11/19	04/11/19 18:48	1064
Copper	**6.8**	ug/L	1.0		1	04/11/19	04/11/19 18:05	1064
Magnesium	**3,790**	ug/L	100		1	04/11/19	04/11/19 18:05	1064
Hardness (Ca & Mg)	**55.0**	mg/L	13.0		1	04/11/19	04/11/19 18:05	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 19041016

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Total Copper plus Hardness

Batch: 163312

Matrix Spike/Matrix Spike Duplicate (MS/MSD) exceedances identified; see MS summary form. The concentration of the following analytes in the reference sample was greater than four times the matrix spike concentration: calcium

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): 19041016
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: NPDES
Project Manager: Ian Cherok

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	20190410-004	Initial	19041016-001	1064	W	76317	163312	04/10/2019	04/11/2019 16:02	04/11/2019 18:05
	76317-1-BKS	BKS	76317-1-BKS	1064	W	76317	163312	--------	04/11/2019 16:02	04/11/2019 18:00
	76317-1-BLK	BLK	76317-1-BLK	1064	W	76317	163312	--------	04/11/2019 16:02	04/11/2019 17:54
	20190410-004 S	MS	19041016-001 S	1064	W	76317	163312	04/10/2019	04/11/2019 16:02	04/11/2019 18:11
	20190410-004 S	Reanalysis	19041016-001 S	1064	W	76317	163312	04/10/2019	04/11/2019 16:02	04/11/2019 18:11
	20190410-004 SD	MSD	19041016-001 SD	1064	W	76317	163312	04/10/2019	04/11/2019 16:02	04/11/2019 18:16
	20190410-004 SD	Reanalysis	19041016-001 SD	1064	W	76317	163312	04/10/2019	04/11/2019 16:02	04/11/2019 18:16
	20190410-004	Reanalysis	19041016-001	1064	W	76317	163314	04/10/2019	04/11/2019 16:02	04/11/2019 18:48
EPA 200.8	20190410-004	Initial	19041016-001	1051	W	76296	163300	04/10/2019	04/10/2019 16:52	04/10/2019 19:48
	76296-1-BKS	BKS	76296-1-BKS	1051	W	76296	163300	--------	04/10/2019 16:52	04/10/2019 19:20
	76296-1-BLK	BLK	76296-1-BLK	1051	W	76296	163300	--------	04/10/2019 16:52	04/10/2019 19:15
	Settling 1 Out S	MS	19040923-003 S	1051	W	76296	163300	04/09/2019	04/10/2019 16:52	04/10/2019 19:31
	Settling 1 Out SD	MSD	19040923-003 SD	1051	W	76296	163300	04/09/2019	04/10/2019 16:52	04/10/2019 19:37

PHASE SEPARATION SCIENCE, INC.

QC Summary 19041016

DDC-4C
NPDES

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 163300 Matrix: Water Date Prep: 04/10/19
MB Sample Id: 76296-1-BLK LCS Sample Id: 76296-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Copper	<1.000	40.00	38.54	96	85-115	ug/L	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 163312 Matrix: Water Date Prep: 04/11/19
MB Sample Id: 76317-1-BLK LCS Sample Id: 76317-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Calcium	<100	400	392.2	98	85-115	ug/L	
Copper	<1.000	40.00	44.82	112	85-115	ug/L	
Magnesium	<100	400	410.2	103	85-115	ug/L	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 163312 Matrix: Surface Water Date Prep: 04/11/19
Parent Sample Id: 19041016-001 MS Sample Id: 19041016-001 S MSD Sample Id: 19041016-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Calcium	15530	400	15540	3	15690	40	70-130	1	25	ug/L	X
Copper	6.782	40.00	48.61	105	48.22	104	70-130	1	25	ug/L	
Magnesium	3785	400	4093	77	4111	82	70-130	0	25	ug/L	

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

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www.phaseonline.com
email: info@phaseonline.com

1

*CLIENT: DDC4C *OFFICE LOC.

*PROJECT MGR: Ian Cherok *PHONE NO.: ( )

EMAIL: Ian.Dcherok@nasa.gov FAX NO.: ( )

*PROJECT NAME: NPDES PROJECT NO.:

SITE LOCATION: Outfall 004 P.O. NO.: CS 54

SAMPLER(S): H. Thomas Lwicklund DW CERT NO.:

PSS Work Order #: 19041016 PAGE 1 OF 1

Matrix Codes:
SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

2

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * hardness	total copper	dissolved copper	REMARKS
1	20190410-004	4/10/19	8:40	SW	3	G	HNO3	X	X	X	* dissolved copper already Filtered
							HNO3				
							HNO3				

5

Relinquished By: (1)	Date	Time	Received By:
	4/10/19	1015	
Relinquished By: (2)	Date	Time	Received By:
	4/10/19	10:45	
Relinquished By: (3)	Date	Time	Received By:
	4/10/19	1:15	
Relinquished By: (4)	Date	Time	Received By:

4

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 1.5°-4.4°C

Shipping Carrier: TDE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO:
MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19041016	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	04/10/2019 01:15:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	05/15/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	4.4
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	H. Thomas/L. Wicklu
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1 Total No. of Containers Received 3

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	Yes
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/10/2019

