

Norris Environmental

Sample Delivery Group: L849504
Samples Received: 07/27/2016
Project Number: GREAT BASINS 1&2
Description: National Fuel Corp Great Basins 1&2 Pit
Site: GB 1&2 PRODUCTION PIT
Report To: Sean Norris
778 23rd Road
Grand Junction, CO 81505

REM 9771

Location ID 312368

Pit Facility ID 119434

Document 2527048

Entire Report Reviewed By:



Jason Romer

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



NFC-GB1&2-E-02 L849504-01 Solid

Collected by
Sean T. NorrisCollected date/time
07/25/16 10:39Received date/time
07/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG893665	1	07/28/16 21:29	07/29/16 11:39	ACM
Volatile Organic Compounds (GC) by Method 8015	WG893973	1	07/29/16 19:32	08/01/16 09:20	ACG
Volatile Organic Compounds (GC) by Method 8021	WG893973	1	07/29/16 19:32	08/02/16 06:38	LRL

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

NFC-GB1&2-BTM-02 L849504-02 Solid

Collected by
Sean T. NorrisCollected date/time
07/25/16 10:00Received date/time
07/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG893665	1	07/28/16 21:29	07/29/16 12:13	ACM
Volatile Organic Compounds (GC) by Method 8015	WG893973	1	07/29/16 19:32	08/01/16 09:43	ACG
Volatile Organic Compounds (GC) by Method 8021	WG893973	1	07/29/16 19:32	08/02/16 06:59	LRL



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.000678		0.000500	1	08/02/2016 06:38	WG893973
Toluene	ND		0.00500	1	08/02/2016 06:38	WG893973
Ethylbenzene	ND		0.000500	1	08/02/2016 06:38	WG893973
Total Xylene	ND		0.00150	1	08/02/2016 06:38	WG893973
TPH (GC/FID) Low Fraction	ND		0.100	1	08/01/2016 09:20	WG893973
(S) a,a,a-Trifluorotoluene(FID)	90.0		59.0-128		08/01/2016 09:20	WG893973
(S) a,a,a-Trifluorotoluene(FID)	98.9		59.0-128		08/02/2016 06:38	WG893973
(S) a,a,a-Trifluorotoluene(PID)	91.6		54.0-144		08/02/2016 06:38	WG893973
(S) a,a,a-Trifluorotoluene(PID)	96.8		54.0-144		08/01/2016 09:20	WG893973

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	86.2		4.00	1	07/29/2016 11:39	WG893665
(S) o-Terphenyl	78.1		50.0-150		07/29/2016 11:39	WG893665

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00162		0.000500	1	08/02/2016 06:59	WG893973
Toluene	ND		0.00500	1	08/02/2016 06:59	WG893973
Ethylbenzene	0.0181		0.000500	1	08/02/2016 06:59	WG893973
Total Xylene	0.0187		0.00150	1	08/02/2016 06:59	WG893973
TPH (GC/FID) Low Fraction	1.97		0.100	1	08/01/2016 09:43	WG893973
(S) a,a,a-Trifluorotoluene(FID)	97.3		59.0-128		08/02/2016 06:59	WG893973
(S) a,a,a-Trifluorotoluene(FID)	87.3		59.0-128		08/01/2016 09:43	WG893973
(S) a,a,a-Trifluorotoluene(PID)	96.6		54.0-144		08/01/2016 09:43	WG893973
(S) a,a,a-Trifluorotoluene(PID)	90.5		54.0-144		08/02/2016 06:59	WG893973

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	256		4.00	1	07/29/2016 12:13	WG893665
(S) o-Terphenyl	82.2		50.0-150		07/29/2016 12:13	WG893665

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3153675-5 07/31/16 16:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0222	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	94.3			59.0-128
(S) a,a,a-Trifluorotoluene(PID)	101			54.0-144

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3153854-5 08/01/16 15:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000257	J	0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	103			59.0-128
(S) a,a,a-Trifluorotoluene(PID)	95.4			54.0-144

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3153675-1 07/31/16 12:06 • (LCSD) R3153675-2 07/31/16 12:28

