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 PRINCE GEORGE'S COUNTY GREENBELT, MD 20771
Permitted Feature:	001 External Outfall	**Discharge:**	**001-A** 08-DP-3156		
Report Dates & Status					
Monitoring Period:	**From 07/01/18 to 09/30/18**	**DMR Due Date:**	**10/28/18**	**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										=	84	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						=	7.1			=	7.8	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								=	0.95			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	=	583.32			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								=	0.95			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								=	0.47			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	=	288.59			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								=	45	=	54	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								=	0.0048	=	0.0054	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								=	0.0063	=	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	=	799522	=	809579	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			=	73.58	8I - Mgal/qtr									01/90 - Quarterly	MS - MEASRD
					Permit Req.				Req Mon QTRTOTAL	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), NASA Goddard Space Flight Center (GSFC) is submitting a third quarter 2018 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 September 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.Pollack@nasa.gov or (301)286-0509.

Attachments

Name	Type	Size
20180703.pdf	pdf	413133
20180806.pdf	pdf	354041
20180727.pdf	pdf	358855
20180905Nutrient.pdf	pdf	375478
20180905.pdf	pdf	376713

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:	2018-10-17 12:56 (Time Zone: -04:00)

Report Last Signed By

User:	TJMEYER59
Name:	Theodore Meyer
E-Mail:	theodore.j.meyer@nasa.gov
Date/Time:	2018-10-17 12:59 (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 PRINCE GEORGE'S COUNTY GREENBELT, MD 20771
Permitted Feature:	004 External Outfall	**Discharge:**	**004-A** 08-DP-3156		
Report Dates & Status					
Monitoring Period:	**From 07/01/18 to 09/30/18**	**DMR Due Date:**	**10/28/18**	**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			
					Sample										=	82.58	15 - deg F		01/30 - Monthly	IT - Immersion Stabiliza ion
00011	Temperature, water deg. fahrenheit	1 - Effluent Gross	0	--	Permit Req.										<=	90 DAILY MX	15 - deg F		01/30 - Monthly	IT - Immersion Stabiliza ion
					Value NODI															
					Sample						=	6.89			=	7.85	12 - SU		01/30 - Monthly	GR - GRAB
00400	pH	1 - Effluent Gross	0	--	Permit Req.						>=	6.5 MINIMUM			<=	8.5 DAILY MX	12 - SU		01/30 - Monthly	GR - GRAB
					Value NODI															
					Sample								=	1			19 - mg/L		01/90 - Quarterly	08 - COMP-8
00600	Nitrogen, total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
					Sample	=	103.81			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
00600	Nitrogen, total [as N]	1 - Effluent Gross	1	--	Permit Req.		Req Mon QRTR AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
					Sample															
00600	Nitrogen, total [as N]	2 - Effluent Net	2	--	Permit Req.				Req Mon ANNL MAX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI				9 - Conditional Monitoring - Not Required This Period											
					Sample								=	1			19 - mg/L		01/90 - Quarterly	08 - COMP-8
00625	Nitrogen, Kjeldahl, total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
					Sample								<	0.1			19 - mg/L		01/90 - Quarterly	08 - COMP-8
00630	Nitrite + Nitrate total [as N]	1 - Effluent Gross	0	--	Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
					Sample								=	0.2			19 - mg/L		01/90 - Quarterly	08 - COMP-8
00665	Phosphorus, total [as P]	1 - Effluent Gross	0	--	Permit Req.									Req Mon QRTR AVG			19 - mg/L		01/90 - Quarterly	08 - COMP-8
					Value NODI															
					Sample	=	20.76			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
00665	Phosphorus, total [as P]	1 - Effluent Gross	1	--	Permit Req.		Req Mon QRTR AVG			9U - lb/qtr									01/90 - Quarterly	CA - CALCTD
					Value NODI															
					Sample															
00665	Phosphorus, total [as P]	2 - Effluent Net	2	--	Permit Req.				Req Mon ANNL MAX	50 - lb/yr									01/90 - Quarterly	CA - CALCTD
					Value NODI				9 - Conditional Monitoring - Not Required This Period											
					Sample								=	35	=	38	19 - mg/L		01/30 - Monthly	GR - GRAB
00900	Hardness, total [as CaCO3]	1 - Effluent Gross	0	--	Permit Req.									Req Mon QRTR AVG		Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
					Sample								=	0.0036	=	0.0044	19 - mg/L		01/30 - Monthly	GR - GRAB
01040	Copper, dissolved [as Cu]	1 - Effluent Gross	0	--	Permit Req.									Req Mon QRTR AVG		Req Mon DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
					Sample								=	0.0057	=	0.006	19 - mg/L		01/30 - Monthly	GR - GRAB
01042	Copper, total [as Cu]	1 - Effluent Gross	0	--	Permit Req.								<=	.009 QRTR AVG	<=	.013 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
					Sample								<	0.1	<	0.1	19 - mg/L		01/30 - Monthly	GR - GRAB
50060	Chlorine, total residual	1 - Effluent Gross	0	--	Permit Req.								<=	.1 QRTR AVG	<=	.1 DAILY MX	19 - mg/L		01/30 - Monthly	GR - GRAB
					Value NODI															
					Sample	=	135258	=	139587	07 - gal/d									01/30 - Monthly	MS - MEASRD
74076	Flow	1 - Effluent Gross	0	--	Permit Req.		Req Mon QRTR AVG		Req Mon DAILY MX	07 - gal/d									01/30 - Monthly	MS - MEASRD
					Value NODI															
					Sample			=	12.44	8I - Mgal/qtr									01/90 - Quarterly	CA - CALCTD
82220	Flow, total	1 - Effluent Gross	2	--	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), NASA Goddard Space Flight Center (GSFC) is submitting a third quarter 2018 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 September for this quarter. All analytical for this permitted feature have been attached to permitted feature [MD006782] 001. For questions/concerns please contact Ms. Janine Pollack at Janine.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:	2018-10-17 12:56 (Time Zone: -04:00)