Thomas Wingate

PM Review and Approval: Amber Confer Date: 04/11/2019

Amber Confer

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19041103

Project Manager: Ian Cherok

Project Name : NPDES

Project Location: Outfall 001, 004

April 19, 2019

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

April 19, 2019

Ian Cherok
DDC-4C
70 West King Street
Chambersburg, PA 17201

Reference: PSS Work Order(s) No: **19041103**
Project Name: NPDES
Project Location: Outfall 001, 004

Dear Ian Cherok :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19041103**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on May 16, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary
Client Name: DDC-4C
Project Name: NPDES

Work Order Number(s): 19041103

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/11/2019 at 12:10 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19041103-001	20190411-001A	SURFACE WATER	04/11/19 08:00
19041103-002	20190411-001B	SURFACE WATER	04/11/19 08:00
19041103-003	20190411-004A	SURFACE WATER	04/11/19 08:00
19041103-004	20190411-004B	SURFACE WATER	04/11/19 08:00

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19041103
DDC-4C, Chambersburg, PA
April 19, 2019

Project Name: NPDES
Project Location: Outfall 001, 004

Sample ID: 20190411-001A **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-001**
Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrite & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 16:50	1053
Nitrite (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 16:50	1053

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**0.7**	mg/L	0.4		04/17/19	04/17/19 11:37	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3 — Preparation Method: E365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.095**	mg/L	0.050		1	04/12/19	04/12/19 12:28	1053

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19041103

DDC-4C, Chambersburg, PA

April 19, 2019

Project Name: NPDES

Project Location: Outfall 001, 004

Sample ID: 20190411-001A **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-001**

Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrogen, Total by calculation Analytical Method: N_Total Calc. NO2+NO3+TKN

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**0.7**	mg/L			1	04/17/19	04/17/19 11:37	1056

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19041103
DDC-4C, Chambersburg, PA
April 19, 2019

Project Name: NPDES
Project Location: Outfall 001, 004

Sample ID: 20190411-001B **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-002**
Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrite & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 17:12	1053
Nitrite (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 17:12	1053

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**0.7**	mg/L	0.4		04/17/19	04/17/19 11:40	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3 — Preparation Method: E365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.092**	mg/L	0.050		1	04/12/19	04/12/19 12:28	1053

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19041103

DDC-4C, Chambersburg, PA

April 19, 2019

Project Name: NPDES

Project Location: Outfall 001, 004

Sample ID: 20190411-001B **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-002**

Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrogen, Total by calculation Analytical Method: N_Total Calc. NO2+NO3+TKN

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**0.7**	mg/L			1	04/17/19	04/17/19 11:40	1056

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19041103
DDC-4C, Chambersburg, PA
April 19, 2019

Project Name: NPDES
Project Location: Outfall 001, 004

Sample ID: 20190411-004A **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-003**
Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrite & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 17:35	1053
Nitrite (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 17:35	1053

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**0.8**	mg/L	0.4		04/18/19	04/18/19 11:32	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3 — Preparation Method: E365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.12**	mg/L	0.050		1	04/12/19	04/12/19 12:28	1053

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CERTIFICATE OF ANALYSIS

No: 19041103

DDC-4C, Chambersburg, PA

April 19, 2019

Project Name: NPDES

Project Location: Outfall 001, 004

Sample ID: 20190411-004A **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-003**

Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrogen, Total by calculation Analytical Method: N_Total Calc. NO2+NO3+TKN

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**0.8**	mg/L			1	04/18/19	04/18/19 11:32	1056

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CERTIFICATE OF ANALYSIS

No: 19041103
DDC-4C, Chambersburg, PA
April 19, 2019

Project Name: NPDES
Project Location: Outfall 001, 004

Sample ID: 20190411-004B **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-004**
Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrite & Nitrate — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 17:57	1053
Nitrite (as N)	ND	mg/L	0.10		1	04/11/19	04/11/19 17:57	1053

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**0.7**	mg/L	0.4		04/18/19	04/18/19 11:40	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3 — Preparation Method: E365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.11**	mg/L	0.050		1	04/12/19	04/12/19 12:28	1053

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19041103

DDC-4C, Chambersburg, PA

April 19, 2019

Project Name: NPDES

Project Location: Outfall 001, 004

Sample ID: 20190411-004B **Date/Time Sampled: 04/11/2019 08:00** **PSS Sample ID: 19041103-004**

Matrix: SURFACE WATER **Date/Time Received: 04/11/2019 12:10**

Nitrogen, Total by calculation Analytical Method: N_Total Calc. NO2+NO3+TKN

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**0.7**	mg/L			1	04/18/19	04/18/19 11:40	1056

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 19041103

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

19041103: Analyses associated with analyst code 4005 were performed by
Enviro-Chem Laboratories, Inc., 47 Loveton Circle, Suite K, Sparks, MD 21152

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

EPA 351.2

Analytical Data Package Information Summary

Work Order(s): 19041103
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: NPDES
Project Manager: Ian Cherok

