NAVFAC
Naval Facilities Engineering Command

Off-Base Drinking Water Sample Results, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG 320-44233-1

Naval Air Warfare Center Warminster
Warminster, Pennsylvania

August 2019

"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","19","ng/L","M","0.97","DL","","TRG","","","5.1","LOQ","YES","-99","","245.9","10.00","2.0",""
"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","19","ng/L","M","2.7","DL","","TRG","","","7.1","LOQ","YES","-99","","245.9","10.00","6.1",""
"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","9.7","ng/L","","0.65","DL","","TRG","","","5.1","LOQ","YES","-99","","245.9","10.00","2.0",""
"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","4.1","ng/L","J","0.81","DL","","TRG","","","5.1","LOQ","YES","-99","","245.9","10.00","2.0",""
"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","8.5","ng/L","","1.3","DL","","TRG","","","5.1","LOQ","YES","-99","","245.9","10.00","3.1",""
"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","2.1","ng/L","J","0.48","DL","","TRG","","","5.1","LOQ","YES","-99","","245.9","10.00","1.0",""
"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","STL00993","13C2 PFHxA","100","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","102","","245.9","10.00","0",""
"NAWC-101518-RW-335","537","RES","320-44233-1","TALSAC","STL00996","13C2 PFDA","100","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","102","","245.9","10.00","0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.0","ng/L","U","0.96","DL","","TRG","","","5.0","LOQ","YES","-99","","248.5","10.00","2.0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","248.5","10.00","6.0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","248.5","10.00","2.0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","248.5","10.00","2.0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","248.5","10.00","3.0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","248.5","10.00","1.0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","STL00993","13C2 PFHxA","94","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","101","","248.5","10.00","0",""
"NAWC-101518-FRB-162","537","RES","320-44233-10","TALSAC","STL00996","13C2 PFDA","99","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","101","","248.5","10.00","0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","21","ng/L","","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","250.4","10.00","2.0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","18","ng/L","M","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","250.4","10.00","6.0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","8.8","ng/L","","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","250.4","10.00","2.0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","15","ng/L","","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","250.4","10.00","2.0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.3","ng/L","","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","250.4","10.00","3.0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","2.4","ng/L","J","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","250.4","10.00","1.0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","STL00993","13C2 PFHxA","100","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","99.8","","250.4","10.00","0",""
"NAWC-101518-RW-260","537","RES","320-44233-11","TALSAC","STL00996","13C2 PFDA","95","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","99.8","","250.4","10.00","0",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.0","ng/L","U","0.96","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","2.0",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","6.1","ng/L","U","2.7","DL","","TRG","","","7.1","LOQ","YES","-99","","246.3","10.00","6.1",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","2.0","ng/L","U","0.65","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","2.0",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.81","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","2.0",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","3.0",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.48","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","1.0",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","102","","246.3","10.00","0",""
"NAWC-101518-FRB-260","537","RES","320-44233-12","TALSAC","STL00996","13C2
PFDA","110","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","102","","246.3","10.00","0",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","38","ng/L","","0.94","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","15","ng/L","M","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","251.8","10.00","6.0",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","5.1","ng/L","","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","10","ng/L","M","0.79","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","5.4","ng/L","M","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","3.0",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.4","ng/L","J","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","0.99",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","STL00993","13C2
PFHxA","95","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","99.3","","251.8","10.00","0",""
"NAWC-101518-RW-362","537","RES","320-44233-13","TALSAC","STL00996","13C2
PFDA","94","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","99.3","","251.8","10.00","0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","249.9","10.00","2.0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","249.9","10.00","6.0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","249.9","10.00","2.0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","249.9","10.00","2.0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","249.9","10.00","3.0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","249.9","10.00","1.0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","SURR","108","","-99","LOQ","YES","100","","249.9","10.00","0",""
"NAWC-101518-FRB-362","537","RES","320-44233-14","TALSAC","STL00996","13C2
PFDA","98","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","100","","249.9","10.00","0",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.96","DL","","TRG","","","5.0","LOQ","YES","-99","","247.6","10.00","2.0",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.1","ng/L","U","2.7","DL","","TRG","","","7.1","LOQ","YES","-99","","247.6","10.00","6.1",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.65","DL","","TRG","","","5.0","LOQ","YES","-99","","247.6","10.00","2.0",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.81","DL","","TRG","","","5.0","LOQ","YES","-99","","247.6","10.00","2.0",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","247.6","10.00","3.0",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","247.6","10.00","1.0",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","101","","247.6","10.00","0",""
"NAWC-101518-FRB-335","537","RES","320-44233-2","TALSAC","STL00996","13C2
PFDA","110","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","101","","247.6","10.00","0",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","19","ng/L","M","0.93","DL","","TRG","","","4.9","LOQ","YES","-99","","254.2","10.00","2.0",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","20","ng/L","M","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","254.2","10.00","5.9",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","7.7","ng/L","","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","254.2","10.00","2.0",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","10","ng/L","","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","254.2","10.00","2.0",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.6","ng/L","","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","254.2","10.00","3.0",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","3.3","ng/L","J","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","254.2","10.00","0.98",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","STL00993","13C2
PFHxA","90","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","98.3","","254.2","10.00","0",""
"NAWC-101518-RW-145","537","RES","320-44233-3","TALSAC","STL00996","13C2
PFDA","89","ng/L","","-99","DL","","SURR","91","","-99","LOQ","YES","98.3","","254.2","10.00","0",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.94","DL","","TRG","","","5.0","LOQ","YES","-99","","251.4","10.00","2.0",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","251.4","10.00","6.0",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","251.4","10.00","2.0",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","251.4","10.00","2.0",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","251.4","10.00","3.0",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.99","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","251.4","10.00","0.99",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","SURR","108","","-99","LOQ","YES","99.4","","251.4","10.00","0",""
"NAWC-101518-FRB-145","537","RES","320-44233-4","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","99.4","","251.4","10.00","0",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","10","ng/L","M","0.98","DL","","TRG","","","5.2","LOQ","YES","-99","","241.3","10.00","2.1",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","14","ng/L","M","2.8","DL","","TRG","","","7.3","LOQ","YES","-99","","241.3","10.00","6.2",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.3","ng/L","J M","0.66","DL","","TRG","","","5.2","LOQ","YES","-99","","241.3","10.00","2.1",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","5.6","ng/L","","0.83","DL","","TRG","","","5.2","LOQ","YES","-99","","241.3","10.00","2.1",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.3","ng/L","J","1.3","DL","","TRG","","","5.2","LOQ","YES","-99","","241.3","10.00","3.1",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.7","ng/L","J","0.49","DL","","TRG","","","5.2","LOQ","YES","-99","","241.3","10.00","1.0",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","104","","241.3","10.00","0",""
"NAWC-101518-RW-146","537","RES","320-44233-5","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","104","","241.3","10.00","0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS)","2.0","ng/L","U","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","250.8","10.00","2.0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.0","ng/L","U M","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","250.8","10.00","6.0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","250.8","10.00","2.0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","250.8","10.00","2.0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","250.8","10.00","3.0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","250.8","10.00","1.0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","STL00993","13C2
PFHxA","97","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","99.7","","250.8","10.00","0",""
"NAWC-101518-FRB-146","537","RES","320-44233-6","TALSAC","STL00996","13C2
PFDA","99","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","99.7","","250.8","10.00","0",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","38","ng/L","M","0.96","DL","","TRG","","","5.1","LOQ","YES","-99","","246.8","10.00","2.0",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","20","ng/L","M","2.7","DL","","TRG","","","7.1","LOQ","YES","-99","","246.8","10.00","6.1",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","15","ng/L","","0.65","DL","","TRG","","","5.1","LOQ","YES","-99","","246.8","10.00","2.0",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","9.8","ng/L","","0.81","DL","","TRG","","","5.1","LOQ","YES","-99","","246.8","10.00","2.0",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.6","ng/L","","1.3","DL","","TRG","","","5.1","LOQ","YES","-99","","246.8","10.00","3.0",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","3.0","ng/L","J","0.48","DL","","TRG","","","5.1","LOQ","YES","-99","","246.8","10.00","1.0",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","101","","246.8","10.00","0",""
"NAWC-101518-RW-161","537","RES","320-44233-7","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","101","","246.8","10.00","0",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.97","DL","","TRG","","","5.1","LOQ","YES","-99","","245.2","10.00","2.0",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.1","ng/L","U","2.8","DL","","TRG","","","7.1","LOQ","YES","-99","","245.2","10.00","6.1",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.65","DL","","TRG","","","5.1","LOQ","YES","-99","","245.2","10.00","2.0",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.82","DL","","TRG","","","5.1","LOQ","YES","-99","","245.2","10.00","2.0",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.1","ng/L","U","1.3","DL","","TRG","","","5.1","LOQ","YES","-99","","245.2","10.00","3.1",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.48","DL","","TRG","","","5.1","LOQ","YES","-99","","245.2","10.00","1.0",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","102","","245.2","10.00","0",""
"NAWC-101518-FRB-161","537","RES","320-44233-8","TALSAC","STL00996","13C2
PFDA","99","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","102","","245.2","10.00","0",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","37","ng/L","","0.92","DL","","TRG","","","4.8","LOQ","YES","-99","","258.3","10.00","1.9",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","14","ng/L","M","2.6","DL","","TRG","","","6.8","LOQ","YES","-99","","258.3","10.00","5.8",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","14","ng/L","","0.62","DL","","TRG","","","4.8","LOQ","YES","-99","","258.3","10.00","1.9",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","7.9","ng/L","","0.77","DL","","TRG","","","4.8","LOQ","YES","-99","","258.3","10.00","1.9",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.6","ng/L","J","1.3","DL","","TRG","","","4.8","LOQ","YES","-99","","258.3","10.00","2.9",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.7","ng/L","J","0.45","DL","","TRG","","","4.8","LOQ","YES","-99","","258.3","10.00","0.97",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","96.8","","258.3","10.00","0",""
"NAWC-101518-RW-162","537","RES","320-44233-9","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","SURR","108","","-99","LOQ","YES","96.8","","258.3","10.00","0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","177","ng/L","","0.95","DL","","SPK","95","","5.0","LOQ","YES","186","","250.00","10.00","2.0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","193","ng/L","","2.7","DL","","SPK","96","","7.0","LOQ","YES","200","","250.00","10.00","6.0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","187","ng/L","","0.64","DL","","SPK","103","","5.0","LOQ","YES","182","","250.00","10.00","2.0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","197","ng/L","","0.80","DL","","SPK","111","","5.0","LOQ","YES","177","","250.00","10.00","2.0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","213","ng/L","","1.3","DL","","SPK","106","","5.0","LOQ","YES","200","","250.00","10.00","3.0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","204","ng/L","","0.47","DL","","SPK","102","","5.0","LOQ","YES","200","","250.00","10.00","1.0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","STL00993","13C2
PFHxA","103","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","100","","250.00","10.00","0",""
"LCS 320-254499/2-A","537","RES","LCS 320-254499/2-A","TALSAC","STL00996","13C2
PFDA","98.5","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","100","","250.00","10.00","0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","182","ng/L","","0.95","DL","","SPK","98","3","5.0","LOQ","YES","186","LCS 320-254499/2-
A","250.00","10.00","2.0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","195","ng/L","","2.7","DL","","SPK","97","1","7.0","LOQ","YES","200","LCS 320-254499/2-
A","250.00","10.00","6.0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","190","ng/L","","0.64","DL","","SPK","104","2","5.0","LOQ","YES","182","LCS 320-254499/2-
A","250.00","10.00","2.0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","192","ng/L","","0.80","DL","","SPK","108","3","5.0","LOQ","YES","177","LCS 320-254499/2-
A","250.00","10.00","2.0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","203","ng/L","","1.3","DL","","SPK","102","5","5.0","LOQ","YES","200","LCS 320-254499/2-
A","250.00","10.00","3.0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","196","ng/L","","0.47","DL","","SPK","98","4","5.0","LOQ","YES","200","LCS 320-254499/2-
A","250.00","10.00","1.0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","STL00993","13C2
PFHxA","105","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","100","LCS 320-254499/2-
A","250.00","10.00","0",""
"LCSD 320-254499/3-A","537","RES","LCSD 320-254499/3-A","TALSAC","STL00996","13C2
PFDA","105","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","100","LCS 320-254499/2-
A","250.00","10.00","0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","250.00","10.00","6.0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","STL00993","13C2
PFHxA","101","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","100","","250.00","10.00","0",""
"MB 320-254499/1-A","537","RES","MB 320-254499/1-A","TALSAC","STL00996","13C2
PFDA","97.6","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","100","","250.00","10.00","0",""
"Unknown","Unknown","NAWC-101518-RW-335","10/15/2018 13:40","AQ","320-44233-
1","NM","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:28","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-FRB-162","10/15/2018 15:35","AQ","320-44233-
10","FB","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
09:50","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255211","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-RW-260","10/15/2018 16:10","AQ","320-44233-
11","NM","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
09:57","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255211","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-FRB-260","10/15/2018 16:05","AQ","320-44233-
12","FB","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
10:04","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255211","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-RW-362","10/15/2018 17:10","AQ","320-44233-
13","NM","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
10:12","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255211","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-FRB-362","10/15/2018 17:05","AQ","320-44233-
14","FB","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
10:19","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255211","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-FRB-335","10/15/2018 13:35","AQ","320-44233-
2","FB","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:36","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-RW-145","10/15/2018 14:10","AQ","320-44233-
3","NM","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:43","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-FRB-145","10/15/2018 14:05","AQ","320-44233-
4","FB","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:50","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-RW-146","10/15/2018 14:40","AQ","320-44233-
5","NM","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:58","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-FRB-146","10/15/2018 14:35","AQ","320-44233-
6","FB","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
09:05","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-