Report Last Signed By

User:	TJMEYER59
Name:	Theodore Meyer
E-Mail:	theodore.j.meyer@nasa.gov
Date/Time:	2018-10-17 12:59 (Time Zone: -04:00)

Analytical Report for

DDC-4C

Certificate of Analysis No.: 18070312

Project Manager: Ian Cherok

Project Name : NPDES

Project Location: Outfall 001

July 11, 2018

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

July 11, 2018

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

Reference: PSS Work Order(s) No: **18070312**
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 **18070312**.

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 August 7, 2018, 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): 18070312

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/03/2018 at 12:10 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18070312-001	2018-001	SURFACE WATER	07/03/18 00:00

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18070312

DDC-4C, Chambersburg, PA

July 11, 2018

Project Name: NPDES
Project Location: Outfall 001

Sample ID: 2018-001 **Date/Time Sampled: 07/03/2018 00:00** **PSS Sample ID: 18070312-001**
Matrix: SURFACE WATER **Date/Time Received: 07/03/2018 12:10**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**4.3**	ug/L	1.0		1	07/05/18	07/05/18 19:24	1051

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**16,400**	ug/L	1,000		10	07/05/18	07/06/18 19:52	1051
Copper	**5.7**	ug/L	1.0		1	07/05/18	07/05/18 16:12	1051
Magnesium	**3,200**	ug/L	100		1	07/05/18	07/05/18 16:12	1051
Hardness (Ca & Mg)	**54.0**	mg/L	2.90		1	07/05/18	07/05/18 16:12	1051

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 18070312

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.

Unless otherwise noted, surrogate recoveries outside of the acceptance criteria are most often the result of sample matrix interference and/or sample dilution.

Quality control samples that display a high bias will not be narrated when sample target compounds are not detected.

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): 18070312
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	2018-001	Initial	18070312-001	1051	W	72214	155044	07/03/2018	07/05/2018 10:08	07/05/2018 16:12
	72214-1-BKS	BKS	72214-1-BKS	1051	W	72214	155044	--------	07/05/2018 10:08	07/05/2018 15:20
	72214-1-BLK	BLK	72214-1-BLK	1051	W	72214	155044	--------	07/05/2018 10:08	07/05/2018 15:15
	Millville 001 S	MS	18070306-001 S	1051	W	72214	155044	07/03/2018	07/05/2018 10:08	07/05/2018 15:29
	July 2018 Sample S	MS	18070327-001 S	1051	W	72214	155044	07/03/2018	07/05/2018 10:08	07/05/2018 17:40
	Millville 001 SD	MSD	18070306-001 SD	1051	W	72214	155044	07/03/2018	07/05/2018 10:08	07/05/2018 15:34
	2018-001	Reanalysis	18070312-001	1051	W	72214	155044	07/03/2018	07/05/2018 10:08	07/05/2018 16:12
	2018-001	Reanalysis	18070312-001	1051	W	72214	155083	07/03/2018	07/05/2018 10:08	07/06/2018 19:52
EPA 200.8	2018-001	Initial	18070312-001	1051	W	72220	155052	07/03/2018	07/05/2018 15:14	07/05/2018 19:24
	72220-1-BKS	BKS	72220-1-BKS	1051	W	72220	155052	--------	07/05/2018 15:14	07/05/2018 18:56
	72220-1-BLK	BLK	72220-1-BLK	1051	W	72220	155052	--------	07/05/2018 15:14	07/05/2018 18:47
	Millville 001 S	MS	18070306-001 S	1051	W	72220	155052	07/03/2018	07/05/2018 15:14	07/05/2018 19:05
	Millville 001 SD	MSD	18070306-001 SD	1051	W	72220	155052	07/03/2018	07/05/2018 15:14	07/05/2018 19:10

PHASE SEPARATION SCIENCE, INC.

QC Summary 18070312

DDC-4C
NPDES

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155044 Matrix: Water Date Prep: 07/05/18
MB Sample Id: 72214-1-BLK LCS Sample Id: 72214-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	406.6	102	85-115	ug/L	07/05/18 15:20	
Copper	<1.000	40.00	38.79	97	85-115	ug/L	07/05/18 15:20	
Magnesium	<100	400	410	103	85-115	ug/L	07/05/18 15:20	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155052 Matrix: Water Date Prep: 07/05/18
MB Sample Id: 72220-1-BLK LCS Sample Id: 72220-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	38.13	95	85-115	ug/L	07/05/18 18:56	

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.