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 300.0	20190411-001A	Initial	19041103-001	1053	W	76309	163310	04/11/2019	04/11/2019 12:50	04/11/2019 16:50
	20190411-001B	Initial	19041103-002	1053	W	76309	163310	04/11/2019	04/11/2019 12:50	04/11/2019 17:12
	20190411-004A	Initial	19041103-003	1053	W	76309	163310	04/11/2019	04/11/2019 12:50	04/11/2019 17:35
	20190411-004B	Initial	19041103-004	1053	W	76309	163310	04/11/2019	04/11/2019 12:50	04/11/2019 17:57
	76309-1-BKS	BKS	76309-1-BKS	1053	W	76309	163310	--------	04/11/2019 10:00	04/11/2019 11:42
	76309-1-BLK	BLK	76309-1-BLK	1053	W	76309	163310	--------	04/11/2019 10:00	04/11/2019 11:20
	76309-1-BSD	BSD	76309-1-BSD	1053	W	76309	163310	--------	04/11/2019 10:00	04/11/2019 12:04
	GTA-1 S	MS	19041101-001 S	1053	W	76309	163310	04/10/2019	04/11/2019 12:50	04/11/2019 13:28
EPA 351.2	20190411-001A	Initial	19041103-001	4005	W	163511	163511	04/11/2019	04/17/2019 11:37	04/17/2019 11:37
	20190411-001B	Initial	19041103-002	4005	W	163511	163511	04/11/2019	04/17/2019 11:40	04/17/2019 11:40
	20190411-004A	Initial	19041103-003	4005	W	163511	163511	04/11/2019	04/18/2019 11:32	04/18/2019 11:32
	20190411-004B	Initial	19041103-004	4005	W	163511	163511	04/11/2019	04/18/2019 11:40	04/18/2019 11:40
EPA 365.3	20190411-001A	Initial	19041103-001	1053	W	76336	163323	04/11/2019	04/12/2019 10:38	04/12/2019 12:28
	20190411-001B	Initial	19041103-002	1053	W	76336	163323	04/11/2019	04/12/2019 10:38	04/12/2019 12:28
	20190411-004A	Initial	19041103-003	1053	W	76336	163323	04/11/2019	04/12/2019 10:38	04/12/2019 12:28
	20190411-004B	Initial	19041103-004	1053	W	76336	163323	04/11/2019	04/12/2019 10:38	04/12/2019 12:28
	76336-1-BKS	BKS	76336-1-BKS	1053	W	76336	163323	--------	04/12/2019 10:38	04/12/2019 12:28
	76336-1-BLK	BLK	76336-1-BLK	1053	W	76336	163323	--------	04/12/2019 10:38	04/12/2019 12:28
	20190411-001A S	MS	19041103-001 S	1053	W	76336	163323	04/11/2019	04/12/2019 10:38	04/12/2019 12:28
	20190411-001A SD	MSD	19041103-001 SD	1053	W	76336	163323	04/11/2019	04/12/2019 10:38	04/12/2019 12:28
N_Total Calc. NO2+NO3+TKN	20190411-001A	Initial	19041103-001	1056	W	163512	163512	04/11/2019	04/17/2019 11:37	04/17/2019 11:37
	20190411-001B	Initial	19041103-002	1056	W	163512	163512	04/11/2019	04/17/2019 11:40	04/17/2019 11:40
	20190411-004A	Initial	19041103-003	1056	W	163512	163512	04/11/2019	04/18/2019 11:32	04/18/2019 11:32
	20190411-004B	Initial	19041103-004	1056	W	163512	163512	04/11/2019	04/18/2019 11:40	04/18/2019 11:40

PHASE SEPARATION SCIENCE, INC.

QC Summary 19041103

DDC-4C
NPDES

Analytical Method: EPA 365.3 Prep Method: E365.3_Prep
Seq Number: 163323 Matrix: Water Date Prep: 04/12/19
MB Sample Id: 76336-1-BLK LCS Sample Id: 76336-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Phosphorus, Total (as P)	<0.0500	0.975	0.991	102	85-115	mg/L	

Analytical Method: EPA 365.3 Prep Method: E365.3_Prep
Seq Number: 163323 Matrix: Surface Water Date Prep: 04/12/19
Parent Sample Id: 19041103-001 MS Sample Id: 19041103-001 S MSD Sample Id: 19041103-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Phosphorus, Total (as P)	0.0950	0.324	0.434	105	0.440	106	70-130	1	20	mg/L	

Analytical Method: EPA 300.0 Prep Method: E300.0P
Seq Number: 163310 Matrix: Water Date Prep: 04/11/19
MB Sample Id: 76309-1-BLK LCS Sample Id: 76309-1-BKS LCSD Sample Id: 76309-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Nitrate (as N)	<0.1000	5.000	5.097	102	4.956	99	90-110	3	20	mg/L	
Nitrite (as N)	<0.1000	5.000	5.131	103	5.068	101	90-110	1	20	mg/L	

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: DDC4C *OFFICE LOC.

