National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 250

April 1, 2019

Mr. Todd Gentry
Washington Suburban Sanitary Commission
14501 Sweitzer Lane, 11th Floor
Laurel, MD 20707-5902

Dear Mr. Gentry:

Enclosed are NASA Goddard Space Flight Center's (GSFC) Industrial Discharge Periodic Compliance Reports (PCR) and supporting documentation for the first quarter 2019 reporting period. Also enclosed is GSFC's Total Toxic Organic (TTO) certification form for Monitoring Point 001.

GSFC performed quarterly monitoring at Monitoring Point FAC on February 5 and 6, 2019, and at the building 5 electroplating facility (Monitoring Point 001) on February 13 and 15, 2019. GSFC performed additional monitoring for the chromium compliance directive at Monitoring Point 001 on February 7 and March 6, 2019.

If you have any questions concerning this report, please contact Ms. Lori Levine at (301) 286-6741 or Lori.M.Levine@nasa.gov.

Sincerely,

Kimberly Finch, P.E.
Chief, Medical and Environmental Management Division

Enclosure

WSSC
Where Water Matters

INDUSTRIAL DISCHARGE CONTROL PROGRAM
PERIODIC COMPLIANCE REPORT

Complete the following information; incomplete reports will be addressed with enforcement action. Attach laboratory data with Minimum Laboratory Reporting Requirements (Section II.D. of your WSSC Permit) and applicable certification statements.

Industrial User	NASA/Goddard Space Flight Center				Outfall	FAC	Permit Number 00449
Reporting Period	Year: 2019	Quarter: (Check One)	January Thru March ☒	April Thru June ☐	July Thru September ☐	October Thru December ☐	
Monitoring Point Description	WSSC manhole labeled "WSSC IWMP" inside the front gate.						
Sampler's Name	Hayley Thomas, Lauren Wicklund		Name of Company Performing Sampling	DDC 4C			

Are all results compliant with effluent limits? Yes ☒ No ☐
If **No**, are additional operation and maintenance and/or additional pretreatment required for you to meet the pretreatment standards and requirements? Yes ☐ No ☐

Parameter	Effluent Limit (mg/l) Daily(1)	Indicate Sample Date and Results in mg/l for Each Parameter					Analytical Method	No. of Results Over Limit	Violations (WSSC Use Only)
		2/4/19	2/5/19	2/6/19	2/7/19				
Cadmium (T)	0.10		<0.001	<0.001			EPA 200.8	0	
Chromium (T)	7.0		<0.001	<0.001			EPA 200.8	0	
Copper (T)	2.0		0.0546	0.074			EPA 200.8	0	
Lead (T)	0.35		<0.001	<0.001			EPA 200.8	0	
Nickel (T)	3.4		0.0054	0.0076			EPA 200.8	0	
Silver (T)	0.50		<0.001	<0.001			EPA 200.8	0	
Zinc (T)	4.2		0.0641	0.105			EPA 200.8	0	
Cyanide (T)	0.40		<0.010	<0.010			SM 4500-CN C,E - 2011	0	
Arsenic (T)	0.28		<0.001	<0.001			EPA 200.8	0	
Selenium (T)	0.40		<0.001	<0.001			EPA 200.8	0	
Molybdenum (T)	0.35		0.002	0.0026			EPA 200.8	0	
Total Phosphorus	8.0		5.1	7.2			EPA 365.3	0	
Ammonia (NH3)	190		33	98			SM 4500-NH3-F-2011	0	

Numeric values must be submitted for all analyses. If values are below detection limit, indicate the numeric detection limit.

For WSSC Use Only

Report is:	☐ On Time	☐ _____ Days Late	☐ Incomplete	Compliance
Violations reported within 24-hours of discovery?	☐ Yes	☐ No	☐ N/A	☐ Yes
Violations resampled within 30 days?	☐ Yes	☐ No	☐ N/A	☐ No
Comments:				
Reviewed by (Print Name):			Date:	
Data Entered by (Print Name):			Date:	

WSSC Where Water Matters

INDUSTRIAL DISCHARGE CONTROL PROGRAM
PERIODIC COMPLIANCE REPORT

Industrial User	NASA/Goddard Space Flight Center				Outfall	FAC	Permit Number	00449
Reporting Period	Year: 2019	Quarter: (Check One)	January Thru March ☒	April Thru June ☐	July Thru September ☐		October Thru December ☐	

Sample Information (Continued)

Parameter	Effluent Limit (mg/l) Daily(1)	Indicate Sample Date and Results in mg/l for Each Parameter					Analytical Method	No. of Results Over Limit	Violations (WSSC Use Only)
		2/4/19	2/5/19	2/6/19	2/7/19				
BOD	3,000		119	165			SM 5210B-2011	0	
pH Minimum(2)	6.0 standard units	7.6	7.1	6.2	7.0		EPA 150.2	0	
pH Maximum(2)	10.0 standard units	9.0	9.0	8.7	8.1		EPA 150.2	0	
Total Composite Volume			13.5	7.5			N/A	0	
Flow (gpd)(1)		43,473 (3)	88,126	71,288	19,948 (4)		Estimated		
Time: Start:		11:05	00:01	00:01	----------		N/A		
Stop:		----------	23:59	23:59	09:36		N/A		

Industry Comment/Changes/Notifications:

Numeric values must be submitted for all analyses. If values are below detection limit, indicate the numeric detection limit.

(1) Daily Maximum
(2) In reporting all pH data, all data should be truncated to one decimal place (the tenths digit).
(3) ***This total represents a partial day of data and is not an accurate representation of flow rates for a 24-hour period. This flow is the total from 12 hours and 55 minutes of monitoring (11:05 through 00:00).***
(4) ***This total represents a partial day of data and is not an accurate representation of flow rates for a 24-hour period. This flow is the total from 9 hours and 35 minutes of monitoring (00:01 through 09:36).***

		GREASE TRAP AND OIL/WATER SEPARATOR SERVICE LOG					
Industrial User		NASA/Goddard Space Flight Center				Permit Number	00449
Reporting Period		Year: 2019	Quarter: (Check One)	January Thru March ☒	April Thru June ☐	July Thru September ☐	October Thru December ☐
Building	**Number Of Tanks/Volume**	**System Type (GT, O/W, GRD, INT)**	**Location**	**Cleaning Frequency**	**Cleaning/Pump Out Dates**	**Waste Hauler**	**Waste Disposal Location**
27	1 tank/ 250 gallons	O/W	Room 170	Biannually	5/8/2018 3/14/2019	Triumvirate Environmental (Baltimore, MD) EPA # MDD093002384	Liquids: FCC Environmental (Wilmington, DE) Solids: Modern Landfill (York, PA) EPA # TXR000078094
95*	1 tank/ 500 gallons	O/W	Behind building	Once per calendar year	12/15/2016	ACE Environmental Services, LLC (Baltimore, MD) EPA # MDR000507780	Environmental Recovery Corporation (Lancaster , PA) EPA # PAD987266749
21	1 tank/ 35 gallons 1 tank/ 83 gallons 3 tanks/ 15 gallons	GT	Cafeteria	Inspected monthly, cleaned as needed	**Cleaned:** 1/28/19 2/25/19 3/28/19	Atlantic Wastewater Solutions LLC (Gambrills, MD) WSSC Permit #Z258 PG Co. Health Dept permit #55866-2015-0	District of Columbia Water and Sewer Authority (Washington, DC) Blue Plains Advanced Wastewater Treatment Plant NPDES Permit DC0021199
33	1 tank/ 45 gallons	GT	Café	Inspected monthly, cleaned as needed	**Cleaned:** 1/28/19 2/25/19 3/28/19	Atlantic Wastewater Solutions LLC (Gambrills, MD) WSSC Permit #Z258 PG Co. Health Dept permit #55866-2015-0	District of Columbia Water and Sewer Authority (Washington, DC) Blue Plains Advanced Wastewater Treatment Plant NPDES Permit DC0021199
1	1 tank/ 30 gallons 1 tank/ 45 gallons	GT	Cafeteria	Inspected monthly, cleaned as needed	**Cleaned:** 1/28/19 2/25/19 3/28/19	Atlantic Wastewater Solutions LLC (Gambrills, MD) WSSC Permit #Z258 PG Co. Health Dept permit #55866-2015-0	District of Columbia Water and Sewer Authority (Washington, DC) Blue Plains Advanced Wastewater Treatment Plant NPDES Permit DC0021199

LEGEND

GT Grease Trap
O/W Oil/Water Separator
GRD Grease Removal Device (i.e. RENN, GK&L, etc.)
INT Grease Interceptor

*Building 95 (Auto Club) is inactive

ATLANTIC WASTEWATER SOLUTIONS
WSSC PERMIT NUMBER: Z258

WSSC
Where Water Matters

INDUSTRIAL DISCHARGE CONTROL PROGRAM
PERIODIC COMPLIANCE REPORT

Industrial User	NASA/Goddard Space Flight Center					Outfall	001	Permit Number	00449
Reporting Period	Year: 2019	Quarter: (Check One)	January Thru March ☒	April Thru June ☐	July Thru September ☐	October Thru December ☐			
Monitoring Point Description	The red spigot located on the effluent pipe of the metal plating pretreatment system located in the building 5 electroplating facility and labeled "WSSC IWMP".								
Sampler's Name	Hayley Thomas, Lauren Wicklund, Ian Cherok		Name of Company Performing Sampling	DDC 4C					

Are all results compliant with effluent limits? Yes ☒ No ☐

If **No**, are additional operation and maintenance and/or additional pretreatment required for you to meet the pretreatment standards and requirements? Yes ☐ No ☐

Parameter	Effluent Limit (mg/l) Daily[1] Monthly[2]	Indicate Sample Date and Results in mg/l for Each Parameter					Analytical Method	No. of Results Over Limit	Violations (WSSC Use Only)
		2/7/19	2/13/19	2/15/19	3/6/19				
Cadmium (T)	0.11 - 0.07		<0.001	<0.001			EPA 200.8	0	
Chromium (T)	2.77 - 1.71	0.0638	0.389	0.246	0.0437		EPA 200.8	0	
Copper (T)	3.38 - 2.07		0.227	0.129			EPA 200.8	0	
Lead (T)	0.69 - 0.43		0.0447	0.0325			EPA 200.8	0	
Nickel (T)	3.98 - 2.38		0.136	0.0837			EPA 200.8	0	
Silver (T)	0.43 - 0.24		0.0057	0.0047			EPA 200.8	0	
Zinc (T)	2.61 - 1.48		0.571	0.384			EPA 200.8	0	
Cyanide (T)	1.20 - 0.65		<0.010	<0.010			SM 4500-CN C,E - 2011	0	
TTO[3]	2.13	----------	----------	----------	----------				
pH Minimum[4]	6.0 standard units	N/A	7.1	7.1	N/A		EPA 150.2	0	
pH Maximum[4]	10.0 standard units	N/A	7.3	7.7	N/A		EPA 150.2	0	
Flow (gpd)[1]		63.1	59.0	72.0	67.6		Estimated		
Time: Start:		10:00	09:17	10:03	10:46		N/A		
Stop:		10:04	09:21	10:08	10:50		N/A		
Industry Comment/Changes/Notifications:									

Numeric values must be submitted for all analyses. If values are below detection limit, indicate the numeric detection limit.

WSSC
Where Water Matters

INDUSTRIAL DISCHARGE CONTROL PROGRAM
PERIODIC COMPLIANCE REPORT

Industrial User	NASA/Goddard Space Flight Center				Outfall	001	Permit Number	00449
Reporting Period	Year: _____	Quarter: (Check One)	January Thru March ☐	April Thru June ☐	July Thru September ☐		October Thru December ☐	

Sample Information (Continued)

Parameter	Effluent Limit (mg/l) Daily(1)	Indicate Sample Date and Results in mg/l for Each Parameter					Analytical Method	No. of Results Over Limit	Violations (WSSC Use Only)
		/ /	/ /	/ /	/ /	/ /			

Numeric values must be submitted for all analyses. If values are below detection limit, indicate the numeric detection limit.