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

EMAIL: ian.d.cherok@noaa.gov FAX NO.: ( )

*PROJECT NAME: NPDES PROJECT NO.:

SITE LOCATION: Outfall 001 & ~~001~~ P.O. NO.:

SAMPLER(S): DW CERT NO.:

PSS Work Order #: 18070312 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	HNO_3	HNO_3	HNO_3								REMARKS
							Analysis/ Method Required (3) *	Total Copper	Dissolved Copper	Hardness								
1	20180703-001	7/3/18		SW	3	G		X	X	X								Dissolved Copper has been filtered
	~~20180703-004~~	~~7/3/18~~		~~SW~~	~~3~~	~~G~~		~~X~~	~~X~~	~~X~~	~~R~~							

(5)

Relinquished By: (1)	Date	Time	Received By:
[signature]	7/3/18	1130	[signature]
Relinquished By: (2) [signature]	07/03/18	1210	[signature]
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 ____

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

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

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 4°-4°C

Shipping Carrier: TPE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18070312	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	07/03/2018 12:10:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	08/07/2018	**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
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		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: 07/03/2018

Thomas Wingate

PM Review and Approval: Lynn Jackson Date: 07/03/2018

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 18072707

Project Manager: Ian Cherok

Project Name : NPDES

Project Location: Outfall 004

August 3, 2018

Phase Separation Science, Inc.

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Baltimore, MD 21228
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Fax: (410) 788-8723

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800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

August 3, 2018

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

Reference: PSS Work Order(s) No: **18072707**
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 **18072707**.

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 August 31, 2018, 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 18072707

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/27/2018 at 12:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18072707-001	20180727-004	SURFACE WATER	07/27/18 09:41

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: 18072707

DDC-4C, Chambersburg, PA

August 3, 2018

Project Name: NPDES
Project Location: Outfall 004

Sample ID: 20180727-004 **Date/Time Sampled: 07/27/2018 09:41** **PSS Sample ID: 18072707-001**
Matrix: SURFACE WATER **Date/Time Received: 07/27/2018 12:40**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**4.4**	ug/L	1.0		1	07/30/18	07/30/18 15:31	1051

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**10,500**	ug/L	1,000		10	07/31/18	08/01/18 17:49	1051
Copper	**5.8**	ug/L	1.0		1	07/31/18	07/31/18 17:22	1051
Magnesium	**2,000**	ug/L	100		1	07/31/18	07/31/18 17:22	1051
Hardness (Ca & Mg)	**34.0**	mg/L	2.90		1	07/31/18	07/31/18 17:22	1051

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 18072707

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.

Unless otherwise noted, surrogate recoveries outside of the acceptance criteria are most often the result of sample matrix interference and/or sample dilution.

Quality control samples that display a high bias will not be narrated when sample target compounds are not detected.

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): 18072707
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	20180727-004	Initial	18072707-001	1051	W	72573	155696	07/27/2018	07/31/2018 14:38	07/31/2018 17:22
	72573-1-BKS	BKS	72573-1-BKS	1051	W	72573	155696	--------	07/31/2018 14:38	07/31/2018 17:04
	72573-1-BLK	BLK	72573-1-BLK	1051	W	72573	155696	--------	07/31/2018 14:38	07/31/2018 16:54
	20180726 S	MS	18072706-001 S	1051	W	72573	155696	07/26/2018	07/31/2018 14:38	07/31/2018 17:13
	20180726 SD	MSD	18072706-001 SD	1051	W	72573	155696	07/26/2018	07/31/2018 14:38	07/31/2018 17:18
	20180727-004	Reanalysis	18072707-001	1051	W	72573	155758	07/27/2018	07/31/2018 14:38	08/01/2018 17:49
EPA 200.8	20180727-004	Initial	18072707-001	1051	W	72558	155658	07/27/2018	07/30/2018 14:49	07/30/2018 15:31
	72558-1-BKS	BKS	72558-1-BKS	1051	W	72558	155658	--------	07/30/2018 14:49	07/30/2018 15:12
	72558-1-BLK	BLK	72558-1-BLK	1051	W	72558	155658	--------	07/30/2018 14:49	07/30/2018 15:03
	GTA-1B S	MS	18072406-001 S	1051	W	72558	155658	07/23/2018	07/30/2018 14:49	07/30/2018 15:22
	GTA-1B SD	MSD	18072406-001 SD	1051	W	72558	155658	07/23/2018	07/30/2018 14:49	07/30/2018 15:26

PHASE SEPARATION SCIENCE, INC.

QC Summary 18072707

DDC-4C
NPDES

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155658 Matrix: Water Date Prep: 07/30/18
MB Sample Id: 72558-1-BLK LCS Sample Id: 72558-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	38.86	97	85-115	ug/L	07/30/18 15:12	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155696 Matrix: Water Date Prep: 07/31/18
MB Sample Id: 72573-1-BLK LCS Sample Id: 72573-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	441.5	110	85-115	ug/L	07/31/18 17:04	
Copper	<1.000	40.00	42.80	107	85-115	ug/L	07/31/18 17:04	
Magnesium	<100	400	387.4	97	85-115	ug/L	07/31/18 17:04	

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.
*PROJECT MGR: Ian Cherok *PHONE NO.: ( )
EMAIL: FAX NO.: ( )
*PROJECT NAME: NPDES PROJECT NO.:
SITE LOCATION: Outfall 004 P.O. NO.: CS54
SAMPLER(S): I. Cherok L. Wickland DW CERT NO.:

