

TECHNICAL MEMORANDUM

DATE: December 1, 2017
TO: John Blee
Alaska Department of Environmental Conservation
FROM: Bob Allen, Project Manager
Bristol Environmental Remediation Services, LLC
RE: Kotzebue Fuel Hydrant Removal Technical Memorandum
Alaska Airlines Terminal, Kotzebue, Alaska

Bristol Environmental Remediation Services, LLC (Bristol), has prepared this technical memorandum (tech memo) to document the removal of a fuel hydrant at the Alaska Airlines Terminal Kotzebue, Alaska. The purpose of this tech memo is to document the hydrant removal and soil sampling activities.

BACKGROUND

A fuel hydrant that was part of a fueling system associated with an above ground storage tank that was previously removed remained in place in the Alaska Airlines apron. The fuel hydrant is located in an area of a known fuel release associated with a previous underground storage tank fueling system. The scope of work for this project was to remove the hydrant vault, collect two soil samples from beneath the vault, grout the hydrants, backfill the excavation, and repave the excavation. If contaminated soil was encountered it would be used as backfill. The location of the hydrant is shown on Figure 1 and is included as Attachment 1.

HYDRANT REMOVAL

Bristol personnel traveled to Kotzebue on August 16, 2017 and met with Drake Construction (Drake) who was performing the fuel hydrant vault removal. On August 15, 2017 Drake had cut the pavement around the vault. On August 16, 2017 Drake removed the pavement from around the vault and removed the top of the vault. Water was present in the vault. The hydrants were previously grouted. The vault was removed and during the removal petroleum contaminated soil was encountered based on observed odor and PID screening. Two soil samples were collected from the base of the excavation at a depth of approximately three feet. During backfilling some of the saturated soil was removed because it was not suitable for reaching the desired compaction density. A cubic yard of contaminated saturated soil was removed and placed in a super sack. Groundwater was not encountered. Additional clean fill was brought in to fill the excavation. The backfill was compacted in lifts. Once the backfill reached the depth of the bottom of the existing pavement cold patch asphalt was used to finish the excavation. Photos of the removal are presented in Attachment 2.

SOIL SAMPLING

Heated headspace field screening samples were collected. Headspace screening sample collection entailed filling (one-third to one-half) a small, re-sealable plastic bag with the sample and quickly sealing the bag. The sample was agitated for 15 seconds and allowed to warm for at least 10 minutes, but for no more than one hour to a temperature of at least 40 °F. The bag was agitated again for 15 seconds and then quickly opened and the tip of a calibrated PID was inserted. The reading was documented in the field notebook.

Two confirmation samples were collected from the bottom of the excavation at a depth of approximately three feet below ground surface.

Confirmation samples were submitted to TestAmerica in Tacoma, Washington, and analyzed for gasoline range organics (GRO) by AK 101, diesel range organics (DRO) by AK 102, RRO by AK 103, volatile organic compounds by SW 8260C, polycyclic aromatic hydrocarbons (PAHs) by SW8270-SIM, and lead by SW6010.

RESULTS

Analytical results were compared to ADEC Method Two Soil Cleanup Levels for the lowest value of the under 40-inch Zone – “Human Health” or “Migration to Groundwater” exposure pathways. The complete analytical data package is presented in Attachment 3.

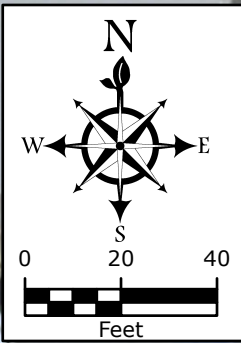
DRO was present in the samples at concentrations of 3,500 and 11,000 milligrams per kilogram (mg/kg). GRO was present in the samples at concentrations of 400 and 690 mg/kg. The DRO and GRO concentration all exceed the ADEC cleanup levels.

SOIL DISPOSAL

The excavated soil was placed in a one cubic yard super sack. The soil was transported to Anchorage via Northern Air Cargo where NRC-Alaska received the soil and disposed of the soil. The certificate of disposal is in Attachment 4.

ATTACHMENT 1

Figure



Alaska Airlines Terminal

Fuel Hydrants

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend


 Fuel Hydrant

FIGURE 1
KOTZEBUE, AK
ALASKA AIRLINES FUEL HYDRANT REMOVAL
SITE MAP

Bristol
 ENVIRONMENTAL
 REMEDIATION SERVICES, LLC
 Phone (907)563-0013 Fax (907)563-6713

DATUM: NAD83
 PROJECTION: SP MT FT
 Project No. 34180036

DATE: 12/1/2017
 DWN. NAP
 SCALE 1" = 40'
 APPRVD. BA

SHEET
 1
 of
 1

ATTACHMENT 2

Photo Log



Photograph 1: Removing hydrant lid
Date: 8/16/2017

Direction: east
Photographer: B. Allen



Photograph 2: View inside vault
Date: 8/16/2017

Direction: down
Photographer: B. Allen



Photograph 3: Vault removal
Date: 8/16/2017

Direction: down
Photographer: B. Allen



Photograph 4: Bottom of vault removal
Date: 8/16/2017

Direction: down
Photographer: B. Allen



Photograph 5: Bottom of vault removed
Date: 8/16/2017

Direction: down
Photographer: B. Allen



Photograph 6: Backfilling
Date: 8/16/2017

Direction: east
Photographer: B. Allen

ATTACHMENT 3

Analytical Data

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-70715-1
Client Project/Site: Kotzebue AK

For:
Bristol Env. Remediation Services LLC
111 W 16th Ave
Suite 301
Anchorage, Alaska 99501

Attn: Bob Allen



Authorized for release by:
9/8/2017 4:23:43 PM
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Job ID: 580-70715-1

Laboratory: TestAmerica Seattle

Narrative

Receipt

The samples were received on 8/21/2017 10:23 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 6.4° C.

Receipt Exceptions

The analytical methods were confirmed with the client on the phone on August 22, 2017 to be 6010C for lead and 8270D_SIM for the PAHs. AA-1 (580-70715-1), AA-2 (580-70715-2) and TB-1 (580-70715-3)

GC/MS VOA

Method(s) 8260C: The surrogate recovery for the following sample was outside control limits: AA-1 (580-70715-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 580-254780 recovered outside acceptance criteria, low biased, for 1,2,3-Trichlorobenzene, Dichlorodifluoromethane and Naphthalene. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method(s) 8260C: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch preparation batch 580-254645 and 580-254645 and analytical batch 580-254780 recovered outside control limits for the following analytes: 1,2,3-Trichlorobenzene and Naphthalene.

Method(s) 8260C: The following sample was re-analyzed due to quality control deficiencies in the initial analysis. TB-1 (580-70715-3)

Method(s) 8260C: The following samples was analyzed at reduced volume due to high concentrations of target analytes: AA-1 (580-70715-1) and AA-2 (580-70715-2). The calculation was completed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

Method(s) AK101: The method blank for preparation batch 580-255472 and 580-255472 and analytical batch 580-255494 contained Gasoline Range Organics (GRO)-C6-C10 above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) AK101: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 580-255472 and analytical batch 580-255494 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) AK101: The surrogate recovery for the following samples was outside control limits: AA-1 (580-70715-1), AA-2 (580-70715-2) and (580-70711-A-10-J). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

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

GC/MS Semi VOA

Method(s) 8270D SIM: The following sample was diluted due to the nature of the sample matrix: AA-1 (580-70715-1). Elevated reporting limits (RLs) are provided.

Method(s) 8270D SIM: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 580-254631 and analytical batch 580-254804 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

GC Semi VOA

Method(s) AK102 & 103: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch preparation batch 580-254318 and analytical batch 580-254522 recovered outside control limits for the following analytes: DRO (nC10-<nC25) and nC25-<nC36. The percent recovery (%R) was within limits, however, therefore the results are reported.

