

ANALYTICAL RESULTS

Prepared by:

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2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

USACE, Baltimore District
ATTN: CENAB-EN-HT
P.O. Box 1715
Baltimore MD 21203-1715

Report Date: May 09, 2017

Project: North Penn

Submittal Date: 04/14/2017

Group Number: 1789688

SDG: NPP02

PO Number: PFC

State of Sample Origin: PA

Client Sample Description

NP-0413-W-1607 Water
NP-0413-W-1645 Water
NP-0413-W-2715 Water
NP-0413-W-2737 Water
NP-0413-W-2737B Water
NP-0413-W-1607 FB Water
NP-0413-W-1645 FB Water
NP-0413-W-2715 FB Water
NP-0413-W-2737 FB Water
NP-0413-W-2737B FB Water

Lancaster Labs

(LL) #

8941025
8941026
8941027
8941028
8941029
8941030
8941031
8941032
8941033
8941034

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To USACE, Baltimore District

Attn: (b) (6)

Respectfully Submitted,

(b) (6)



Project Name: North Penn
LL Group #: 1789688

General Comments:

All analyses have been performed in accordance with DOD QSM Version 5.0 unless otherwise noted below.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 537 Rev. 1.1 modified, Misc. Organics**

Sample #s: 8941025, 8941026, 8941027, 8941028, 8941029, 8941030, 8941031, 8941032, 8941033, 8941034

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 17108003 (Sample number(s): 8941025-8941034 UNSPK: 8941025)

The recovery(ies) for one or more surrogates were below the acceptance window for sample(s) 8941025, 8941026, 8941027, 8941028, 8941029, 8941030, 8941031, 8941032, 8941033, 8941034, LCS, LCSD, MS

Sample Description: NP-0413-W-1607 Water
North Penn

LL Sample # WW 8941025
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 09:30 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US001 SDG#: NPP02-01

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	15	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	6	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	4	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	2 J	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	1 J	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	3 J	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 18:57	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-1645 Water
North Penn

LL Sample # WW 8941026
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 10:15 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US002 SDG#: NPP02-02

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	2 U	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	2 U	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	3 U	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	3 U	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6 U	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 19:18	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-2715 Water
North Penn

LL Sample # WW 8941027
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 10:45 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US003 SDG#: NPP02-03

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	2 U	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	2 U	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	3 U	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	3 U	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6 U	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 20:40	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-2737 Water
North Penn

LL Sample # WW 8941028
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 13:45 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US004 SDG#: NPP02-04

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	28	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	6	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	49	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	39	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	9	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	96	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	82	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 21:00	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-2737B Water
North Penn

LL Sample # WW 8941029
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 13:45 by (b)

USACE, Baltimore District
ATTN: CENAB-EN-HT
P.O. Box 1715
Baltimore MD 21203-1715

Submitted: 04/14/2017 09:30
Reported: 05/09/2017 09:30

US005 SDG#: NPP02-05

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	28	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	6	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	0.6 J	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	53	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	37	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	9	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	97	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	83	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 21:21	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-1607 FB Water
North Penn

LL Sample # WW 8941030
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 09:30 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US006 SDG#: NPP02-06FB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	2 U	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	2 U	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	3 U	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	3 U	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6 U	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 21:41	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-1645 FB Water
North Penn

LL Sample # WW 8941031
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 10:15 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US007 SDG#: NPP02-07FB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	0.8 J	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	2 U	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	2 U	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	3 U	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	3 U	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6 U	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/26/2017 23:20	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-2715 FB Water
North Penn

LL Sample # WW 8941032
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 10:45 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US008 SDG#: NPP02-08FB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	2 U	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	2 U	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	3 U	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	3 U	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6 U	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 22:22	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-2737 FB Water
North Penn

LL Sample # WW 8941033
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 13:45 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US009 SDG#: NPP02-09FB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	2 U	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	2 U	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	3 U	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	3 U	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6 U	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 22:43	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Sample Description: NP-0413-W-2737B FB Water
North Penn