PSS Work Order #: 18072707 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) * Total Copper	Dissolved Copper	Hardness									
1	20180727-004	7/27/18	0941	SW	3	G	X	X	X									Dissolved Copper has been filtered
1																		

(5)

Relinquished By: (1)	Date	Time	Received By:
[signature]	7/27/18	1200	[signature]
Relinquished By: (2) [signature]	7/27/18	1240	[signature]
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 ____
Special Instructions:
DW COMPLIANCE? YES ☐ EDD FORMAT TYPE ____ STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 4°C
Shipping Carrier: TTE

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18072707	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	07/27/2018 12:40:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	08/31/2018	**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
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: 07/27/2018

PM Review and Approval: Lynn Jackson Date: 07/30/2018

Analytical Report for

DDC-4C

Certificate of Analysis No.: 18080622

Project Manager: Ian Cherok

Project Name : NPDES

Project Location: Outfall 001 & 004

August 13, 2018

Phase Separation Science, Inc.

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

PHASE SEPARATION SCIENCE, INC.

August 13, 2018

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

Reference: PSS Work Order(s) No: **18080622**
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 **18080622**.

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 September 10, 2018, 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): 18080622

The following samples were received under chain of custody by Phase Separation Science (PSS) on 08/06/2018 at 01:00 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18080622-001	20180806-001	SURFACE WATER	08/06/18 10:16
18080622-002	20180806-004	SURFACE WATER	08/06/18 09:54

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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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18080622

DDC-4C, Chambersburg, PA

August 13, 2018

Project Name: NPDES
Project Location: Outfall 001 & 004

Sample ID: 20180806-001 **Date/Time Sampled: 08/06/2018 10:16** **PSS Sample ID: 18080622-001**
Matrix: SURFACE WATER **Date/Time Received: 08/06/2018 13:00**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**5.4**	ug/L	1.0		1	08/07/18	08/07/18 13:54	1064

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**11,700**	ug/L	2,000		20	08/07/18	08/08/18 18:59	1051
Copper	**6.8**	ug/L	1.0		1	08/07/18	08/07/18 19:28	1051
Magnesium	**2,310**	ug/L	100		1	08/07/18	08/08/18 19:18	1051
Hardness (Ca & Mg)	**39.0**	mg/L	5.40		1	08/07/18	08/08/18 19:18	1051

Sample ID: 20180806-004 **Date/Time Sampled: 08/06/2018 09:54** **PSS Sample ID: 18080622-002**
Matrix: SURFACE WATER **Date/Time Received: 08/06/2018 13:00**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**3.4**	ug/L	1.0		1	08/07/18	08/07/18 14:09	1064

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**11,200**	ug/L	2,000		20	08/07/18	08/08/18 19:04	1051
Copper	**5.2**	ug/L	1.0		1	08/07/18	08/07/18 19:33	1051
Magnesium	**2,300**	ug/L	100		1	08/07/18	08/08/18 19:22	1051
Hardness (Ca & Mg)	**38.0**	mg/L	5.40		1	08/07/18	08/08/18 19:22	1051

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 18080622

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.

Unless otherwise noted, surrogate recoveries outside of the acceptance criteria are most often the result of sample matrix interference and/or sample dilution.

Quality control samples that display a high bias will not be narrated when sample target compounds are not detected.

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): 18080622
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	72682-1-BKS	BKS	72682-1-BKS	1051	W	72682	155884	--------	08/07/2018 13:36	08/07/2018 14:30
	72682-1-BLK	BLK	72682-1-BLK	1051	W	72682	155884	--------	08/07/2018 13:36	08/07/2018 14:25
	20180806-001	Initial	18080622-001	1051	W	72682	155913	08/06/2018	08/07/2018 13:36	08/07/2018 19:28
	20180806-004	Initial	18080622-002	1051	W	72682	155913	08/06/2018	08/07/2018 13:36	08/07/2018 19:33
	72682-1-BKS	BKS	72682-1-BKS	1051	W	72682	155913	--------	08/07/2018 13:36	08/07/2018 19:05
	72682-1-BLK	BLK	72682-1-BLK	1051	W	72682	155913	--------	08/07/2018 13:36	08/07/2018 18:55
	PLY-008a S	MS	18080315-001 S	1051	W	72682	155913	08/03/2018	08/07/2018 13:36	08/07/2018 19:14
	Cell 7A/B S	MS	18080704-003 S	1051	W	72682	155913	08/06/2018	08/07/2018 13:36	08/07/2018 20:34
	PLY-008a SD	MSD	18080315-001 SD	1051	W	72682	155913	08/03/2018	08/07/2018 13:36	08/07/2018 19:19
	72682-1-BKS	Reanalysis	72682-1-BKS	1051	W	72682	155974	--------	08/07/2018 13:36	08/08/2018 15:01
	72682-1-BLK	Reanalysis	72682-1-BLK	1051	W	72682	155974	--------	08/07/2018 13:36	08/08/2018 14:56
	20180806-001	Reanalysis	18080622-001	1051	W	72682	155974	08/06/2018	08/07/2018 13:36	08/08/2018 19:18
	20180806-004	Reanalysis	18080622-002	1051	W	72682	155974	08/06/2018	08/07/2018 13:36	08/08/2018 19:22
	20180806-001	Reanalysis	18080622-001	1051	W	72682	155974	08/06/2018	08/07/2018 13:36	08/08/2018 18:59
	20180806-004	Reanalysis	18080622-002	1051	W	72682	155974	08/06/2018	08/07/2018 13:36	08/08/2018 19:04
EPA 200.8	20180806-001	Initial	18080622-001	1064	W	72681	155883	08/06/2018	08/07/2018 11:28	08/07/2018 13:54
	20180806-004	Initial	18080622-002	1064	W	72681	155883	08/06/2018	08/07/2018 11:28	08/07/2018 14:09
	72681-1-BKS	BKS	72681-1-BKS	1064	W	72681	155883	--------	08/07/2018 11:28	08/07/2018 13:49
	72681-1-BLK	BLK	72681-1-BLK	1064	W	72681	155883	--------	08/07/2018 11:28	08/07/2018 13:44
	20180806-001 S	MS	18080622-001 S	1064	W	72681	155883	08/06/2018	08/07/2018 11:28	08/07/2018 13:59
	20180806-001 SD	MSD	18080622-001 SD	1064	W	72681	155883	08/06/2018	08/07/2018 11:28	08/07/2018 14:04