*PROJECT MGR: IanCherok *PHONE NO.:( )

EMAIL: Ian.D.Cherok@nasa.gov FAX NO.: ( )

*PROJECT NAME: NPDES PROJECT NO.:

SITE LOCATION: Outfall 001, 004 P.O. NO.: CS54

SAMPLER(S): H.Thomas ICherok DW CERT NO.:

PSS Work Order #: 19041103 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used: H2SO4	H2SO4	none	Analysis/ Method Required (3) * total phosphorus	total nitrogen	nitrite+ nitrate	REMARKS
1	20190411-001A	4/11/19	00:00-08:00	SW	3	C				X	X	X	
2	20190411-001B	4/11/19	00:01-08:00	SW	3	C				X	X	X	
3	20190411-004A	4/11/19	00:01-08:00	SW	3	C				X	X	X	
4	20190411-004B	4/11/19	00:01-08:00	SW	3	C				X	X	X	

(5)

Relinquished By: (1)	Date 4/11/19	Time 1015	Received By:
Relinquished By: (2)	Date 4/11/19	Time 1210	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 2.6-2.8°C

Shipping Carrier: ~~FHCT~~ TTE

Special Instructions: ASL 4/11/19

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19041103	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	04/11/2019 12:10:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	05/16/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2.8
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	H. Thomas/I. Cherok
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 4 Total No. of Containers Received 12

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	Yes
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/11/2019

Thomas Wingate

PM Review and Approval: Amber J Confer Date: 04/11/2019

Amber Confer

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19050114

Project Manager: Ian Cherok
Project Name : NPDES
Project Location: Outfall 001

May 8, 2019

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

May 8, 2019

Ian Cherok
DDC-4C
70 West King Street
Chambersburg, PA 17201

Reference: PSS Work Order(s) No: **19050114**
Project Name: NPDES
Project Location: Outfall 001

Dear Ian Cherok :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19050114**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on June 5, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary
Client Name: DDC-4C
Project Name: NPDES

Work Order Number(s): 19050114

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/01/2019 at 11:40 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19050114-001	20190501-001	SURFACE WATER	05/01/19 09:23

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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800-932-9047
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19050114

DDC-4C, Chambersburg, PA

May 8, 2019

Project Name: NPDES

Project Location: Outfall 001

Sample ID: 20190501-001 **Date/Time Sampled: 05/01/2019 09:23** **PSS Sample ID: 19050114-001**

Matrix: SURFACE WATER **Date/Time Received: 05/01/2019 11:40**

Dissolved Copper — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**5.0**	ug/L	1.0		1	05/02/19	05/03/19 21:21	1064

Total Copper plus Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**17,600**	ug/L	1,000		10	05/02/19	05/03/19 20:25	1064
Copper	**5.6**	ug/L	1.0		1	05/02/19	05/02/19 18:11	1064
Magnesium	**4,730**	ug/L	1,000		10	05/02/19	05/03/19 20:25	1064
Hardness (Ca & Mg)	**63.0**	mg/L	6.60		10	05/02/19	05/03/19 20:25	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 19050114

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): 19050114
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: NPDES
Project Manager: Ian Cherok

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	20190501-001	Initial	19050114-001	1064	W	76605	163931	05/01/2019	05/02/2019 11:08	05/02/2019 18:11
	76605-1-BKS	BKS	76605-1-BKS	1064	W	76605	163931	--------	05/02/2019 11:08	05/02/2019 16:41
	76605-1-BLK	BLK	76605-1-BLK	1064	W	76605	163931	--------	05/02/2019 11:08	05/02/2019 16:35
	FT-24 S	MS	19042605-001 S	1064	W	76605	163931	04/26/2019	05/02/2019 11:08	05/02/2019 17:32
	FT-24 SD	MSD	19042605-001 SD	1064	W	76605	163931	04/26/2019	05/02/2019 11:08	05/02/2019 17:38
	76605-1-BKS	Reanalysis	76605-1-BKS	1064	W	76605	163977	--------	05/02/2019 11:08	05/03/2019 19:57
	20190501-001	Reanalysis	19050114-001	1064	W	76605	163977	05/01/2019	05/02/2019 11:08	05/03/2019 20:25
EPA 200.8	76614-1-BKS	BKS	76614-1-BKS	1064	W	76614	163934	--------	05/02/2019 15:34	05/02/2019 20:20
	76614-1-BLK	BLK	76614-1-BLK	1064	W	76614	163934	--------	05/02/2019 15:34	05/02/2019 20:09
	20190501-001 S	MS	19050114-001 S	1064	W	76614	163934	05/01/2019	05/02/2019 15:34	05/02/2019 20:31
	20190501-001 SD	MSD	19050114-001 SD	1064	W	76614	163934	05/01/2019	05/02/2019 15:34	05/02/2019 20:37
	76614-1-BKS	Reanalysis	76614-1-BKS	1064	W	76614	163993	--------	05/02/2019 15:34	05/03/2019 21:16
	20190501-001	Reanalysis	19050114-001	1064	W	76614	163993	05/01/2019	05/02/2019 15:34	05/03/2019 21:21

PHASE SEPARATION SCIENCE, INC.

QC Summary 19050114

DDC-4C
NPDES

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 163931 Matrix: Water Date Prep: 05/02/19
MB Sample Id: 76605-1-BLK LCS Sample Id: 76605-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Calcium	<100	400	447.4	112	85-115	ug/L	
Copper	<1.000	40.00	40.93	102	85-115	ug/L	
Magnesium	<100	400	430.4	108	85-115	ug/L	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 163934 Matrix: Water Date Prep: 05/02/19
MB Sample Id: 76614-1-BLK LCS Sample Id: 76614-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Copper	<1.000	40.00	38.26	96	85-115	ug/L	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 163934 Matrix: Surface Water Date Prep: 05/02/19
Parent Sample Id: 19050114-001 MS Sample Id: 19050114-001 S MSD Sample Id: 19050114-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Copper	5.513	40.00	44.36	97	45.31	99	70-130	2	25	ug/L	