255149","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-RW-161","10/15/2018 15:10","AQ","320-44233-
7","NM","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
09:13","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-FRB-161","10/15/2018 15:05","AQ","320-44233-
8","FB","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
09:35","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255211","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","NAWC-101518-RW-162","10/15/2018 15:40","AQ","320-44233-
9","NM","","2.80","537","METHOD","RES","10/24/2018 08:22","10/26/2018
09:42","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255211","320-44233-1","10/16/2018 09:15","10/29/2018 10:41",""
"Unknown","Unknown","LCS 320-254499/2-A","","AQ","LCS 320-254499/2-
A","LCS","","-99","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:13","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/24/2018 08:22","10/29/2018 10:41",""
"Unknown","Unknown","LCSD 320-254499/3-A","","AQ","LCSD 320-254499/3-
A","LCSD","","-99","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:21","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/24/2018 08:22","10/29/2018 10:41",""
"Unknown","Unknown","MB 320-254499/1-A","","AQ","MB 320-254499/1-
A","MB","","-99","537","METHOD","RES","10/24/2018 08:22","10/26/2018
08:06","TALSAC","COA","WET","NA","1","NA","NA","","100","320-254499","320-254499","NA","320-
255149","320-44233-1","10/24/2018 08:22","10/29/2018 10:41",""

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **A. FREBOWITZ** **DATE:** **NOVEMBER 6, 2018**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-44233-1

SAMPLES: 7/Field Reagent Blank (FRB)

NAWC-101518-FRB-145	NAWC-101518-FRB-146
NAWC-101518-FRB-161	NAWC-101518-FRB-162
NAWC-101518-FRB-260	NAWC-101518-FRB-335
NAWC-101518-FRB-362	

7/Drinking Water

NAWC-101518-RW-145	NAWC-101518-RW-146
NAWC-101518-RW-161	NAWC-101518-RW-162
NAWC-101518-RW-260	NAWC-101518-RW-335
NAWC-101518-RW-362	

Overview

The sample set for NAS JRB Willow Grove, SDG 320-44233-1, consisted of seven (7) drinking water samples and seven (7) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech on October 15, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, tune check, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRB results, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, injected internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

Notes

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

Sample	Associated FRB
NAWC-101518-RW-145	NAWC-101518-FRB-145
NAWC-101518-RW-146	NAWC-101518-FRB-146
NAWC-101518-RW-161	NAWC-101518-FRB-161
NAWC-101518-RW-162	NAWC-101518-FRB-162
NAWC-101518-RW-260	NAWC-101518-FRB-260
NAWC-101518-RW-335	NAWC-101518-FRB-335
NAWC-101518-RW-362	NAWC-101518-FRB-362

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

Executive Summary

Laboratory Performance: No issues.

Other Factors Affecting Data Quality: Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-101518-FRB-145			NAWC-101518-FRB-146			NAWC-101518-FRB-161			NAWC-101518-FRB-162		
SDG: 320-44233-1	LAB_ID	320-44233-4			320-44233-6			320-44233-8			320-44233-10		
FRACTION: PFAS	SAMP_DATE	10/15/2018			10/15/2018			10/15/2018			10/15/2018		
MEDIA: WATER	QC_TYPE	FB			FB			FB			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		6	U		6	U		6.1	U		6	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		2	U		2	U		2	U		2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		3	U		3	U		3.1	U		3	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2	U		2	U		2	U		2	U	
PERFLUORONONANOIC ACID (PFNA)		0.99	U		1	U		1	U		1	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2	U		2	U		2	U		2	U	

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-101518-FRB-260			NAWC-101518-FRB-335			NAWC-101518-FRB-362			NAWC-101518-RW-145		
SDG: 320-44233-1	LAB_ID	320-44233-12			320-44233-2			320-44233-14			320-44233-3		
FRACTION: PFAS	SAMP_DATE	10/15/2018			10/15/2018			10/15/2018			10/15/2018		
MEDIA: WATER	QC_TYPE	FB			FB			FB			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		6.1	U		6.1	U		6	U		20		
PERFLUOROBUTANESULFONIC ACID (PFBS)		2	U		2	U		2	U		10		
PERFLUOROHEPTANOIC ACID (PFHPA)		3	U		3	U		3	U		6.6		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2	U		2	U		2	U		7.7		
PERFLUORONONANOIC ACID (PFNA)		1	U		1	U		1	U		3.3	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		2	U		2	U		2	U		19		