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QC Summary 18080622

DDC-4C
NPDES

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155883 Matrix: Water Date Prep: 08/07/18
MB Sample Id: 72681-1-BLK LCS Sample Id: 72681-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	39.70	99	85-115	ug/L	08/07/18 13:49	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155884 Matrix: Water Date Prep: 08/07/18
MB Sample Id: 72682-1-BLK LCS Sample Id: 72682-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	<100	0	85-115	ug/L	08/07/18 14:30	
Copper	<1.000	40.00	39.29	98	85-115	ug/L	08/07/18 14:30	
Magnesium	<100	400	395.5	99	85-115	ug/L	08/07/18 14:30	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155913 Matrix: Water Date Prep: 08/07/18
MB Sample Id: 72682-1-BLK LCS Sample Id: 72682-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	392.2	98	85-115	ug/L	08/07/18 19:05	
Copper	<1.000	40.00	39.46	99	85-115	ug/L	08/07/18 19:05	
Magnesium	<100	400	388.1	97	85-115	ug/L	08/08/18 15:01	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 155883 Matrix: Surface Water Date Prep: 08/07/18
Parent Sample Id: 18080622-001 MS Sample Id: 18080622-001 S MSD Sample Id: 18080622-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	5.382	40.00	45.39	100	42.80	94	70-130	6	25	ug/L	08/07/18 13:59	

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: DDL-4C *OFFICE LOC.

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

EMAIL: ian.d.chook@nasa.gov FAX NO.: ( )

*PROJECT NAME: NPDES PROJECT NO.:

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

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

PSS Work Order #: 18080622 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) *	Total Copper	Dissolved Copper	Hardness									
1	20180806-001	8/6/18	1016	SW	3	G		X	X	X									
2	20180806-004	8/6/18	0954	SW	3	G		X	X	X									

(5)

Relinquished By:	Date	Time	Received By:
(1)	8/6/18	1220	
(2)	8/6	1300	
(3)			
(4)			

(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 ____

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

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

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 2°-4°C

Shipping Carrier: TTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18080622	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	08/06/2018 01:00:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	09/10/2018	**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
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 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: 08/06/2018

PM Review and Approval: Lynn Jackson Date: 08/07/2018

Analytical Report for

DDC-4C

Certificate of Analysis No.: 18090523

Project Manager: Ian Cherok

Project Name : NPDES

Project Location: 001, 004

September 12, 2018

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

September 12, 2018

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

Reference: PSS Work Order(s) No: **18090523**
Project Name: NPDES
Project Location: 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 **18090523**.

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 October 10, 2018, 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): 18090523

The following samples were received under chain of custody by Phase Separation Science (PSS) on 09/05/2018 at 02:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18090523-001	20180905-001	SURFACE WATER	09/05/18 09:37
18090523-002	20180905-004	SURFACE WATER	09/05/18 09:14

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:
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ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18090523

DDC-4C, Chambersburg, PA

September 12, 2018

Project Name: NPDES
Project Location: 001, 004

Sample ID: 20180905-001 **Date/Time Sampled: 09/05/2018 09:37** **PSS Sample ID: 18090523-001**
Matrix: SURFACE WATER **Date/Time Received: 09/05/2018 14:40**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**4.8**	ug/L	1.0		1	09/06/18	09/07/18 16:54	1064

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**12,700**	ug/L	1,000		10	09/06/18	09/10/18 18:23	1064
Copper	**6.4**	ug/L	1.0		1	09/06/18	09/07/18 15:43	1064
Magnesium	**2,590**	ug/L	100		1	09/06/18	09/07/18 15:43	1064
Hardness (Ca & Mg)	**42.0**	mg/L	2.90		1	09/06/18	09/07/18 15:43	1064

Sample ID: 20180905-004 **Date/Time Sampled: 09/05/2018 09:14** **PSS Sample ID: 18090523-002**
Matrix: SURFACE WATER **Date/Time Received: 09/05/2018 14:40**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**3.1**	ug/L	1.0		1	09/06/18	09/07/18 16:59	1064

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Calcium	**9,910**	ug/L	1,000		10	09/06/18	09/10/18 18:28	1064
Copper	**6.0**	ug/L	1.0		1	09/06/18	09/07/18 15:48	1064
Magnesium	**1,990**	ug/L	100		1	09/06/18	09/07/18 15:48	1064
Hardness (Ca & Mg)	**33.0**	mg/L	2.90		1	09/06/18	09/07/18 15:48	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 18090523

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.