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: DDC4C *OFFICE LOC.: GSFC NASA
*PROJECT MGR: Ian Cherok *PHONE NO.:( )
EMAIL: Ian.D.Cherok@nasa.gov FAX NO.: ( )
*PROJECT NAME: NPDES PROJECT NO.:
SITE LOCATION: Outfall 001 P.O. NO.: CS54
SAMPLER(S): ~~Outfa~~ H. Thomas L. Wicklund DW CERT NO.:

PSS Work Order #: 1905014 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) *	REMARKS
								HNO3 HNO3 HNO3	
								total copper / hardness / dissolved copper	
1	20190501-001	5/1/19	9:23	SW	3	G		X X X	*dissolved copper is already filtered

(5)

Relinquished By: (1)	Date	Time	Received By:
	5/1/19	1100	
Relinquished By: (2)	Date	Time	Received By:
	5/1/19	1140	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: ~~COA~~ QC SUMM CLP LIKE OTHER
☐ ☐ ☐ _____

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 2.5°-3.6°C
Shipping Carrier: FDE

Special Instructions:

DW COMPLIANCE? YES ☐ EDD FORMAT TYPE _____

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER _____

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19050114	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	05/01/2019 11:40:00 AM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	06/05/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	3.6
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Hayley Thomas
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1 Total No. of Containers Received 3

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	Yes
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 05/01/2019

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 05/01/2019

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19050722

Project Manager: Ian Cherok
Project Name : NPDES
Project Location: Outfall 004

May 14, 2019

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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BALTIMORE, MD 21228
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800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

May 14, 2019

Ian Cherok
DDC-4C
70 West King Street
Chambersburg, PA 17201

Reference: PSS Work Order(s) No: **19050722**
Project Name: NPDES
Project Location: Outfall 004

Dear Ian Cherok :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19050722**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on June 11, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary
Client Name: DDC-4C
Project Name: NPDES

Work Order Number(s): 19050722

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/07/2019 at 12:45 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19050722-001	20190507-004	SURFACE WATER	05/07/19 09:08

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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BALTIMORE, MD 21228
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800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19050722

DDC-4C, Chambersburg, PA

May 14, 2019

Project Name: NPDES

Project Location: Outfall 004

Sample ID: 20190507-004 **Date/Time Sampled: 05/07/2019 09:08** **PSS Sample ID: 19050722-001**

Matrix: SURFACE WATER **Date/Time Received: 05/07/2019 12:45**

Dissolved Copper — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**3.2**	ug/L	1.0		1	05/08/19	05/08/19 21:49	1051

Total Copper plus Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**12,900**	ug/L	5,000		50	05/08/19	05/08/19 18:51	1051
Copper	**4.5**	ug/L	1.0		1	05/08/19	05/08/19 19:54	1051
Magnesium	**2,870**	ug/L	100		1	05/08/19	05/08/19 19:54	1051
Hardness (Ca & Mg)	**44.0**	mg/L	13.0		1	05/08/19	05/08/19 19:54	1051

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 19050722

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): **19050722**
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: NPDES
Project Manager: Ian Cherok

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	20190507-004	Initial	19050722-001	1051	W	76711	164135	05/07/2019	05/08/2019 16:13	05/08/2019 19:54
	76711-1-BKS	BKS	76711-1-BKS	1051	W	76711	164135	--------	05/08/2019 16:13	05/08/2019 18:28
	76711-1-BLK	BLK	76711-1-BLK	1051	W	76711	164135	--------	05/08/2019 16:13	05/08/2019 18:22
	Millville 001 S	MS	19050710-001 S	1051	W	76711	164135	05/07/2019	05/08/2019 16:13	05/08/2019 19:03
	Millville 001 SD	MSD	19050710-001 SD	1051	W	76711	164135	05/07/2019	05/08/2019 16:13	05/08/2019 19:37
	20190507-004	Reanalysis	19050722-001	1051	W	76711	164135	05/07/2019	05/08/2019 16:13	05/08/2019 18:51
EPA 200.8	20190507-004	Initial	19050722-001	1051	W	76712	164138	05/07/2019	05/08/2019 17:06	05/08/2019 21:49
	76712-1-BKS	BKS	76712-1-BKS	1051	W	76712	164138	--------	05/08/2019 17:06	05/08/2019 21:04
	76712-1-BLK	BLK	76712-1-BLK	1051	W	76712	164138	--------	05/08/2019 17:06	05/08/2019 20:58
	Influent 050819 S	MS	19050820-001 S	1051	W	76712	164138	05/08/2019	05/08/2019 17:06	05/08/2019 21:15
	Influent 050819 SD	MSD	19050820-001 SD	1051	W	76712	164138	05/08/2019	05/08/2019 17:06	05/08/2019 21:21

PHASE SEPARATION SCIENCE, INC.

QC Summary 19050722

DDC-4C
NPDES

Analytical Method: EPA 200.8 | Prep Method: E200.8_PREP
Seq Number: 164135 | Matrix: Water | Date Prep: 05/08/19
MB Sample Id: 76711-1-BLK | LCS Sample Id: 76711-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Calcium	<100	400	434.2	109	85-115	ug/L	
Copper	<1.000	40.00	43.17	108	85-115	ug/L	
Magnesium	<100	400	429.6	107	85-115	ug/L	

Analytical Method: EPA 200.8 | Prep Method: E200.8_PREP
Seq Number: 164138 | Matrix: Water | Date Prep: 05/08/19
MB Sample Id: 76712-1-BLK | LCS Sample Id: 76712-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Copper	<1.000	40.00	39.68	99	85-115	ug/L	

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: DDC-40 *OFFICE LOC.

