

Water Analysis for Livestock Suitability

Fritzler Resources, Inc.

West Fork Unit Application for Beneficial Use of Produced Water

1. Colorado Department of Health
Regulation 31, Tables I,II,III

2. Livestock Drinking Water Quality no. 4.908 CSU
Table 1: Recommendations for levels of toxic substances in drinking water for livestock

3. Fritzler Resources, Inc. Analytical data
West Fork Evaporation Pit Analytical Results

CDPHE
Agricultural Values
(ug / l)

CSU Cooperative Extension
mg/l (ug / l)

Technology Laboratory Inc.
mg/l (ug / l)

Analytes

Aluminum		5.0 (5000)	0.813 (813)
Arsenic	100	0.2 (200)	< 0.005 (5)
Beryllium		no data	<0.0003 (0.3)
Barium			0.154
Boron	0.75 mg/l	5.0 (5000)	3.08
Calcium			8.09
Cadmium	10	0.05 (50)	<0.001 (1)
Chromium, III	100	1.0 (1000)	0.043 (43)
Chromium, VI			<0.01 (10)
Chloride			1128
Cobalt		1.0 (1000)	<0.002 (2)
Copper	200	0.5 (500)	<0.005 (5)
Cyanide	.2 mg / l (200 ug/l)		< 0.02 (20)
Fluoride		2.0 (2000)	4.12 (4120)
Iron		no data	0.413 (413)
Lead	100	0.1 (100)	0.02 (20)
Lithium			2.44 (2440)
Magnesium			1.19
Manganese	200	no data	0.034 (34)
Mercury		0.01 (10)	<0.0002 (0.2)
Molybdenum	300	no data	<0.008 (8)
Nickel	200	no data	<0.005 (5)
Potassium			4.6
Phosphorous		no data	0.088 (88)
Selenium	20	0.05 (50)	<0.005 (5)
Sodium			1128
Vandadium		no data	<0.004
Zinc	2000	24.0 (24000)	<0.002 (2)

Table 2: Guide to the use of saline waters for livestock and poultry

Salinity Levels

TDS

<1000	excellent	3000
1000-3000	Very Satisfactory	3000
3000-5000	satisfactory	
5000-7000	can be used , not for poultry	
7000-10000	risk for pregnant , cows, horses, Sheep	

Electrical Conductivity, EC

1.5	excellent	
1.5-5.	Very Satisfactory	3.85
5.0-8.0	satisfactory	
8.0-11.	can be used , not for poultry	
11.0-16.0	risk for pregnant , cows, horses, Sheep	

Physical Parameteres

Alkalinity, as CaCO3			79.6
Ammonium			0.4
Bicarbonate			1110
Carbonate			48
Hardness			13.7
Nitrate	100 mg/l	100 mg/l	<0.05 (50)
Nitrite	10 mg/l	10 mg/l	<0.05 (50)
pH	5.0 - 9.0		8.31
Sulfate			13.9
Turbidity			52
Temperature			Ambient

Organics

Benzene			nd
Tolulene			nd
Xylene			nd
Ethylene			nd

- 1 COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT WATER QUALITY CONTROL COMMISSION REGULATION NO. 31 THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER (5 CCR 1002-31)
- 2 P.N. Soltanpour, Colorado State University Professor, Soil and Crop Sciences; and W.L.Raley, former Colorado State University Cooperative Extension Western District Director, Livestock Drinking Water Quality no. 4.908
- 3 Technology Laboratory Inc. Report No: B3111-01, B3125-01, B3126-01



TECHNOLOGY LABORATORY, INC.