(1) Daily Maximum
(2) Monthly Average
(3) The term TTO shall mean total toxic organics, which is the summation of all quantifiable values greater than .01 milligrams per liter for the toxic organics listed in 40 CFR433.11 (e).
(4) In reporting all pH data, all data shall be truncated to one decimal place (the tenths digit).

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Representative Printed Name	Authorized Representative Signature	Date
Kimberly Finch	K Finch	04/01/2019

MAIL COMPLETED REPORT TO: Washington Suburban Sanitary Commission
Regulatory Services Division
Industrial Discharge Control Section
14501 Sweitzer Lane, 11th Floor
Laurel, MD 20707

INDUSTRY ID NO. 00449
IWMP 001

WASHINGTON SUBURBAN SANITARY COMMISSION
REGULATORY SERVICES GROUP
INDUSTRIAL DISCHARGE CONTROL PROGRAM

TOTAL TOXIC ORGANICS (TTO) CERTIFICATION

Section II

Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for Total Toxic Organics (TTO), I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the toxic organic management plan submitted to the control authority.

NASA Goodard Space Flight Center
Industry Name

Kimberly Finch, P.E.
Authorized Representative

Chief, Medical and Environmental Manangement Division
Title

K [signature]
Signature

04/9/2019
Date

1st Qtr (January-March)
Reporting Period

2019
Year

Insight For Windows: Version: 5.10.6

==========

Program settings

Site Id: 20190205

Program settings

PGM:
900MAX VERSION: 7.64

SITE ID: 20190205
LEVEL SENSOR: SUBMERGED XDUCER
TYPE: 0-10 FT
CAL OFFSET: 408
CAL GAIN: 6.991 /cm
USER OFFSET: 0.00 cm
NUMBER OF BOTTLES: 2
BOTTLE VOLUME: 10.00 gal
INTAKE TUBE LENGTH: 12 ft
INTAKE TUBE TYPE: 3/8" VINYL
FIRST: IMMEDIATELY
TIMED BOTTLE SETS:
TIME INTERVAL:00:00
BOTTLES PER SET: 1
CONTINUOUS MODE: ON
LIQUID SENSORS: ON
SAMPLE VOLUME: 100 ml
INTAKE RINSES: 0
SAMPLE RETRIES: 3
SITE ID: 20190205
FLOW METER:
FLOW UNITS: gpm
TOTAL FLOW UNITS: gal
LEVEL UNITS: in.
MANNING EQUATION
SHAPE: U-SHAPE CHANNEL
WIDTH: 11.00 in.
SLOPE: 0.00500
ROUGHNESS: 0.0170
SCREEN SAVER MODE: OFF
LOADED PROGRAM: 1
RS232 BAUD RATE: 19200
DAYS TO LOG: 9.0
INSTALLED MEMORY: 128K
EXTENDED POWER: OFF

--INPUT------UNITS-LOGGING--INTV-
PROC.TEMP F OFF
pH pH ON 1min
FLOW gpm ON 5min
LEVEL in. ON 5min
VELOCITY fps OFF
CAB.TEMP. C OFF

MEMORY MODE: SLATE
THERMAL CALIBRATE
AT: 15:02 24-OCT-18
pH CALIBRATION
AT: 11:42 06-FEB-19
PGM CMPLT OUTPUT
DISABLED
SPECIAL OUTPUT:
DISABLED
UPSET SAMPLING:
DISABLED

DONE

==========

Day Report - 04/FEB/19
Monday
Site Id: 20190205

---

	pH/ORP (pH)	Level (in.)	Flow 1 (gpm)
Minimum:	6.98*	1.295	20.137
	11:05	21:50	21:50
Maximum:	10.07**	3.287	133.249
	11:08	11:10	11:10
Average:	----	2.069	56.094

Total Flow1: 43472.629 (gal)

*This pH is a pH check, not sanitary. The lowest pH was 7.60 at 23:50 on 2/4/2019.
**This pH is a pH check, not sanitary. The highest pH was 9.01 at 15:54 on 2/4/2019.

==========
==========

Day Report - 05/FEB/19
Tuesday
Site Id: 20190205

---

	pH/ORP (pH)	Level (in.)	Flow 1 (gpm)
Minimum:	7.10	1.054	13.090
	08:12	21:00	21:00
Maximum:	10.09**	4.206	212.622
	22:56	10:45	10:45
Average:	----	2.101	61.199

Total Flow1: 88126.336 (gal)

**This pH is a pH check, not sanitary. The highest pH was 9.00 at 15:48 on 2/5/2019.
==========
==========
Day Report - 06/FEB/19
Wednesday
Site Id: 20190205
---

	pH/ORP (pH)	Level (in.)	Flow 1 (gpm)
Minimum:	6.22	0.970	10.994
	07:07	02:35	02:35
Maximum:	10.16**	3.786	174.624
	11:34	07:25	07:25
Average:	----	1.917	49.506

Total Flow1: 71288.094 (gal)

**This pH is a pH check, not sanitary. The highest pH was 8.73 at 11:02 on 2/6/2019.
==========
==========
Day Report - 07/FEB/19
Thursday
Site Id: 20190205
---

	pH/ORP (pH)	Level (in.)	Flow 1 (gpm)
Minimum:	6.85*	1.236	18.291
	09:29	02:40	02:40
Maximum:	9.93**	2.755	94.258
	09:31	09:00	09:00
Average:	----	1.649	34.692

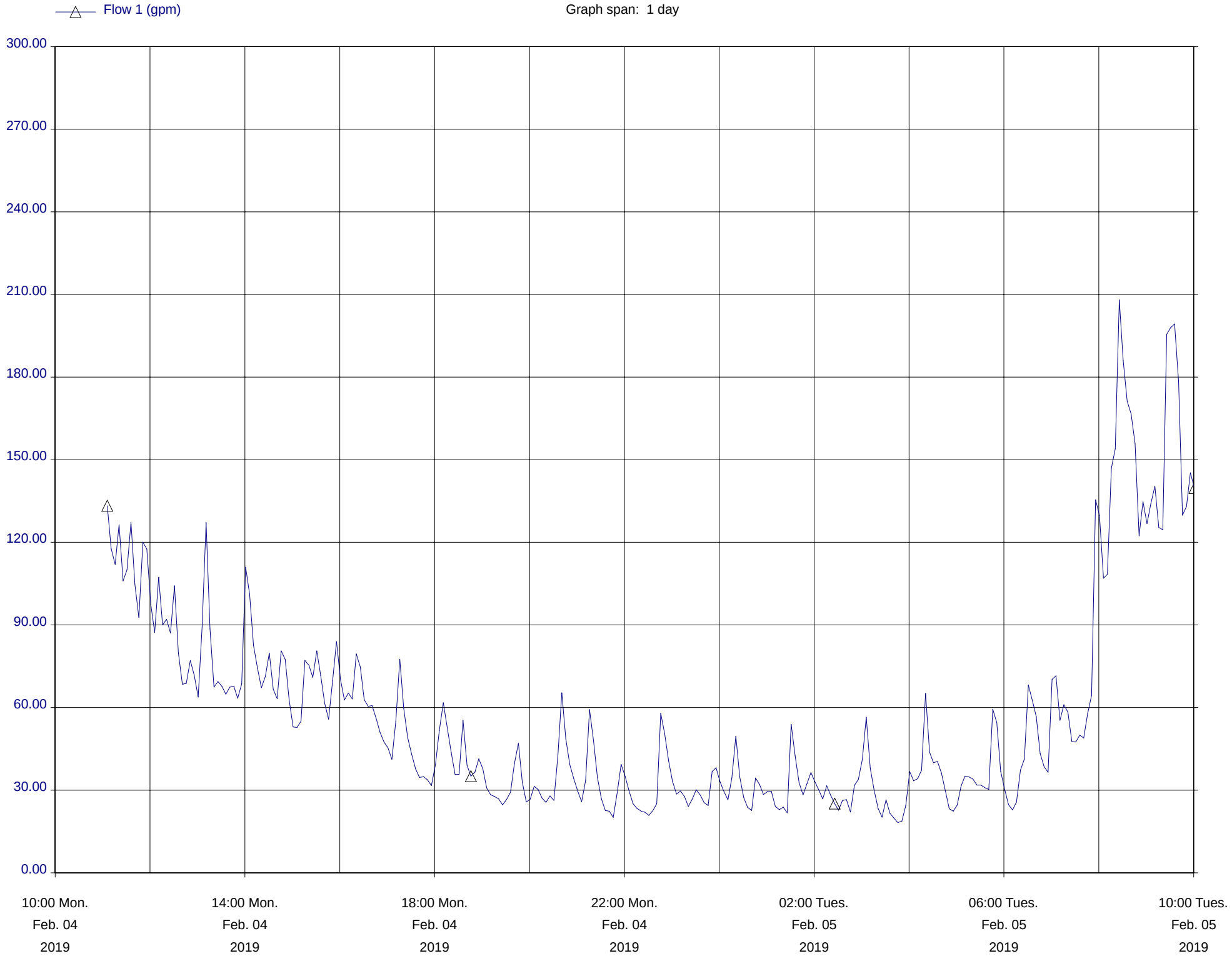
Total Flow1: 19948.031 (gal)

*This pH is a pH check, not sanitary. The lowest pH was 7.05 at 3:18 on 2/7/2019.
**This pH is a pH check, not sanitary. The highest pH was 8.19 at 9:21 on 2/7/2019.

==========

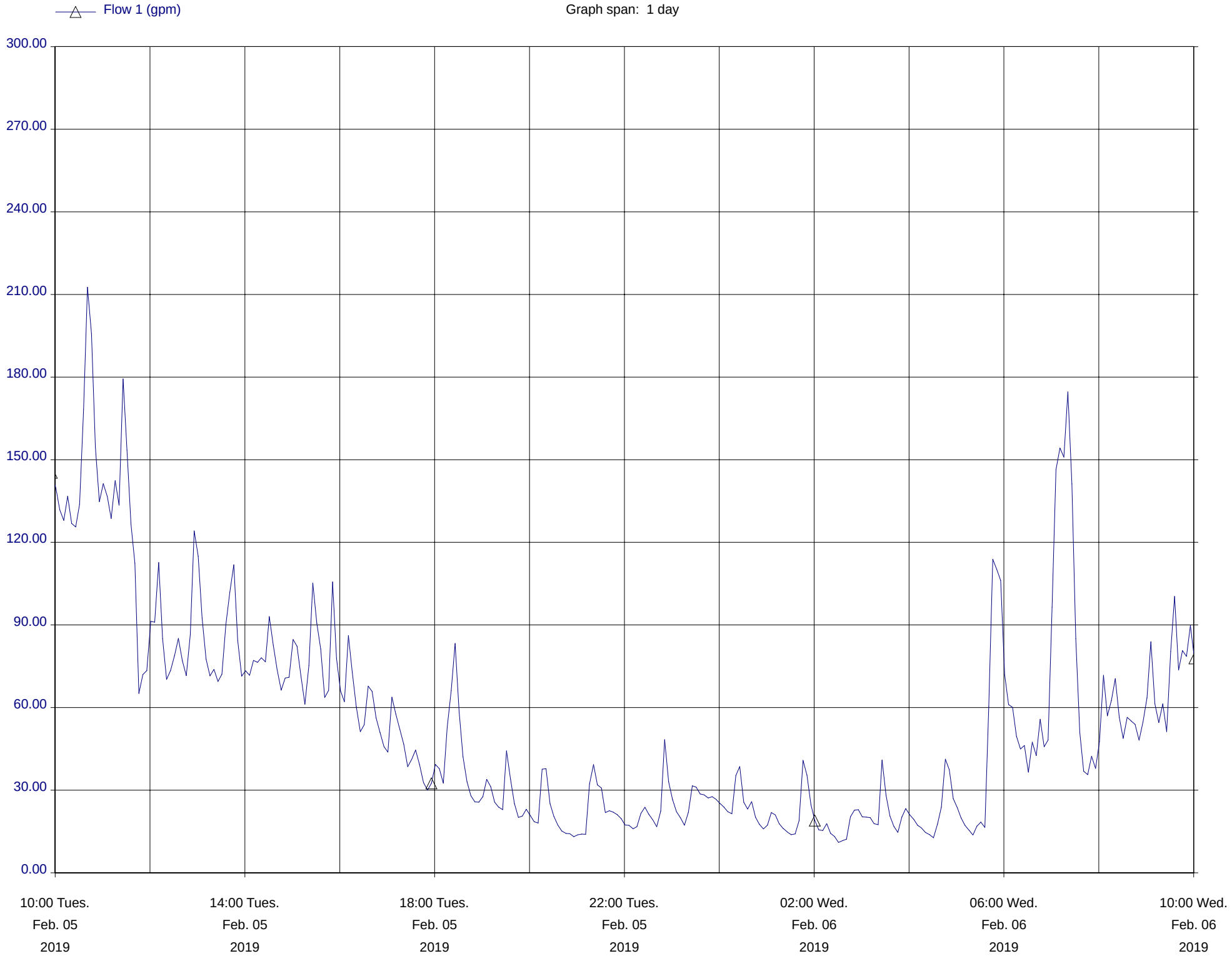
WSSC First Quarter Flow Monitoring Graph 2/4/19 - 2/7/19