*PROJECT MGR: Ian Chadek *PHONE NO.: ( )

EMAIL: FAX NO.: ( )

*PROJECT NAME: NPDES PROJECT NO.:

SITE LOCATION: Outfall 004 P.O. NO.: CS 54

SAMPLER(S): I. Chadek, L. Wickland DW CERT NO.:

PSS Work Order #: 1905072 2 PAGE 1 OF 1

Matrix Codes:
SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * Total Copper	Dissolved Copper	Total Hardness	REMARKS
							HNO3	HNO3	HNO3		
1	20190507-004	5/7/19	0908	SW	3	G	X	X	X		Dissolved Copper has been filtered

(5)

	Date	Time	
Relinquished By: (1)	5/7/19	1120	Received By:
Relinquished By: (2)	5/7/19	1245	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 2.0°, 2.7°C

Shipping Carrier: FDE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19050722	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	05/07/2019 12:45:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	06/11/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2.7
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Ian Cherok
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1 Total No. of Containers Received 3

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	Yes
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 05/07/2019

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 05/07/2019

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19060411

Project Manager: Ian Cherok

Project Name : NPDES

Project Location: Outfalls 001 + 004

June 13, 2019

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

June 13, 2019

Ian Cherok
DDC-4C
70 West King Street
Chambersburg, PA 17201

Reference: PSS Work Order(s) No: **19060411**
Project Name: NPDES
Project Location: Outfalls 001 + 004

Dear Ian Cherok :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19060411**. This report has been revised to update total and dissolved metals. This report version includes revised sample results. This report cancels and supersedes report version 1.000 dated June 11, 2019.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on July 9, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary
Client Name: DDC-4C
Project Name: NPDES

Work Order Number(s): 19060411

The following samples were received under chain of custody by Phase Separation Science (PSS) on 06/04/2019 at 01:30 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19060411-001	20190604-001	SURFACE WATER	06/04/19 08:58
19060411-002	20190604-004	SURFACE WATER	06/04/19 08:35

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19060411

DDC-4C, Chambersburg, PA

June 13, 2019

Project Name: NPDES

Project Location: Outfalls 001 + 004

Sample ID: 20190604-001 **Date/Time Sampled: 06/04/2019 08:58** **PSS Sample ID: 19060411-001**

Matrix: SURFACE WATER **Date/Time Received: 06/04/2019 13:30**

Dissolved Copper — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**3.6**	ug/L	1.0		1	06/04/19	06/12/19 14:13	1064

Total Copper plus Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**21,700**	ug/L	5,000		50	06/06/19	06/07/19 02:21	1064
Copper	**4.5**	ug/L	1.0		1	06/06/19	06/12/19 14:24	1064
Magnesium	**3,800**	ug/L	100		1	06/06/19	06/07/19 01:04	1064
Hardness (Ca & Mg)	**70.0**	mg/L	13.0		1	06/06/19	06/07/19 01:04	1064

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19060411

DDC-4C, Chambersburg, PA

June 13, 2019

Project Name: NPDES

Project Location: Outfalls 001 + 004

Sample ID: 20190604-004 **Date/Time Sampled: 06/04/2019 08:35** **PSS Sample ID: 19060411-002**

Matrix: SURFACE WATER **Date/Time Received: 06/04/2019 13:30**

Dissolved Copper — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**3.8**	ug/L	1.0		1	06/04/19	06/12/19 14:18	1064

Total Copper plus Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**14,900**	ug/L	5,000		50	06/06/19	06/07/19 02:26	1064
Copper	**5.3**	ug/L	1.0		1	06/06/19	06/12/19 14:29	1064
Magnesium	**2,880**	ug/L	100		1	06/06/19	06/07/19 01:09	1064
Hardness (Ca & Mg)	**49.0**	mg/L	13.0		1	06/06/19	06/07/19 01:09	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 19060411

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): 19060411
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: NPDES
Project Manager: Ian Cherok