CENTRE PROFESSIONAL PARK

1012 Centre Avenue
Fort Collins, Colorado 80526
(970) 490-1414

CERTIFICATE OF ANALYSIS

Fritzler Resources
300 E Burlington Ave
Fort Morgan, CO 80701

Sample ID: Westfork Pit

Laboratory ID B3111-01

Sampled: 05/12/15

Received: 05/13/15

Project No.: Westfork Pit

Matrix: Water

<u>CAS Number</u>	<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>MDL</u>	<u>Method</u>	<u>Date Analyzed</u>
N/A	Alkalinity (as CaCO ₃)	79.6	mg/L	1	SM-2320 B	05/14/15
7429-90-5	Total Aluminum	0.813	mg/L	0.01	EPA-6010B	05/14/15
7664-41-7	Ammonia-N	0.40	mg/L	0.02	SM4500NH3G	05/14/15
7440-38-2	Total Recoverable Arsenic	< 0.005	mg/L	0.005	EPA-6010B	05/14/15
7440-39-3	Total Recoverable Barium	0.154	mg/L	0.01	EPA-6010B	05/14/15
7440-41-7	Total Beryllium	< 0.0003	mg/L	0.0003	EPA-6010B	05/14/15
71-52-3	Bicarbonate	1110	mg/L	1	EPA-310.2	05/14/15
7440-42-8	Total Boron	3.08	mg/L	0.006	EPA-6010B	05/14/15
7440-43-9	Total Cadmium	< 0.001	mg/L	0.001	EPA-6010B	05/14/15
7440-70-2	Total Calcium	8.09	mg/L	0.01	EPA-6010B	05/14/15
97328-76-2	Carbonate (CO ₃)	48.0	mg/L	1	EPA-310.2	05/14/15
16887-00-6	Chloride	1128	mg/L	1	EPA-300.1	05/14/15
7440-47-3	Total Chromium	0.043	mg/L	0.004	EPA-6010B	05/14/15
7440-48-4	Total Cobalt	< 0.002	mg/L	0.002	EPA-6010B	05/14/15
N/A	Specific Conductance	3.85	μS/cm @ 25°C	1	EPA-120.1	05/14/15
7440-50-8	Total Copper	< 0.005	mg/L	0.005	EPA-6010B	05/14/15
16984-48-8	Fluoride	4.12	mg/L	0.05	EPA-300.1	05/14/15
N/A	Hardness as CaCO ₃	13.7	mg	1	EPA-130.2	05/14/15

TECHNOLOGY LABORATORY, INC.



TECHNOLOGY LABORATORY, INC.

CENTRE PROFESSIONAL PARK

1012 Centre Avenue
Fort Collins, Colorado 80526
(970) 490-1414

CERTIFICATE OF ANALYSIS

Fritzler Resources
300 E Burlington Ave
Fort Morgan, CO 80701

Sample ID: Westfork Pit

Laboratory ID B3111-01

Sampled: 05/12/15

Received: 05/13/15

Project No.: Westfork Pit

Matrix: Water

<u>CAS Number</u>	<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>MDL</u>	<u>Method</u>	<u>Date Analyzed</u>
18540-29-9	Dissolved Hexavalent Chromium	< 0.01	mg/L	0.01	SM-3500 Cr B 2009	05/15/15
7439-89-6	Total Recoverable Iron	0.413	mg/L	0.007	EPA-6010B	05/14/15
7439-92-1	Total Recoverable Lead	0.020	mg/L	0.003	EPA-6010B	05/14/15
7439-95-4	Total Magnesium	1.19	mg/L	0.01	EPA-6010B	05/14/15
7439-96-5	Total Manganese	0.034	mg/L	0.004	EPA-6010B	05/14/15
7439-97-6	Total Recoverable Mercury	< 0.0002	mg/L	0.0002	EPA-245.1	05/19/15
7439-98-7	Total Molybdenum	< 0.008	mg/L	0.008	EPA-6010B	05/14/15
7440-02-0	Total Nickel	< 0.005	mg/L	0.005	EPA-6010B	05/14/15
84145-82-4	Nitrate-N	< 0.05	mg/L	0.05	EPA-300.1	05/14/15
14797-65-0	Nitrite-N	< 0.05	mg/L	0.05	EPA-300.1	05/14/15
N/A	pH	8.31	Units		SM-4500 HB	05/13/15
7723-14-0	Total Phosphorous-P	0.088	mg/L	0.01	EPA-365.3	05/14/15
7440-09-7	Total Potassium	4.60	mg/L	0.01	EPA-6010B	05/14/15
	Total Recoverable Selenium	< 0.005			EPA-6010B	05/14/15
7440-23-5	Total Sodium	1128	mg/L	0.01	EPA-6010B	05/14/15
18785-72-3	Sulfate	13.9	mg/L	0.05	EPA-300.1	05/14/15
N/A	Total Dissolved Solids (TDS)	3000	mg/L	5	SM-2540 C	05/14/15
N/A	TSS	52.0	mg/L	5	SM-2540 D	05/15/15
7440-62-2	Total Vanadium	< 0.004	mg/L	0.004	EPA-6010B	05/14/15
7440-66-6	Total Zinc	< 0.002	mg/L	0.002	EPA-6010B	05/14/15

TECHNOLOGY LABORATORY, INC.



TECHNOLOGY LABORATORY, INC.