Site Id: 20190205 File name: 02070940.000



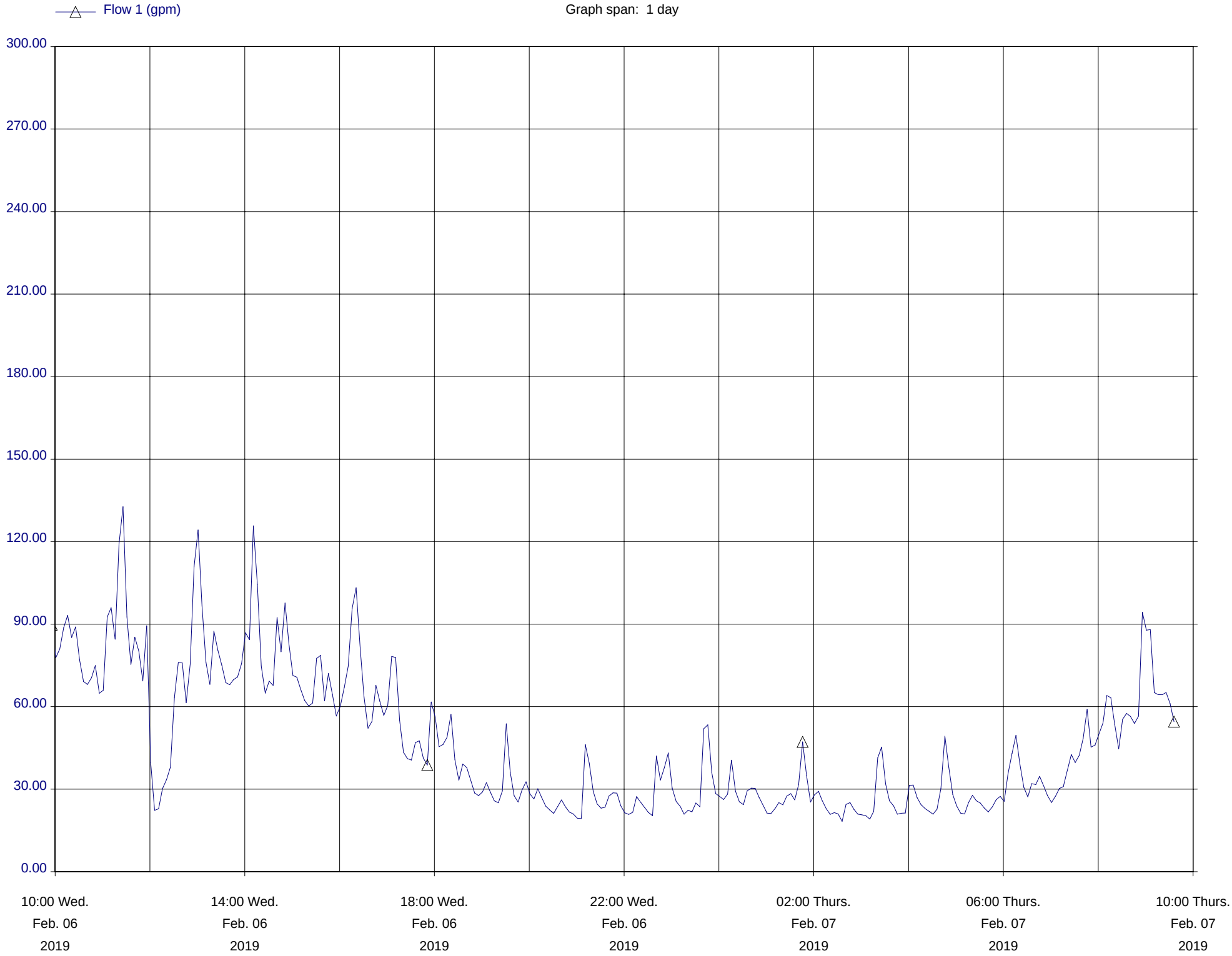
WSSC First Quarter Flow Monitoring Graph 2/4/19 - 2/7/19

Site Id: 20190205 File name: 02070940.000



WSSC First Quarter Flow Monitoring Graph 2/4/19 - 2/7/19

Site Id: 20190205 File name: 02070940.000

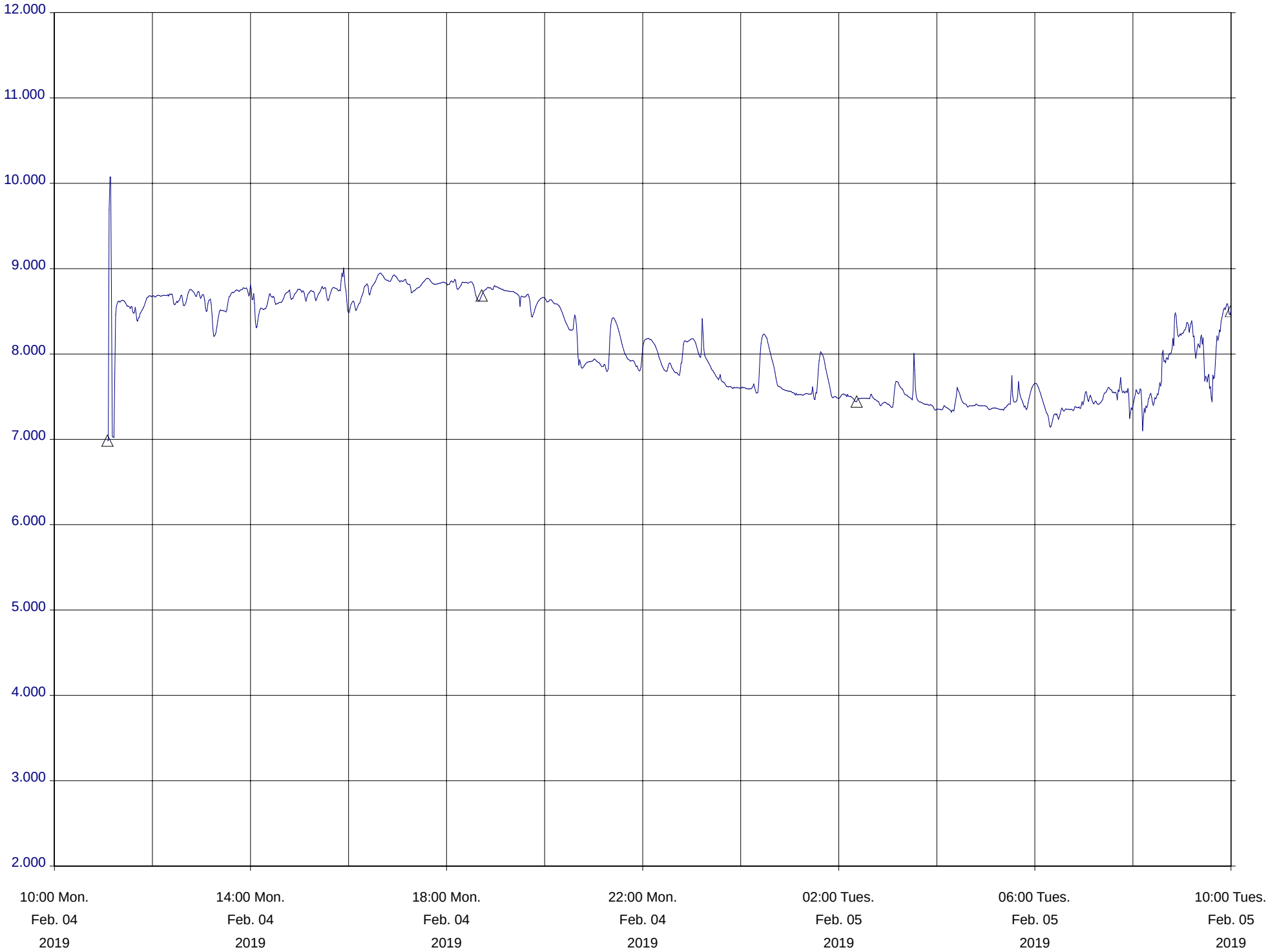


WSSC First Quarter pH Monitoring Graph 2/4/19 - 2/7/19

Site Id: 20190205 File name: 02070940.000

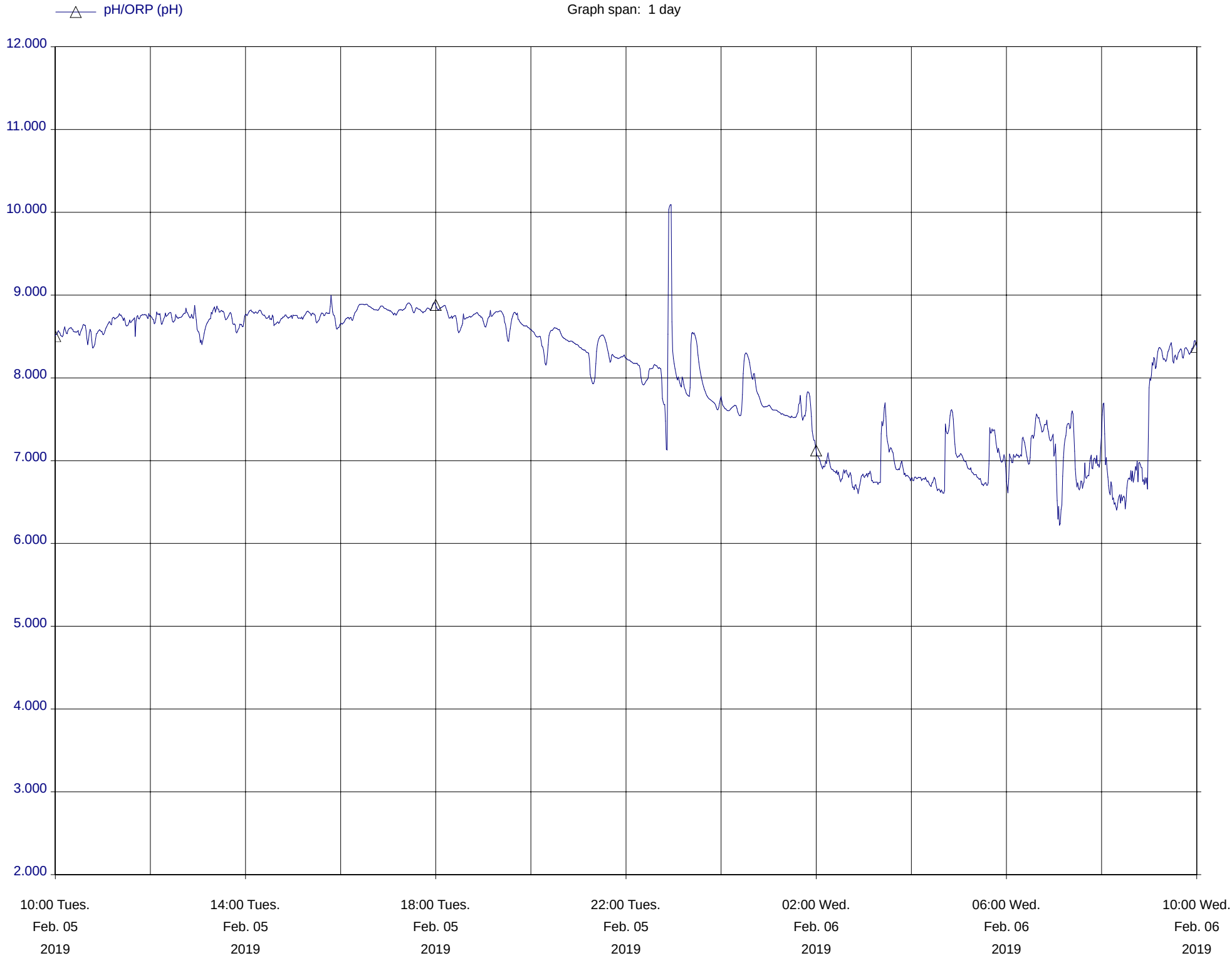
pH/ORP (pH)