Unless otherwise noted, surrogate recoveries outside of the acceptance criteria are most often the result of sample matrix interference and/or sample dilution.

Quality control samples that display a high bias will not be narrated when sample target compounds are not detected.

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): 18090523
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	20180905-001	Initial	18090523-001	1064	W	73157	156943	09/05/2018	09/06/2018 12:54	09/07/2018 15:43
	20180905-004	Initial	18090523-002	1064	W	73157	156943	09/05/2018	09/06/2018 12:54	09/07/2018 15:48
	73157-1-BKS	BKS	73157-1-BKS	1064	W	73157	156943	--------	09/06/2018 12:54	09/07/2018 14:29
	73157-1-BLK	BLK	73157-1-BLK	1064	W	73157	156943	--------	09/06/2018 12:54	09/07/2018 14:24
	801 S	MS	18090504-001 S	1064	W	73157	156943	09/05/2018	09/06/2018 12:54	09/07/2018 14:39
	801 SD	MSD	18090504-001 SD	1064	W	73157	156943	09/05/2018	09/06/2018 12:54	09/07/2018 14:44
	20180905-001	Reanalysis	18090523-001	1064	W	73157	156969	09/05/2018	09/06/2018 12:54	09/10/2018 18:23
	20180905-004	Reanalysis	18090523-002	1064	W	73157	156969	09/05/2018	09/06/2018 12:54	09/10/2018 18:28
EPA 200.8	20180905-001	Initial	18090523-001	1064	W	73160	156947	09/05/2018	09/06/2018 14:38	09/07/2018 16:54
	20180905-004	Initial	18090523-002	1064	W	73160	156947	09/05/2018	09/06/2018 14:38	09/07/2018 16:59
	73160-1-BKS	BKS	73160-1-BKS	1064	W	73160	156947	--------	09/06/2018 14:38	09/07/2018 16:03
	73160-1-BLK	BLK	73160-1-BLK	1064	W	73160	156947	--------	09/06/2018 14:38	09/07/2018 15:58
	Upstream S	MS	18090516-001 S	1064	W	73160	156947	09/05/2018	09/06/2018 14:38	09/07/2018 16:14
	Upstream SD	MSD	18090516-001 SD	1064	W	73160	156947	09/05/2018	09/06/2018 14:38	09/07/2018 16:19

PHASE SEPARATION SCIENCE, INC.

QC Summary 18090523

DDC-4C
NPDES

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 156943 Matrix: Water Date Prep: 09/06/18
MB Sample Id: 73157-1-BLK LCS Sample Id: 73157-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	408.3	102	85-115	ug/L	09/07/18 14:29	
Copper	<1.000	40.00	39.95	100	85-115	ug/L	09/07/18 14:29	
Magnesium	<100	400	394.5	99	85-115	ug/L	09/07/18 14:29	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 156947 Matrix: Water Date Prep: 09/06/18
MB Sample Id: 73160-1-BLK LCS Sample Id: 73160-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	38.29	96	85-115	ug/L	09/07/18 16:03	

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: Ian.d.cherok@nasa.gov FAX NO.: ( )
*PROJECT NAME: NPDES PROJECT NO.:
SITE LOCATION: 001, 004 P.O. NO.: C554
SAMPLER(S): H. Thomas L. Wicklund DW CERT NO.:

PSS Work Order #: 18090523 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) *	total copper	dissolved copper	Hardness								
1	20180905-001	9/5/18	0937	SW	3	G		X	X	X								*dissolved copper has already been filtered.
2	20180905-004	9/5/18	0918	SW	3	G		X	X	X								

(5)

Relinquished By: (1)	Date	Time	Received By:
[illegible]	9/5/18	1319	TE 123
Relinquished By: (2)	Date	Time	Received By:
TE 123	9/5	1345	Gama
Relinquished By: (3)	Date	Time	Received By:
Gama	9/5	1440	[illegible]
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 ____

Special Instructions:

DW COMPLIANCE? YES ☐ EDD FORMAT TYPE ____

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

# of Coolers: 1
Custody Seal: ABS
Ice Present: PREJ Temp: 4.6-5.6°C
Shipping Carrier: TTE

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18090523	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	09/05/2018 02:40:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	10/10/2018	**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)	5.6
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 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: 09/05/2018

PM Review and Approval: Lynn Jackson Date: 09/05/2018

Analytical Report for

DDC-4C

Certificate of Analysis No.: 18090524

Project Manager: Ian Cherok

Project Name : NPDES

Project Location: 001, 004

September 12, 2018

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

September 12, 2018

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

Reference: PSS Work Order(s) No: **18090524**
Project Name: NPDES
Project Location: 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 **18090524**.