Case Narrative

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Job ID: 580-70715-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

Method(s) AK102 & 103: Due to the high concentration of nC25-nC36, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 580-254318 and analytical batch 580-254522 could not be evaluated for accuracy and precision.

Method(s) AK102 & 103: Due to the high concentration of nC25-nC36, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 580-254318 and analytical batch 580-254522 could not be evaluated for accuracy and precision.

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

Metals

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

General Chemistry

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

Organic Prep

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

Definitions/Glossary

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
X	Surrogate is outside control limits

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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)

Client Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-1

Date Collected: 08/16/17 12:00

Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-1

Matrix: Solid

Percent Solids: 91.8

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		190	43	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Chloromethane	ND		95	9.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Vinyl chloride	ND		140	25	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Bromomethane	ND		190	13	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Chloroethane	ND		380	15	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Trichlorofluoromethane	ND		190	36	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,1-Dichloroethene	ND		19	4.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Carbon disulfide	ND		57	8.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Acetone	ND		760	160	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Methylene Chloride	ND		240	61	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
trans-1,2-Dichloroethene	ND		38	14	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,1-Dichloroethane	ND		38	4.0	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
2,2-Dichloropropane	ND		38	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
2-Butanone	ND		570	180	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
cis-1,2-Dichloroethene	ND		38	4.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Bromochloromethane	ND		38	5.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Chloroform	ND		38	4.0	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,1,1-Trichloroethane	ND		38	3.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Carbon tetrachloride	ND		19	3.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,1-Dichloropropene	ND		38	5.0	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Benzene	ND		19	8.1	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2-Dichloroethane	ND		19	5.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Trichloroethene	ND		24	7.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2-Dichloropropane	ND		19	2.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Dibromomethane	ND		57	7.0	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Bromodichloromethane	ND		38	3.5	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
cis-1,3-Dichloropropene	ND		19	3.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
4-Methyl-2-pentanone	ND		190	14	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Toluene	ND		140	30	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
trans-1,3-Dichloropropene	ND		38	6.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,1,2-Trichloroethane	ND		19	2.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Tetrachloroethene	ND		19	5.0	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,3-Dichloropropane	ND		38	5.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
2-Hexanone	ND		190	34	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Dibromochloromethane	ND		38	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2-Dibromoethane	ND		19	3.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Chlorobenzene	ND		38	9.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Ethylbenzene	ND		38	8.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,1,1,2-Tetrachloroethane	ND		38	10	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
m-Xylene & p-Xylene	1200		190	31	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
o-Xylene	1200		38	13	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Styrene	210		38	5.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Bromoform	ND		190	25	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Isopropylbenzene	ND		38	8.1	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Bromobenzene	ND		95	16	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
N-Propylbenzene	52		38	6.4	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,1,2,2-Tetrachloroethane	ND		19	2.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
4-Chlorotoluene	ND		38	9.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
t-Butylbenzene	ND		38	7.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1

TestAmerica Seattle

Client Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-1

Date Collected: 08/16/17 12:00

Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-1

Matrix: Solid

Percent Solids: 91.8

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	ND		38	7.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,3-Dichlorobenzene	ND		57	5.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
4-Isopropyltoluene	2100		38	7.4	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,4-Dichlorobenzene	ND		57	10	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
n-Butylbenzene	3300		38	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2-Dichlorobenzene	ND		38	4.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2-Dibromo-3-Chloropropane	ND		240	93	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2,4-Trichlorobenzene	ND		57	15	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2,3-Trichlorobenzene	ND	*	38	14	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Hexachlorobutadiene	ND		95	17	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
Methyl tert-butyl ether	ND		38	5.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
1,2,3-Trichloropropane	ND		38	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1
2-Chlorotoluene	ND		38	8.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		75 - 120	08/25/17 11:19	08/25/17 20:01	1
4-Bromofluorobenzene (Surr)	80		47 - 150	08/25/17 11:19	08/25/17 20:01	1
Dibromofluoromethane (Surr)	102		80 - 118	08/25/17 11:19	08/25/17 20:01	1
Trifluorotoluene (Surr)	151	X	60 - 150	08/25/17 11:19	08/25/17 20:01	1
1,2-Dichloroethane-d4 (Surr)	100		80 - 121	08/25/17 11:19	08/25/17 20:01	1

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	13000		200	31	ug/Kg	☼	08/25/17 11:19	08/30/17 19:16	1
Naphthalene	8600		310	65	ug/Kg	☼	08/25/17 11:19	08/30/17 19:16	1
1,3,5-Trimethylbenzene	12000		200	39	ug/Kg	☼	08/25/17 11:19	08/30/17 19:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		75 - 120	08/25/17 11:19	08/30/17 19:16	1
4-Bromofluorobenzene (Surr)	105		47 - 150	08/25/17 11:19	08/30/17 19:16	1
Dibromofluoromethane (Surr)	103		80 - 118	08/25/17 11:19	08/30/17 19:16	1
Trifluorotoluene (Surr)	121		60 - 150	08/25/17 11:19	08/30/17 19:16	1
1,2-Dichloroethane-d4 (Surr)	97		80 - 121	08/25/17 11:19	08/30/17 19:16	1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	17000		26	3.3	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
2-Methylnaphthalene	20000		26	2.4	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Acenaphthene	220		26	3.2	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Acenaphthylene	200		26	2.6	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Anthracene	11	J	26	3.2	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Benzo[a]anthracene	8.2	J	26	4.0	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Benzo[a]pyrene	7.8	J	26	2.1	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Benzo[b]fluoranthene	12	J	26	3.1	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Benzo[g,h,i]perylene	8.4	J	26	2.6	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Benzo[k]fluoranthene	ND		26	3.2	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Chrysene	29		26	7.9	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Dibenz(a,h)anthracene	ND		26	3.8	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Fluoranthene	23	J	26	7.4	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Fluorene	420		26	2.6	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5

TestAmerica Seattle

Client Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-1

Lab Sample ID: 580-70715-1

Date Collected: 08/16/17 12:00

Matrix: Solid

Date Received: 08/21/17 10:23

Percent Solids: 91.8

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	ND		26	3.2	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Naphthalene	6300		26	4.2	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Phenanthrene	240		26	3.6	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Pyrene	24 J		26	5.1	ug/Kg	☼	08/25/17 08:45	08/28/17 14:39	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	70		68 - 138				08/25/17 08:45	08/28/17 14:39	5

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	400	B	3.8	1.1	mg/Kg	☼	09/06/17 15:41	09/06/17 22:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	193	X	50 - 150				09/06/17 15:41	09/06/17 22:00	1
4-Bromofluorobenzene (Surr)	1029	X	50 - 150				09/06/17 15:41	09/06/17 22:00	1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	3500	*	100	32	mg/Kg	☼	08/22/17 13:45	08/25/17 02:31	5
RRO (nC25-nC36)	270	*	260	57	mg/Kg	☼	08/22/17 13:45	08/25/17 02:31	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	82		50 - 150				08/22/17 13:45	08/25/17 02:31	5
n-Triacontane-d62	104		50 - 150				08/22/17 13:45	08/25/17 02:31	5

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	4.9		1.3	0.19	mg/Kg	☼	09/01/17 18:15	09/05/17 14:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	91.8		0.1	0.1	%			08/23/17 13:26	1
Percent Moisture	8.2		0.1	0.1	%			08/23/17 13:26	1

Client Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-2
Date Collected: 08/16/17 12:30
Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-2
Matrix: Solid
Percent Solids: 89.4