Graph span: 1 day



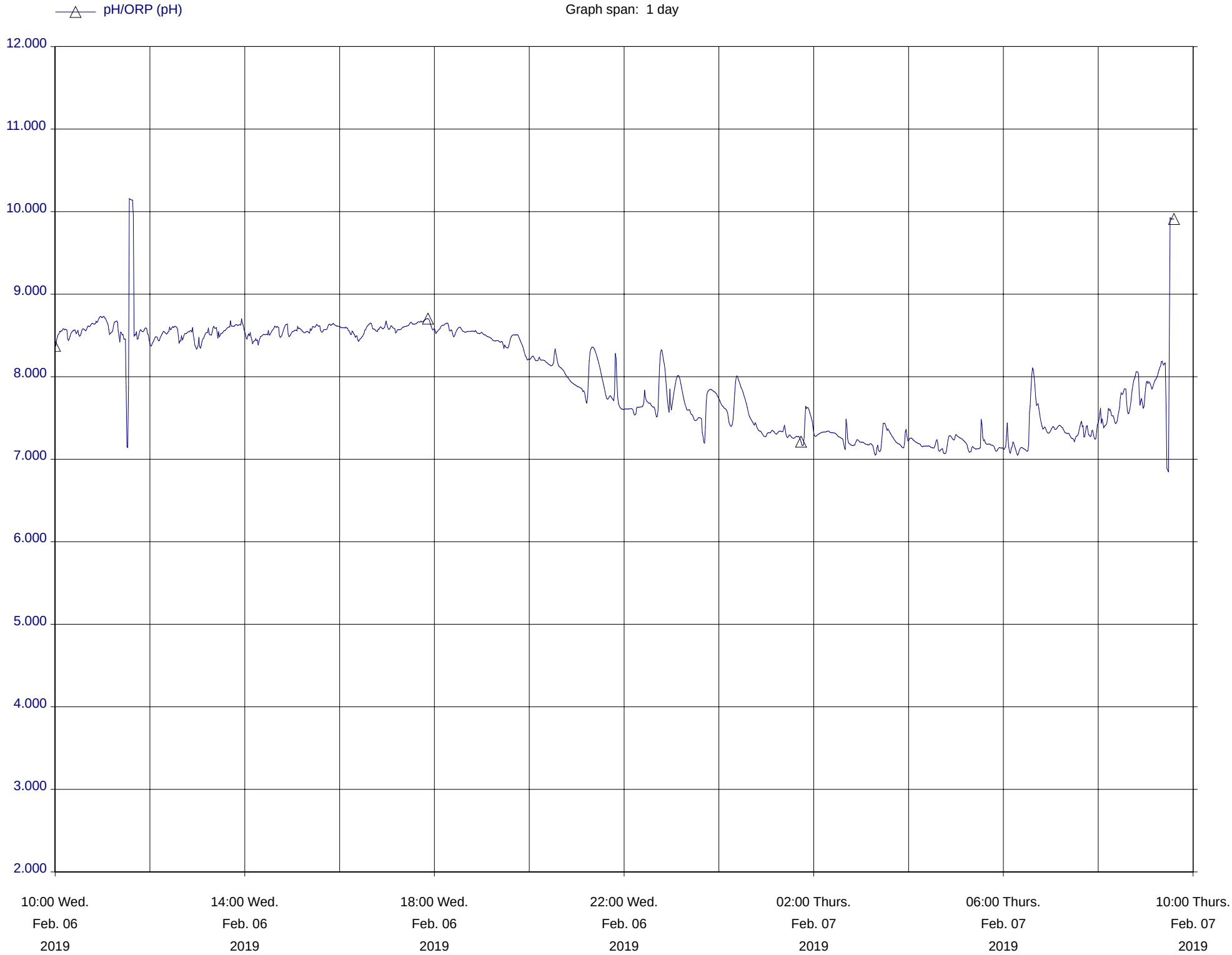
WSSC First Quarter pH Monitoring Graph 2/4/19 - 2/7/19

Site Id: 20190205 File name: 02070940.000



WSSC First Quarter pH Monitoring Graph 2/4/19 - 2/7/19

Site Id: 20190205 File name: 02070940.000



Analytical Report for

DDC-4C

Certificate of Analysis No.: 19020609

Project Manager: Ian Cherok
Project Name : WSSC
Project Location: FAC IWMP

February 13, 2019

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

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

PHASE SEPARATION SCIENCE, INC.

February 13, 2019

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

Reference: PSS Work Order(s) No: **19020609**
Project Name: WSSC
Project Location: FAC IWMP

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 **19020609**.

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 March 13, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

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

Work Order Number(s): 19020609

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/06/2019 at 12:58 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19020609-001	20190205g1&g2	WASTE WATER	02/05/19 13:24
19020609-002	20190205c	WASTE WATER	02/05/19 23:59

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: 19020609
DDC-4C, Chambersburg, PA
February 13, 2019

Project Name: WSSC
Project Location: FAC IWMP

Sample ID: 20190205g1&g2 **Date/Time Sampled: 02/05/2019 13:24** **PSS Sample ID: 19020609-001**
Matrix: WASTE WATER **Date/Time Received: 02/06/2019 12:58**

Total Cyanide — Analytical Method: SM 4500-CN C,E -2011 — Preparation Method: SM4500CN-C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/L	0.010		1	02/07/19	02/07/19 16:03	1053

Sample ID: 20190205c **Date/Time Sampled: 02/05/2019 23:59** **PSS Sample ID: 19020609-002**
Matrix: WASTE WATER **Date/Time Received: 02/06/2019 12:58**

Total Metals (10) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	ND	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Cadmium	ND	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Chromium	ND	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Copper	**54.6**	ug/L	1.00		1	02/07/19	02/07/19 18:36	1064
Lead	ND	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Molybdenum	**2.0**	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Nickel	**5.4**	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Selenium	ND	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Silver	ND	ug/L	1.0		1	02/07/19	02/07/19 18:36	1064
Zinc	**64.1**	ug/L	20.0		1	02/07/19	02/07/19 18:36	1064

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**5.1**	mg/L	0.50		10	02/07/19	02/07/19 13:44	1053

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	**33**	mg/L	1.9		9.375	02/08/19	02/08/19 15:47	1053

Biochemical Oxygen Demand — Analytical Method: SM 5210B -2011

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	**119**	mg/L	60.0		02/06/19	02/06/19 17:00	4005

Case Narrative Summary

Client Name: DDC-4C

Project Name: WSSC

Work Order Number(s): 19020609

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

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

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

Sample Receipt:

All sample receipt conditions were acceptable.

19020609: Analyses associated with analyst code 4005 were performed by
Enviro-Chem Laboratories, Inc., 47 Loveton Circle, Suite K, Sparks, MD 21152

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

SM 5210B -2011

Analytical Data Package Information Summary

Work Order(s): 19020609
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: WSSC
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	20190205c	Initial	19020609-002	1064	W	75401	161365	02/05/2019	02/07/2019 15:07	02/07/2019 18:36
	75401-1-BKS	BKS	75401-1-BKS	1064	W	75401	161365	--------	02/07/2019 15:07	02/07/2019 18:31
	75401-1-BLK	BLK	75401-1-BLK	1064	W	75401	161365	--------	02/07/2019 15:07	02/07/2019 17:59
	20190205c S	MS	19020609-002 S	1064	W	75401	161365	02/05/2019	02/07/2019 15:07	02/07/2019 18:41
	20190205c SD	MSD	19020609-002 SD	1064	W	75401	161365	02/05/2019	02/07/2019 15:07	02/07/2019 18:46
EPA 365.3	20190205c	Initial	19020609-002	1053	W	75404	161346	02/05/2019	02/07/2019 12:07	02/07/2019 13:44
	75404-1-BKS	BKS	75404-1-BKS	1053	W	75404	161346	--------	02/07/2019 12:07	02/07/2019 13:44
	75404-1-BLK	BLK	75404-1-BLK	1053	W	75404	161346	--------	02/07/2019 12:07	02/07/2019 13:44
SM 4500-CN C,E - 2011	20190205g1&g2	Initial	19020609-001	1053	W	75390	161394	02/05/2019	02/07/2019 10:44	02/07/2019 16:03
	75390-1-BKS	BKS	75390-1-BKS	1053	W	75390	161394	--------	02/07/2019 10:44	02/07/2019 15:33
	75390-1-BLK	BLK	75390-1-BLK	1053	W	75390	161394	--------	02/07/2019 10:44	02/07/2019 15:30
	75390-1-BSD	BSD	75390-1-BSD	1053	W	75390	161394	--------	02/07/2019 10:44	02/07/2019 15:36
	Week 5 Grab Discharge S	MS	19020509-001 S	1053	W	75390	161394	01/31/2019	02/07/2019 10:44	02/07/2019 15:54
	FT-13 S	MS	19020513-001 S	1053	W	75390	161394	02/05/2019	02/07/2019 10:44	02/07/2019 15:45
	FT-13 SD	MSD	19020513-001 SD	1053	W	75390	161394	02/05/2019	02/07/2019 10:44	02/07/2019 15:48
SM 4500-NH3-F - 2011	20190205c	Initial	19020609-002	1053	W	75412	161389	02/05/2019	02/08/2019 11:06	02/08/2019 15:47
	75412-1-BKS	BKS	75412-1-BKS	1053	W	75412	161389	--------	02/08/2019 11:06	02/08/2019 14:25
	75412-1-BLK	BLK	75412-1-BLK	1053	W	75412	161389	--------	02/08/2019 11:06	02/08/2019 14:21
	75412-1-BSD	BSD	75412-1-BSD	1053	W	75412	161389	--------	02/08/2019 11:06	02/08/2019 14:29
	BAF Effluent S	MS	19020705-003 S	1053	W	75412	161389	02/07/2019	02/08/2019 11:06	02/08/2019 14:54
	BAF Effluent SD	MSD	19020705-003 SD	1053	W	75412	161389	02/07/2019	02/08/2019 11:06	02/08/2019 14:58
SM 5210B -2011	20190205c	Initial	19020609-002	4005	W	161474	161474	02/05/2019	02/06/2019 17:00	02/06/2019 17:00

PHASE SEPARATION SCIENCE, INC.