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-101518-RW-146			NAWC-101518-RW-161			NAWC-101518-RW-162			NAWC-101518-RW-260		
SDG: 320-44233-1	LAB_ID	320-44233-5			320-44233-7			320-44233-9			320-44233-11		
FRACTION: PFAS	SAMP_DATE	10/15/2018			10/15/2018			10/15/2018			10/15/2018		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		14			20			14			18		
PERFLUOROBUTANESULFONIC ACID (PFBS)		5.6			9.8			7.9			15		
PERFLUOROHEPTANOIC ACID (PFHPA)		4.3	J	P	6.6			4.6	J	P	5.3		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2.3	J	P	15			14			8.8		
PERFLUORONONANOIC ACID (PFNA)		1.7	J	P	3	J	P	1.7	J	P	2.4	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		10			38			37			21		

PROJ_NO: 08005-WE04	NSAMPLE	NAWC-101518-RW-335			NAWC-101518-RW-362		
SDG: 320-44233-1	LAB_ID	320-44233-1			320-44233-13		
FRACTION: PFAS	SAMP_DATE	10/15/2018			10/15/2018		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		19			15		
PERFLUOROBUTANESULFONIC ACID (PFBS)		4.1	J	P	10		
PERFLUOROHEPTANOIC ACID (PFHPA)		8.5			5.4		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		9.7			5.1		
PERFLUORONONANOIC ACID (PFNA)		2.1	J	P	2.4	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		19			38		

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-335 | Lab Sample ID: 320-44233-1

Matrix: Water | Lab File ID: 2018.10.25_537B_010.d

Analysis Method: 537 | Date Collected: 10/15/2018 13:40

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 245.9(mL) | Date Analyzed: 10/26/2018 08:28

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	~~M~~	5.1	2.0	0.97
335-67-1	Perfluorooctanoic acid (PFOA)	19	~~M~~	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.1	J	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.7		5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.5		5.1	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.1	J	5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	98		70-130

11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-335 | Lab Sample ID: 320-44233-2

Matrix: Water | Lab File ID: 2018.10.25_537B_011.d

Analysis Method: 537 | Date Collected: 10/15/2018 13:35

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 247.6(mL) | Date Analyzed: 10/26/2018 08:36

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	106		70-130

11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-145 | Lab Sample ID: 320-44233-3

Matrix: Water | Lab File ID: 2018.10.25_537B_012.d

Analysis Method: 537 | Date Collected: 10/15/2018 14:10

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 254.2(mL) | Date Analyzed: 10/26/2018 08:43

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	~~M~~	4.9	2.0	0.93
335-67-1	Perfluorooctanoic acid (PFOA)	20	~~M~~	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.3	J	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.7		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	10		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	91		70-130

Toni L Salomon
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-145 Lab Sample ID: 320-44233-4

Matrix: Water Lab File ID: 2018.10.25_537B_013.d

Analysis Method: 537 Date Collected: 10/15/2018 14:05

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 251.4(mL) Date Analyzed: 10/26/2018 08:50

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		70-130
STL00996	13C2 PFDA	103		70-130

11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-146 | Lab Sample ID: 320-44233-5

Matrix: Water | Lab File ID: 2018.10.25_537B_014.d

Analysis Method: 537 | Date Collected: 10/15/2018 14:40

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 241.3(mL) | Date Analyzed: 10/26/2018 08:58

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	~~M~~	5.2	2.1	0.98
335-67-1	Perfluorooctanoic acid (PFOA)	14	~~M~~	7.3	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.7	J	5.2	1.0	0.49
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.3	J ~~M~~	5.2	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.3	J	5.2	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.6		5.2	2.1	0.83

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	99		70-130

Toni L Salomon
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-146 | Lab Sample ID: 320-44233-6

Matrix: Water | Lab File ID: 2018.10.25_537B_015.d

Analysis Method: 537 | Date Collected: 10/15/2018 14:35

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 250.8(mL) | Date Analyzed: 10/26/2018 09:05

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U ~~M~~	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	99		70-130

Dani L Salemon
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-161 | Lab Sample ID: 320-44233-7

Matrix: Water | Lab File ID: 2018.10.25_537B_016.d

Analysis Method: 537 | Date Collected: 10/15/2018 15:10

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 246.8(mL) | Date Analyzed: 10/26/2018 09:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38	~~M~~	5.1	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	20	~~M~~	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.0	J	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15		5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6		5.1	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.8		5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	95		70-130

Dawn L Salemen
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-161 | Lab Sample ID: 320-44233-8

Matrix: Water | Lab File ID: 2018.10.25_537B_019.d

Analysis Method: 537 | Date Collected: 10/15/2018 15:05

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 245.2(mL) | Date Analyzed: 10/26/2018 09:35

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.1	2.0	0.97
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.1	U	5.1	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.1	2.0	0.82

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	97		70-130

Dawn L Salerno
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-162 | Lab Sample ID: 320-44233-9

Matrix: Water | Lab File ID: 2018.10.25_537B_020.d

Analysis Method: 537 | Date Collected: 10/15/2018 15:40

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 258.3(mL) | Date Analyzed: 10/26/2018 09:42

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37		4.8	1.9	0.92
335-67-1	Perfluorooctanoic acid (PFOA)	14	~~M~~	6.8	5.8	2.6
375-95-1	Perfluorononanoic acid (PFNA)	1.7	J	4.8	0.97	0.45
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14		4.8	1.9	0.62
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J	4.8	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.9		4.8	1.9	0.77

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	108		70-130

Dawn L Salemen
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-162 Lab Sample ID: 320-44233-10

Matrix: Water Lab File ID: 2018.10.25_537B_021.d

Analysis Method: 537 Date Collected: 10/15/2018 15:35

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 248.5(mL) Date Analyzed: 10/26/2018 09:50

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	98		70-130

11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-260 | Lab Sample ID: 320-44233-11

Matrix: Water | Lab File ID: 2018.10.25_537B_022.d

Analysis Method: 537 | Date Collected: 10/15/2018 16:10

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 250.4(mL) | Date Analyzed: 10/26/2018 09:57

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21		5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	18	~~M~~	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.4	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.8		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.3		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	15		5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	95		70-130

Dawn L Salerno
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-260 Lab Sample ID: 320-44233-12

Matrix: Water Lab File ID: 2018.10.25_537B_023.d

Analysis Method: 537 Date Collected: 10/15/2018 16:05

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 246.3(mL) Date Analyzed: 10/26/2018 10:04

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.1	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.1	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	105		70-130

Dani L Salemon
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-362 | Lab Sample ID: 320-44233-13

Matrix: Water | Lab File ID: 2018.10.25_537B_024.d

Analysis Method: 537 | Date Collected: 10/15/2018 17:10

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 251.8(mL) | Date Analyzed: 10/26/2018 10:12

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38		5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	15	M	6.9	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.4	J	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.1		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	M	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	10	M	5.0	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	95		70-130

Terri L Salomon
11/06/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-362 | Lab Sample ID: 320-44233-14

Matrix: Water | Lab File ID: 2018.10.25_537B_025.d

Analysis Method: 537 | Date Collected: 10/15/2018 17:05

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 249.9(mL) | Date Analyzed: 10/26/2018 10:19

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		70-130
STL00996	13C2 PFDA	98		70-130

Toni L Salomon
11/06/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-335 Lab Sample ID: 320-44233-1

Matrix: Water Lab File ID: 2018.10.25_537B_010.d

Analysis Method: 537 Date Collected: 10/15/2018 13:40

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 245.9(mL) Date Analyzed: 10/26/2018 08:28

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	M	5.1	2.0	0.97
335-67-1	Perfluorooctanoic acid (PFOA)	19	M	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.1	J	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.7		5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.5		5.1	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.1	J	5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-335 | Lab Sample ID: 320-44233-2

Matrix: Water | Lab File ID: 2018.10.25_537B_011.d

Analysis Method: 537 | Date Collected: 10/15/2018 13:35

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 247.6(mL) | Date Analyzed: 10/26/2018 08:36

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-145 | Lab Sample ID: 320-44233-3

Matrix: Water | Lab File ID: 2018.10.25_537B_012.d

Analysis Method: 537 | Date Collected: 10/15/2018 14:10

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 254.2(mL) | Date Analyzed: 10/26/2018 08:43

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	19	M	4.9	2.0	0.93
335-67-1	Perfluorooctanoic acid (PFOA)	20	M	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.3	J	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.7		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	10		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	91		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-145 Lab Sample ID: 320-44233-4

Matrix: Water Lab File ID: 2018.10.25_537B_013.d

Analysis Method: 537 Date Collected: 10/15/2018 14:05

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 251.4(mL) Date Analyzed: 10/26/2018 08:50

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-146 | Lab Sample ID: 320-44233-5

Matrix: Water | Lab File ID: 2018.10.25_537B_014.d

Analysis Method: 537 | Date Collected: 10/15/2018 14:40

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 241.3(mL) | Date Analyzed: 10/26/2018 08:58