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		160	36	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Chloromethane	ND		79	7.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Vinyl chloride	ND		120	21	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Bromomethane	ND		160	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Chloroethane	ND		310	13	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Trichlorofluoromethane	ND		160	30	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,1-Dichloroethene	ND		16	3.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Carbon disulfide	ND		47	7.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Acetone	ND		630	140	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Methylene Chloride	ND		200	51	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
trans-1,2-Dichloroethene	ND		31	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,1-Dichloroethane	ND		31	3.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
2,2-Dichloropropane	ND		31	9.5	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
2-Butanone	ND		470	150	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
cis-1,2-Dichloroethene	ND		31	3.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Bromochloromethane	ND		31	4.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Chloroform	ND		31	3.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,1,1-Trichloroethane	ND		31	2.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Carbon tetrachloride	ND		16	3.0	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,1-Dichloropropene	ND		31	4.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Benzene	ND		16	6.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2-Dichloroethane	ND		16	4.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Trichloroethene	ND		20	6.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2-Dichloropropane	ND		16	1.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Dibromomethane	ND		47	5.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Bromodichloromethane	ND		31	2.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
cis-1,3-Dichloropropene	ND		16	3.1	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
4-Methyl-2-pentanone	ND		160	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Toluene	ND		120	25	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
trans-1,3-Dichloropropene	ND		31	5.5	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,1,2-Trichloroethane	ND		16	2.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Tetrachloroethene	ND		16	4.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,3-Dichloropropane	ND		31	4.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
2-Hexanone	ND		160	28	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Dibromochloromethane	ND		31	8.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2-Dibromoethane	ND		16	2.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Chlorobenzene	ND		31	7.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Ethylbenzene	ND		31	7.2	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,1,1,2-Tetrachloroethane	ND		31	8.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
m-Xylene & p-Xylene	260		160	26	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
o-Xylene	510		31	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Styrene	77		31	4.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Bromoform	ND		160	21	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Isopropylbenzene	ND		31	6.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Bromobenzene	ND		79	13	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
N-Propylbenzene	ND		31	5.4	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,1,2,2-Tetrachloroethane	ND		16	1.8	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
4-Chlorotoluene	ND		31	7.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
t-Butylbenzene	ND		31	6.1	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1

TestAmerica Seattle

Client Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-2
Date Collected: 08/16/17 12:30
Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-2
Matrix: Solid
Percent Solids: 89.4

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	1100		31	4.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
sec-Butylbenzene	ND		31	6.4	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,3-Dichlorobenzene	ND		47	4.6	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
4-Isopropyltoluene	210		31	6.1	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,4-Dichlorobenzene	ND		47	8.5	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
n-Butylbenzene	4400		31	9.3	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2-Dichlorobenzene	ND		31	3.5	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2-Dibromo-3-Chloropropane	ND		200	77	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2,4-Trichlorobenzene	ND		47	12	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2,3-Trichlorobenzene	ND *		31	11	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Hexachlorobutadiene	ND		79	14	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
Methyl tert-butyl ether	ND		31	4.7	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
1,2,3-Trichloropropane	ND		31	9.1	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1
2-Chlorotoluene	ND		31	6.9	ug/Kg	☼	08/25/17 11:19	08/25/17 20:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	105		75 - 120	08/25/17 11:19	08/25/17 20:27	1
<i>4-Bromofluorobenzene (Surr)</i>	77		47 - 150	08/25/17 11:19	08/25/17 20:27	1
<i>Dibromofluoromethane (Surr)</i>	103		80 - 118	08/25/17 11:19	08/25/17 20:27	1
<i>Trifluorotoluene (Surr)</i>	129		60 - 150	08/25/17 11:19	08/25/17 20:27	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	100		80 - 121	08/25/17 11:19	08/25/17 20:27	1

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	3300		250	54	ug/Kg	☼	08/25/17 11:19	08/30/17 19:42	1
1,3,5-Trimethylbenzene	24000		170	32	ug/Kg	☼	08/25/17 11:19	08/30/17 19:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	97		75 - 120	08/25/17 11:19	08/30/17 19:42	1
<i>4-Bromofluorobenzene (Surr)</i>	109		47 - 150	08/25/17 11:19	08/30/17 19:42	1
<i>Dibromofluoromethane (Surr)</i>	103		80 - 118	08/25/17 11:19	08/30/17 19:42	1
<i>Trifluorotoluene (Surr)</i>	116		60 - 150	08/25/17 11:19	08/30/17 19:42	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	96		80 - 121	08/25/17 11:19	08/30/17 19:42	1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	20000		23	2.9	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
2-Methylnaphthalene	6700		23	2.1	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Acenaphthene	320		23	2.8	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Acenaphthylene	730		23	2.3	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Anthracene	47		23	2.8	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Benzo[a]anthracene	33		23	3.6	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Benzo[a]pyrene	22 J		23	1.9	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Benzo[b]fluoranthene	28		23	2.8	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Benzo[g,h,i]perylene	ND		23	2.3	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Benzo[k]fluoranthene	3.9 J		23	2.8	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Chrysene	24		23	7.0	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Dibenz(a,h)anthracene	ND		23	3.4	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Fluoranthene	37		23	6.5	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Fluorene	1600		23	2.3	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5

TestAmerica Seattle

Client Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-2

Date Collected: 08/16/17 12:30

Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-2

Matrix: Solid

Percent Solids: 89.4

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	ND		23	2.8	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Naphthalene	2200		23	3.7	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Phenanthrene	480		23	3.2	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Pyrene	40		23	4.5	ug/Kg	☼	08/24/17 16:40	08/27/17 03:11	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	100		68 - 138				08/24/17 16:40	08/27/17 03:11	5

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	690	B	3.1	0.94	mg/Kg	☼	09/06/17 15:41	09/06/17 22:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	166	X	50 - 150				09/06/17 15:41	09/06/17 22:30	1
4-Bromofluorobenzene (Surr)	1155	X	50 - 150				09/06/17 15:41	09/06/17 22:30	1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	11000	*	200	60	mg/Kg	☼	08/22/17 13:45	08/25/17 02:51	10
RRO (nC25-nC36)	500	*	490	110	mg/Kg	☼	08/22/17 13:45	08/25/17 02:51	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	125		50 - 150				08/22/17 13:45	08/25/17 02:51	10
n-Triacontane-d62	127		50 - 150				08/22/17 13:45	08/25/17 02:51	10

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	3.9		1.0	0.15	mg/Kg	☼	09/01/17 18:15	09/05/17 14:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	89.4		0.1	0.1	%			08/23/17 13:26	1
Percent Moisture	10.6		0.1	0.1	%			08/23/17 13:26	1

Client Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: TB-1

Date Collected: 08/16/17 13:00

Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-3

Matrix: Solid

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		200	46	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Chloromethane	ND		100	10	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Vinyl chloride	ND		150	26	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Bromomethane	ND		200	13	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Chloroethane	ND		400	16	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Trichlorofluoromethane	ND		200	38	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,1-Dichloroethene	ND		20	4.9	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Carbon disulfide	ND		60	9.3	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Acetone	ND		800	170	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Methylene Chloride	ND		250	65	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
trans-1,2-Dichloroethene	ND		40	15	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,1-Dichloroethane	ND		40	4.2	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
2,2-Dichloropropane	ND		40	12	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
2-Butanone	ND		600	190	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
cis-1,2-Dichloroethene	ND		40	4.9	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Bromochloromethane	ND		40	6.2	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Chloroform	ND		40	4.2	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,1,1-Trichloroethane	ND		40	3.4	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Carbon tetrachloride	ND		20	3.8	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,1-Dichloropropene	ND		40	5.3	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Benzene	ND		20	8.6	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2-Dichloroethane	ND		20	5.5	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Trichloroethene	ND		25	8.0	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2-Dichloropropane	ND		20	2.4	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Dibromomethane	ND		60	7.4	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Bromodichloromethane	ND		40	3.7	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
cis-1,3-Dichloropropene	ND		20	4.0	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
4-Methyl-2-pentanone	ND		200	15	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Toluene	ND		150	32	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
trans-1,3-Dichloropropene	ND		40	7.0	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,1,2-Trichloroethane	ND		20	2.8	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Tetrachloroethene	ND		20	5.3	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,3-Dichloropropane	ND		40	5.5	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
2-Hexanone	ND		200	36	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Dibromochloromethane	ND		40	11	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2-Dibromoethane	ND		20	3.4	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Chlorobenzene	ND		40	9.8	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Ethylbenzene	ND		40	9.1	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,1,1,2-Tetrachloroethane	ND		40	11	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
m-Xylene & p-Xylene	ND		200	33	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
o-Xylene	ND		40	13	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Styrene	ND		40	6.1	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Bromoform	ND		200	26	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Isopropylbenzene	ND		40	8.6	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Bromobenzene	ND		100	17	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
N-Propylbenzene	ND		40	6.8	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,1,2,2-Tetrachloroethane	ND		20	2.3	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
4-Chlorotoluene	ND		40	9.8	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
t-Butylbenzene	ND		40	7.7	ug/Kg		08/25/17 11:19	08/25/17 20:53	1