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	4.88	5.05	88.7	91.7	63.5-137			3.32	20
(S) a,a,a-Trifluorotoluene(FID)				104	104	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				112	112	54.0-144				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3153854-1 08/01/16 13:42 • (LCSD) R3153854-2 08/01/16 14:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0548	0.0549	110	110	70.0-130			0.190	20
Toluene	0.0500	0.0542	0.0541	108	108	70.0-130			0.180	20
Ethylbenzene	0.0500	0.0552	0.0554	110	111	70.0-130			0.310	20
Total Xylene	0.150	0.170	0.168	113	112	70.0-130			0.980	20
(S) a,a,a-Trifluorotoluene(FID)				102	102	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				105	106	54.0-144				



L849218-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L849218-01 07/31/16 16:51 • (MS) R3153675-3 07/31/16 15:21 • (MSD) R3153675-4 07/31/16 15:44

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	ND	3.53	3.55	63.7	64.2	1	28.5-138			0.730	23.6
(S) a,a,a-Trifluorotoluene(FID)					98.4	99.3		59.0-128				
(S) a,a,a-Trifluorotoluene(PID)					106	107		54.0-144				

L849218-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L849218-01 08/01/16 19:15 • (MS) R3153854-6 08/02/16 09:09 • (MSD) R3153854-7 08/02/16 09:31

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	ND	0.0402	0.0428	79.9	85.1	1	49.7-127			6.30	23.5
Toluene	0.0500	ND	0.0375	0.0399	74.3	79.1	1	49.8-132			6.15	23.5
Ethylbenzene	0.0500	ND	0.0339	0.0366	67.6	73.0	1	40.8-141			7.65	23.8
Total Xylene	0.150	ND	0.106	0.113	70.6	75.3	1	41.2-140			6.35	23.7
(S) a,a,a-Trifluorotoluene(FID)					102	102		59.0-128				
(S) a,a,a-Trifluorotoluene(PID)					99.5	103		54.0-144				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3153165-1 07/29/16 09:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	79.7			50.0-150

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3153165-2 07/29/16 09:53 • (LCSD) R3153165-3 07/29/16 10:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	60.0	42.1	42.1	70.2	70.2	50.0-150			0.0200	20
(S) o-Terphenyl				80.6	76.8	50.0-150				

L849504-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L849504-01 07/29/16 11:39 • (MS) R3153165-4 07/29/16 11:50 • (MSD) R3153165-5 07/29/16 12:02

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	60.0	86.2	134	128	79.1	70.4	1	50.0-150			3.98	20
(S) o-Terphenyl					64.1	76.1		50.0-150				



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
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J	The identification of the analyte is acceptable; the reported value is an estimate.
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¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