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	M	5.2	2.1	0.98
335-67-1	Perfluorooctanoic acid (PFOA)	14	M	7.3	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.7	J	5.2	1.0	0.49
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.3	J M	5.2	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.3	J	5.2	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.6		5.2	2.1	0.83

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-146 | Lab Sample ID: 320-44233-6

Matrix: Water | Lab File ID: 2018.10.25_537B_015.d

Analysis Method: 537 | Date Collected: 10/15/2018 14:35

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 250.8(mL) | Date Analyzed: 10/26/2018 09:05

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U M	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-161 | Lab Sample ID: 320-44233-7

Matrix: Water | Lab File ID: 2018.10.25_537B_016.d

Analysis Method: 537 | Date Collected: 10/15/2018 15:10

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 246.8(mL) | Date Analyzed: 10/26/2018 09:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38	M	5.1	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	20	M	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.0	J	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15		5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.6		5.1	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.8		5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	95		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-161 | Lab Sample ID: 320-44233-8

Matrix: Water | Lab File ID: 2018.10.25_537B_019.d

Analysis Method: 537 | Date Collected: 10/15/2018 15:05

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 245.2(mL) | Date Analyzed: 10/26/2018 09:35

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.1	2.0	0.97
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.1	U	5.1	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.1	2.0	0.82

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	97		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-162 | Lab Sample ID: 320-44233-9

Matrix: Water | Lab File ID: 2018.10.25_537B_020.d

Analysis Method: 537 | Date Collected: 10/15/2018 15:40

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 258.3(mL) | Date Analyzed: 10/26/2018 09:42

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37		4.8	1.9	0.92
335-67-1	Perfluorooctanoic acid (PFOA)	14	M	6.8	5.8	2.6
375-95-1	Perfluorononanoic acid (PFNA)	1.7	J	4.8	0.97	0.45
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	14		4.8	1.9	0.62
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J	4.8	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.9		4.8	1.9	0.77

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	108		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-162 Lab Sample ID: 320-44233-10

Matrix: Water Lab File ID: 2018.10.25_537B_021.d

Analysis Method: 537 Date Collected: 10/15/2018 15:35

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 248.5(mL) Date Analyzed: 10/26/2018 09:50

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-260 Lab Sample ID: 320-44233-11

Matrix: Water Lab File ID: 2018.10.25_537B_022.d

Analysis Method: 537 Date Collected: 10/15/2018 16:10

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 250.4(mL) Date Analyzed: 10/26/2018 09:57

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21		5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	18	M	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.4	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.8		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.3		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	15		5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	95		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-260 | Lab Sample ID: 320-44233-12

Matrix: Water | Lab File ID: 2018.10.25_537B_023.d

Analysis Method: 537 | Date Collected: 10/15/2018 16:05

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 246.3(mL) | Date Analyzed: 10/26/2018 10:04

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.1	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.1	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-RW-362 Lab Sample ID: 320-44233-13

Matrix: Water Lab File ID: 2018.10.25_537B_024.d

Analysis Method: 537 Date Collected: 10/15/2018 17:10

Extraction Method: 537 Date Extracted: 10/24/2018 08:22

Sample wt/vol: 251.8(mL) Date Analyzed: 10/26/2018 10:12

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38		5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	15	M	6.9	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.4	J	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.1		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	M	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	10	M	5.0	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	95		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: NAWC-101518-FRB-362 | Lab Sample ID: 320-44233-14

Matrix: Water | Lab File ID: 2018.10.25_537B_025.d

Analysis Method: 537 | Date Collected: 10/15/2018 17:05

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 249.9(mL) | Date Analyzed: 10/26/2018 10:19

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255211 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		70-130
STL00996	13C2 PFDA	98		70-130

Appendix C

Support Documentation

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☑ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 10/15/2018	COC No:
TetraTech	Tel/Fax: 610.382.2920	Lab Contact: Dave Alltucker	Carrier: FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	Analysis Turnaround Time			Sampler: Mary Kay Bond
King of Prussia, PA 19406	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
610-382-2924	TAT if different from Below 21			Walk-in Client:
610-491-9688	☑ 2 weeks			Lab Sampling:
Project Name: WE04	☐ 1 week			
Site: WE04	☐ 2 days			Job / SDG No.:
P O # 1132358 (through EarthToxics)	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-101518-RW-335	10/15/2018	13:40	G	DW	2	N	N	Y	
NAWC-101518-FRB-335	10/15/2018	13:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-101518-RW-145	10/15/2018	14:10	G	DW	2	N	N	Y	
NAWC-101518-FRB-145	10/15/2018	14:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-101518-RW-146	10/15/2018	14:40	G	DW	2	N	N	Y	
NAWC-101518-FRB-146	10/15/2018	14:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-101518-RW-161	10/15/2018	15:10	G	DW	2	N	N	Y	
NAWC-101518-FRB-161	10/15/2018	15:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-101518-RW-162	10/15/2018	15:40	G	DW	2	N	N	Y	
NAWC-101518-FRB-162	10/15/2018	15:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-101518-RW-260	10/15/2018	16:10	G	DW	2	N	N	Y	
NAWC-101518-FRB-260	10/15/2018	16:05	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-101518-RW-362	10/15/2018	17:10	G	DW	2	N	N	Y	
NAWC-101518-FRB-362	10/15/2018	17:05	G	DW	2	N	N	Y	Field Reagent Blank
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma								6	

320-44233 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Fed Ex Tracking: **7734 7317 3043**

Custody Seals Intact: ☒ Yes ☐ No | Custody Seal No.: 453744 453745 | Cooler Temp. (°C): Obs'd: 2.1 Corr'd: 2.5 | Therm ID No.: AK-5

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Mary Kay Bond	Tetra Tech	10/15/2018 16:00		TA-SAC	10/16/18 0915
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Job Narrative
320-44233-1

Receipt
The samples were received on 10/16/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.8° C.

LCMS
Method(s) 537: The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 320-254499.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-44233-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Tetra Tech, Inc.
TestAmerica Job ID: 320-44233-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-44233-1	NAWC-101518-RW-335	Water	10/15/18 13:40	10/16/18 09:15
320-44233-2	NAWC-101518-FRB-335	Water	10/15/18 13:35	10/16/18 09:15
320-44233-3	NAWC-101518-RW-145	Water	10/15/18 14:10	10/16/18 09:15
320-44233-4	NAWC-101518-FRB-145	Water	10/15/18 14:05	10/16/18 09:15
320-44233-5	NAWC-101518-RW-146	Water	10/15/18 14:40	10/16/18 09:15
320-44233-6	NAWC-101518-FRB-146	Water	10/15/18 14:35	10/16/18 09:15
320-44233-7	NAWC-101518-RW-161	Water	10/15/18 15:10	10/16/18 09:15
320-44233-8	NAWC-101518-FRB-161	Water	10/15/18 15:05	10/16/18 09:15
320-44233-9	NAWC-101518-RW-162	Water	10/15/18 15:40	10/16/18 09:15
320-44233-10	NAWC-101518-FRB-162	Water	10/15/18 15:35	10/16/18 09:15
320-44233-11	NAWC-101518-RW-260	Water	10/15/18 16:10	10/16/18 09:15
320-44233-12	NAWC-101518-FRB-260	Water	10/15/18 16:05	10/16/18 09:15
320-44233-13	NAWC-101518-RW-362	Water	10/15/18 17:10	10/16/18 09:15
320-44233-14	NAWC-101518-FRB-362	Water	10/15/18 17:05	10/16/18 09:15

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-101518-RW-335	320-44233-1	102	98
NAWC-101518-FRB-335	320-44233-2	106	106
NAWC-101518-RW-145	320-44233-3	92	91
NAWC-101518-FRB-145	320-44233-4	108	103
NAWC-101518-RW-146	320-44233-5	100	99
NAWC-101518-FRB-146	320-44233-6	98	99
NAWC-101518-RW-161	320-44233-7	105	95
NAWC-101518-FRB-161	320-44233-8	100	97
NAWC-101518-RW-162	320-44233-9	106	108
NAWC-101518-FRB-162	320-44233-10	93	98
NAWC-101518-RW-260	320-44233-11	102	95
NAWC-101518-FRB-260	320-44233-12	105	105
NAWC-101518-RW-362	320-44233-13	96	95
NAWC-101518-FRB-362	320-44233-14	108	98
	MB 320-254499/1-A	101	98
	LCS 320-254499/2-A	103	99
	LCSD 320-254499/3-A	105	105

	QC LIMITS
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.25_537B_008.d

Lab ID: LCS 320-254499/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	186	177	95	70-130	
Perfluorooctanoic acid (PFOA)	200	193	96	70-130	
Perfluorononanoic acid (PFNA)	200	204	102	70-130	
Perfluorohexanesulfonic acid (PFHxS)	182	187	103	70-130	
Perfluoroheptanoic acid (PFHpA)	200	213	106	70-130	
Perfluorobutanesulfonic acid (PFBS)	177	197	111	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.25_537B_009.d

Lab ID: LCSD 320-254499/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	186	182	98	3	30	70-130	
Perfluorooctanoic acid (PFOA)	200	195	97	1	30	70-130	
Perfluorononanoic acid (PFNA)	200	196	98	4	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	182	190	104	2	30	70-130	
Perfluoroheptanoic acid (PFHpA)	200	203	102	5	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	177	192	108	3	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab File ID: 2018.10.25_537B_007.d Lab Sample ID: MB 320-254499/1-A