TestAmerica Seattle

Client Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: TB-1

Lab Sample ID: 580-70715-3

Date Collected: 08/16/17 13:00

Matrix: Solid

Date Received: 08/21/17 10:23

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	ND		40	6.0	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
sec-Butylbenzene	ND		40	8.1	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,3-Dichlorobenzene	ND		60	5.9	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
4-Isopropyltoluene	ND		40	7.8	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,4-Dichlorobenzene	ND		60	11	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
n-Butylbenzene	ND		40	12	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2-Dichlorobenzene	ND		40	4.5	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2-Dibromo-3-Chloropropane	ND		250	98	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2,4-Trichlorobenzene	ND		60	15	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2,3-Trichlorobenzene	ND	*	40	14	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Hexachlorobutadiene	ND		100	18	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
Methyl tert-butyl ether	ND		40	6.0	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
1,2,3-Trichloropropane	ND		40	12	ug/Kg		08/25/17 11:19	08/25/17 20:53	1
2-Chlorotoluene	ND		40	8.8	ug/Kg		08/25/17 11:19	08/25/17 20:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		75 - 120	08/25/17 11:19	08/25/17 20:53	1
4-Bromofluorobenzene (Surr)	101		47 - 150	08/25/17 11:19	08/25/17 20:53	1
Dibromofluoromethane (Surr)	101		80 - 118	08/25/17 11:19	08/25/17 20:53	1
Trifluorotoluene (Surr)	91		60 - 150	08/25/17 11:19	08/25/17 20:53	1
1,2-Dichloroethane-d4 (Surr)	95		80 - 121	08/25/17 11:19	08/25/17 20:53	1

Method: 8260C - Volatile Organic Compounds by GC/MS - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		60	13	ug/Kg		08/25/17 11:19	08/30/17 17:08	1
1,3,5-Trimethylbenzene	ND		40	7.6	ug/Kg		08/25/17 11:19	08/30/17 17:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		75 - 120	08/25/17 11:19	08/30/17 17:08	1
4-Bromofluorobenzene (Surr)	102		47 - 150	08/25/17 11:19	08/30/17 17:08	1
Dibromofluoromethane (Surr)	103		80 - 118	08/25/17 11:19	08/30/17 17:08	1
Trifluorotoluene (Surr)	96		60 - 150	08/25/17 11:19	08/30/17 17:08	1
1,2-Dichloroethane-d4 (Surr)	99		80 - 121	08/25/17 11:19	08/30/17 17:08	1

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		4.0	1.2	mg/Kg		09/06/17 15:41	09/06/17 21:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	97		50 - 150	09/06/17 15:41	09/06/17 21:29	1
4-Bromofluorobenzene (Surr)	91		50 - 150	09/06/17 15:41	09/06/17 21:29	1

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-254645/1-A

Matrix: Solid

Analysis Batch: 254780

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 254645

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		200	46	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Chloromethane	ND		100	10	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Vinyl chloride	ND		150	26	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Bromomethane	ND		200	13	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Chloroethane	ND		400	16	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Trichlorofluoromethane	ND		200	38	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,1-Dichloroethene	ND		20	4.9	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Carbon disulfide	ND		60	9.3	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Acetone	ND		800	170	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Methylene Chloride	ND		250	65	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
trans-1,2-Dichloroethene	ND		40	15	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,1-Dichloroethane	ND		40	4.2	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
2,2-Dichloropropane	ND		40	12	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
2-Butanone	ND		600	190	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
cis-1,2-Dichloroethene	ND		40	4.9	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Bromochloromethane	ND		40	6.2	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Chloroform	ND		40	4.2	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,1,1-Trichloroethane	ND		40	3.4	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Carbon tetrachloride	ND		20	3.8	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,1-Dichloropropene	ND		40	5.3	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Benzene	ND		20	8.6	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2-Dichloroethane	ND		20	5.5	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Trichloroethene	ND		25	8.0	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2-Dichloropropane	ND		20	2.4	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Dibromomethane	ND		60	7.4	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Bromodichloromethane	ND		40	3.7	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
cis-1,3-Dichloropropene	ND		20	4.0	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
4-Methyl-2-pentanone	ND		200	15	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Toluene	ND		150	32	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
trans-1,3-Dichloropropene	ND		40	7.0	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,1,2-Trichloroethane	ND		20	2.8	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Tetrachloroethene	ND		20	5.3	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,3-Dichloropropane	ND		40	5.5	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
2-Hexanone	ND		200	36	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Dibromochloromethane	ND		40	11	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2-Dibromoethane	ND		20	3.4	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Chlorobenzene	ND		40	9.8	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Ethylbenzene	ND		40	9.1	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,1,1,2-Tetrachloroethane	ND		40	11	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
m-Xylene & p-Xylene	ND		200	33	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
o-Xylene	ND		40	13	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Styrene	ND		40	6.1	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Bromoform	ND		200	26	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Isopropylbenzene	ND		40	8.6	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Bromobenzene	ND		100	17	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
N-Propylbenzene	ND		40	6.8	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,1,2,2-Tetrachloroethane	ND		20	2.3	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
4-Chlorotoluene	ND		40	9.8	ug/Kg		08/25/17 11:18	08/25/17 14:27	1

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 580-254645/1-A
Matrix: Solid
Analysis Batch: 254780

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254645

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
t-Butylbenzene	ND		40	7.7	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2,4-Trimethylbenzene	ND		40	6.0	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
sec-Butylbenzene	ND		40	8.1	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,3-Dichlorobenzene	ND		60	5.9	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
4-Isopropyltoluene	ND		40	7.8	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,4-Dichlorobenzene	ND		60	11	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
n-Butylbenzene	ND		40	12	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2-Dichlorobenzene	ND		40	4.5	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2-Dibromo-3-Chloropropane	ND		250	98	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2,4-Trichlorobenzene	ND		60	15	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2,3-Trichlorobenzene	ND		40	14	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Hexachlorobutadiene	ND		100	18	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Naphthalene	ND		60	13	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
Methyl tert-butyl ether	ND		40	6.0	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,2,3-Trichloropropane	ND		40	12	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
1,3,5-Trimethylbenzene	ND		40	7.6	ug/Kg		08/25/17 11:18	08/25/17 14:27	1
2-Chlorotoluene	ND		40	8.8	ug/Kg		08/25/17 11:18	08/25/17 14:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		75 - 120	08/25/17 11:18	08/25/17 14:27	1
4-Bromofluorobenzene (Surr)	97		47 - 150	08/25/17 11:18	08/25/17 14:27	1
Dibromofluoromethane (Surr)	102		80 - 118	08/25/17 11:18	08/25/17 14:27	1
Trifluorotoluene (Surr)	102		60 - 150	08/25/17 11:18	08/25/17 14:27	1
1,2-Dichloroethane-d4 (Surr)	103		80 - 121	08/25/17 11:18	08/25/17 14:27	1