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	20190604-001	Initial	19060411-001	1064	W	77151	165053	06/04/2019	06/06/2019 11:42	06/07/2019 01:04
	20190604-004	Initial	19060411-002	1064	W	77151	165053	06/04/2019	06/06/2019 11:42	06/07/2019 01:09
	77151-1-BKS	BKS	77151-1-BKS	1064	W	77151	165053	--------	06/06/2019 11:42	06/07/2019 00:43
	77151-1-BLK	BLK	77151-1-BLK	1064	W	77151	165053	--------	06/06/2019 11:42	06/07/2019 00:38
	801 S	MS	19060404-001 S	1064	W	77151	165053	06/04/2019	06/06/2019 11:42	06/07/2019 00:54
	Millville 001 S	MS	19060508-001 S	1064	W	77151	165053	06/05/2019	06/06/2019 11:42	06/07/2019 02:11
	801 SD	MSD	19060404-001 SD	1064	W	77151	165053	06/04/2019	06/06/2019 11:42	06/07/2019 00:59
	20190604-001	Reanalysis	19060411-001	1064	W	77151	165053	06/04/2019	06/06/2019 11:42	06/07/2019 02:21
	20190604-004	Reanalysis	19060411-002	1064	W	77151	165053	06/04/2019	06/06/2019 11:42	06/07/2019 02:26
	20190604-001	Reanalysis	19060411-001	1064	W	77151	165222	06/04/2019	06/06/2019 11:42	06/12/2019 14:24
	20190604-004	Reanalysis	19060411-002	1064	W	77151	165222	06/04/2019	06/06/2019 11:42	06/12/2019 14:29
EPA 200.8	77111-1-BKS	BKS	77111-1-BKS	1064	W	77111	164941	--------	06/04/2019 16:05	06/04/2019 22:36
	77111-1-BLK	BLK	77111-1-BLK	1064	W	77111	164941	--------	06/04/2019 16:05	06/04/2019 22:30
	PW-01-053019 S	MS	19053009-001 S	1064	W	77111	164941	05/30/2019	06/04/2019 16:05	06/04/2019 23:26
	PW-01-053019 SD	MSD	19053009-001 SD	1064	W	77111	164941	05/30/2019	06/04/2019 16:05	06/04/2019 23:32
	77111-1-BKS	Reanalysis	77111-1-BKS	1064	W	77111	164975	--------	06/04/2019 16:05	06/05/2019 19:42
	77111-1-BLK	Reanalysis	77111-1-BLK	1064	W	77111	164975	--------	06/04/2019 16:05	06/05/2019 19:37
	20190604-001	Reanalysis	19060411-001	1064	W	77111	165220	06/04/2019	06/04/2019 16:05	06/12/2019 14:13
	20190604-004	Reanalysis	19060411-002	1064	W	77111	165220	06/04/2019	06/04/2019 16:05	06/12/2019 14:18

PHASE SEPARATION SCIENCE, INC.

QC Summary 19060411

DDC-4C
NPDES

Analytical Method: EPA 200.8 — Prep Method: E200.8_PREP
Seq Number: 164941 — Matrix: Water — Date Prep: 06/04/19
MB Sample Id: 77111-1-BLK — LCS Sample Id: 77111-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Copper	<1.000	40.00	42.07	105	85-115	ug/L	

Analytical Method: EPA 200.8 — Prep Method: E200.8_PREP
Seq Number: 165053 — Matrix: Water — Date Prep: 06/06/19
MB Sample Id: 77151-1-BLK — LCS Sample Id: 77151-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Calcium	<100	400	434.6	109	85-115	ug/L	
Copper	<1.000	40.00	38.72	97	85-115	ug/L	
Magnesium	<100	400	402.7	101	85-115	ug/L	

Analytical Method: EPA 200.8 — Prep Method: E200.8_PREP
Seq Number: 164975 — Matrix: Water — Date Prep: 06/04/19
REBLK Sample Id: 77111-1-BLK — LCS Sample Id: 77111-1-BKS

Parameter	REBLK Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Copper	<1.000	40.00	40.79	102	70-130	ug/L	

Analytical Method: EPA 200.8 — Prep Method: E200.8_PREP
Seq Number: 165112 — Matrix: Water — Date Prep: 06/06/19
REBLK Sample Id: 77151-1-BLK — LCS Sample Id: 77151-1-BKS

Parameter	REBLK Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Calcium	<100	400	425	106	70-130	ug/L	
Copper	<1.000	40.00	40.15	100	70-130	ug/L	
Magnesium	<100	400	448.5	112	70-130	ug/L	

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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email: info@phaseonline.com

(1) *CLIENT: DDC-4C *OFFICE LOC.

*PROJECT MGR: Ian Cherok *PHONE NO.: ( )

EMAIL: FAX NO.: ( )

*PROJECT NAME: NPDES PROJECT NO.:

SITE LOCATION: Outfalls 001 + 004 P.O. NO.: CS 54

SAMPLER(S): I. Cherok, R. Wilhide DW CERT NO.:

PSS Work Order #: 1906041 PAGE 1 OF 1

Matrix Codes:
SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * Total Copper	Dissolved Copper	Hardness	REMARKS
1	20190604-001	6/4/19	8:58	SW	3	G	HNO3	X	X	X	*dissolved copper samples are already filtered.
2	20190604-004	6/4/19	8:35	SW	3	G	HNO3	X	X	X	

(5)

Relinquished By: (1)	Date	Time	Received By:
	6/6/19	1300	
Relinquished By: (2)	Date	Time	Received By:
	6/4/19	1370	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 1.4°-3.0°C

Shipping Carrier: FDE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO:
MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19060411	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	06/04/2019 01:30:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	07/09/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	3.0
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Ian Cherok
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Holding Time

Total No. of Samples Received 2

Total No. of Containers Received 6

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	Yes
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 06/04/2019

Thomas Wingate

PM Review and Approval: Lynn Jackson Date: 06/04/2019

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19040220

Project Manager: Ian Cherok
Project Name : NPDES
Project Location: 001

April 9, 2019

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

April 9, 2019

Ian Cherok
DDC-4C
70 West King Street
Chambersburg, PA 17201

Reference: PSS Work Order(s) No: **19040220**
Project Name: NPDES
Project Location: 001

Dear Ian Cherok :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19040220**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on May 7, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary
Client Name: DDC-4C
Project Name: NPDES

Work Order Number(s): 19040220

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/02/2019 at 01:50 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19040220-001	20190402-001	SURFACE WATER	04/02/19 09:46

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19040220

DDC-4C, Chambersburg, PA

April 9, 2019

Project Name: NPDES
Project Location: 001

Sample ID: 20190402-001 **Date/Time Sampled: 04/02/2019 09:46** **PSS Sample ID: 19040220-001**
Matrix: SURFACE WATER **Date/Time Received: 04/02/2019 13:50**

Dissolved Copper — Analytical Method: EPA 200.8 — Preparation Method: 200.8

Qualifier(s): See Batch 76177 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**5.0**	ug/L	1.0		1	04/02/19	04/02/19 21:17	1051

Total Copper plus Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

Qualifier(s): See Batch 163125 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**18,200**	ug/L	2,000		20	04/04/19	04/05/19 17:58	1064
Copper	**6.0**	ug/L	1.0		1	04/04/19	04/05/19 17:47	1064
Magnesium	**4,790**	ug/L	100		1	04/04/19	04/04/19 18:09	1064
Hardness (Ca & Mg)	**65.0**	mg/L	5.40		1	04/04/19	04/04/19 18:09	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 19040220

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Total Copper plus Hardness

Batch: 163125

Method Blank (MB) exceeded the acceptance criteria for magnesium at 9.007 ppb. All results that were 10 times the blank result were reported for this analyte.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): 19040220
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: NPDES
Project Manager: Ian Cherok

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	20190402-001	Initial	19040220-001	1064	W	76214	163125	04/02/2019	04/04/2019 11:44	04/04/2019 18:09
	76214-1-BKS	BKS	76214-1-BKS	1064	W	76214	163125	--------	04/04/2019 11:44	04/04/2019 17:43
	76214-1-BLK	BLK	76214-1-BLK	1064	W	76214	163125	--------	04/04/2019 11:44	04/04/2019 17:38
	Rainwater Tank S	MS	19040217-001 S	1064	W	76214	163125	04/02/2019	04/04/2019 11:44	04/04/2019 17:53
	Rainwater Tank SD	MSD	19040217-001 SD	1064	W	76214	163125	04/02/2019	04/04/2019 11:44	04/04/2019 17:59
	20190402-001	Reanalysis	19040220-001	1064	W	76214	163182	04/02/2019	04/04/2019 11:44	04/05/2019 17:47
	20190402-001	Reanalysis	19040220-001	1064	W	76214	163182	04/02/2019	04/04/2019 11:44	04/05/2019 17:58
EPA 200.8	20190402-001	Initial	19040220-001	1051	W	76177	163061	04/02/2019	04/02/2019 16:02	04/02/2019 21:17
	76177-1-BKS	BKS	76177-1-BKS	1051	W	76177	163061	--------	04/02/2019 16:02	04/02/2019 20:55
	76177-1-BLK	BLK	76177-1-BLK	1051	W	76177	163061	--------	04/02/2019 16:02	04/02/2019 20:49

PHASE SEPARATION SCIENCE, INC.

QC Summary 19040220

DDC-4C
NPDES

Analytical Method: EPA 200.8 — Prep Method: E200.8_PREP
Seq Number: 163061 — Matrix: Water — Date Prep: 04/02/19
MB Sample Id: 76177-1-BLK — LCS Sample Id: 76177-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Copper	<1.000	40.00	37.92	95	85-115	ug/L	

Analytical Method: EPA 200.8 — Prep Method: E200.8_PREP
Seq Number: 163125 — Matrix: Water — Date Prep: 04/04/19
MB Sample Id: 76214-1-BLK — LCS Sample Id: 76214-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Calcium	<100	400	433.1	108	85-115	ug/L	
Copper	<1.000	40.00	42.23	106	85-115	ug/L	
Magnesium	<100	400	417.2	104	85-115	ug/L	

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: DDC 4C *OFFICE LOC. GSFC NASA

*PROJECT MGR: Ian Cherok *PHONE NO.: ( )

EMAIL: FAX NO.: ( )

*PROJECT NAME: NPDES PROJECT NO.:

SITE LOCATION: 001 P.O. NO.: C554

SAMPLER(S): H. Thomas DW CERT NO.:

PSS Work Order #: 19040220 PAGE 1 OF 1

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wtr **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **L**=Liquid **SOL**=Solid **A**=Air **WI**=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	HNO3	HNO3	HNO3									REMARKS
							Analysis/ Method Required (3) *	hardness	total copper	dissolved copper*									
1	20190402-001	4/2/19	9:46	SW	3	G		X	X	X									*dissolved copper is already filtered

(5)

Relinquished By: (1) Lauren Wicklund	Date 4/2/19	Time 1208	Received By:
Relinquished By: (2)	Date 4/2/19	Time 1330	Received By:
Relinquished By: (3)	Date 4-2	Time 150	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 2.1-2.3°C
Shipping Carrier: FE

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE ____
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19040220	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	04/02/2019 01:50:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	05/07/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2.3
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Hayley Thomas
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1 Total No. of Containers Received 3

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	Yes
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/02/2019

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 04/02/2019

Lynn Jackson