LL Sample # WW 8941034
LL Group # 1789688
Account # 07587

Project Name: North Penn

Collected: 04/13/2017 13:45 by (b) USACE, Baltimore District
Submitted: 04/14/2017 09:30 ATTN: CENAB-EN-HT
Reported: 05/09/2017 09:30 P.O. Box 1715
Baltimore MD 21203-1715

US010 SDG#: NPP02-10FB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	0.6	2	2	1
10954	Perfluorononanoic acid	375-95-1	2 U	0.6	2	2	1
10954	Perfluorodecanoic acid	335-76-2	2 U	0.5	2	2	1
10954	Perfluoroundecanoic acid	2058-94-8	3 U	1	3	3	1
10954	Perfluorododecanoic acid	307-55-1	2 U	0.5	2	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2 U	0.5	2	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2 U	0.5	2	2	1
10954	Perfluorohexanoic acid	307-24-4	2 U	0.6	2	2	1
10954	Perfluoroheptanoic acid	375-85-9	2 U	0.5	2	2	1
10954	Perfluorobutanesulfonate	375-73-5	3 U	0.8	3	3	1
10954	Perfluorohexanesulfonate	355-46-4	3 U	1	3	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6 U	2	6	6	1
10954	NETFOSAA	2991-50-6	3 U	1	3	3	1
NETFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	3 U	1	3	3	1
NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.							

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFCs in Water by EPA 537	EPA 537 Rev. 1.1 modified	1	17108003	04/24/2017 23:03	(b) (6)	1
14091	PFAS Water Prep	EPA 537 Rev. 1.1 modified	1	17108003	04/18/2017 09:55	(b) (6)	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: USACE, Baltimore District
Reported: 05/09/2017 09:30

Group Number: 1789688

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	DL**	LOD	LOQ
	ng/l	ng/l	ng/l	ng/l
Batch number: 17108003				
Sample number(s): 8941025-8941034				
Perfluorooctanoic acid	0.2 U	0.06	0.2	0.2
Perfluorononanoic acid	0.2 U	0.06	0.2	0.2
Perfluorodecanoic acid	0.2 U	0.05	0.2	0.2
Perfluoroundecanoic acid	0.3 U	0.1	0.3	0.3
Perfluorododecanoic acid	0.2 U	0.05	0.2	0.2
Perfluorotridecanoic acid	0.2 U	0.05	0.2	0.2
Perfluorotetradecanoic acid	0.2 U	0.05	0.2	0.2
Perfluorohexanoic acid	0.2 U	0.06	0.2	0.2
Perfluoroheptanoic acid	0.2 U	0.05	0.2	0.2
Perfluorobutanesulfonate	0.3 U	0.08	0.3	0.3
Perfluorohexanesulfonate	0.3 U	0.1	0.3	0.3
Perfluoro-octanesulfonate	0.6 U	0.2	0.6	0.6
NEtFOSAA	0.3 U	0.1	0.3	0.3
NMeFOSAA	0.3 U	0.1	0.3	0.3

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ng/l	ng/l	ng/l	ng/l					
Batch number: 17108003									
Sample number(s): 8941025-8941034									
Perfluorooctanoic acid	200	203.52	200	199.59	102	100	70-130	2	30
Perfluorononanoic acid	200	195.35	200	214.04	98	107	70-130	9	30
Perfluorodecanoic acid	200	214.77	200	185.77	107	93	70-130	14	30
Perfluoroundecanoic acid	200	195.53	200	189.08	98	95	70-130	3	30
Perfluorododecanoic acid	200	211.43	200	224.36	106	112	70-130	6	30
Perfluorotridecanoic acid	200	229.46	200	243.59	115	122	70-130	6	30
Perfluorotetradecanoic acid	200	210.25	200	202.26	105	101	70-130	4	30
Perfluorohexanoic acid	200	199.66	200	204.07	100	102	70-130	2	30
Perfluoroheptanoic acid	200	205.5	200	185.46	103	93	70-130	10	30
Perfluorobutanesulfonate	176.8	161.53	176.8	155.98	91	88	70-130	3	30
Perfluorohexanesulfonate	189.2	170.88	189.2	166.38	90	88	70-130	3	30
Perfluoro-octanesulfonate	191.2	174.36	191.2	183.29	91	96	70-130	5	30
NEtFOSAA	200	223.39	200	194.81	112	97	70-130	14	30
NMeFOSAA	200	193.31	200	207.89	97	104	70-130	7	30