Lab Sample ID: LCS 580-254645/2-A
Matrix: Solid
Analysis Batch: 254780

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254645

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Dichlorodifluoromethane	800	706		ug/Kg		88	33 - 137
Chloromethane	800	893		ug/Kg		112	53 - 145
Vinyl chloride	800	869		ug/Kg		109	28 - 150
Bromomethane	800	871		ug/Kg		109	57 - 146
Chloroethane	800	883		ug/Kg		110	55 - 150
Trichlorofluoromethane	800	902		ug/Kg		113	73 - 143
1,1-Dichloroethene	800	825		ug/Kg		103	77 - 137
Carbon disulfide	800	851		ug/Kg		106	68 - 150
Acetone	4000	4350		ug/Kg		109	48 - 150
Methylene Chloride	800	834		ug/Kg		104	66 - 150
trans-1,2-Dichloroethene	800	825		ug/Kg		103	71 - 150
1,1-Dichloroethane	800	889		ug/Kg		111	70 - 141
2,2-Dichloropropane	800	896		ug/Kg		112	54 - 150
2-Butanone	4000	3950		ug/Kg		99	51 - 146
cis-1,2-Dichloroethene	800	801		ug/Kg		100	74 - 138
Bromochloromethane	800	850		ug/Kg		106	76 - 150
Chloroform	800	883		ug/Kg		110	80 - 133
1,1,1-Trichloroethane	800	892		ug/Kg		112	78 - 150

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-254645/2-A
Matrix: Solid
Analysis Batch: 254780

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254645

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon tetrachloride	800	891		ug/Kg		111	77 - 150
1,1-Dichloropropene	800	844		ug/Kg		105	76 - 150
Benzene	800	852		ug/Kg		107	79 - 135
1,2-Dichloroethane	800	864		ug/Kg		108	68 - 150
Trichloroethene	800	879		ug/Kg		110	80 - 144
1,2-Dichloropropane	800	894		ug/Kg		112	75 - 136
Dibromomethane	800	856		ug/Kg		107	72 - 150
Bromodichloromethane	800	849		ug/Kg		106	79 - 132
cis-1,3-Dichloropropene	800	820		ug/Kg		103	70 - 122
4-Methyl-2-pentanone	4000	4080		ug/Kg		102	64 - 125
Toluene	800	824		ug/Kg		103	80 - 125
trans-1,3-Dichloropropene	800	795		ug/Kg		99	75 - 121
1,1,2-Trichloroethane	800	815		ug/Kg		102	73 - 123
Tetrachloroethene	800	824		ug/Kg		103	61 - 150
1,3-Dichloropropane	800	811		ug/Kg		101	75 - 120
2-Hexanone	4000	3990		ug/Kg		100	63 - 125
Dibromochloromethane	800	802		ug/Kg		100	75 - 125
1,2-Dibromoethane	800	834		ug/Kg		104	77 - 123
Chlorobenzene	800	838		ug/Kg		105	80 - 123
Ethylbenzene	800	825		ug/Kg		103	80 - 127
1,1,1,2-Tetrachloroethane	800	819		ug/Kg		102	79 - 128
m-Xylene & p-Xylene	800	772		ug/Kg		96	80 - 128
o-Xylene	800	816		ug/Kg		102	80 - 125
Styrene	800	816		ug/Kg		102	79 - 129
Bromoform	800	792		ug/Kg		99	65 - 134
Isopropylbenzene	800	832		ug/Kg		104	80 - 128
Bromobenzene	800	804		ug/Kg		101	68 - 126
N-Propylbenzene	800	843		ug/Kg		105	74 - 127
1,1,2,2-Tetrachloroethane	800	747		ug/Kg		93	57 - 127
4-Chlorotoluene	800	795		ug/Kg		99	68 - 126
t-Butylbenzene	800	827		ug/Kg		103	71 - 127
1,2,4-Trimethylbenzene	800	806		ug/Kg		101	73 - 127
sec-Butylbenzene	800	811		ug/Kg		101	70 - 129
1,3-Dichlorobenzene	800	811		ug/Kg		101	52 - 150
4-Isopropyltoluene	800	814		ug/Kg		102	71 - 129
1,4-Dichlorobenzene	800	801		ug/Kg		100	71 - 123
n-Butylbenzene	800	795		ug/Kg		99	71 - 130
1,2-Dichlorobenzene	800	767		ug/Kg		96	67 - 126
1,2-Dibromo-3-Chloropropane	800	686		ug/Kg		86	53 - 129
1,2,4-Trichlorobenzene	800	675		ug/Kg		84	68 - 131
1,2,3-Trichlorobenzene	800	488		ug/Kg		61	60 - 129
Hexachlorobutadiene	800	828		ug/Kg		103	65 - 136
Naphthalene	800	497		ug/Kg		62	61 - 124
Methyl tert-butyl ether	800	842		ug/Kg		105	69 - 150
1,2,3-Trichloropropane	800	753		ug/Kg		94	59 - 127
1,3,5-Trimethylbenzene	800	820		ug/Kg		102	72 - 128
2-Chlorotoluene	800	819		ug/Kg		102	71 - 127

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-254645/2-A
Matrix: Solid
Analysis Batch: 254780

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254645

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	99		75 - 120
4-Bromofluorobenzene (Surr)	100		47 - 150
Dibromofluoromethane (Surr)	102		80 - 118
Trifluorotoluene (Surr)	101		60 - 150
1,2-Dichloroethane-d4 (Surr)	100		80 - 121

Lab Sample ID: LCSD 580-254645/3-A
Matrix: Solid
Analysis Batch: 254780

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 254645

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dichlorodifluoromethane	800	725		ug/Kg		91	33 - 137	3	30
Chloromethane	800	936		ug/Kg		117	53 - 145	5	28
Vinyl chloride	800	893		ug/Kg		112	28 - 150	3	29
Bromomethane	800	924		ug/Kg		116	57 - 146	6	38
Chloroethane	800	931		ug/Kg		116	55 - 150	5	40
Trichlorofluoromethane	800	948		ug/Kg		119	73 - 143	5	26
1,1-Dichloroethene	800	941		ug/Kg		118	77 - 137	13	23
Carbon disulfide	800	932		ug/Kg		116	68 - 150	9	30
Acetone	4000	4210		ug/Kg		105	48 - 150	3	40
Methylene Chloride	800	936		ug/Kg		117	66 - 150	12	40
trans-1,2-Dichloroethene	800	877		ug/Kg		110	71 - 150	6	22
1,1-Dichloroethane	800	940		ug/Kg		117	70 - 141	6	30
2,2-Dichloropropane	800	906		ug/Kg		113	54 - 150	1	28
2-Butanone	4000	4040		ug/Kg		101	51 - 146	2	31
cis-1,2-Dichloroethene	800	867		ug/Kg		108	74 - 138	8	14
Bromochloromethane	800	919		ug/Kg		115	76 - 150	8	15
Chloroform	800	915		ug/Kg		114	80 - 133	4	13
1,1,1-Trichloroethane	800	940		ug/Kg		118	78 - 150	5	14
Carbon tetrachloride	800	933		ug/Kg		117	77 - 150	5	12
1,1-Dichloropropene	800	909		ug/Kg		114	76 - 150	8	11
Benzene	800	892		ug/Kg		111	79 - 135	5	10
1,2-Dichloroethane	800	916		ug/Kg		114	68 - 150	6	17
Trichloroethene	800	955		ug/Kg		119	80 - 144	8	10
1,2-Dichloropropane	800	935		ug/Kg		117	75 - 136	4	10
Dibromomethane	800	921		ug/Kg		115	72 - 150	7	14
Bromodichloromethane	800	935		ug/Kg		117	79 - 132	10	10
cis-1,3-Dichloropropene	800	864		ug/Kg		108	70 - 122	5	16
4-Methyl-2-pentanone	4000	4470		ug/Kg		112	64 - 125	9	27
Toluene	800	863		ug/Kg		108	80 - 125	5	16
trans-1,3-Dichloropropene	800	839		ug/Kg		105	75 - 121	5	17
1,1,2-Trichloroethane	800	847		ug/Kg		106	73 - 123	4	15
Tetrachloroethene	800	864		ug/Kg		108	61 - 150	5	16
1,3-Dichloropropane	800	855		ug/Kg		107	75 - 120	5	18
2-Hexanone	4000	4400		ug/Kg		110	63 - 125	10	28
Dibromochloromethane	800	848		ug/Kg		106	75 - 125	6	17
1,2-Dibromoethane	800	865		ug/Kg		108	77 - 123	4	18
Chlorobenzene	800	870		ug/Kg		109	80 - 123	4	10