Matrix: Water Date Extracted: 10/24/2018 08:22

Instrument ID: A8_N Date Analyzed: 10/26/2018 08:06

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-254499/2-A	2018.10.25_537B_008.d	10/26/2018 08:13
	LCSD 320-254499/3-A	2018.10.25_537B_009.d	10/26/2018 08:21
NAWC-101518-RW-335	320-44233-1	2018.10.25_537B_010.d	10/26/2018 08:28
NAWC-101518-FRB-335	320-44233-2	2018.10.25_537B_011.d	10/26/2018 08:36
NAWC-101518-RW-145	320-44233-3	2018.10.25_537B_012.d	10/26/2018 08:43
NAWC-101518-FRB-145	320-44233-4	2018.10.25_537B_013.d	10/26/2018 08:50
NAWC-101518-RW-146	320-44233-5	2018.10.25_537B_014.d	10/26/2018 08:58
NAWC-101518-FRB-146	320-44233-6	2018.10.25_537B_015.d	10/26/2018 09:05
NAWC-101518-RW-161	320-44233-7	2018.10.25_537B_016.d	10/26/2018 09:13
NAWC-101518-FRB-161	320-44233-8	2018.10.25_537B_019.d	10/26/2018 09:35
NAWC-101518-RW-162	320-44233-9	2018.10.25_537B_020.d	10/26/2018 09:42
NAWC-101518-FRB-162	320-44233-10	2018.10.25_537B_021.d	10/26/2018 09:50
NAWC-101518-RW-260	320-44233-11	2018.10.25_537B_022.d	10/26/2018 09:57
NAWC-101518-FRB-260	320-44233-12	2018.10.25_537B_023.d	10/26/2018 10:04
NAWC-101518-RW-362	320-44233-13	2018.10.25_537B_024.d	10/26/2018 10:12
NAWC-101518-FRB-362	320-44233-14	2018.10.25_537B_025.d	10/26/2018 10:19

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44233-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-254499/1-A

Matrix: Water | Lab File ID: 2018.10.25_537B_007.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/24/2018 08:22

Sample wt/vol: 250.00(mL) | Date Analyzed: 10/26/2018 08:06

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 10(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 255149 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	98		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 10/25/2018 15:43

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		954978	2.58	794812	2.98		
UPPER LIMIT		1432467	3.08	1192218	3.48		
LOWER LIMIT		477489	2.08	397406	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-254941/10		971947	2.58	820552	2.98		
ICV 320-254941/12		974787	2.58	788400	2.98		
CCVL 320-255149/1		962543	2.58	788442	2.96		
CCV 320-255149/2 CCVIS		990446	2.59	835770	2.98		
MB 320-254499/1-A		1176497	2.58	963170	2.97		
LCS 320-254499/2-A		1161668	2.58	953812	2.96		
LCSD 320-254499/3-A		1152269	2.58	916315	2.96		
320-44233-1	NAWC-101518-RW-335	1220412	2.58	1018058	2.96		
320-44233-2	NAWC-101518-FRB-335	1164574	2.58	1008524	2.96		
320-44233-3	NAWC-101518-RW-145	1306454	2.58	1052766	2.96		
320-44233-4	NAWC-101518-FRB-145	1214105	2.58	1004367	2.96		
320-44233-5	NAWC-101518-RW-146	1285498	2.58	1067939	2.97		
320-44233-6	NAWC-101518-FRB-146	1230494	2.58	989217	2.98		
320-44233-7	NAWC-101518-RW-161	1174746	2.58	978537	2.96		
CCV 320-255149/14 CCVIS		971828	2.58	818556	2.96		
CCV 320-255211/14 CCVIS		971828	2.58	818556	2.96		
320-44233-8	NAWC-101518-FRB-161	1201992	2.58	1007263	2.98		
320-44233-9	NAWC-101518-RW-162	1175026	2.58	1002344	2.98		
320-44233-10	NAWC-101518-FRB-162	1216766	2.58	968371	2.98		
320-44233-11	NAWC-101518-RW-260	1210851	2.58	1014960	2.98		
320-44233-12	NAWC-101518-FRB-260	1155710	2.59	984248	2.98		
320-44233-13	NAWC-101518-RW-362	1258721	2.58	969331	2.98		
320-44233-14	NAWC-101518-FRB-362	1235862	2.59	1038691	2.98		
CCV 320-255211/23 CCVIS		1042752	2.59	853121	2.98		

13PFOA = 13C2 PFOA
PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Sample No.: CCV 320-255149/2 Date Analyzed: 10/26/2018 07:51

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.25_537B_005 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		990446	2.59	835770	2.98		
UPPER LIMIT		1386624	3.09	1170078	3.48		
LOWER LIMIT		693312	2.09	585039	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-254499/1-A		1176497	2.58	963170	2.97		
LCS 320-254499/2-A		1161668	2.58	953812	2.96		
LCSD 320-254499/3-A		1152269	2.58	916315	2.96		
320-44233-1	NAWC-101518-RW-335	1220412	2.58	1018058	2.96		
320-44233-2	NAWC-101518-FRB-335	1164574	2.58	1008524	2.96		
320-44233-3	NAWC-101518-RW-145	1306454	2.58	1052766	2.96		
320-44233-4	NAWC-101518-FRB-145	1214105	2.58	1004367	2.96		
320-44233-5	NAWC-101518-RW-146	1285498	2.58	1067939	2.97		
320-44233-6	NAWC-101518-FRB-146	1230494	2.58	989217	2.98		
320-44233-7	NAWC-101518-RW-161	1174746	2.58	978537	2.96		

13PFOA = 13C2 PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Sample No.: CCV 320-255149/14 Date Analyzed: 10/26/2018 09:20

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.25_537B_017 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		971828	2.58	818556	2.96		
UPPER LIMIT		1360559	3.08	1145978	3.46		
LOWER LIMIT		680280	2.08	572989	2.46		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-254499/1-A		1176497	2.58	963170	2.97		
LCS 320-254499/2-A		1161668	2.58	953812	2.96		
LCSD 320-254499/3-A		1152269	2.58	916315	2.96		
320-44233-1	NAWC-101518-RW-335	1220412	2.58	1018058	2.96		
320-44233-2	NAWC-101518-FRB-335	1164574	2.58	1008524	2.96		
320-44233-3	NAWC-101518-RW-145	1306454	2.58	1052766	2.96		
320-44233-4	NAWC-101518-FRB-145	1214105	2.58	1004367	2.96		
320-44233-5	NAWC-101518-RW-146	1285498	2.58	1067939	2.97		
320-44233-6	NAWC-101518-FRB-146	1230494	2.58	989217	2.98		
320-44233-7	NAWC-101518-RW-161	1174746	2.58	978537	2.96		

13PFOA = 13C2 PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Sample No.: CCV 320-255211/14 Date Analyzed: 10/26/2018 09:20

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.25_537B_017 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		971828	2.58	818556	2.96		
UPPER LIMIT		1360559	3.08	1145978	3.46		
LOWER LIMIT		680280	2.08	572989	2.46		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-44233-8	NAWC-101518-FRB-161	1201992	2.58	1007263	2.98		
320-44233-9	NAWC-101518-RW-162	1175026	2.58	1002344	2.98		
320-44233-10	NAWC-101518-FRB-162	1216766	2.58	968371	2.98		
320-44233-11	NAWC-101518-RW-260	1210851	2.58	1014960	2.98		
320-44233-12	NAWC-101518-FRB-260	1155710	2.59	984248	2.98		
320-44233-13	NAWC-101518-RW-362	1258721	2.58	969331	2.98		
320-44233-14	NAWC-101518-FRB-362	1235862	2.59	1038691	2.98		

13PFOA = 13C2 PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Sample No.: CCV 320-255211/23 Date Analyzed: 10/26/2018 10:26

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.25_537B_026 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1042752	2.59	853121	2.98		
UPPER LIMIT		1459853	3.09	1194369	3.48		
LOWER LIMIT		729926	2.09	597185	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-44233-8	NAWC-101518-FRB-161	1201992	2.58	1007263	2.98		
320-44233-9	NAWC-101518-RW-162	1175026	2.58	1002344	2.98		
320-44233-10	NAWC-101518-FRB-162	1216766	2.58	968371	2.98		
320-44233-11	NAWC-101518-RW-260	1210851	2.58	1014960	2.98		
320-44233-12	NAWC-101518-FRB-260	1155710	2.59	984248	2.98		
320-44233-13	NAWC-101518-RW-362	1258721	2.58	969331	2.98		
320-44233-14	NAWC-101518-FRB-362	1235862	2.59	1038691	2.98		

13PFOA = 13C2 PFOA
PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1 Analy Batch No.: 254941