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

(3) The surrogate spike amount was less than the LOD.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: USACE, Baltimore District
Reported: 05/09/2017 09:30

Group Number: 1789688

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17108003	Sample number(s): 8941025-8941034 UNSPK: 8941025									
Perfluorooctanoic acid	14.68	200.02	229.1			107		70-130		
Perfluorononanoic acid	2 U	200.02	196.41			98		70-130		
Perfluorodecanoic acid	2 U	200.02	218.08			109		70-130		
Perfluoroundecanoic acid	3 U	200.02	202.66			101		70-130		
Perfluorododecanoic acid	2 U	200.02	218.29			109		70-130		
Perfluorotridecanoic acid	2 U	200.02	234.79			117		70-130		
Perfluorotetradecanoic acid	2 U	200.02	206.08			103		70-130		
Perfluorohexanoic acid	5.83	200.02	198.11			96		70-130		
Perfluoroheptanoic acid	4.22	200.02	190.86			93		70-130		
Perfluorobutanesulfonate	1.58	176.82	164.82			92		70-130		
Perfluorohexanesulfonate	1.19	189.22	189.52			100		70-130		
Perfluoro-octanesulfonate	3.32	191.22	209.33			108		70-130		
NEtFOSAA	3 U	200.02	191.36			96		70-130		
NMeFOSAA	3 U	200.02	211.24			106		70-130		

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PFCs in Water by EPA 537
Batch number: 17108003

	13C4-PFBA		13C3-PFBS		13C5-PFHxA		13C3-PFHxS		13C4-PFHpA		13C8-PFOA	
	%Rec	LOD	%Rec	LOD	%Rec	LOD	%Rec	LOD	%Rec	LOD	%Rec	LOD
	(ng/l)		(ng/l)		(ng/l)		(ng/l)		(ng/l)		(ng/l)	
8941025	68*	100 (3)	81	100 (3)	66*	20 (3)	63*	100 (3)	70	20 (3)	64*	20 (3)
8941026	75	100 (3)	87	100 (3)	68*	20 (3)	73	100 (3)	72	20 (3)	67*	20 (3)
8941027	69*	100 (3)	76	100 (3)	69*	20 (3)	67*	100 (3)	70	20 (3)	66*	20 (3)
8941028	66*	100 (3)	77	100 (3)	66*	20 (3)	69*	100 (3)	68*	20 (3)	63*	20 (3)
8941029	69*	100 (3)	80	100 (3)	64*	20 (3)	66*	100 (3)	70	20 (3)	65*	20 (3)
8941030	67*	100 (3)	72	100 (3)	70	20 (3)	70	100 (3)	77	20 (3)	69*	20 (3)
8941031	78	100 (3)	91	100 (3)	64*	20 (3)	65*	100 (3)	72	20 (3)	69*	20 (3)
8941032	78	100 (3)	87	100 (3)	78	20 (3)	80	100 (3)	81	20 (3)	74	20 (3)
8941033	67*	100 (3)	74	100 (3)	65*	20 (3)	66*	100 (3)	67*	20 (3)	65*	20 (3)
8941034	71	100 (3)	76	100 (3)	75	20 (3)	71	100 (3)	79	20 (3)	70	20 (3)
LCS	70	100 (3)	83	100 (3)	65*	20 (3)	66*	100 (3)	72	20 (3)	66*	20 (3)
LCSD	73	100 (3)	82	100 (3)	66*	20 (3)	72	100 (3)	72	20 (3)	66*	20 (3)
MS	62*	100 (3)	74	100 (3)	65*	20 (3)	58*	100 (3)	70	20 (3)	56*	20 (3)
Limits:	70-130		70-130		70-130		70-130		70-130		70-130	