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-254645/3-A

Matrix: Solid

Analysis Batch: 254780

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 254645

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylbenzene	800	862		ug/Kg		108	80 - 127	4	10
1,1,1,2-Tetrachloroethane	800	852		ug/Kg		107	79 - 128	4	11
m-Xylene & p-Xylene	800	810		ug/Kg		101	80 - 128	5	13
o-Xylene	800	852		ug/Kg		107	80 - 125	4	14
Styrene	800	853		ug/Kg		107	79 - 129	4	15
Bromoform	800	841		ug/Kg		105	65 - 134	6	17
Isopropylbenzene	800	870		ug/Kg		109	80 - 128	4	17
Bromobenzene	800	846		ug/Kg		106	68 - 126	5	19
N-Propylbenzene	800	873		ug/Kg		109	74 - 127	4	17
1,1,1,2-Tetrachloroethane	800	804		ug/Kg		100	57 - 127	7	18
4-Chlorotoluene	800	846		ug/Kg		106	68 - 126	6	16
t-Butylbenzene	800	869		ug/Kg		109	71 - 127	5	13
1,2,4-Trimethylbenzene	800	853		ug/Kg		107	73 - 127	6	12
sec-Butylbenzene	800	856		ug/Kg		107	70 - 129	5	12
1,3-Dichlorobenzene	800	841		ug/Kg		105	52 - 150	4	12
4-Isopropyltoluene	800	850		ug/Kg		106	71 - 129	4	11
1,4-Dichlorobenzene	800	860		ug/Kg		108	71 - 123	7	12
n-Butylbenzene	800	841		ug/Kg		105	71 - 130	6	12
1,2-Dichlorobenzene	800	815		ug/Kg		102	67 - 126	6	12
1,2-Dibromo-3-Chloropropane	800	819		ug/Kg		102	53 - 129	18	20
1,2,4-Trichlorobenzene	800	789		ug/Kg		99	68 - 131	16	16
1,2,3-Trichlorobenzene	800	670	*	ug/Kg		84	60 - 129	32	18
Hexachlorobutadiene	800	889		ug/Kg		111	65 - 136	7	19
Naphthalene	800	663	*	ug/Kg		83	61 - 124	29	17
Methyl tert-butyl ether	800	909		ug/Kg		114	69 - 150	8	30
1,2,3-Trichloropropane	800	812		ug/Kg		101	59 - 127	8	16
1,3,5-Trimethylbenzene	800	856		ug/Kg		107	72 - 128	4	16
2-Chlorotoluene	800	868		ug/Kg		108	71 - 127	6	16

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
Toluene-d8 (Surr)	99		75 - 120
4-Bromofluorobenzene (Surr)	99		47 - 150
Dibromofluoromethane (Surr)	104		80 - 118
Trifluorotoluene (Surr)	102		60 - 150
1,2-Dichloroethane-d4 (Surr)	100		80 - 121

Lab Sample ID: MB 580-255046/1-A

Matrix: Solid

Analysis Batch: 254988

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 255046

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	ND		40	6.0	ug/Kg		08/30/17 14:00	08/30/17 15:50	1
Naphthalene	ND		60	13	ug/Kg		08/30/17 14:00	08/30/17 15:50	1
1,3,5-Trimethylbenzene	ND		40	7.6	ug/Kg		08/30/17 14:00	08/30/17 15:50	1

Surrogate	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		75 - 120	08/30/17 14:00	08/30/17 15:50	1

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 580-255046/1-A
Matrix: Solid
Analysis Batch: 254988

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 255046

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	103		47 - 150	08/30/17 14:00	08/30/17 15:50	1
Dibromofluoromethane (Surr)	104		80 - 118	08/30/17 14:00	08/30/17 15:50	1
Trifluorotoluene (Surr)	105		60 - 150	08/30/17 14:00	08/30/17 15:50	1
1,2-Dichloroethane-d4 (Surr)	99		80 - 121	08/30/17 14:00	08/30/17 15:50	1

Lab Sample ID: LCS 580-255046/2-A
Matrix: Solid
Analysis Batch: 254988

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 255046

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trimethylbenzene	800	797		ug/Kg		100	73 - 127
Naphthalene	800	799		ug/Kg		100	61 - 124
1,3,5-Trimethylbenzene	800	808		ug/Kg		101	72 - 128

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	97		75 - 120
4-Bromofluorobenzene (Surr)	102		47 - 150
Dibromofluoromethane (Surr)	104		80 - 118
Trifluorotoluene (Surr)	105		60 - 150
1,2-Dichloroethane-d4 (Surr)	98		80 - 121

Lab Sample ID: LCSD 580-255046/3-A
Matrix: Solid
Analysis Batch: 254988

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 255046

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,4-Trimethylbenzene	800	801		ug/Kg		100	73 - 127	0	12
Naphthalene	800	804		ug/Kg		101	61 - 124	1	17
1,3,5-Trimethylbenzene	800	810		ug/Kg		101	72 - 128	0	16

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Toluene-d8 (Surr)	97		75 - 120
4-Bromofluorobenzene (Surr)	102		47 - 150
Dibromofluoromethane (Surr)	106		80 - 118
Trifluorotoluene (Surr)	105		60 - 150
1,2-Dichloroethane-d4 (Surr)	98		80 - 121

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-254610/1-A
Matrix: Solid
Analysis Batch: 254742

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254610

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	ND		5.0	0.63	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
2-Methylnaphthalene	ND		5.0	0.45	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Acenaphthene	ND		5.0	0.60	ug/Kg		08/24/17 16:40	08/26/17 17:02	1

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 580-254610/1-A
Matrix: Solid
Analysis Batch: 254742

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254610

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Acenaphthylene	ND		5.0	0.50	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Anthracene	ND		5.0	0.60	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Benzo[a]anthracene	ND		5.0	0.76	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Benzo[a]pyrene	ND		5.0	0.40	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Benzo[b]fluoranthene	ND		5.0	0.59	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Benzo[g,h,i]perylene	ND		5.0	0.50	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Benzo[k]fluoranthene	ND		5.0	0.60	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Chrysene	ND		5.0	1.5	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Dibenz(a,h)anthracene	ND		5.0	0.72	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Fluoranthene	ND		5.0	1.4	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Fluorene	ND		5.0	0.50	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Indeno[1,2,3-cd]pyrene	ND		5.0	0.60	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Naphthalene	ND		5.0	0.80	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Phenanthrene	ND		5.0	0.69	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
Pyrene	ND		5.0	0.97	ug/Kg		08/24/17 16:40	08/26/17 17:02	1
	MB	MB							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	89		68 - 138				08/24/17 16:40	08/26/17 17:02	1

Lab Sample ID: LCS 580-254610/2-A
Matrix: Solid
Analysis Batch: 254742

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254610

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	Limits
		Result	Qualifier				
1-Methylnaphthalene	1000	799		ug/Kg		80	71 - 120
2-Methylnaphthalene	1000	797		ug/Kg		80	75 - 120
Acenaphthene	1000	753		ug/Kg		75	68 - 120
Acenaphthylene	1000	800		ug/Kg		80	68 - 120
Anthracene	1000	768		ug/Kg		77	73 - 125
Benzo[a]anthracene	1000	774		ug/Kg		77	66 - 120
Benzo[a]pyrene	1000	729		ug/Kg		73	72 - 124
Benzo[b]fluoranthene	1000	736		ug/Kg		74	63 - 121
Benzo[g,h,i]perylene	1000	712		ug/Kg		71	63 - 124
Benzo[k]fluoranthene	1000	742		ug/Kg		74	63 - 129
Chrysene	1000	744		ug/Kg		74	69 - 120
Dibenz(a,h)anthracene	1000	815		ug/Kg		81	70 - 125
Fluoranthene	1000	827		ug/Kg		83	65 - 125
Fluorene	1000	790		ug/Kg		79	66 - 121
Indeno[1,2,3-cd]pyrene	1000	888		ug/Kg		89	65 - 121
Naphthalene	1000	792		ug/Kg		79	70 - 120
Phenanthrene	1000	733		ug/Kg		73	73 - 120
Pyrene	1000	795		ug/Kg		80	64 - 120
		LCS	LCS				
Surrogate	%Recovery	Qualifier	Limits				
Terphenyl-d14	82		68 - 138				