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 October 10, 2018, 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 18090524

The following samples were received under chain of custody by Phase Separation Science (PSS) on 09/05/2018 at 02:40 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18090524-001	20180905-001A	SURFACE WATER	09/05/18 08:00
18090524-002	20180905-001B	SURFACE WATER	09/05/18 08:00
18090524-003	20180905-004A	SURFACE WATER	09/05/18 08:00
18090524-004	20180905-004B	SURFACE WATER	09/05/18 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: 18090524

DDC-4C, Chambersburg, PA

September 12, 2018

Project Name: NPDES
Project Location: 001, 004

Sample ID: 20180905-001A **Date/Time Sampled: 09/05/2018 08:00** **PSS Sample ID: 18090524-001**
Matrix: SURFACE WATER **Date/Time Received: 09/05/2018 14:40**

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	09/06/18	09/06/18 13:59	1059
Nitrite (as N)	ND	mg/L	0.10		1	09/06/18	09/06/18 13:59	1059

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**1.0**	mg/L	0.4		09/10/18	09/10/18 10:43	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.47**	mg/L	0.050		1	09/12/18	09/12/18 16:10	1064

Nitrogen, Total by calculation — Analytical Method: N_Total Calc. TKN+NO32

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**1.0**	mg/L			09/10/18	09/10/18 10:43	4005

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18090524

DDC-4C, Chambersburg, PA

September 12, 2018

Project Name: NPDES
Project Location: 001, 004

Sample ID: 20180905-001B **Date/Time Sampled: 09/05/2018 08:00** **PSS Sample ID: 18090524-002**
Matrix: SURFACE WATER **Date/Time Received: 09/05/2018 14:40**

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	09/06/18	09/06/18 14:44	1059
Nitrite (as N)	ND	mg/L	0.10		1	09/06/18	09/06/18 14:44	1059

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**0.9**	mg/L	0.4		09/10/18	09/10/18 10:45	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.47**	mg/L	0.050		1	09/12/18	09/12/18 16:10	1064

Nitrogen, Total by calculation — Analytical Method: N_Total Calc. TKN+NO32

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**0.9**	mg/L			09/10/18	09/10/18 10:45	4005

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18090524

DDC-4C, Chambersburg, PA

September 12, 2018

Project Name: NPDES
Project Location: 001, 004

Sample ID: 20180905-004A **Date/Time Sampled: 09/05/2018 08:00** **PSS Sample ID: 18090524-003**
Matrix: SURFACE WATER **Date/Time Received: 09/05/2018 14:40**

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	09/06/18	09/06/18 15:06	1059
Nitrite (as N)	ND	mg/L	0.10		1	09/06/18	09/06/18 15:06	1059

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**1.0**	mg/L	0.4		09/10/18	09/10/18 10:48	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.20**	mg/L	0.050		1	09/12/18	09/12/18 16:10	1064

Nitrogen, Total by calculation — Analytical Method: N_Total Calc. TKN+NO32

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**1.0**	mg/L			09/10/18	09/10/18 10:48	4005

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18090524

DDC-4C, Chambersburg, PA

September 12, 2018

Project Name: NPDES
Project Location: 001, 004

Sample ID: 20180905-004B **Date/Time Sampled: 09/05/2018 08:00** **PSS Sample ID: 18090524-004**
Matrix: SURFACE WATER **Date/Time Received: 09/05/2018 14:40**

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	09/06/18	09/06/18 15:29	1059
Nitrite (as N)	ND	mg/L	0.10		1	09/06/18	09/06/18 15:29	1059

Total Kjeldahl Nitrogen — Analytical Method: EPA 351.2

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Nitrogen, Total Kjeldahl	**1.0**	mg/L	0.4		09/10/18	09/10/18 10:50	4005

Phosphorus, Total as P — Analytical Method: EPA 365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.20**	mg/L	0.050		1	09/12/18	09/12/18 16:10	1064

Nitrogen, Total by calculation — Analytical Method: N_Total Calc. TKN+NO32

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Total Nitrogen(NO2 & NO3 & TKN)	**1.0**	mg/L			09/10/18	09/10/18 10:50	4005

Case Narrative Summary

Client Name: DDC-4C

Project Name: NPDES

Work Order Number(s): 18090524

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.

Unless otherwise noted, surrogate recoveries outside of the acceptance criteria are most often the result of sample matrix interference and/or sample dilution.

Quality control samples that display a high bias will not be narrated when sample target compounds are not detected.

Sample Receipt:

All sample receipt conditions were acceptable.

18090524: Analyses associated with analyst code 4005 were performed by Enviro-Chem Laboratories, Inc.