QC Summary 19020609

DDC-4C
WSSC

Analytical Method: EPA 365.3 Prep Method: E365.3_Prep
Seq Number: 161346 Matrix: Water Date Prep: 02/07/19
MB Sample Id: 75404-1-BLK LCS Sample Id: 75404-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Phosphorus, Total (as P)	<0.0500	0.972	0.990	102	85-115	mg/L	02/07/19 13:44	

Analytical Method: SM 4500-CN C,E -2011 Prep Method: SM4500CN-CPRE
Seq Number: 161394 Matrix: Water Date Prep: 02/07/19
MB Sample Id: 75390-1-BLK LCS Sample Id: 75390-1-BKS LCSD Sample Id: 75390-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Cyanide, Total	<0.01000	0.1000	0.09007	90	0.09649	96	85-115	7	20	mg/L	02/07/19 15:33	

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B
Seq Number: 161389 Matrix: Water Date Prep: 02/08/19
MB Sample Id: 75412-1-BLK LCS Sample Id: 75412-1-BKS LCSD Sample Id: 75412-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.565	103	2.627	105	85-115	2	20	mg/L	02/08/19 14:25	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 161365 Matrix: Water Date Prep: 02/07/19
MB Sample Id: 75401-1-BLK LCS Sample Id: 75401-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Arsenic	<1.000	40.00	37.41	94	85-115	ug/L	02/07/19 18:31	
Cadmium	<1.000	40.00	36.61	92	85-115	ug/L	02/07/19 18:31	
Chromium	<1.000	40.00	38.10	95	85-115	ug/L	02/07/19 18:31	
Copper	<1.000	40.00	38.99	97	85-115	ug/L	02/07/19 18:31	
Lead	<1.000	40.00	39.99	100	85-115	ug/L	02/07/19 18:31	
Molybdenum	<1.000	40.00	39.20	98	85-115	ug/L	02/07/19 18:31	
Nickel	<1.000	40.00	38.06	95	85-115	ug/L	02/07/19 18:31	
Selenium	<1.000	40.00	35.56	89	85-115	ug/L	02/07/19 18:31	
Silver	<1.000	40.00	38.33	96	85-115	ug/L	02/07/19 18:31	
Zinc	<20.00	200	189.1	95	85-115	ug/L	02/07/19 18:31	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19020609

DDC-4C
WSSC

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 161365 Matrix: Waste Water Date Prep: 02/07/19

Parent Sample Id: 19020609-002 MS Sample Id: 19020609-002 S MSD Sample Id: 19020609-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Arsenic	<1.000	40.00	38.14	95	37.42	94	70-130	2	25	ug/L	02/07/19 18:41	
Cadmium	<1.000	40.00	36.49	91	35.99	90	70-130	1	25	ug/L	02/07/19 18:41	
Chromium	<1.000	40.00	38.13	95	37.14	93	70-130	3	25	ug/L	02/07/19 18:41	
Copper	54.59	40.00	94.34	99	93.54	97	70-130	1	25	ug/L	02/07/19 18:41	
Lead	<1.000	40.00	39.57	99	41.02	103	70-130	4	25	ug/L	02/07/19 18:41	
Molybdenum	2.019	40.00	42.78	102	44.82	107	70-130	5	25	ug/L	02/07/19 18:41	
Nickel	5.411	40.00	42.74	93	41.73	91	70-130	2	25	ug/L	02/07/19 18:41	
Selenium	<1.000	40.00	35.59	89	35.39	88	70-130	1	25	ug/L	02/07/19 18:41	
Silver	<1.000	40.00	36.12	90	37.50	94	70-130	4	25	ug/L	02/07/19 18:41	
Zinc	64.09	200	252.6	94	247.6	92	70-130	2	25	ug/L	02/07/19 18:41	

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

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: DDC4C *OFFICE LOC.: GSFC NASA
*PROJECT MGR: Ian Cherok *PHONE NO.: ( )
EMAIL: Ian.D.Cherok@nasa.gov FAX NO.: ( )
*PROJECT NAME: WSSC PROJECT NO.:
SITE LOCATION: FAC IWMP P.O. NO.: CSS4
SAMPLER(S): H. Thomas DW CERT NO.:

PSS Work Order #: 19020609 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	none	H2SO4	NaOH							REMARKS
							Analysis/ Method Required (3) *	total metals	Arsenic, Selenium, Molybdenum	BOD	total phosphorous Ammonia	Cyanide							
1	20190205g1	2/5/19	11:40	WW	1	G					X								* please combine 20190205g1 and 20190205g2 and analyze as one sample.
1	20190205g2	2/5/19	13:24	WW	1	G					X								
2	20190205c	2/5/19	0001-23:59	WW	4	C	X	X	X	X									

(5)

Relinquished By: (1)	Date	Time	Received By:
	2/6/19	12:15	
Relinquished By: (2)	Date	Time	Received By:
	2/6/19	1258	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

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

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

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 2.8-4.9°
Shipping Carrier: FED EX

Special Instructions:

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19020609	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	02/06/2019 12:58:00 PM
Project Name	WSSC	**Delivered By**	Trans Time Express
Disposal Date	03/13/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	4.9
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 5

Preservation

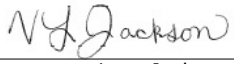
Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	Yes
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	Yes
VOC, BTEX (VOA Vials 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:  Date: 02/06/2019

Thomas Wingate

PM Review and Approval:  Date: 02/06/2019

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19020707

Project Manager: Ian Cherok
Project Name : WSSC
Project Location: FAC IWMP

February 18, 2019

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

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

PHASE SEPARATION SCIENCE, INC.

February 18, 2019

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

Reference: PSS Work Order(s) No: **19020707**
Project Name: WSSC
Project Location: FAC IWMP

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 **19020707**.

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 March 14, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

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

Work Order Number(s): 19020707

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/07/2019 at 11:50 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19020707-001	20190206g1&g2	WASTE WATER	02/06/19 13:28
19020707-002	20190206c	WASTE WATER	02/06/19 23:59

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: 19020707
DDC-4C, Chambersburg, PA
February 18, 2019

Project Name: WSSC
Project Location: FAC IWMP

Sample ID: 20190206g1&g2 **Date/Time Sampled: 02/06/2019 13:28** **PSS Sample ID: 19020707-001**
Matrix: WASTE WATER **Date/Time Received: 02/07/2019 11:50**

Total Cyanide — Analytical Method: SM 4500-CN C,E -2011 — Preparation Method: SM4500CN-C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/L	0.010		1	02/12/19	02/12/19 13:31	1053

Sample ID: 20190206c **Date/Time Sampled: 02/06/2019 23:59** **PSS Sample ID: 19020707-002**
Matrix: WASTE WATER **Date/Time Received: 02/07/2019 11:50**

Total Metals (10) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	ND	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Cadmium	ND	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Chromium	ND	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Copper	**74.0**	ug/L	1.00		1	02/11/19	02/11/19 22:04	1064
Lead	ND	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Molybdenum	**2.6**	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Nickel	**7.6**	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Selenium	ND	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Silver	ND	ug/L	1.0		1	02/11/19	02/11/19 22:04	1064
Zinc	**105**	ug/L	20.0		1	02/11/19	02/11/19 22:04	1064

Phosphorus, Total as P — Analytical Method: EPA 365.3

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**7.2**	mg/L	0.50		10	02/11/19	02/11/19 12:39	1059

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	**98**	mg/L	38		187.5	02/11/19	02/11/19 16:09	1053

Biochemical Oxygen Demand — Analytical Method: SM 5210B -2011

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	**165**	mg/L	60.0		02/08/19	02/08/19 15:00	4005

Case Narrative Summary

Client Name: DDC-4C

Project Name: WSSC

Work Order Number(s): 19020707

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

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

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

Sample Receipt:

Received additional containers for cyanide composite 2/11/19 at 1145. Received on ice, 4.7-5.1 Degrees C. Composited upon receipt 2/11/19 at 1310.

19020707: Analyses associated with analyst code 4005 were performed by
Enviro-Chem Laboratories, Inc., 47 Loveton Circle, Suite K, Sparks, MD 21152

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

SM 5210B -2011

Analytical Data Package Information Summary

Work Order(s): 19020707
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: WSSC
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	20190206c	Initial	19020707-002	1064	W	75431	161446	02/06/2019	02/11/2019 12:14	02/11/2019 22:04
	75431-1-BKS	BKS	75431-1-BKS	1064	W	75431	161446	--------	02/11/2019 12:14	02/11/2019 21:22
	75431-1-BLK	BLK	75431-1-BLK	1064	W	75431	161446	--------	02/11/2019 12:14	02/11/2019 21:17
	Mississippi Day 1 S	MS	19020615-001 S	1064	W	75431	161446	02/06/2019	02/11/2019 12:14	02/11/2019 21:53
	Mississippi Day 1 SD	MSD	19020615-001 SD	1064	W	75431	161446	02/06/2019	02/11/2019 12:14	02/11/2019 21:58
EPA 365.3	20190206c	Initial	19020707-002	1059	W	161422	161422	02/06/2019	02/11/2019 12:39	02/11/2019 12:39
	161422-1-BKS	BKS	161422-1-BKS	1059	W	161422	161422	--------	02/11/2019 12:39	02/11/2019 12:39
	161422-1-BLK	BLK	161422-1-BLK	1059	W	161422	161422	--------	02/11/2019 12:39	02/11/2019 12:39
	20190206c S	MS	19020707-002 S	1059	W	161422	161422	02/06/2019	02/11/2019 12:39	02/11/2019 12:39
	20190206c SD	MSD	19020707-002 SD	1059	W	161422	161422	02/06/2019	02/11/2019 12:39	02/11/2019 12:39
SM 4500-CN C,E - 2011	20190206g1&g2	Initial	19020707-001	1053	W	75442	161459	02/06/2019	02/12/2019 10:24	02/12/2019 13:31
	75442-1-BKS	BKS	75442-1-BKS	1053	W	75442	161459	--------	02/12/2019 10:24	02/12/2019 13:22
	75442-1-BLK	BLK	75442-1-BLK	1053	W	75442	161459	--------	02/12/2019 10:24	02/12/2019 13:19
	75442-1-BSD	BSD	75442-1-BSD	1053	W	75442	161459	--------	02/12/2019 10:24	02/12/2019 13:25
	Covanta S	MS	19021101-001 S	1053	W	75442	161459	02/04/2019	02/12/2019 10:24	02/12/2019 13:46
	Covanta SD	MSD	19021101-001 SD	1053	W	75442	161459	02/04/2019	02/12/2019 10:24	02/12/2019 13:49
SM 4500-NH3-F - 2011	20190206c	Initial	19020707-002	1053	W	75430	161419	02/06/2019	02/11/2019 11:56	02/11/2019 16:09
	75430-1-BKS	BKS	75430-1-BKS	1053	W	75430	161419	--------	02/11/2019 11:56	02/11/2019 13:41
	75430-1-BLK	BLK	75430-1-BLK	1053	W	75430	161419	--------	02/11/2019 11:56	02/11/2019 13:37
	75430-1-BSD	BSD	75430-1-BSD	1053	W	75430	161419	--------	02/11/2019 11:56	02/11/2019 13:45
	06A Outfall New S	MS	19020810-001 S	1053	W	75430	161419	02/08/2019	02/11/2019 11:56	02/11/2019 13:53
	06A Outfall New SD	MSD	19020810-001 SD	1053	W	75430	161419	02/08/2019	02/11/2019 11:56	02/11/2019 13:57
SM 5210B -2011	20190206c	Initial	19020707-002	4005	W	161573	161573	02/06/2019	02/08/2019 15:00	02/08/2019 15:00

PHASE SEPARATION SCIENCE, INC.