QC Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 580-254631/1-A
Matrix: Solid
Analysis Batch: 254804

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254631

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	ND		5.0	0.63	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
2-Methylnaphthalene	ND		5.0	0.45	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Acenaphthene	ND		5.0	0.60	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Acenaphthylene	ND		5.0	0.50	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Anthracene	ND		5.0	0.60	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Benzo[a]anthracene	ND		5.0	0.76	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Benzo[a]pyrene	ND		5.0	0.40	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Benzo[b]fluoranthene	ND		5.0	0.59	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Benzo[g,h,i]perylene	ND		5.0	0.50	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Benzo[k]fluoranthene	ND		5.0	0.60	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Chrysene	ND		5.0	1.5	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Dibenz(a,h)anthracene	ND		5.0	0.72	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Fluoranthene	ND		5.0	1.4	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Fluorene	ND		5.0	0.50	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Indeno[1,2,3-cd]pyrene	ND		5.0	0.60	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Naphthalene	ND		5.0	0.80	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Phenanthrene	ND		5.0	0.69	ug/Kg		08/25/17 08:45	08/28/17 13:01	1
Pyrene	ND		5.0	0.97	ug/Kg		08/25/17 08:45	08/28/17 13:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14	81		68 - 138	08/25/17 08:45	08/28/17 13:01	1

Lab Sample ID: LCS 580-254631/2-A
Matrix: Solid
Analysis Batch: 254804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254631

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1-Methylnaphthalene	1000	1000		ug/Kg		100	71 - 120
2-Methylnaphthalene	1000	1010		ug/Kg		101	75 - 120
Acenaphthene	1000	916		ug/Kg		92	68 - 120
Acenaphthylene	1000	1010		ug/Kg		101	68 - 120
Anthracene	1000	1040		ug/Kg		104	73 - 125
Benzo[a]anthracene	1000	969		ug/Kg		97	66 - 120
Benzo[a]pyrene	1000	1020		ug/Kg		102	72 - 124
Benzo[b]fluoranthene	1000	936		ug/Kg		94	63 - 121
Benzo[g,h,i]perylene	1000	891		ug/Kg		89	63 - 124
Benzo[k]fluoranthene	1000	963		ug/Kg		96	63 - 129
Chrysene	1000	859		ug/Kg		86	69 - 120
Dibenz(a,h)anthracene	1000	1020		ug/Kg		102	70 - 125
Fluoranthene	1000	1050		ug/Kg		105	65 - 125
Fluorene	1000	947		ug/Kg		95	66 - 121
Indeno[1,2,3-cd]pyrene	1000	961		ug/Kg		96	65 - 121
Naphthalene	1000	937		ug/Kg		94	70 - 120
Phenanthrene	1000	928		ug/Kg		93	73 - 120
Pyrene	1000	1020		ug/Kg		102	64 - 120

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-254631/2-A
Matrix: Solid
Analysis Batch: 254804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254631

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Terphenyl-d14	79		68 - 138

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Lab Sample ID: MB 580-255472/27-A
Matrix: Solid
Analysis Batch: 255494

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 255472

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	1.40	J	4.0	1.2	mg/Kg		09/06/17 15:44	09/06/17 20:28	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	124		50 - 150	09/06/17 15:44	09/06/17 20:28	1
4-Bromofluorobenzene (Surr)	88		50 - 150	09/06/17 15:44	09/06/17 20:28	1

Lab Sample ID: LCS 580-255472/28-A
Matrix: Solid
Analysis Batch: 255494

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 255472

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Organics (GRO) -C6-C10	40.0	42.4		mg/Kg		106	60 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Trifluorotoluene (Surr)	121		50 - 150
4-Bromofluorobenzene (Surr)	88		50 - 150

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Lab Sample ID: MB 580-254318/1-A
Matrix: Solid
Analysis Batch: 254522

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254318

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	ND		20	6.1	mg/Kg		08/22/17 13:45	08/24/17 17:24	1
RRO (nC25-nC36)	ND		50	11	mg/Kg		08/22/17 13:45	08/24/17 17:24	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	101		50 - 150	08/22/17 13:45	08/24/17 17:24	1
n-Triacontane-d62	80		50 - 150	08/22/17 13:45	08/24/17 17:24	1

TestAmerica Seattle

QC Sample Results

Client: Bristol Env. Remediation Services LLC
 Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) (Continued)

Lab Sample ID: LCS 580-254318/2-A
Matrix: Solid
Analysis Batch: 254522

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254318

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
DRO (nC10-<nC25)	500	483		mg/Kg		97	75 - 125	
RRO (nC25-nC36)	500	510		mg/Kg		102	60 - 120	
Surrogate	LCS %Recovery		LCS Qualifier	Limits				
<i>o</i> -Terphenyl	93			50 - 150				
<i>n</i> -Triacontane-d62	102			50 - 150				

Lab Sample ID: LCSD 580-254318/3-A
Matrix: Solid
Analysis Batch: 254522

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 254318

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	Limit
DRO (nC10-<nC25)	500	411	*	mg/Kg		82	75 - 125	16	11	
RRO (nC25-nC36)	500	439	*	mg/Kg		88	60 - 120	15	10	
Surrogate	LCSD %Recovery		LCSD Qualifier	Limits						
<i>o</i> -Terphenyl	75			50 - 150						
<i>n</i> -Triacontane-d62	85			50 - 150						

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 580-255269/17-A
Matrix: Solid
Analysis Batch: 255417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 255269

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Lead	ND		1.5	0.22	mg/Kg		09/01/17 18:15	09/05/17 14:16	1

Lab Sample ID: LCS 580-255269/18-A
Matrix: Solid
Analysis Batch: 255417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 255269

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
Lead	50.0	51.1		mg/Kg		102	80 - 120	

Lab Sample ID: LCSD 580-255269/19-A
Matrix: Solid
Analysis Batch: 255417

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 255269

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	Limit
Lead	50.0	50.5		mg/Kg		101	80 - 120	1	20	

TestAmerica Seattle

Lab Chronicle

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-1
Date Collected: 08/16/17 12:00
Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	254451	08/23/17 13:26	APR	TAL SEA

Client Sample ID: AA-1
Date Collected: 08/16/17 12:00
Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-1
Matrix: Solid
Percent Solids: 91.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			254645	08/25/17 11:19	SHK	TAL SEA
Total/NA	Analysis	8260C		1	254780	08/25/17 20:01	JSM	TAL SEA
Total/NA	Prep	5035	DL		255046	08/25/17 11:19	JSM	TAL SEA
Total/NA	Analysis	8260C	DL	1	254988	08/30/17 19:16	T1W	TAL SEA
Total/NA	Prep	3546			254631	08/25/17 08:45	TTN	TAL SEA
Total/NA	Analysis	8270D SIM		5	254804	08/28/17 14:39	TL1	TAL SEA
Total/NA	Prep	5035			255472	09/06/17 15:41	SHK	TAL SEA
Total/NA	Analysis	AK101		1	255494	09/06/17 22:00	JCV	TAL SEA
Total/NA	Prep	3546			254318	08/22/17 13:45	APR	TAL SEA
Total/NA	Analysis	AK102 & 103		5	254522	08/25/17 02:31	ERZ	TAL SEA
Total/NA	Prep	3050B			255269	09/01/17 18:15	PAB	TAL SEA
Total/NA	Analysis	6010C		1	255417	09/05/17 14:52	HJM	TAL SEA