CENTRE PROFESSIONAL OFFICE PARK

1012 Centre Avenue
Fort Collins, Colorado 80526
(970) 490-1414

CERTIFICATE OF ANALYSIS – HEXAVALENT CHROMIUM CAS Number: 18540-29-9

Fritzler Resources
300 E. Burlington Ave
Fort Morgan, CO 80701

Received: 05/12/15
Analyzed: 05/13/15

Laboratory ID: B3111

Project No.: Westfork Pit
Matrix: Water
Method: EPA 6010B

<u>Parameter</u>	<u>Laboratory ID</u>	<u>Sample ID</u>	<u>Date Sampled</u>	<u>Result</u> <u>(mg/L)</u>
Total Lithium	B3111-01	Westfork Pit	5/12/15	2.44

A handwritten signature in blue ink, reading "Ben Betters".

TECHNOLOGY LABORATORY, INC.



TECHNOLOGY LABORATORY, INC.

CENTRE PROFESSIONAL PARK

1012 Centre Avenue
Fort Collins, Colorado 80526
(970) 490-1414

CERTIFICATE OF ANALYSIS

Fritzler Resources
300 E Burlington Ave
Fort Morgan, CO 80701

Sample ID: Westfork Pit

Laboratory ID B3111-01

Sampled: 05/12/15

Received: 05/13/15

Project No.: Westfork Pit

Matrix: Water

<u>CAS Number</u>	<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>MDL</u>	<u>Method</u>	<u>Date Analyzed</u>
57-12-5	Cyanide	<0.02	mg/L	0.02	SM-4500-CN-E	05/29/15
74-90-8	Total Cyanide	<0.02	mg/L	0.02	SM-4500-CN-E	05/29/15

TECHNOLOGY LABORATORY, INC.

The results contained in this report
relate only to those items tested.



TECHNOLOGY LABORATORY, INC.

1012 CENTRE AVENUE
FORT COLLINS, CO 80526
Phone: (970)490-1414 Fax: (970)472-5488
www.techlabusa.com info@techlabusa.com

W.O. NUMBER B311

CHAIN-OF-CUSTODY REPORT

COMPANY NAME <u>Feinberg Reservoir</u>		ANALYSIS REQUESTED		OTHER	
PROJECT MANAGER <u>Gene Fritzel</u>	PROJECT NUMBER <u>West Fork P.T.</u>	DATE/TIME SAMPLED	SAMPLE ID	DATE/TIME SAMPLED	SAMPLE ID
PROJECT LOCATION OR NAME <u>West Fork</u>					
SAMPLER'S SIGNATURE <u>Gene Fritzel</u>					
NUMBER OF CONTAINERS					
SAMPLE MATRIX: SOIL (S) AIR (A) AQUEOUS (W) OTHER (O)					
OIL & GREASE					
TEPH (DRO)					
VOC 624 / 8260 (TOTAL / TCLP)					
SVOC 625 / 8270 / PAH (TOTAL / TCLP)					
PH / TSS / TDS					
RCRA 8 METALS (TOTAL / TCLP / DISSOLVED)					
React. / Ignite. / Corr. / Paint Filt.					
BTX/TPH Emissions Vapor					
Conductivity / Hardness					
TO-14 / TO-15 / TVPH Vapor					
NITRATE / NITRITE / AMMONIA					
Sulfate, Borate, Chloride					
Acidity, pH, Carb + Bicarb					
See attached - vs					
Total Recoverable: B					
CA, K, Na, Al, Fe, Be, Cd, Cr, Hex Cr, Ag, Cu, Fe, Pb, Li, Mn, Mg, Hg, Mo, Ni, P, Se, V, Zn					
Total CN, Free CN					
HOLD AFTER ANALYSIS					
HOLD, DON'T ANALYZE					

LOGGED IN BY: W Sample ☒ ≤ 6° C ☐ None ☐ Other
Preservative: ☐ Acid ☐ Filtered

TURNAROUND TIME
☒ Normal (≤10 Working Days)
☐ 3 Day (1.5 x Normal Rates)
☐ Next Day (2 x Normal Rates)
☐ Same Day (4 x Normal Rates)

PAGE 1 OF 1

DISCHARGE PERMIT YES NO

COMMENTS:
Need by 5/22!

RELINQUISHED BY: Gene Fritzel DATE: 5/12/11
COMPANY: FEINBERG RESERVOIR TIME: 3:25
RELINQUISHED BY: Gene Fritzel DATE: 5/13/11
COMPANY: FEINBERG RESERVOIR TIME: 3:25



TECHNOLOGY LABORATORY, INC.