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.1273 1.1348	1.0472 1.1821	1.2473	1.1325	1.0470	Ave		1.1312				6.3		30.0			
Perfluoroheptanoic acid (PFHpA)	1.1170 1.0911	1.0831 1.0164	1.1125	1.0906	1.1077	Ave		1.0883				3.1		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.7276 1.4629	1.5144 1.5084	1.4933	1.5080	1.4474	Ave		1.5232				6.1		30.0			
Perfluorooctanoic acid (PFOA)	1.2693 1.1068	1.2760 1.0811	1.0751	1.0892	1.1110	Ave		1.1441				7.8		30.0			
Perfluorononanoic acid (PFNA)	0.7828 0.8003	0.9188 0.8042	0.8858	0.8660	0.8198	Ave		0.8397				6.1		30.0			
Perfluorooctanesulfonic acid (PFOS)	1.2092 1.0233	1.3067 1.0468	1.1301	1.0534	1.0463	Ave		1.1166				9.5		30.0			
13C2 PFHxA	0.9719 0.9620	0.9669 0.9685	0.9927	1.0476	1.0117	Ave		0.9888				3.2		30.0			
13C2 PFDA	0.7273 0.6763	0.6718 0.6663	0.6660	0.7153	0.7053	Ave		0.6898				3.7		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1 Analy Batch No.: 254941

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_537ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	7850 1805727	15129 3593985	90415	321034	771338	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	10502 2168310	20433 4036861	107565	394448	1045338	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	12384 2396371	22521 4720764	111433	440068	1097729	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	11946 2201725	24097 4298280	104050	394334	1049529	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluorononanoic acid (PFNA)	13PF OA	Ave	7360 1590432	17333 3194105	85638	313227	773614	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	8839 1709437	19817 3340812	86001	313486	809220	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
13C2 PFHxA	13PF OA	Ave	913787 955852	912101 961713	959790	947296	954767	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDA	13PF OA	Ave	683785 672010	633723 661601	643936	646763	665573	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:
Ave = Average ISTD

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1 Analy Batch No.: 254941

SDG No.:

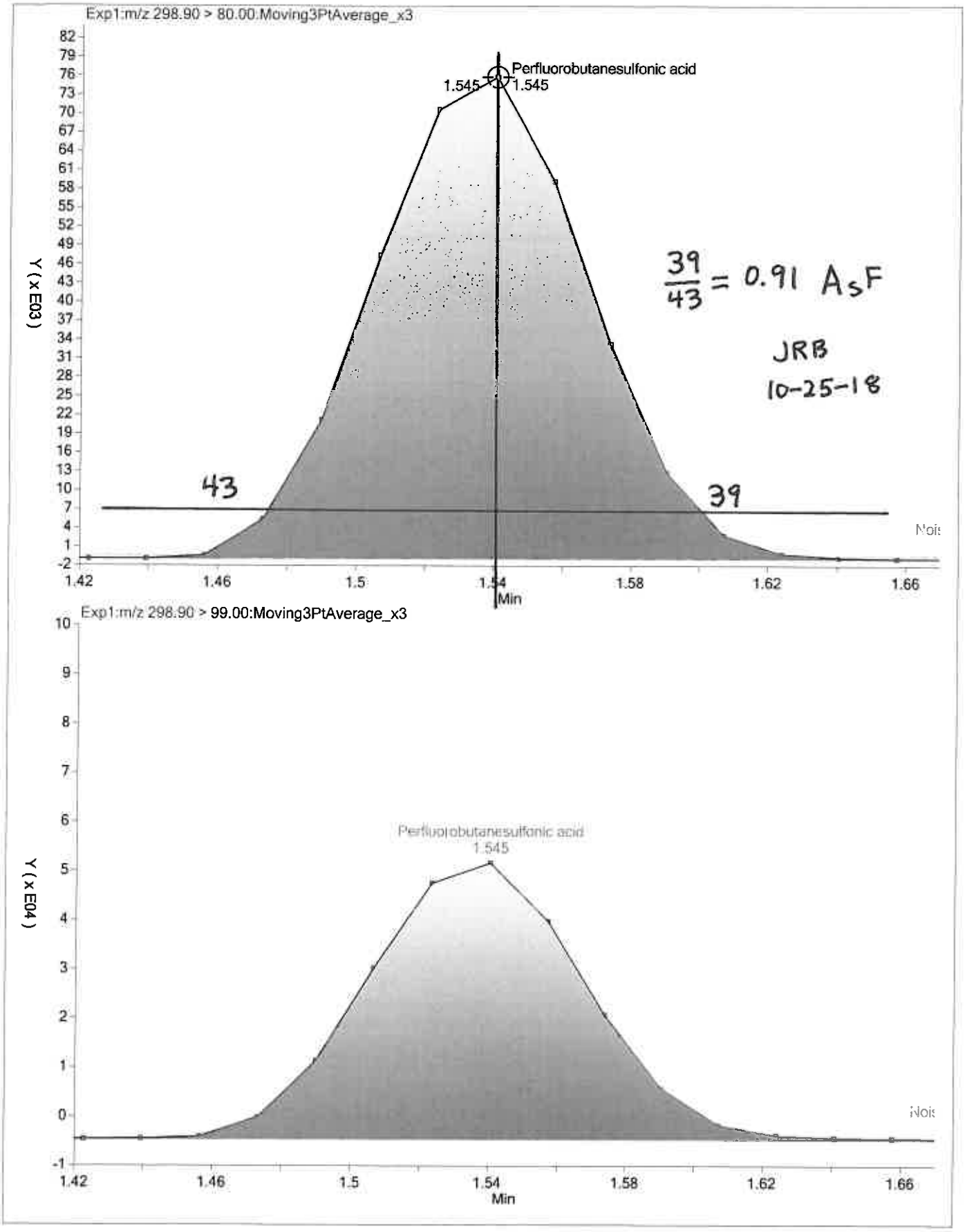
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_537ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-0.3 4.5	-7.4	10.3	0.1	-7.4	0.3	50 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	2.6 -6.6	-0.5	2.2	0.2	1.8	0.3	50 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	13.4 -1.0	-0.6	-2.0	-1.0	-5.0	-4.0	50 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	10.9 -5.5	11.5	-6.0	-4.8	-2.9	-3.3	50 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-6.8 -4.2	9.4	5.5	3.1	-2.4	-4.7	50 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	8.3 -6.3	17.0	1.2	-5.7	-6.3	-8.3	50 30	30	30	30	30	30
13C2 PFHxA	-1.7 -2.0	-2.2	0.4	6.0	2.3	-2.7	30 30	30	30	30	30	30
13C2 PFDA	5.4 -3.4	-2.6	-3.4	3.7	2.2	-1.9	30 30	30	30	30	30	30



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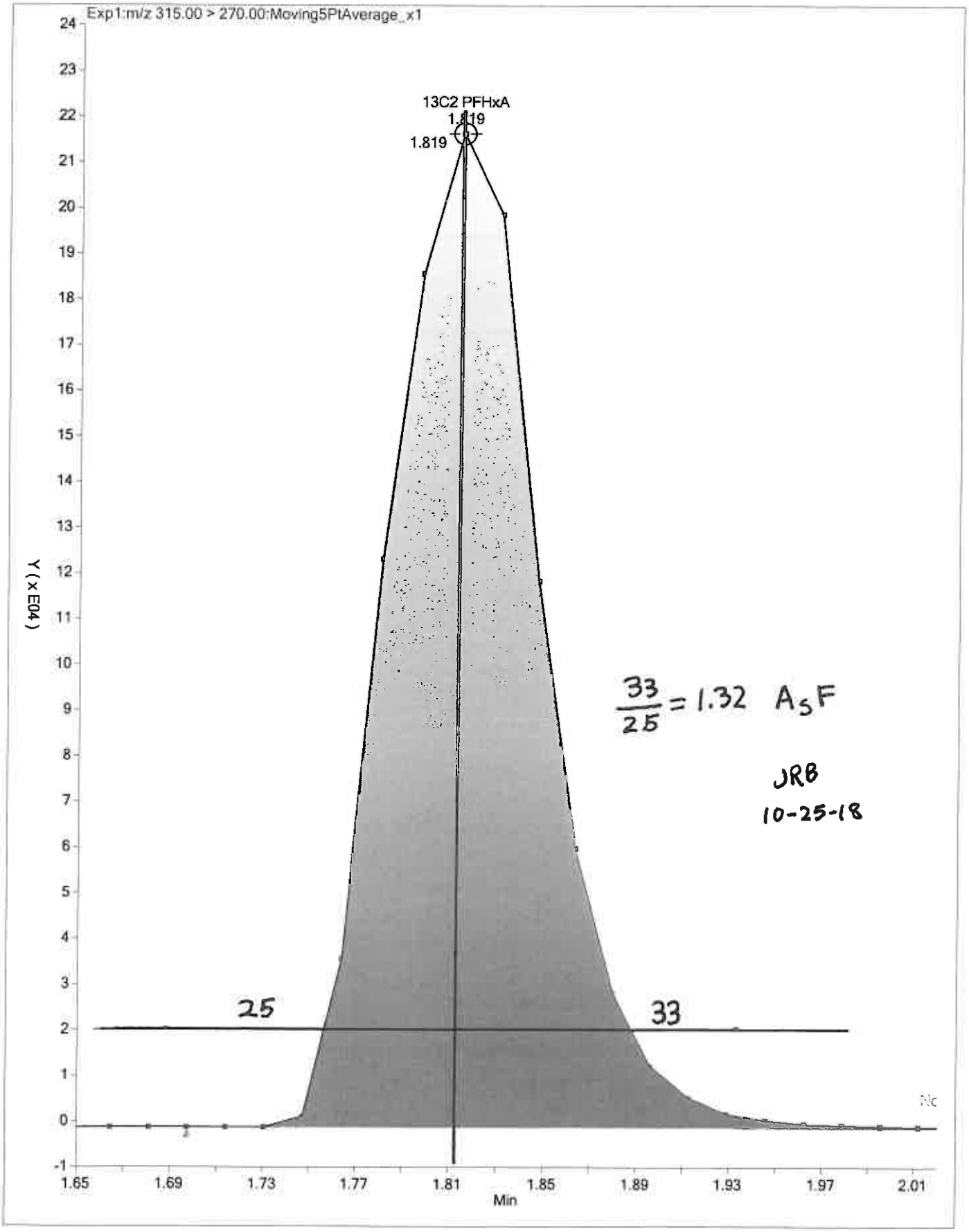
JRB
10-25-18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13C2 PFHxA
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1.819
Y (x E04)
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25
33
Nc
33/25 = 1.32 A5F
JRB
10-25-18