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): 18090524
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	20180905-001A	Initial	18090524-001	1059	W	73154	156934	09/05/2018	09/06/2018 11:17	09/06/2018 13:59
	20180905-001B	Initial	18090524-002	1059	W	73154	156934	09/05/2018	09/06/2018 11:17	09/06/2018 14:44
	20180905-004A	Initial	18090524-003	1059	W	73154	156934	09/05/2018	09/06/2018 11:17	09/06/2018 15:06
	20180905-004B	Initial	18090524-004	1059	W	73154	156934	09/05/2018	09/06/2018 11:17	09/06/2018 15:29
	73154-1-BKS	BKS	73154-1-BKS	1059	W	73154	156934	--------	09/06/2018 11:17	09/06/2018 12:52
	73154-1-BLK	BLK	73154-1-BLK	1059	W	73154	156934	--------	09/06/2018 11:17	09/06/2018 12:29
	73154-1-BSD	BSD	73154-1-BSD	1059	W	73154	156934	--------	09/06/2018 11:17	09/06/2018 13:14
	20180905-001A S	MS	18090524-001 S	1059	W	73154	156934	09/05/2018	09/06/2018 11:17	09/06/2018 14:21
EPA 351.2	20180905-001A	Initial	18090524-001	4005	W	157023	157023	09/05/2018	09/10/2018 10:43	09/10/2018 10:43
	20180905-001B	Initial	18090524-002	4005	W	157023	157023	09/05/2018	09/10/2018 10:45	09/10/2018 10:45
	20180905-004A	Initial	18090524-003	4005	W	157023	157023	09/05/2018	09/10/2018 10:48	09/10/2018 10:48
	20180905-004B	Initial	18090524-004	4005	W	157023	157023	09/05/2018	09/10/2018 10:50	09/10/2018 10:50
EPA 365.3	20180905-001A	Initial	18090524-001	1064	W	157058	157058	09/05/2018	09/12/2018 16:10	09/12/2018 16:10
	20180905-001B	Initial	18090524-002	1064	W	157058	157058	09/05/2018	09/12/2018 16:10	09/12/2018 16:10
	20180905-004A	Initial	18090524-003	1064	W	157058	157058	09/05/2018	09/12/2018 16:10	09/12/2018 16:10
	20180905-004B	Initial	18090524-004	1064	W	157058	157058	09/05/2018	09/12/2018 16:10	09/12/2018 16:10
	157058-1-BKS	BKS	157058-1-BKS	1064	W	157058	157058	--------	09/12/2018 16:10	09/12/2018 16:10
	157058-1-BLK	BLK	157058-1-BLK	1064	W	157058	157058	--------	09/12/2018 16:10	09/12/2018 16:10
	20180905-001A S	MS	18090524-001 S	1064	W	157058	157058	09/05/2018	09/12/2018 16:10	09/12/2018 16:10
	20180905-001A SD	MSD	18090524-001 SD	1064	W	157058	157058	09/05/2018	09/12/2018 16:10	09/12/2018 16:10
N_Total Calc. TKN+NO32	20180905-001A	Initial	18090524-001	4005	W	157023	157023	09/05/2018	09/10/2018 10:43	09/10/2018 10:43
	20180905-001B	Initial	18090524-002	4005	W	157023	157023	09/05/2018	09/10/2018 10:45	09/10/2018 10:45
	20180905-004A	Initial	18090524-003	4005	W	157023	157023	09/05/2018	09/10/2018 10:48	09/10/2018 10:48
	20180905-004B	Initial	18090524-004	4005	W	157023	157023	09/05/2018	09/10/2018 10:50	09/10/2018 10:50

PHASE SEPARATION SCIENCE, INC.

QC Summary 18090524

DDC-4C
NPDES

Analytical Method: EPA 365.3
Seq Number: 157058 Matrix: Water
MB Sample Id: 157058-1-BLK LCS Sample Id: 157058-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Phosphorus, Total (as P)	<0.0500	0.972	0.995	102	85-115	mg/L	09/12/18 16:10	

Analytical Method: EPA 365.3
Seq Number: 157058 Matrix: Surface Water
Parent Sample Id: 18090524-001 MS Sample Id: 18090524-001 S MSD Sample Id: 18090524-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Phosphorus, Total (as P)	0.472	0.328	0.717	75	0.880	124	70-130	20	20	mg/L	09/12/18 16:10	

Analytical Method: EPA 300.0 Prep Method: E300.0P
Seq Number: 156934 Matrix: Water Date Prep: 09/06/18
MB Sample Id: 73154-1-BLK LCS Sample Id: 73154-1-BKS LCSD Sample Id: 73154-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrate (as N)	<0.1000	5.000	5.005	100	4.993	100	90-110	0	20	mg/L	09/06/18 12:52	
Nitrite (as N)	<0.1000	5.000	5.044	101	5.042	101	90-110	0	20	mg/L	09/06/18 12:52	

Analytical Method: EPA 300.0 Prep Method: E300.0P
Seq Number: 156934 Matrix: Surface Water Date Prep: 09/06/18
Parent Sample Id: 18090524-001 MS Sample Id: 18090524-001 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Nitrate (as N)	<0.1000	5.000	5.015	100	87-115	mg/L	09/06/18 14:21	
Nitrite (as N)	<0.1000	5.000	5.023	100	80-112	mg/L	09/06/18 14:21	

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: DDCLC *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: 001,004 P.O. NO.: C554

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

PSS Work Order #: 18090524 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	total phosphorus (H2SO4)	nitrate/nitrite (none)	total nitrogen (H2SO4)									REMARKS
1	20180905-001A	9/5/18	00:01-08:00	SW	3	C	X	X	X									
2	20180905-001B	9/5/18	00:01-08:00	SW	3	C	X	X	X									
3	20180905-004A	9/5/18	00:01-08:00	SW	3	C	X	X	X									
4	20180905-004B	9/5/18	00:01-08:00	SW	3	C	X	X	X									

(5)

Relinquished By:	Date	Time	Received By:
(1)	9/5/18	1319	TE123
(2) TE123	9/5	1345	Gama
(3) Gama	9/5	1448	
(4)			

(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 _____

Special Instructions:

DW COMPLIANCE? YES ☐ EDD FORMAT TYPE _____

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

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 3.9-4.4°C

Shipping Carrier: TTE

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

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18090524	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	09/05/2018 02:40:00 PM
Project Name	NPDES	**Delivered By**	Trans Time Express
Disposal Date	10/10/2018	**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	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 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: 09/05/2018

Thomas Wingate

PM Review and Approval: Lynn Jackson Date: 09/05/2018

Lynn Jackson