CENTRE PROFESSIONAL PARK

1012 Centre Avenue
Fort Collins, Colorado 80526
(970) 490-1414

CERTIFICATE OF ANALYSIS

Fritzler Resources
300 E Burlington Ave
Fort Morgan, CO 80701

Sample ID: A
Laboratory ID B3125-01

Sampled: 05/14/15
Received: 05/14/15

Project No.: Westfork Pit
Matrix: Water

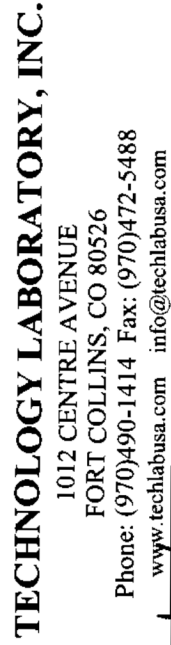
<u>CAS Number</u>	<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>MDL</u>	<u>Method</u>	<u>Date Analyzed</u>
71-43-2	Benzene	< 0.001	mg/L	0.001	EPA-8260B	05/15/15
108-88-3	Toluene	< 0.001	mg/L	0.001	EPA-8260B	05/15/15
100-41-4	Ethylbenzene	< 0.001	mg/L	0.001	EPA-8260B	05/15/15
1330-20-7	Total Xylenes	< 0.001	mg/L	0.001	EPA-8260B	05/15/15

QA/QC SURROGATE RECOVERIES

<u>Compound</u>	<u>% Recovery</u>	<u>% Rec. Limits</u>
Dibromofluoromethane	103	68-120
Toluene-d8	96	81-128
Bromofluorobenzene	99	70-113

TECHNOLOGY LABORATORY, INC.

The results contained in this report
relate only to those items tested.



TECHNOLOGY LABORATOR
1012 CENTRE AVENUE
FORT COLLINS, CO 80526
Phone: (970)490-1414 Fax: (970)472-5488
www.techlabusa.com info@techlabusa.com

CHAIN-OF-CUSTODY REPORT

COMPANY NAME Frutiger Associates		ANALYSIS REQUESTED										OTHER									
PROJECT MANAGER Gene Cristofari		SAMPLE MATRIX: SOIL (S) AIR (A)										HOLD AFTER ANALYSIS									
PROJECT NUMBER 10		NUMBER OF CONTAINERS 2										HOLD, DON'T ANALYZE									
PROJECT LOCATION OR NAME West Fork Ditch		VOC 624 / 8260 (TOTAL / TCLP)										BTEX / TVPH Emissions Vapor									
SAMPLER'S SIGNATURE [Signature]		SVOC 625 / 8270 / PAH (TOTAL / TCLP)										React. / Ignite. / Corr. / Paint Filt.									
DATE/TIME SAMPLED 5/14/11 11:30		TEPH (DRO)										BTEX Soil Vapor									
SAMPLE ID 1-1		BTX / MTBE / TVPH										TO-14 / TO-15 / TVPH Vapor									
DATE/TIME SAMPLED 5/14/11 11:30		pH / TSS / TDS										NITRATE / NITRITE / AMMONIA									
DATE/TIME SAMPLED 5/14/11 11:30		BOD / COD										PCBS									
DATE/TIME SAMPLED 5/14/11 11:30		RCRA 8 METALS (TOTAL / TCLP / DISSOLVED)										BTEX / TVPH Emissions Vapor									
DATE/TIME SAMPLED 5/14/11 11:30		VOC 624 / 8260 (TOTAL / TCLP)										React. / Ignite. / Corr. / Paint Filt.									
DATE/TIME SAMPLED 5/14/11 11:30		SVOC 625 / 8270 / PAH (TOTAL / TCLP)										BTEX Soil Vapor									
DATE/TIME SAMPLED 5/14/11 11:30		TEPH (DRO)										TO-14 / TO-15 / TVPH Vapor									
DATE/TIME SAMPLED 5/14/11 11:30		BTX / MTBE / TVPH										NITRATE / NITRITE / AMMONIA									
DATE/TIME SAMPLED 5/14/11 11:30		pH / TSS / TDS										BOD / COD									
DATE/TIME SAMPLED 5/14/11 11:30		RCRA 8 METALS (TOTAL / TCLP / DISSOLVED)										PCBS									

COMMENTS: **Results by 5/12 please**

LOGGED IN BY: **W**

SAMPLE: ☒ 6°C ☐ None ☐ Other

PRESERVATIVE: ☐ Acid ☐ Filtered

TURNAROUND TIME:

☒ Normal (≤10 Working Days)

☐ 3 Day (1.5 x Normal Rates)

☐ Next Day (2 x Normal Rates)

☐ Same Day (4 x Normal Rates)

RECEIVED BY: **W**

COMPANY: **W**

DATE: **5-14-11**

TIME: **3:35**