*- Outside of specification

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(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

(3) The surrogate spike amount was less than the LOD.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: USACE, Baltimore District
Reported: 05/09/2017 09:30

Group Number: 1789688

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PFCs in Water by EPA 537
Batch number: 17108003

	13C8-PFOS		13C9-PFNA		13C6-PFDA		d3-NMeFOSAA		13C7-PFUnDA		d5-NEIFOSAA	
	%Rec	LOD (ng/l)	%Rec	LOD (ng/l)	%Rec	LOD (ng/l)	%Rec	LOD (ng/l)	%Rec	LOD (ng/l)	%Rec	LOD (ng/l)
8941025	73	100 (3)	71	20 (3)	70	20 (3)	63*	80 (3)	75	40 (3)	83	80 (3)
8941026	67*	100 (3)	70	20 (3)	69*	20 (3)	53*	80 (3)	76	40 (3)	67*	80 (3)
8941027	69*	100 (3)	64*	20 (3)	69*	20 (3)	60*	80 (3)	70	40 (3)	79	80 (3)
8941028	60*	100 (3)	63*	20 (3)	69*	20 (3)	56*	80 (3)	66*	40 (3)	70	80 (3)
8941029	62*	100 (3)	59*	20 (3)	69*	20 (3)	59*	80 (3)	70	40 (3)	74	80 (3)
8941030	63*	100 (3)	72	20 (3)	68*	20 (3)	52*	80 (3)	64*	40 (3)	62*	80 (3)
8941031	73	100 (3)	107	20 (3)	64*	20 (3)	33*	80 (3)	47*	40 (3)	46*	80 (3)
8941032	75	100 (3)	83	20 (3)	77	20 (3)	64*	80 (3)	94	40 (3)	88	80 (3)
8941033	66*	100 (3)	62*	20 (3)	61*	20 (3)	50*	80 (3)	61*	40 (3)	64*	80 (3)
8941034	63*	100 (3)	66*	20 (3)	72	20 (3)	60*	80 (3)	76	40 (3)	64*	80 (3)
LCS	77	100 (3)	76	20 (3)	65*	20 (3)	71	80 (3)	74	40 (3)	70	80 (3)
LCSD	72	100 (3)	68*	20 (3)	69*	20 (3)	69*	80 (3)	73	40 (3)	66*	80 (3)
MS	61*	100 (3)	62*	20 (3)	54*	20 (3)	57*	80 (3)	57*	40 (3)	64*	80 (3)

Limits: 70-130 70-130 70-130 70-130 70-130 70-130

	13C2-PFDoDA		13C2-PFTeDA	
	%Rec	LOD (ng/l)	%Rec	LOD (ng/l)
8941025	71	50 (3)	67*	50 (3)
8941026	60*	50 (3)	54*	50 (3)
8941027	67*	50 (3)	58*	50 (3)
8941028	59*	50 (3)	60*	50 (3)
8941029	63*	50 (3)	65*	50 (3)
8941030	64*	50 (3)	55*	50 (3)
8941031	33*	50 (3)	38*	50 (3)
8941032	81	50 (3)	83	50 (3)
8941033	53*	50 (3)	54*	50 (3)
8941034	68*	50 (3)	62*	50 (3)
LCS	67*	50 (3)	63*	50 (3)
LCSD	62*	50 (3)	69*	50 (3)
MS	56*	50 (3)	58*	50 (3)

Limits: 70-130 70-130

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

(3) The surrogate spike amount was less than the LOD.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



Client: USACE

Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>04/14/2017 9:30</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>PA</u>		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Wendy Wakeley (1669) at 12:45 on 04/14/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

<u>Cooler #</u>	<u>Thermometer ID</u>	<u>Corrected Temp</u>	<u>Therm. Type</u>	<u>Ice Type</u>	<u>Ice Present?</u>	<u>Ice Container</u>	<u>Elevated Temp?</u>
1	DT146	1.8	DT	Wet	Y	Bagged	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	none detected
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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Additional Data Qualifiers

Qualifier	Definition
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD