

October 17, 2018

Ms. Danielle Duncan Alaska Department of Environmental Conservation 410 Willoughby Avenue, Suite 303 Juneau, Alaska 99811

Re: Tenakee Springs Tank Farm, Tenakee Springs, Alaska – Groundwater Sampling DEC Hazard ID: 4251 ADEC File # 1527.38.010

Dear Ms. Duncan,

This report summarizes the results of groundwater sampling conducted by Cox Environmental Services (CES) at the Tenakee Springs Tank Farm Site and the downgradient well at Snyder Merchantile in Tenakee Springs, Alaska.

Groundwater Sampling

On September 27, 2017, the onsite groundwater monitoring well (MW-2) and the downgradient well at Snyder Merchantile (SW-1) were sampled. Groundwater samples MW-2 and SW-1 were analyzed for diesel range organics (DRO) and residual range organics (RRO) by Alaska Methods 102 & 103.

The laboratory analytical report and laboratory data review checklist are presented in Attachment A.

Groundwater Analytical Results

DRO and RRO were not detected in either MW-2 nor SW-1. These results indicate DRO and RRO contamination do not appear to be present in on-site shallow groundwater (MW-2) or in the deeper downgradient drinking water well at Snyder Merchantile in excess of ADEC groundwater cleanup levels for DRO and RRO.

Please don't hesitate to contact me at 907-723-9946 if you have any questions.

Sincerely

Tolene M Cox Principal Environmental Scientist



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: 580-71855-1 Client Project/Site: Tenakee Spring Tank Farm

For:

Cox Environmental Services 712 W 12th Street Juneau, Alaska 99801

Attn: Jolene Cox

Shuid crug

Authorized for release by: 10/13/2017 3:02:06 PM

Sheri Cruz, Project Manager I (253)922-2310 sheri.cruz@testamericainc.com

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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Job ID: 580-71855-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative 580-71855-1

Comments

No additional comments.

Receipt

The samples were received on 10/5/2017 2:26 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

GC Semi VOA

Method(s) AK102 & 103: The following continuing calibration verification (CCV) standard associated with batch 580-258608 recovered outside acceptance criteria for %D for surrogate n-Triacontane-d62. The %recovery is within the acceptance criteria for the CCV and all associated samples; therefore, the data have been qualified and reported. MW-2 (580-71855-1), MW-2D (580-71855-2), SW-1 (580-71855-3), (CCV 580-258608/14), (LCS 580-258535/2-A), (LCSD 580-258535/3-A) and (MB 580-258535/1-A)

Method(s) AK102 & 103: The Diesel Range Organics (C10-C25) concentration reported for the following samples is due to the presence of discrete peaks: MW-2 (580-71855-1) and MW-2D (580-71855-2).

Method(s) AK102 & 103: The peak profile present in this sample SW-1 (580-71855-3) is atypical of a hydrocarbon pattern and consists of two discrete peaks.

Method(s) AK102 & 103: The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: SW-1 (580-71855-3).

No additional analytical or quality issues were noted, other than those described above or 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: Cox Environmental Services Project/Site: Tenakee Spring Tank Farm

Glossary		
Abbreviation	These commonly used abbreviations may or may not be present in this report.	Λ
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	5
CFL	Contains Free Liquid	J
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)	8
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	9
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 ID: MW-2 Date Collected: 09/27/17 12:15

Date Received: 10/05/17 14:26

Lab Sample ID: 580-71855-1 Matrix: Water

Method: AK102 & 103 -	Alaska - Diesel Ra	ange Orga	NICS & Resid	ge Orga	nics ((Bronarod	Analyzod	Dil Eac
Analyte	Kesuit	Quaimer	INE	Unit		Fiepaleu	Analyzeu	Dirrac
DRO (nC10- <nc25)< th=""><th>ND</th><th></th><th>0.11</th><th>mg/L</th><th></th><th>10/11/17 09:04</th><th>10/11/17 21:49</th><th>1</th></nc25)<>	ND		0.11	mg/L		10/11/17 09:04	10/11/17 21:49	1
RRO (nC25-nC36)	ND		0.11	mg/L		10/11/17 09:04	10/11/17 21:49	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
o-Terphenyl	71		50 - 150			10/11/17 09:04	10/11/17 21:49	1
n-Triacontane-d62	105		50 - 150			10/11/17 09:04	10/11/17 21:49	1

Client Sample ID: MW-2D Date Collected: 09/27/17 12:15

Date Received: 10/05/17 14:26

Lab Sample ID: 580-71855-2 Matrix: Water

5

	a - Diesel Ra	ange Orgai	nics & Residu	al Rang	ge Orga	nics (O	GC)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10- <nc25)< td=""><td>ND</td><td></td><td>0.10</td><td></td><td>mg/L</td><td></td><td>10/11/17 09:04</td><td>10/11/17 22:17</td><td>1</td></nc25)<>	ND		0.10		mg/L		10/11/17 09:04	10/11/17 22:17	1
RRO (nC25-nC36)	ND		0.10		mg/L		10/11/17 09:04	10/11/17 22:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	71		50 - 150				10/11/17 09:04	10/11/17 22:17	1
n-Triacontane-d62	106		50 - 150				10/11/17 09:04	10/11/17 22:17	1

Client Sample ID: SW-1 Date Collected: 09/27/17 11:36

Date Received: 10/05/17 14:26

Lab Sample ID: 580-71855-3 Matrix: Water

5

	aska - Diesel Ra	ange Orga	nics & Resid	ual Rang	ge Orga	nics ((GC)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10- <nc25)< td=""><td>ND</td><td></td><td>0.10</td><td></td><td>mg/L</td><td></td><td>10/11/17 09:04</td><td>10/11/17 23:14</td><td>1</td></nc25)<>	ND		0.10		mg/L		10/11/17 09:04	10/11/17 23:14	1
RRO (nC25-nC36)	ND		0.10		mg/L		10/11/17 09:04	10/11/17 23:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	76		50 - 150				10/11/17 09:04	10/11/17 23:14	1
n-Triacontane-d62	111		50 - 150				10/11/17 09:04	10/11/17 23:14	1

RL

0.10

0.10

Limits

50 - 150

50 - 150

MDL Unit

mg/L

mg/L

D

Prepared

Prepared

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

MB MB

MB MB %Recovery Qualifier

ND

ND

81

114

Result Qualifier

Lab Sample ID: MB 580-258535/1-A

Matrix: Water

DRO (nC10-<nC25)

RRO (nC25-nC36)

n-Triacontane-d62

Analyte

Surrogate

o-Terphenyl

Analysis Batch: 258608

Client Sample ID: Method Blank

10/11/17 09:04 10/11/17 18:04

10/11/17 09:04 10/11/17 18:04

10/11/17 09:04 10/11/17 18:04

10/11/17 09:04 10/11/17 18:04

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Type: Total/NA

5	258535	Prep Batch: 2
6	Dil Fac	Analyzed
	1	10/11/17 18:04
	1	10/11/17 18:04
8	Dil Fac	Analyzed
	1	10/11/17 18:04
0	1	10/11/17 18:04

Lab Sample ID: LCS 580-258535/2-A **Matrix: Water**

Analysis Batch: 258608		Spike	LCS	LCS				Prep Ва %Rec.	itch: 258	535
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits		
DRO (nC10- <nc25)< td=""><td> </td><td>2.00</td><td>1.54</td><td></td><td>mg/L</td><td></td><td>77</td><td>75 - 125</td><td></td><td></td></nc25)<>	 	2.00	1.54		mg/L		77	75 - 125		
RRO (nC25-nC36)		2.00	1.85		mg/L		93	60 - 120		

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
o-Terphenyl	90		50 - 150
n-Triacontane-d62	106		50 - 150

Lab Sample ID: LCSD 580-258535/3-A Matrix: Water Α

Matrix: Water							Prep Ty	pe: Tot	al/NA
Analysis Batch: 258608							Prep Ba	tch: 2	58535
-	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
DRO (nC10- <nc25)< td=""><td></td><td>1.64</td><td></td><td>mg/L</td><td></td><td>82</td><td>75 - 125</td><td>6</td><td>16</td></nc25)<>		1.64		mg/L		82	75 - 125	6	16
RRO (nC25-nC36)	2.00	1.89		mg/L		94	60 - 120	2	17
1.05									

Surrogate	%Recovery Qualifier	Limits
o-Terphenyl	93	50 - 150
n-Triacontane-d62	113	50 - 150

Dilution

Factor

1

Run

Batch

Number

Prepared

or Analyzed

258535 10/11/17 09:04 NDB

258608 10/11/17 21:49 D1R

Analyst

Lab TAL SEA

TAL SEA

Batch

Туре

Prep

Analysis

Batch

Method

AK102 & 103

3510C

Client Sample ID: MW-2

Date Collected: 09/27/17 12:15

Date Received: 10/05/17 14:26

Client Sample ID: MW-2D

Date Collected: 09/27/17 12:15

Date Received: 10/05/17 14:26

Prep Type

Total/NA

Total/NA

Lab Sample ID: 580-71855-1

2 3 4 5 6 7 8 9

Matrix: Water

Matrix: Water

Lab Sample ID: 580-71855-2

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			258535	10/11/17 09:04	NDB	TAL SEA
Total/NA	Analysis	AK102 & 103		1	258608	10/11/17 22:17	D1R	TAL SEA

Client Sample ID: SW-1 Date Collected: 09/27/17 11:36 Date Received: 10/05/17 14:26

Lab Sample ID: 580-71855-3

Matrix: Water

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			258535	10/11/17 09:04	NDB	TAL SEA
Total/NA	Analysis	AK102 & 103		1	258608	10/11/17 23:14	D1R	TAL SEA

Laboratory References:

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

Client: Cox Environmental Services Project/Site: Tenakee Spring Tank Farm

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program		EPA Region	Identification Numbe	r Expiration Date
Alaska (UST)	State Prog	State Program		UST-022	03-02-18
The following englyte	are included in this report	t but approditation	partification is not off	and by the governing ou	thority:
The following analyte	s are included in this repor	t, but accreditation/	certification is not off	ered by the governing au	thority:
The following analyte	s are included in this repor Prep Method	t, but accreditation/ Matrix	certification is not off Analvt	ered by the governing au	thority:
The following analyte Analysis Method	s are included in this report	t, but accreditation/ Matrix	certification is not off	ered by the governing au te	thority:

Sample Summary

Client: Cox Environmental Services Project/Site: Tenakee Spring Tank Farm TestAmerica Job ID: 580-71855-1

Project/Site: Tena	kee Spring Tank Farm	TestAmerica Job ID: 580-71855-1				
				_		
Lab Sample ID	Client Sample ID	Matrix	Collected Receive	ed 3		
580-71855-1	MW-2	Water	09/27/17 12:15 10/05/17 1	14:26		
580-71855-2	MW-2D	Water	09/27/17 12:15 10/05/17 1	14:26		
580-71855-3	SW-1	Water	09/27/17 11:36 10/05/17 1	14:26 5		
				8		
				9		



Client: Cox Environmental Services

Login Number: 71855 List Number: 1 Creator: Hobbs, Kenneth F

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
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?	True	
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.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

List Source: TestAmerica Seattle

- Completed by: Jolene M Cox
- Title: Principal Environmental Scientist
- Date: October 17, 2018
- CS Report Name: Tenakee Springs Tank Farm
- Report Date: October 13, 2017
- **Consultant Firm:** Cox Environmental Services
- Laboratory Name: TestAmerica, Inc.
- Laboratory Report Number: 580-71855-1
- ADEC File Number:

ADEC RecKey Number:

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **YES**
- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved? **YES**

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)? YES
- b. Correct analyses requested? **YES**

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^\circ \pm 2^\circ C$)? **YES**
- b. Sample preservation acceptable acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **YES**
- c. Sample condition documented broken, leaking (Methanol), zero headspace (VOC vials)? N/A
- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.? **N/A**
- e. Data quality or usability affected? NO