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab Sample ID: CCVL 320-254941/10 Calibration Date: 10/25/2018 15:58

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_537ICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.160		9.00	0.0442	2.6	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.236		1.00	0.0500	13.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.856		3.00	0.0455	21.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.011		2.00	0.0501	-11.6	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8737		5.00	0.0500	4.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	0.9171		4.00	0.0464	-17.9	50.0
13C2 PFHxA	Ave	0.9888	1.053		2.66	2.50	6.5	30.0
13C2 PFDA	Ave	0.6898	0.6953		2.52	2.50	0.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab Sample ID: ICV 320-254941/12 Calibration Date: 10/25/2018 16:12

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_537ICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.180		9.00	1.77	4.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.136		2.09	2.00	4.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.516		1.82	1.82	-0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.037		1.81	2.00	-9.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8648		2.06	2.00	3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.116		1.85	1.85	-0.0	30.0
13C2 PFHxA	Ave	0.9888	1.084		2.74	2.50	9.7	30.0
13C2 PFDA	Ave	0.6898	0.7056		2.56	2.50	2.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab Sample ID: CCVL 320-255149/1 Calibration Date: 10/26/2018 07:44

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_537B_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.239		9.00	0.0442	9.5	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.200		1.00	0.0500	10.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.433		3.00	0.0455	-5.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.446		2.00	0.0501	26.4	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.9713		5.00	0.0500	15.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.118		4.00	0.0464	0.1	50.0
13C2 PFHxA	Ave	0.9888	1.010		2.55	2.50	2.2	30.0
13C2 PFDA	Ave	0.6898	0.7125		2.58	2.50	3.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab Sample ID: CCV 320-255149/2 Calibration Date: 10/26/2018 07:51

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_537B_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.142		9.00	0.0000147	0.9	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.065		0.979	0.0000167	-2.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.465		3.00	0.0000152	-3.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.088		0.952	0.0000167	-4.9	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8909		5.00	0.0000167	6.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.058		4.00	0.0000155	-5.2	30.0
13C2 PFHxA	Ave	0.9888	0.9634		2.44	0.0000417	-2.6	30.0
13C2 PFDA	Ave	0.6898	0.6885		2.50	0.0000417	-0.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab Sample ID: CCV 320-255149/14 Calibration Date: 10/26/2018 09:20

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_537B_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.185		4.63	0.0000737	4.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.092		5.02	0.0000833	0.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.494		4.46	0.0000758	-1.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.067		4.67	0.0000834	-6.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8200		4.88	0.0000833	-2.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.029		4.28	0.0000773	-7.8	30.0
13C2 PFHxA	Ave	0.9888	1.026		2.59	0.0000417	3.7	30.0
13C2 PFDA	Ave	0.6898	0.6822		2.47	0.0000417	-1.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab Sample ID: CCV 320-255211/14 Calibration Date: 10/26/2018 09:20

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_537B_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.185		4.63	0.0000737	4.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.092		5.02	0.0000833	0.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.494		4.46	0.0000758	-1.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.067		4.67	0.0000834	-6.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8200		4.88	0.0000833	-2.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.029		4.28	0.0000773	-7.8	30.0
13C2 PFHxA	Ave	0.9888	1.026		2.59	0.0000417	3.7	30.0
13C2 PFDA	Ave	0.6898	0.6822		2.47	0.0000417	-1.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Lab Sample ID: CCV 320-255211/23 Calibration Date: 10/26/2018 10:26

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_537B_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.136		9.00	0.0000147	0.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.075		0.987	0.0000167	-1.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.514		3.00	0.0000152	-0.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.092		0.956	0.0000167	-4.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8265		5.00	0.0000167	-1.6	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.121		4.00	0.0000155	0.4	30.0
13C2 PFHxA	Ave	0.9888	1.070		2.71	0.0000417	8.2	30.0
13C2 PFDA	Ave	0.6898	0.7046		2.55	0.0000417	2.2	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Instrument ID: A8_N Start Date: 10/25/2018 14:59

Analysis Batch Number: 254941 End Date: 10/25/2018 16:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-254941/2		10/25/2018 14:59	1	2018.10.25_537ICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-254941/3		10/25/2018 15:06	1	2018.10.25_537ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-254941/4		10/25/2018 15:14	1	2018.10.25_537ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-254941/5 ICISAV		10/25/2018 15:21	1	2018.10.25_537ICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-254941/6		10/25/2018 15:29	1	2018.10.25_537ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-254941/7		10/25/2018 15:36	1	2018.10.25_537ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-254941/8		10/25/2018 15:43	1	2018.10.25_537ICAL 009.d	GeminiC18 3x100 3(mm)
CCVL 320-254941/10		10/25/2018 15:58	1	2018.10.25_537ICAL 011.d	GeminiC18 3x100 3(mm)
ICB 320-254941/11		10/25/2018 16:05	1		GeminiC18 3x100 3(mm)
ICV 320-254941/12		10/25/2018 16:12	1	2018.10.25_537ICAL 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Instrument ID: A8_N Start Date: 10/26/2018 07:44

Analysis Batch Number: 255149 End Date: 10/26/2018 09:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-255149/1		10/26/2018 07:44	1	2018.10.25_537B 004.d	GeminiC18 3x100 3(mm)
CCV 320-255149/2 CCVIS		10/26/2018 07:51	1	2018.10.25_537B 005.d	GeminiC18 3x100 3(mm)
MB 320-254499/1-A		10/26/2018 08:06	1	2018.10.25_537B 007.d	GeminiC18 3x100 3(mm)
LCS 320-254499/2-A		10/26/2018 08:13	1	2018.10.25_537B 008.d	GeminiC18 3x100 3(mm)
LCSD 320-254499/3-A		10/26/2018 08:21	1	2018.10.25_537B 009.d	GeminiC18 3x100 3(mm)
320-44233-1		10/26/2018 08:28	1	2018.10.25_537B 010.d	GeminiC18 3x100 3(mm)
320-44233-2		10/26/2018 08:36	1	2018.10.25_537B 011.d	GeminiC18 3x100 3(mm)
320-44233-3		10/26/2018 08:43	1	2018.10.25_537B 012.d	GeminiC18 3x100 3(mm)
320-44233-4		10/26/2018 08:50	1	2018.10.25_537B 013.d	GeminiC18 3x100 3(mm)
320-44233-5		10/26/2018 08:58	1	2018.10.25_537B 014.d	GeminiC18 3x100 3(mm)
320-44233-6		10/26/2018 09:05	1	2018.10.25_537B 015.d	GeminiC18 3x100 3(mm)
320-44233-7		10/26/2018 09:13	1	2018.10.25_537B 016.d	GeminiC18 3x100 3(mm)
CCV 320-255149/14 CCVIS		10/26/2018 09:20	1	2018.10.25_537B 017.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Instrument ID: A8_N Start Date: 10/26/2018 09:20