QC Summary 19020707

DDC-4C
WSSC

Analytical Method: EPA 365.3

Seq Number: 161422 Matrix: Water
MB Sample Id: 161422-1-BLK LCS Sample Id: 161422-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Phosphorus, Total (as P)	<0.0500	0.972	0.970	100	85-115	mg/L	02/11/19 12:39	

Analytical Method: EPA 365.3

Seq Number: 161422 Matrix: Waste Water
Parent Sample Id: 19020707-002 MS Sample Id: 19020707-002 S MSD Sample Id: 19020707-002 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)	7.15	3.28	10.4	99	10.2	93	70-130	2	20	mg/L	02/11/19 12:39	

Analytical Method: SM 4500-CN C,E -2011 Prep Method: SM4500CN-CPRE

Seq Number: 161459 Matrix: Water Date Prep: 02/12/19
MB Sample Id: 75442-1-BLK LCS Sample Id: 75442-1-BKS LCSD Sample Id: 75442-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Cyanide, Total	<0.01000	0.1000	0.09175	92	0.08986	90	85-115	2	20	mg/L	02/12/19 13:22	

Analytical Method: SM 4500-NH3-F -2011 Prep Method: SM4500-NH3B

Seq Number: 161419 Matrix: Water Date Prep: 02/11/19
MB Sample Id: 75430-1-BLK LCS Sample Id: 75430-1-BKS LCSD Sample Id: 75430-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.553	102	2.604	104	85-115	2	20	mg/L	02/11/19 13:41	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 161446 Matrix: Water Date Prep: 02/11/19
MB Sample Id: 75431-1-BLK LCS Sample Id: 75431-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Arsenic	<1.000	40.00	40.24	101	85-115	ug/L	02/11/19 21:22	
Cadmium	<1.000	40.00	40.31	101	85-115	ug/L	02/11/19 21:22	
Chromium	<1.000	40.00	39.99	100	85-115	ug/L	02/11/19 21:22	
Copper	<1.000	40.00	41.60	104	85-115	ug/L	02/11/19 21:22	
Lead	<1.000	40.00	40.32	101	85-115	ug/L	02/11/19 21:22	
Molybdenum	<1.000	40.00	39.62	99	85-115	ug/L	02/11/19 21:22	
Nickel	<1.000	40.00	40.43	101	85-115	ug/L	02/11/19 21:22	
Selenium	<1.000	40.00	42.47	106	85-115	ug/L	02/11/19 21:22	
Silver	<1.000	40.00	41.98	105	85-115	ug/L	02/11/19 21:22	
Zinc	<20.00	200	202.8	101	85-115	ug/L	02/11/19 21:22	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19020707

DDC-4C
WSSC

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

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1)

*CLIENT: DDC4C *OFFICE LOC. GSFC NASA

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

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

*PROJECT NAME: WSSC PROJECT NO.:

SITE LOCATION: FAC IWMP P.O. NO.: CSS4

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

PSS Work Order #: 19020707 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	none	H2SO4	NaOH							REMARKS
							Analysis/ Method Required (3) *		Total metals	Arsenic, Selenium, Molybdenum	BOD	total phosphorus, Ammonia	Cyanide							
1 1	20190206g1	2/6/19	11:28	WW	1	G							X							* please
1 2	20190206g2	2/6/19	13:28	WW	1	G							X							combine
2 3	20190206C	2/6/19	00:01 23:59	WW	4	C	X		X	X	X	X								20190206g1
																				and
																				20190206g2
																				and analyze
																				as one
																				sample.

(5)

Relinquished By: (1)	Date	Time	Received By:
Hayley Thomas	2/7/19	1055	
Relinquished By: (2)	Date	Time	Received By:
	2-7-19	1150	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

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

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

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 3.0°-3.3°

Shipping Carrier: FDE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE

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

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

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: DDCC *OFFICE LOC. GSFC NASA

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

EMAIL: jan.d.cherok@nasa.gov FAX NO.: ( )

*PROJECT NAME: WSSC PROJECT NO.:

SITE LOCATION: FAC IWMP P.O. NO.:

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

PSS Work Order #: 19020707 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: Nat'l	Analysis/ Method Required (3) * Cyanide	REMARKS
1	20190206g1	2/6/19	11:28	WW	1	G		X	*please combine 20190206g1 and 20190206g2 and analyze as one sample.
2	20190206g2	2/6/19	13:28	WW	1	G		X	

(5)

Relinquished By: (1)	Date	Time	Received By:
Hayley Thomas	2/11/19	10:35	
Relinquished By: (2)	Date	Time	Received By:
	2-11-19	1145	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

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

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

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 4.7°-5.1°

Shipping Carrier: TDF

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19020707	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	02/07/2019 11:50:00 AM
Project Name	WSSC	**Delivered By**	Trans Time Express
Disposal Date	03/14/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	3.3
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No
		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	5.1
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

COC agrees with sample labels?	Yes	Sampler Name	Not Provided
Chain of Custody	Yes		N/A

Sample Container

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

Total No. of Samples Received 2 Total No. of Containers Received 5

Preservation

Total Metals	(pH<2)	Yes
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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19020707	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	02/07/2019 11:50:00 AM
Project Name	WSSC	**Delivered By**	Trans Time Express
Disposal Date	03/14/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

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.

Received additional containers for cyanide composite 2/11/19 at 1145. Received on ice, 4.7-5.1 Degrees C. Composited upon receipt 2/11/19 at 1310.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 02/07/2019

PM Review and Approval: Lynn Jackson Date: 02/11/2019

Permit Number 00449

Daily pH Sampling Log – Grab[1] Samples

Industry Name: Monitoring Point 001 Date: 2/07/19

Time[2]	pH	Flow (gallons)[3]	Comments
10:00	N/A	0	Monthly compliance sample for Cr
10:01	N/A	15.8	
10:02	N/A	15.7	Chromium grab
10:03	N/A	15.8	
10:04	N/A	15.8	
		Total : 63.1	

Calibration Reading at Start: ---, ----[4]

Calibration Check at Stop: -.--, --.—[4]

Buffer Solutions Used for Calibration: - -----[4]
Analytical Equipment Used: None

Discharges are: (Check all that apply) ☒ Batch ☐ Continuous ☐ Both

[1] A grab sample is defined as an individual sample collected over a time period not exceeding 15 minutes, without regard for flow or time.

[2] Time intervals between grabs shall not exceed 15 minutes.

[3] Flow rate is recorded at the start of the discharge but is not included in the first reading in the average discharge calculation. The first reading is marked as zero.

[4] No pH readings taken during this sampling activity

Permit Number 00449

Daily pH Sampling Log – Grab[1] Samples

Industry Name: Monitoring Point 001 Date: 2/13/19

Time[2]	pH	Flow (gallons)[3]	Comments
9:17	7.36	0	
9:18	7.33	14.4	Cyanide grab
9:19	7.20	14.8	Total metals grab
9:20	7.14	14.9	
9:21	7.11	14.9	
		Total : 59	

Calibration Reading at Start: 7.01, 10.04

Calibration Check at Stop: 6.96, 9.95

Buffer Solutions Used for Calibration: 4,7, 10
Analytical Equipment Used: Hanna pH meter HI 98191

Discharges are: (Check all that apply) ☒ Batch ☐ Continuous ☐ Both

[1] A grab sample is defined as an individual sample collected over a time period not exceeding 15 minutes, without regard for flow or time.

[2] Time intervals between grabs shall not exceed 15 minutes.

[3] Flow rate is recorded at the start of the discharge but is not included in the first reading in the average discharge calculation. The first reading is marked as zero.

Permit Number 00449

Daily pH Sampling Log – Grab[1] Samples

Industry Name: Monitoring Point 001 Date: 2/15/19

Time[2]	pH	Flow (gallons)[3]	Comments
10:03	7.19	0	
10:04	7.29	13.7	
10:05	7.51	14.2	Cyanide grab
10:06	7.63	14.6	Total metals grab
10:07	7.59	14.7	
10:08	7.73	14.8	
		Total : 72	

Calibration Reading at Start: 7.03, 10.00

Calibration Check at Stop: 7.11, 10.11

Buffer Solutions Used for Calibration: 4, 7, 10
Analytical Equipment Used: Hanna pH meter HI 98183

Discharges are: (Check all that apply) ☒ Batch ☐ Continuous ☐ Both

[1] A grab sample is defined as an individual sample collected over a time period not exceeding 15 minutes, without regard for flow or time.

[2] Time intervals between grabs shall not exceed 15 minutes.

[3] Flow rate is recorded at the start of the discharge but is not included in the first reading in the average discharge calculation. The first reading is marked as zero.

Permit Number 00449

Daily pH Sampling Log – Grab[1] Samples

Industry Name: Monitoring Point 001 Date: 3/6/19

Time[2]	pH	Flow (gallons)[3]	Comments
10:46	N/A	0	
10:47	N/A	17.0	
10:48	N/A	16.9	Chromium grab
10:49	N/A	16.9	
10:50	N/A	16.8	
		Total : 67.6	

Calibration Reading at Start: ---, ----[4]

Calibration Check at Stop: -.--, --.—[4]

Buffer Solutions Used for Calibration: - -----[4]
Analytical Equipment Used: None

Discharges are: (Check all that apply) ☒ Batch ☐ Continuous ☐ Both

[1] A grab sample is defined as an individual sample collected over a time period not exceeding 15 minutes, without regard for flow or time.

[2] Time intervals between grabs shall not exceed 15 minutes.

[3] Flow rate is recorded at the start of the discharge but is not included in the first reading in the average discharge calculation. The first reading is marked as zero.

[4] No pH readings taken during this sampling activity

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19020708

Project Manager: Ian Cherok

Project Name : WSSC

Project Location: Monitoring Point 001 IWMP

February 14, 2019

Phase Separation Science, Inc.

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

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

PHASE SEPARATION SCIENCE, INC.

February 14, 2019

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

Reference: PSS Work Order(s) No: **19020708**
Project Name: WSSC
Project Location: Monitoring Point 001 IWMP

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 **19020708**.

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 March 14, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

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

Work Order Number(s): 19020708

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/07/2019 at 11:50 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19020708-001	20190207g	WASTE WATER	02/07/19 10:02

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: 19020708

DDC-4C, Chambersburg, PA

February 14, 2019

Project Name: WSSC

Project Location: Monitoring Point 001 IWMP

Sample ID: 20190207g **Date/Time Sampled: 02/07/2019 10:02** **PSS Sample ID: 19020708-001**

Matrix: WASTE WATER **Date/Time Received: 02/07/2019 11:50**

Cr Analytical Method: EPA 200.8 Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chromium	**63.8**	ug/L	1.00		1	02/11/19	02/11/19 22:09	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: WSSC

Work Order Number(s): 19020708

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

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

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

Sample Receipt:

All sample receipt conditions were acceptable.

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

Analytical Data Package Information Summary

Work Order(s): **19020708**
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: WSSC
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	20190207g	Initial	19020708-001	1064	W	75431	161446	02/07/2019	02/11/2019 12:14	02/11/2019 22:09
	75431-1-BKS	BKS	75431-1-BKS	1064	W	75431	161446	--------	02/11/2019 12:14	02/11/2019 21:22
	75431-1-BLK	BLK	75431-1-BLK	1064	W	75431	161446	--------	02/11/2019 12:14	02/11/2019 21:17
	Mississippi Day 1 S	MS	19020615-001 S	1064	W	75431	161446	02/06/2019	02/11/2019 12:14	02/11/2019 21:53
	Mississippi Day 1 SD	MSD	19020615-001 SD	1064	W	75431	161446	02/06/2019	02/11/2019 12:14	02/11/2019 21:58

PHASE SEPARATION SCIENCE, INC.