Client Sample ID: AA-2
Date Collected: 08/16/17 12:30
Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	254451	08/23/17 13:26	APR	TAL SEA

Client Sample ID: AA-2
Date Collected: 08/16/17 12:30
Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-2
Matrix: Solid
Percent Solids: 89.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			254645	08/25/17 11:19	SHK	TAL SEA
Total/NA	Analysis	8260C		1	254780	08/25/17 20:27	JSM	TAL SEA
Total/NA	Prep	5035	DL		255046	08/25/17 11:19	JSM	TAL SEA
Total/NA	Analysis	8260C	DL	1	254988	08/30/17 19:42	T1W	TAL SEA
Total/NA	Prep	3546			254610	08/24/17 16:40	APR	TAL SEA
Total/NA	Analysis	8270D SIM		5	254742	08/27/17 03:11	CJ	TAL SEA
Total/NA	Prep	5035			255472	09/06/17 15:41	SHK	TAL SEA
Total/NA	Analysis	AK101		1	255494	09/06/17 22:30	JCV	TAL SEA
Total/NA	Prep	3546			254318	08/22/17 13:45	APR	TAL SEA
Total/NA	Analysis	AK102 & 103		10	254522	08/25/17 02:51	ERZ	TAL SEA
Total/NA	Prep	3050B			255269	09/01/17 18:15	PAB	TAL SEA

TestAmerica Seattle

Lab Chronicle

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Client Sample ID: AA-2

Date Collected: 08/16/17 12:30

Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-2

Matrix: Solid

Percent Solids: 89.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6010C		1	255417	09/05/17 14:55	HJM	TAL SEA

Client Sample ID: TB-1

Date Collected: 08/16/17 13:00

Date Received: 08/21/17 10:23

Lab Sample ID: 580-70715-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			254645	08/25/17 11:19	SHK	TAL SEA
Total/NA	Analysis	8260C		1	254780	08/25/17 20:53	JSM	TAL SEA
Total/NA	Prep	5035	RA		255046	08/25/17 11:19	JSM	TAL SEA
Total/NA	Analysis	8260C	RA	1	254988	08/30/17 17:08	T1W	TAL SEA
Total/NA	Prep	5035			255472	09/06/17 15:41	SHK	TAL SEA
Total/NA	Analysis	AK101		1	255494	09/06/17 21:29	JCV	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-18
California	State Program	9	2901	01-31-18
L-A-B	DoD ELAP		L2236	01-19-19
L-A-B	ISO/IEC 17025		L2236	01-19-19
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-17
US Fish & Wildlife	Federal		LE058448-0	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-18

Sample Summary

Client: Bristol Env. Remediation Services LLC
Project/Site: Kotzebue AK

TestAmerica Job ID: 580-70715-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-70715-1	AA-1	Solid	08/16/17 12:00	08/21/17 10:23
580-70715-2	AA-2	Solid	08/16/17 12:30	08/21/17 10:23
580-70715-3	TB-1	Solid	08/16/17 13:00	08/21/17 10:23

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Login Sample Receipt Checklist

Client: Bristol Env. Remediation Services LLC

Job Number: 580-70715-1

Login Number: 70715

List Source: TestAmerica Seattle

List Number: 1

Creator: Ponce-McDermott, Monica

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	No name
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT 4

Waste Disposal Certificate

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. 15003	Manifest Document No. 118334	2. Page 1 of 2
3. Generator's Name and Mailing Address ALASKA AIRLINES PO BOX 68000, SEASIDE SEATTLE, AK 98168		ALASKA AIRLINES - RALPH WEIN MEMORIAL 1 AIRPORT ROAD KOTzebue, AK 99752		
4. Generator's Phone ()				
5. Transporter 1 Company Name DRAKE CONSTRUCTION, INC.		6. US EPA ID Number EXEMPT	A. State Transporter's ID 307-442-2512	
7. Transporter 2 Company Name NORTHSTAR AIR CARGO, INC.		8. US EPA ID Number AK0000000000	C. State Transporter's ID 1100-478-3330	
9. Designated Facility Name and Site Address NRC ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501		10. US EPA ID Number AKR0000004184	E. State Facility's ID	
F. Facility's Phone (907) 258-1555				

11. WASTE DESCRIPTION	Containers		13. Total Quantity	14. Unit Wt./Vol.
	No.	Type		
a. MATERIAL NOT REGULATED BY D.O.T.	1	CF	971	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above EA0705 NON-RCRA AND/OR PETROLEUM CONTAMINATED SOIL/SAND	H. Handling Codes for Wastes Listed Above D11839
--	---

15. Special Handling Instructions and Additional Information
 Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name SUNJIN J PIPER	Signature <i>[Signature]</i>	Date 11 02 17
17. Transporter 1 Acknowledgement of Receipt of Materials		
Printed/Typed Name MICHAEL CAIN FOR DRAKE CONSTRUCTION	Signature <i>[Signature]</i>	Date 11 02 17
18. Transporter 2 Acknowledgement of Receipt of Materials		
Printed/Typed Name Northstar Air Cargo	Signature <i>[Signature]</i>	Date 11 02 17
19. Discrepancy Indication Space		
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.		
Printed/Typed Name Nara R. Noland	Signature <i>[Signature]</i>	Date 11 13 17

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)		21. Generator ID Number VSOG	22. Page 2	23. Manifest Tracking Number 118334			
24. Generator's Name ALASKA AIRLINES - RALPH WEIN MEMORIAL AIRPORT 1 AIRPORT ROAD KOTZEBUE, AK 99752							
25. Transporter _____ Company Name 3 NRC ALASKA LLC				U.S. EPA ID Number AKR000004184			
26. Transporter _____ Company Name 4				U.S. EPA ID Number			
GENERATOR	27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers		29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes
			No.	Type			
32. Special Handling Instructions and Additional Information							
TRANSPORTER	33. Transporter _____ Acknowledgment of Receipt of Materials						
	Printed/Typed Name Roy C Tisdale JR	Signature <i>Roy C Tisdale JR</i>			Month 11	Day 10	Year 17
DESIGNATED FACILITY	34. Transporter _____ Acknowledgment of Receipt of Materials						
	Printed/Typed Name	Signature			Month	Day	Year
35. Discrepancy							
36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)							

Drum Tracking Log for Manifest Number 118334

Manifest 118334		Arrived 13-NOV-17			Gen ALASKA AIRLINES - RALPH WEIN MEMORIAL AIRPORT			Tsdw NRC ALASKA LLC			
Document	Item	Line	Profile	Type	Size	Oil Fuel	Water	Antifreeze	Sludge	Solids	Location
D11899	1	1	EA0705	CF		0	0	0	0	175	PAD2: 1460.38 P, 175.00 G
Totals:						0	0	0	0	175	

RECEIVED

NOV 14 2017

TRN



CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: ALASKA AIRLINES - RALPH WEIN MEMORIAL AIRPORT
1 AIRPORT ROAD
KOTZEBUE, AK 99752

DISPOSAL FACILITY: NRC ALASKA LLC
2020 VIKING DRIVE
ANCHORAGE, AK 99501

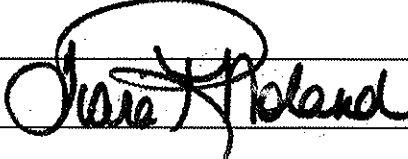
EPA ID NUMBER: VSQG
MANIFEST/DOCUMENT #: 118334
DATE OF DISPOSAL/RECYCLE: NOV-13-2017

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	NON-RCRA AND/OR PETROLEUM CONTAMINATED SOIL/SAND/GRAVEL	1	CF	971	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: TRN

NOV 13 2017

SIGNATURE: 

DATE: _____