Analysis Batch Number: 255211 End Date: 10/26/2018 10:26

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-255211/14 CCVIS		10/26/2018 09:20	1	2018.10.25_537B 017.d	GeminiC18 3x100 3(mm)
320-44233-8		10/26/2018 09:35	1	2018.10.25_537B 019.d	GeminiC18 3x100 3(mm)
320-44233-9		10/26/2018 09:42	1	2018.10.25_537B 020.d	GeminiC18 3x100 3(mm)
320-44233-10		10/26/2018 09:50	1	2018.10.25_537B 021.d	GeminiC18 3x100 3(mm)
320-44233-11		10/26/2018 09:57	1	2018.10.25_537B 022.d	GeminiC18 3x100 3(mm)
320-44233-12		10/26/2018 10:04	1	2018.10.25_537B 023.d	GeminiC18 3x100 3(mm)
320-44233-13		10/26/2018 10:12	1	2018.10.25_537B 024.d	GeminiC18 3x100 3(mm)
320-44233-14		10/26/2018 10:19	1	2018.10.25_537B 025.d	GeminiC18 3x100 3(mm)
CCV 320-255211/23 CCVIS		10/26/2018 10:26	1	2018.10.25_537B 026.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Batch Number: 254499 Batch Start Date: 10/24/18 08:21 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/24/18 16:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00086
MB 320-254499/1		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
LCS 320-254499/2		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
LCSD 320-254499/3		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
320-44233-A-1	NAWC-101518-RW-335	537, 537	T	274.00 g	28.10 g	245.9 mL	10.00 mL	7 SU	500 uL
320-44233-A-2	NAWC-101518-FRB-335	537, 537	T	275.14 g	27.53 g	247.6 mL	10.00 mL	7 SU	500 uL
320-44233-A-3	NAWC-101518-RW-145	537, 537	T	282.52 g	28.32 g	254.2 mL	10.00 mL	7 SU	500 uL
320-44233-A-4	NAWC-101518-FRB-145	537, 537	T	279.80 g	28.41 g	251.4 mL	10.00 mL	7 SU	500 uL
320-44233-A-5	NAWC-101518-RW-146	537, 537	T	270.66 g	29.36 g	241.3 mL	10.00 mL	7 SU	500 uL
320-44233-A-6	NAWC-101518-FRB-146	537, 537	T	279.42 g	28.63 g	250.8 mL	10.00 mL	7 SU	500 uL
320-44233-A-7	NAWC-101518-RW-161	537, 537	T	274.80 g	28.01 g	246.8 mL	10.00 mL	7 SU	500 uL
320-44233-A-8	NAWC-101518-FRB-161	537, 537	T	272.62 g	27.44 g	245.2 mL	10.00 mL	7 SU	500 uL
320-44233-A-9	NAWC-101518-RW-162	537, 537	T	286.72 g	28.45 g	258.3 mL	10.00 mL	7 SU	500 uL
320-44233-A-10	NAWC-101518-FRB-162	537, 537	T	276.31 g	27.79 g	248.5 mL	10.00 mL	7 SU	500 uL
320-44233-A-11	NAWC-101518-RW-260	537, 537	T	280.04 g	29.60 g	250.4 mL	10.00 mL	7 SU	500 uL
320-44233-A-12	NAWC-101518-FRB-260	537, 537	T	273.84 g	27.52 g	246.3 mL	10.00 mL	7 SU	500 uL
320-44233-A-13	NAWC-101518-RW-362	537, 537	T	281.02 g	29.26 g	251.8 mL	10.00 mL	7 SU	500 uL
320-44233-A-14	NAWC-101518-FRB-362	537, 537	T	278.42 g	28.57 g	249.9 mL	10.00 mL	7 SU	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00083	LC537SP 00010	AnalysisComment			
MB 320-254499/1		537, 537		500 uL		Chlorine, ND			
LCS 320-254499/2		537, 537		500 uL	500 uL	Chlorine, ND			
LCSD 320-254499/3		537, 537		500 uL	500 uL	Chlorine, ND			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Batch Number: 254499 Batch Start Date: 10/24/18 08:21 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/24/18 16:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00083	LC537SP 00010	AnalysisComment			
320-44233-A-1	NAWC-101518-RW-335	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-2	NAWC-101518-FRB-335	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-3	NAWC-101518-RW-145	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-4	NAWC-101518-FRB-145	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-5	NAWC-101518-RW-146	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-6	NAWC-101518-FRB-146	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-7	NAWC-101518-RW-161	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-8	NAWC-101518-FRB-161	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-9	NAWC-101518-RW-162	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-10	NAWC-101518-FRB-162	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-11	NAWC-101518-RW-260	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-12	NAWC-101518-FRB-260	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-13	NAWC-101518-RW-362	537, 537	T	500 uL		Chlorine, ND			
320-44233-A-14	NAWC-101518-FRB-362	537, 537	T	500 uL		Chlorine, ND			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44233-1

SDG No.:

Batch Number: 254499 Batch Start Date: 10/24/18 08:21 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/24/18 16:00

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA labels SKD 10/24/18
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1408094
Manifold ID	Q, M
Methanol ID	1398284
pH Indicator ID	4390-01
Pipette ID	I 46162G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	MYV
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	MYV
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	MYV
SPE Cartridge Lot ID	6413968-03, 6413968-05
Trizma ID	SLBR5241V
Reagent Water ID	10/20/18

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

PFAS Calibration Calculations:

Initial Calibration 10/25/2018
Instrument A8_N

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
0.025	11946	940209	2.5	1.27057	1.2693
0.0501	24097	943285	2.5	1.27474	1.276
0.25	104050	966840	2.5	1.07619	1.0751
1	394334	904232	2.5	1.09025	1.0892
2.5	1049529	943717	2.5	1.11212	1.111
5	2201725	993600	2.5	1.10795	1.1068
10	4298280	992963	2.5	1.08219	1.0811
			Average	1.14486	1.1441
			Standard Deviation	0.0883	
			RSD	0.0771	
			%RSD	7.70874	7.8

Continuing Calibration 10/26/2018 @ 7:44
PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
0.0501	27858	962543	2.5	1.4442	26.231601	1.446	26.4

Sample Identification NAWC-101518-RW-335
Compound PFOA

Compound Area	261662	Average RRF	1.144
Internal Standard Amount (ng)	2.5	Sample Volume(ml)	245.9
Dilution Factor	1	Volume Extract (ml)	10
Internal Standard Area	1220412		
Concentration	19.0542 ng/L		
Reported Result	19 ng/L		

Surrogate PFHxA

Compound Area	1228086		
Internal Standard Amount (ng)	2.5		
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1220412	Injection Volume (µl	1
Average RRF	0.9888		
Concentration	2.5442		
Surrogate %R	101.77	Spike amount	2.5

LCS %R 320-254499/2-A

PFOA	Spike amount	LCS concentration
96.50	200	193

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20181026-66639.b\2018.10.25_537B_010.d
Lims ID: 320-44233-A-1-A
Client ID: NAWC-101518-RW-335
Sample Type: Client
Inject. Date: 26-Oct-2018 08:28:46 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-44233-a-1-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20181026-66639.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 26-Oct-2018 15:29:10 Calib Date: 25-Oct-2018 15:43:40
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20181025-66581.b\2018.10.25_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: CTX0326

First Level Reviewer: barnettj Date: 26-Oct-2018 14:54:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.545	1.545	0.0	1.000	49067	0.1018		16.2	
298.90 > 99.00	1.545	1.545	0.0	1.000	33914		1.45(0.00-0.00)	16.8	
13 Perfluorohexanoic acid									
313.00 > 269.00	1.803	1.819	-0.016	0.700	121260	0.2794		30.0	
313.00 > 119.00	1.803	1.819	-0.016	0.700	15043		8.06(0.00-0.00)	32.2	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.819	1.835	-0.016	1.000	1228086	2.54		5825	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.189	2.205	-0.016	1.000	111679	0.2102		16.9	
363.00 > 169.00	2.189	2.205	-0.016	1.000	35369		3.16(0.00-0.00)	45.1	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.221	2.221	0.0	1.000	155449	0.2396		126	
399.00 > 99.00	2.221	2.221	0.0	1.000	49449		3.14(0.00-0.00)	39.1	
* 5 13C2 PFOA									
415.00 > 370.00	2.575	2.591	-0.016		1220412	2.50		6738	
6 Perfluorooctanoic acid									M
413.00 > 369.00	2.575	2.591	-0.016	1.000	261662	0.4685		36.8	
413.00 > 169.00	2.575	2.591	-0.016	1.000	156273		1.67(0.00-0.00)	186	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.962	2.978	-0.016	1.000	20889	0.0510		2.9	
463.00 > 169.00	2.962	2.978	-0.016	1.000	5470		3.82(0.00-0.00)	27.3	
* 7 13C4 PFOS									
503.00 > 80.00	2.962	2.978	-0.016		1018058	2.39		1989	
8 Perfluorooctanesulfonic acid									M
499.00 > 80.00	2.962	3.010	-0.048	1.000	222569	0.4680		64.6	
499.00 > 99.00	2.962	3.010	-0.048	1.000	43366		5.13(0.00-0.00)	64.0	M
$ 10 13C2 PFDA									
515.00 > 470.00	3.332	3.332	0.0	1.000	825558	2.45		5223	

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N

WARRINGTON

WARWICK

NORTHAMPTON

IVYLAND

WARMINSTER

HAGS

NASJRB
Willow Grove

HORSHAM

HATBORO

UPPER SOUTHAMPTON

UPPER MORELAND

LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- FORMER NAWC WARMINSTER
- TOWNSHIP BOUNDARY

3,000 1,500 0 3,000 6,000
Feet

NAVFAC

PFC SAMPLE RESULTS MAP
FORMER NAWC WAMINSTER
MONTGOMERY COUNTY, PENNSYLVANIA

SCALE	AS NOTED
FILE	NAWC
REV	0
DATE	01/24/19
FIGURE NUMBER	FIGURE 1