QC Summary 19020708

DDC-4C
WSSC

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 161446 Matrix: Water Date Prep: 02/11/19

MB Sample Id: 75431-1-BLK LCS Sample Id: 75431-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Chromium	<1.000	40.00	39.99	100	85-115	ug/L	02/11/19 21:22	

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: WSSL PROJECT NO.:

SITE LOCATION: Monitoring Point 601 IWTP P.O. NO.: C554

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

PSS Work Order #: 1902070S 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	Analysis/ Method Required (3) * Chromium	REMARKS
1	20190207g	2/7/19	10:02	WW	1	G		X	

5

Relinquished By: (1)	Date	Time	Received By:
Hayley Thom	2/7/19	1055	
Relinquished By: (2)	Date	Time	Received By:
	2-7-19	1150	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

4

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

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

# of Coolers: 1
Custody Seal: ABS
Ice Present: YES Temp: 3.3 °C
Shipping Carrier: FTE

Special Instructions:

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19020708	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	02/07/2019 11:50:00 AM
Project Name	WSSC	**Delivered By**	Trans Time Express
Disposal Date	03/14/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	3.3
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

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

Sample Container

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

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

Preservation

Total Metals	(pH<2)	Yes
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)	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: 02/07/2019

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 02/08/2019

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19021315

Project Manager: Ian Cherok

Project Name : WSSC

Project Location: Monitoring Point 001 IWMP

February 20, 2019

Phase Separation Science, Inc.

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

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

PHASE SEPARATION SCIENCE, INC.

February 20, 2019

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

Reference: PSS Work Order(s) No: **19021315**
Project Name: WSSC
Project Location: Monitoring Point 001 IWMP

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 **19021315**. This report has been revised to correct the sample date. The sample results are not impacted by this revision. This report cancels and supersedes report version 1.000 dated February 19, 2019.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on March 20, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

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

Work Order Number(s): 19021315

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/13/2019 at 12:05 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19021315-001	20190213g1	WASTE WATER	02/13/19 09:18
19021315-002	20190213g2	WASTE WATER	02/13/19 09:19

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: 19021315

DDC-4C, Chambersburg, PA

February 20, 2019

Project Name: WSSC

Project Location: Monitoring Point 001 IWMP

Sample ID: 20190213g1 **Date/Time Sampled: 02/13/2019 09:18** **PSS Sample ID: 19021315-001**

Matrix: WASTE WATER **Date/Time Received: 02/13/2019 12:05**

Total Cyanide — Analytical Method: SM 4500-CN C,E -2011 — Preparation Method: SM4500CN-C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/L	0.010		1	02/18/19	02/18/19 15:21	1053

Sample ID: 20190213g2 **Date/Time Sampled: 02/13/2019 09:19** **PSS Sample ID: 19021315-002**

Matrix: WASTE WATER **Date/Time Received: 02/13/2019 12:05**

Total Metals (7) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Cadmium	ND	ug/L	1.0		1	02/14/19	02/14/19 17:38	1064
Chromium	**389**	ug/L	1.00		1	02/14/19	02/14/19 17:38	1064
Copper	**227**	ug/L	1.00		1	02/14/19	02/14/19 17:38	1064
Lead	**44.7**	ug/L	1.00		1	02/14/19	02/14/19 17:38	1064
Nickel	**136**	ug/L	1.00		1	02/14/19	02/14/19 17:38	1064
Silver	**5.7**	ug/L	1.0		1	02/14/19	02/15/19 20:22	1064
Zinc	**571**	ug/L	20.0		1	02/14/19	02/14/19 17:38	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: WSSC

Work Order Number(s): 19021315

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

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

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

Sample Receipt:

All sample receipt conditions were acceptable.

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

Analytical Data Package Information Summary

Work Order(s): **19021315**
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: WSSC
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	75472-1-BKS	BKS	75472-1-BKS	1064	W	75472	161528	--------	02/14/2019 11:12	02/14/2019 15:34
	75472-1-BLK	BLK	75472-1-BLK	1064	W	75472	161528	--------	02/14/2019 11:12	02/14/2019 15:28
	20190213g2	Initial	19021315-002	1064	W	75472	161568	02/13/2019	02/14/2019 11:12	02/14/2019 17:38
	75472-1-BKS	BKS	75472-1-BKS	1064	W	75472	161568	--------	02/14/2019 11:12	02/14/2019 15:34
	75472-1-BLK	BLK	75472-1-BLK	1064	W	75472	161568	--------	02/14/2019 11:12	02/14/2019 15:28
	B-54-02112019 S	MS	19021112-001 S	1064	W	75472	161568	02/11/2019	02/14/2019 11:12	02/14/2019 15:49
	DPS Wet Well S	MS	19021327-004 S	1064	W	75472	161568	02/13/2019	02/14/2019 11:12	02/14/2019 18:45
	B-54-02112019 SD	MSD	19021112-001 SD	1064	W	75472	161568	02/11/2019	02/14/2019 11:12	02/14/2019 15:54
	75472-1-BKS	Reanalysis	75472-1-BKS	1064	W	75472	161616	--------	02/14/2019 11:12	02/15/2019 18:28
	20190213g2	Reanalysis	19021315-002	1064	W	75472	161616	02/13/2019	02/14/2019 11:12	02/15/2019 20:22
SM 4500-CN C,E - 2011	20190213g1	Initial	19021315-001	1053	W	75511	161611	02/13/2019	02/18/2019 11:31	02/18/2019 15:21
	75511-1-BKS	BKS	75511-1-BKS	1053	W	75511	161611	--------	02/18/2019 11:31	02/18/2019 15:12
	75511-1-BLK	BLK	75511-1-BLK	1053	W	75511	161611	--------	02/18/2019 11:31	02/18/2019 15:09
	75511-1-BSD	BSD	75511-1-BSD	1053	W	75511	161611	--------	02/18/2019 11:31	02/18/2019 15:15
	Week 1 Grab Discharge S	MS	19021311-001 S	1053	W	75511	161611	02/07/2019	02/18/2019 11:31	02/18/2019 15:33
	20190213g1 S	MS	19021315-001 S	1053	W	75511	161611	02/13/2009	02/18/2019 11:31	02/18/2019 15:24
	20190213g1 SD	MSD	19021315-001 SD	1053	W	75511	161611	02/13/2009	02/18/2019 11:31	02/18/2019 15:27

PHASE SEPARATION SCIENCE, INC.

QC Summary 19021315

DDC-4C
WSSC

Analytical Method: SM 4500-CN C,E -2011 Prep Method: SM4500CN-CPRE
Seq Number: 161611 Matrix: Water Date Prep: 02/18/19
MB Sample Id: 75511-1-BLK LCS Sample Id: 75511-1-BKS LCSD Sample Id: 75511-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Cyanide, Total	<0.01000	0.1000	0.09490	95	0.09493	95	85-115	0	20	mg/L	02/18/19 15:12	

Analytical Method: SM 4500-CN C,E -2011 Prep Method: SM4500CN-CPRE
Seq Number: 161611 Matrix: Waste Water Date Prep: 02/18/19
Parent Sample Id: 19021315-001 MS Sample Id: 19021315-001 S MSD Sample Id: 19021315-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Cyanide, Total	<0.01000	0.1000	0.08871	89	0.08509	85	80-120	4	20	mg/L	02/18/19 15:24	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 161528 Matrix: Water Date Prep: 02/14/19
MB Sample Id: 75472-1-BLK LCS Sample Id: 75472-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Cadmium	<1.000	40.00	38.61	97	85-115	ug/L	02/14/19 15:34	
Chromium	<1.000	40.00	37.60	94	85-115	ug/L	02/14/19 15:34	
Copper	<1.000	40.00	39.74	99	85-115	ug/L	02/14/19 15:34	
Lead	<1.000	40.00	41.21	103	85-115	ug/L	02/14/19 15:34	
Nickel	<1.000	40.00	38.43	96	85-115	ug/L	02/14/19 15:34	
Silver	<1.000	40.00	34.30	86	85-115	ug/L	02/14/19 15:34	
Zinc	<20.00	200	190	95	85-115	ug/L	02/14/19 15:34	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 161568 Matrix: Water Date Prep: 02/14/19
MB Sample Id: 75472-1-BLK LCS Sample Id: 75472-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Cadmium	<1.000	40.00	38.61	97	85-115	ug/L	02/14/19 15:34	
Chromium	<1.000	40.00	37.60	94	85-115	ug/L	02/14/19 15:34	
Copper	<1.000	40.00	39.74	99	85-115	ug/L	02/14/19 15:34	
Lead	<1.000	40.00	41.21	103	85-115	ug/L	02/14/19 15:34	
Nickel	<1.000	40.00	38.43	96	85-115	ug/L	02/14/19 15:34	
Silver	<1.000	40.00	34.30	86	85-115	ug/L	02/14/19 15:34	
Zinc	<20.00	200	190	95	85-115	ug/L	02/14/19 15:34	

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: DDCH *OFFICE LOC.

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

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

*PROJECT NAME: WSSC PROJECT NO.:

SITE LOCATION: Monitoring Point 001 IWMP P.O. NO.: CS54

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

PSS Work Order #: 1902315 PAGE 1 OF 1

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

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE (C = COMP, G = GRAB)	Preservatives Used	Analysis/ Method Required (3) * Cyanide (NaOH)	Total metals (HNO3)	REMARKS
1	20190213g1	2/13/19	0918	WW	1	G		X		
2	20190213g2	2/13/19	0919	WW	1	G			X	

(5)

Relinquished By: (1)	Date	Time	Received By:
	2/13/19	1125	
Relinquished By: (2)	Date	Time	Received By:
	2-13-19	1205	
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: 0.7-0.9°C

Shipping Carrier: TTE

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19021315	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	02/13/2019 12:05:00 PM
Project Name	WSSC	**Delivered By**	Trans Time Express
Disposal Date	03/20/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	.9
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 2

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	Yes
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: 02/13/2019

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 02/13/2019

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19021521

Project Manager: Ian Cherok

Project Name : WSSC

Project Location: Monitoring Point 001 IWMP

February 22, 2019

Phase Separation Science, Inc.

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

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

PHASE SEPARATION SCIENCE, INC.

February 22, 2019

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

Reference: PSS Work Order(s) No: **19021521**
Project Name: WSSC
Project Location: Monitoring Point 001 IWMP

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 **19021521**.

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 March 22, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

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

Work Order Number(s): 19021521

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/15/2019 at 03:27 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19021521-001	20190215g1	WASTE WATER	02/15/19 10:05
19021521-002	20190215g2	WASTE WATER	02/15/19 10:06

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: 19021521

DDC-4C, Chambersburg, PA

February 22, 2019

Project Name: WSSC

Project Location: Monitoring Point 001 IWMP

Sample ID: 20190215g1 **Date/Time Sampled: 02/15/2019 10:05** **PSS Sample ID: 19021521-001**

Matrix: WASTE WATER **Date/Time Received: 02/15/2019 15:27**

Total Cyanide — Analytical Method: SM 4500-CN C,E -2011 — Preparation Method: SM4500CN-C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/L	0.010		1	02/18/19	02/18/19 15:45	1053

Sample ID: 20190215g2 **Date/Time Sampled: 02/15/2019 10:06** **PSS Sample ID: 19021521-002**

Matrix: WASTE WATER **Date/Time Received: 02/15/2019 15:27**

Total Metals (7) — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Cadmium	ND	ug/L	1.0		1	02/18/19	02/19/19 21:00	1051
Chromium	**246**	ug/L	1.00		1	02/18/19	02/19/19 21:00	1051
Copper	**129**	ug/L	1.00		1	02/18/19	02/19/19 21:00	1051
Lead	**32.5**	ug/L	1.00		1	02/18/19	02/19/19 21:00	1051
Nickel	**83.7**	ug/L	1.00		1	02/18/19	02/19/19 21:00	1051
Silver	**4.7**	ug/L	1.0		1	02/18/19	02/19/19 21:00	1051
Zinc	**384**	ug/L	20.0		1	02/18/19	02/19/19 21:00	1051

Case Narrative Summary

Client Name: DDC-4C

Project Name: WSSC

Work Order Number(s): 19021521

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

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

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

Sample Receipt:

All sample receipt conditions were acceptable.

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

Analytical Data Package Information Summary

Work Order(s): 19021521
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: WSSC
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	20190215g2	Initial	19021521-002	1051	W	75506	161671	02/15/2019	02/18/2019 10:20	02/19/2019 21:00
	75506-1-BKS	BKS	75506-1-BKS	1051	W	75506	161671	--------	02/18/2019 10:20	02/19/2019 19:50
	75506-1-BLK	BLK	75506-1-BLK	1051	W	75506	161671	--------	02/18/2019 10:20	02/19/2019 19:45
	D4-D11 HV226 S	MS	19021416-001 S	1051	W	75506	161671	01/17/2019	02/18/2019 10:20	02/19/2019 19:58
	CH-13-02152019 S	MS	19021528-001 S	1051	W	75506	161671	02/15/2019	02/18/2019 10:20	02/19/2019 22:05
	D4-D11 HV226 SD	MSD	19021416-001 SD	1051	W	75506	161671	01/17/2019	02/18/2019 10:20	02/19/2019 20:03
SM 4500-CN C,E - 2011	20190215g1	Initial	19021521-001	1053	W	75511	161611	02/15/2019	02/18/2019 11:31	02/18/2019 15:45
	75511-1-BKS	BKS	75511-1-BKS	1053	W	75511	161611	--------	02/18/2019 11:31	02/18/2019 15:12
	75511-1-BLK	BLK	75511-1-BLK	1053	W	75511	161611	--------	02/18/2019 11:31	02/18/2019 15:09
	75511-1-BSD	BSD	75511-1-BSD	1053	W	75511	161611	--------	02/18/2019 11:31	02/18/2019 15:15
	Week 1 Grab Discharge S	MS	19021311-001 S	1053	W	75511	161611	02/07/2019	02/18/2019 11:31	02/18/2019 15:33
	20190213g1 S	MS	19021315-001 S	1053	W	75511	161611	02/13/2009	02/18/2019 11:31	02/18/2019 15:24
	20190213g1 SD	MSD	19021315-001 SD	1053	W	75511	161611	02/13/2009	02/18/2019 11:31	02/18/2019 15:27

PHASE SEPARATION SCIENCE, INC.

QC Summary 19021521

DDC-4C
WSSC

Analytical Method: SM 4500-CN C,E -2011 Prep Method: SM4500CN-CPRE

Seq Number: 161611 Matrix: Water Date Prep: 02/18/19

MB Sample Id: 75511-1-BLK LCS Sample Id: 75511-1-BKS LCSD Sample Id: 75511-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Cyanide, Total	<0.01000	0.1000	0.09490	95	0.09493	95	85-115	0	20	mg/L	02/18/19 15:12	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 161671 Matrix: Water Date Prep: 02/18/19

MB Sample Id: 75506-1-BLK LCS Sample Id: 75506-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Cadmium	<1.000	40.00	39.79	99	85-115	ug/L	02/19/19 19:50	
Chromium	<1.000	40.00	38.81	97	85-115	ug/L	02/19/19 19:50	
Copper	<1.000	40.00	39.50	99	85-115	ug/L	02/19/19 19:50	
Lead	<1.000	40.00	37.75	94	85-115	ug/L	02/19/19 19:50	
Nickel	<1.000	40.00	39.70	99	85-115	ug/L	02/19/19 19:50	
Silver	<1.000	40.00	35.55	89	85-115	ug/L	02/19/19 19:50	
Zinc	<20.00	200	190.6	95	85-115	ug/L	02/19/19 19:50	

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

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

1

*CLIENT: DDC4C *OFFICE LOC.

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

EMAIL: Ian.d.Clerok@nasa.gov FAX NO.: ( )

*PROJECT NAME: WSSC PROJECT NO.:

SITE LOCATION: monitoring point 201 WWTP PO. NO.: CS 54

SAMPLER(S): I. Clerk, L. Wicklund DW CERT NO.:

PSS Work Order #: 1902152 1 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: NaOH / HNO3 — Analysis/ Method Required (3) * cyanide / total metals	REMARKS
1	20190215g1	2/15/19	1005	WW	1	g	X	
2	20190215g2	2/15/19	1006	WW	1	g	X	

5

Relinquished By: (1)	Date	Time	Received By:
[signature]	2/15/19	1405	[signature]
Relinquished By: (2) [signature]	02/15/19	1537	[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 ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 1.5 - 2.5°C

Shipping Carrier: FTE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19021521	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	02/15/2019 03:27:00 PM
Project Name	WSSC	**Delivered By**	Trans Time Express
Disposal Date	03/22/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2.5
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

COC agrees with sample labels?	Yes
Chain of Custody	Yes

Sampler Name Ian Cherok

MD DW Cert. No. N/A

Sample Container

Appropriate for Specified Analysis?	Yes
Intact?	Yes
Labeled and Labels Legible?	Yes

Custody Seal(s) Intact? Not Applicable

Seal(s) Signed / Dated Not Applicable

Total No. of Samples Received 2

Total No. of Containers Received 2

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	Yes
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: 02/15/2019

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 02/18/2019

Lynn Jackson

Analytical Report for

DDC-4C

Certificate of Analysis No.: 19030616

Project Manager: Ian Cherok

Project Name : WSSC

Project Location: Monitoring Point 001 IWMP

March 13, 2019

Phase Separation Science, Inc.

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

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

PHASE SEPARATION SCIENCE, INC.

March 13, 2019

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

Reference: PSS Work Order(s) No: **19030616**
Project Name: WSSC
Project Location: Monitoring Point 001 IWMP

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 **19030616**.

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 April 10, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

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

Work Order Number(s): 19030616

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/06/2019 at 12:45 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19030616-001	20190306	WASTE WATER	03/06/19 10:48

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: 19030616

DDC-4C, Chambersburg, PA

March 13, 2019

Project Name: WSSC

Project Location: Monitoring Point 001 IWMP

Sample ID: 20190306 **Date/Time Sampled: 03/06/2019 10:48** **PSS Sample ID: 19030616-001**

Matrix: WASTE WATER **Date/Time Received: 03/06/2019 12:45**

Total Chromium — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chromium	**43.7**	ug/L	1.00		1	03/07/19	03/07/19 17:22	1064

Case Narrative Summary

Client Name: DDC-4C

Project Name: WSSC

Work Order Number(s): 19030616

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

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

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

Sample Receipt:

All sample receipt conditions were acceptable.

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

Analytical Data Package Information Summary

Work Order(s): **19030616**
Report Prepared For: DDC-4C, Chambersburg, PA
Project Name: WSSC
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	20190306	Initial	19030616-001	1064	W	75755	162212	03/06/2019	03/07/2019 14:09	03/07/2019 17:22
	75755-1-BKS	BKS	75755-1-BKS	1064	W	75755	162212	--------	03/07/2019 14:09	03/07/2019 16:05
	75755-1-BLK	BLK	75755-1-BLK	1064	W	75755	162212	--------	03/07/2019 14:09	03/07/2019 16:00
	801 S	MS	19030508-001 S	1064	W	75755	162212	03/05/2019	03/07/2019 14:09	03/07/2019 16:15
	801 SD	MSD	19030508-001 SD	1064	W	75755	162212	03/05/2019	03/07/2019 14:09	03/07/2019 16:21

PHASE SEPARATION SCIENCE, INC.

QC Summary 19030616

DDC-4C
WSSC

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP

Seq Number: 162212 Matrix: Water Date Prep: 03/07/19

MB Sample Id: 75755-1-BLK LCS Sample Id: 75755-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Chromium	<1.000	40.00	35.39	88	85-115	ug/L	

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

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

1

*CLIENT: DDC-4C *OFFICE LOC.

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

EMAIL: FAX NO.: ( )

*PROJECT NAME: WSSC PROJECT NO.:

SITE LOCATION: Monitoring Point 001 Dump P.O. NO.:

SAMPLER(S): I. Cherok, L. Wicklund DW CERT NO.:

PSS Work Order #: 1903 0616 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	Analysis/ Method Required (3) * Total Metals	Chromium	REMARKS
1	20190306	3/6/19	1046	WW	1	G	X	X		

5

	Date	Time	Received By:
Relinquished By: (1)	3/6/19	1200	
Relinquished By: (2)	3-6-19	1245	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

4

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

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

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 3.2°C
Shipping Carrier: TTE

Special Instructions:

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

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19030616	**Received By**	Thomas Wingate
Client Name	DDC-4C	**Date Received**	03/06/2019 12:45:00 PM
Project Name	WSSC	**Delivered By**	Trans Time Express
Disposal Date	04/10/2019	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	3.2
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 1

Preservation

Total Metals	(pH<2)	Yes
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)	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: 03/06/2019

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 03/07/2019

Lynn Jackson

Shipping and Mailing Request Form

(For use with express, certified, and registered domestic and international small packages)

077109

SHIP TO: (Please include a complete street address, city, state, zip code, and telephone number)	Mr. Todd Gormley Washington Suburban Sanitary Commission 14501 Sweitzer Lane, 11th Floor Laurel, MD 20707-5902
DESCRIPTION OF ITEM BEING SHIPPED/MAILED: (this information is required)	

TYPE OF SERVICE REQUESTED: (Please read options carefully)

Express Delivery Services	Certified and Registered Mail Services
☑ Priority Overnight Service	☐ Certified Mail
☐ Standard Overnight Service	☐ Registered Mail
☐ Second Day Service	☐ Return Receipt
☐ Third Day Service	
☐ International Express Service *	
☐ International Economy Service *	
☐ Saturday Delivery	
☐ Least Costly Method	

*** The following information must be provided for all packages being shipped or mailed to an international destination.**

To the best of my knowledge, this shipment is not restricted for export. If you are unsure of current ITAR (22 CFR Parts 120-130) and export (15 CFR Parts 730-774) regulations, please contact the GSFC Export Control Office at 6-6388/6-4579 or visit their website at http://export.gsfc.nasa.gov

Signature and Date of Sender

International packages going to a "Designated Country" must be approved by the International Coordinator's Office, Code 101, ext. 6-8300. A list of Designated Countries can be found at http://export.gsfc.nasa.gov

Signature and Date of International Coordinator's Office representative

ORIGINATOR: **I certify that services requested are for NASA Official Business Only**

Name: Lori Levine	Code: 250	Telephone: (301) 286-6741	Date: 04/02/19

For Internal Use Only:

770047077858		4/2/19
Package Identification Number	Mode of Shipment	Date Processed

GSFC 11-54 (9/07) Previous editions are obsolete

FedEx

April 4,2019

Dear Customer:

The following is the proof-of-delivery for tracking number **477004707858**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Mailroom
Signed for by:	S.LEWIS	**Delivery location:**	LAUREL, MD
Service type:	FedEx Priority Overnight	**Delivery date:**	Apr 3, 2019 10:00
Special Handling:	Deliver Weekday		

Signature image is available. In order to view image and detailed information, the shipper or payor account number of the shipment must be provided.

Shipping Information:

Tracking number:	477004707858	**Ship date:**	Apr 2, 2019
		Weight:	2.0 lbs/0.9 kg

Recipient:	**Shipper:**
LAUREL, MD US	Greenbelt, MD US
Reference	077109
Department number	250

Thank you for choosing FedEx.