4. Case Narrative

- a. Present and understandable? YES
- 5. Discrepancies, errors or QC failures identified by the lab? **YES**

Method(s) AK102 & 103: The following continuing calibration verification (CCV) standard associated with batch 580-258608 recovered outside acceptance criteria for %D for surrogate n-Triacontane-d62. The %recovery is within the acceptance criteria for the CCV and all associated samples; therefore, the data have been qualified and reported. MW-2 (580-71855-1), MW-2D (580-71855-2), SW-1 (580-71855-3), (CCV 580-258608/14), (LCS 580-258535/2-A), (LCSD 580-258535/3-A) and (MB 580-258535/1-A)

Method(s) AK102 & 103: The Diesel Range Organics (C10-C25) concentration reported for the following samples is due to the presence of discrete peaks: MW-2 (580-71855-1) and MW-2D (580-71855-2). Method(s) AK102 & 103: The peak profile present in this sample SW-1 (580-71855-3) is atypical of a hydrocarbon pattern and consists of two discrete peaks. Method(s) AK102 & 103: The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: SW-1 (580-71855-3).

- a. Were all corrective actions documented? $\ensuremath{\textbf{YES}}$
- b. What is the effect on data quality/usability according to the case narrative? **NONE**

6. Samples Results

- a. Correct analyses performed/reported as requested on COC? **YES**
- b. All applicable holding times met? **YES**
- c. All soils reported on a dry weight basis? **YES**
- d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project? **YES**
- e. Data quality or usability affected? NO

7. QC Samples

- a. Method Blank
 - i. One method blank reported per matrix, analysis and 20 samples? YES
 - ii. All method blank results less than PQL? YES
 - iii. If above PQL, what samples are affected? **N/A**
 - iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? **N/A**
 - v. Data quality or usability affected? **NO**
- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
 - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples (LCS/LCSD required per AK methods, LCS required per SW846)? **YES**
 - ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples? N/A
 - iii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)? YES
 - iv. Precision All relative percent differences (RPD) reported and less than method or laboratory limits RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)? **YES**
 - v. If %R or RPD is outside of acceptable limits, what samples are affected? N/A
 - vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? N/A
 - vii. Data quality or usability affected? **NO**
- c. Surrogates Órganics Only
 - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples? YES
 - ii. Accuracy All percent recoveries (%R) reported and within method or laboratory limits (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)? NO Method(s) AK102 & 103: The following continuing calibration verification (CCV) standard associated with batch 580-258608 recovered outside acceptance criteria for %D for surrogate n-Triacontane-d62. The %recovery is within the acceptance criteria for the CCV and all associated samples; therefore, the data have been qualified and reported. MW-2 (580-71855-1), MW-2D (580-71855-2), SW-1 (580-71855-3), (CCV 580-258608/14), (LCS 580-258535/2-A), (LCSD 580-258535/3-A) and (MB 580-258535/1-A)
 - iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined? **YES**
 - iv. Data quality or usability affected? NO
- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.):
 - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples (if not, enter explanation below.)? **NO**
 - ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC (If not, a comment explaining why must be entered below)? **N/A**
 - iii. All results less than PQL? **N/A**
 - iv. If above PQL, what samples are affected? N/A
 - v. Data quality or usability affected? NO
- e. Field Duplicate
 - i. One field duplicate submitted per matrix, analysis and 10 project samples? **YES**
 - ii. Submitted blind to lab? **YES**
 - iii. Precision All relative percent differences (RPD) less than specified DQOs (Recommended: 30% water, 50% soil)? YES
 - RPD (%) = Absolute value of: (R1-R2)/((R1+R2)/2) x 100
 - Where R1 = Sample Concentration R2 = Field Duplicate Concentration
 - iv. Data quality or usability affected? **NO**
- f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)
 - i. All results less than PQL? **N/A**

- ii. If above PQL, what samples are affected? N/Aiii. Data quality or usability affected? NO
- Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

 a. Defined and appropriate? N/A