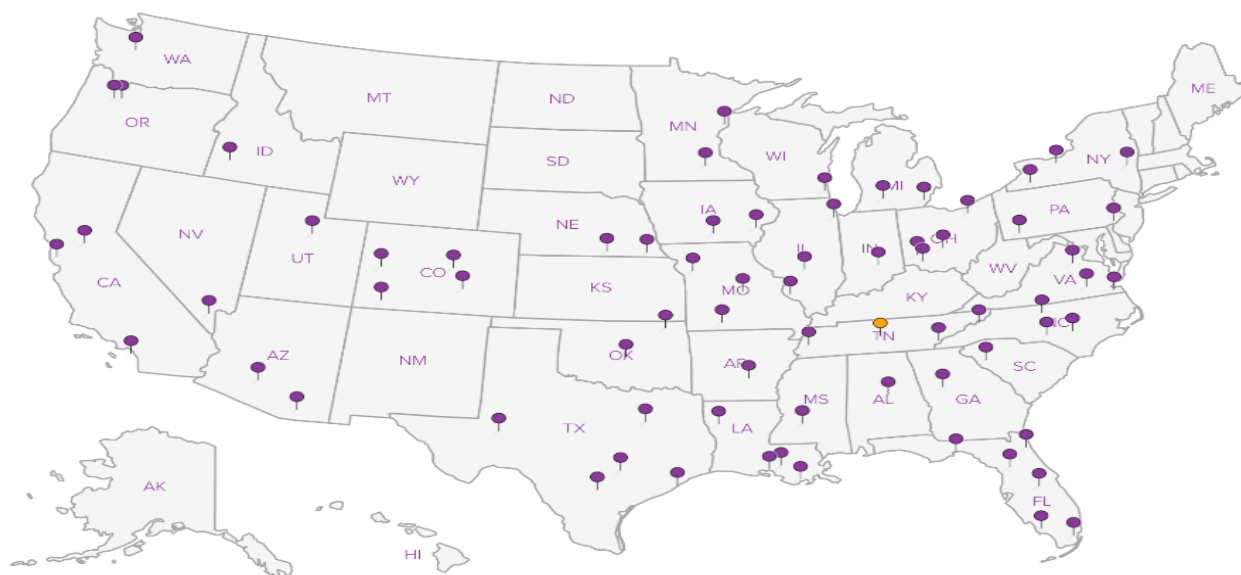
Third Party & Federal Accreditations



A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



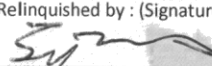

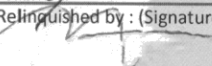
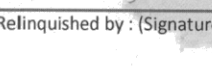
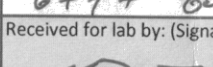
Company Name/Address: Norris Environmental LLC 778 23 Road Grand Junction, CO 81505				Billing Information: Same				Analysis / Container / Preservative										Chain of Custody Page ____ of ____  YOUR LAB OF CHOICE 12065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859 	
Report to: Sean T. Norris				Email To: sean@norrisenvironmentalllc.com				<div style="display: flex; justify-content: space-between;"> <div>BTEX GRO/DRO - 8021/8015</div> <div>SV8270PAHSIM - 8270SIM</div> <div>SPCON - 9050AMod</div> <div>SAR - CALC</div> <div>RCRA8 Metals + Cu, Ni and Zn - 6010/7470</div> <div>CR6SS - 3060A/7196</div> <div>CR3 - CALC</div> <div>Arsenic</div> </div>											
Project Description: National Fuel Corp Great Basins 1&2 Pit				City/State Collected: Mesa County CO															
Phone: 970-241-9974 Fax:		Client Project # Great Basins 1&2		Lab Project #															
Collected by (print): Sean T. Norris		Site/Facility ID # GB 1&2 Production Pit		P.O. #															
Collected by (signature): Immediately Packed on Ice N ____ Y <input checked="" type="checkbox"/>		Rush? (Lab MUST Be Notified) ____ Same Day200% ____ Next Day100% ____ Two Day50% ____ Three Day25%		Date Results Needed Email? ____ No <input checked="" type="checkbox"/> Yes FAX? ____ No ____ Yes		No. of Cntrs													

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX GRO/DRO - 8021/8015	SV8270PAHSIM - 8270SIM	SPCON - 9050AMod	SAR - CALC	RCRA8 Metals + Cu, Ni and Zn - 6010/7470	CR6SS - 3060A/7196	CR3 - CALC	Arsenic	Rem./Contaminant	Sample # (lab only)
NFC-GB1&2-E-02	Grab	SS	6"	7/25/2016	10:39	2	X									-01
NFC-GB1&2-BTM-02	Grab	SS	6"	7/25/2016	10:00	2	X									-02

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Flow _____ Other _____

Relinquished by: (Signature) 		Date: 7/26/16	Time: 15:00	Received by: (Signature) 		Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____		Hold #	
Relinquished by: (Signature) 		Date: 7/26/16	Time: 15:30	Received by: (Signature) 6777 6003 5480		Temp: _____ °C Bottles Received: 3.4 4 = 402		Condition: (lab use only) SW1 OK	
Relinquished by: (Signature) 		Date:	Time:	Received for lab by: (Signature) 		Date: 7/27/16 Time: 0900		COC Seal Intact: ____ Y ____ N ____ NA pH Checked: _____ NCF: _____	



YOUR LAB OF CHOICE

Cooler Receipt Checklist

Client: NORWEGSD SDG# 6849504

Cooler Received/Opened On: 7/27/16 By: Michael Lowe

Temperature Upon Receipt: 3.4 °C

[Signature]
(Signature)

Cooler Receipt Check List			Yes	No	N/A
Were custody seals on outside of cooler and intact?			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were custody papers properly filled out (ink, signed, etc.)?			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did all bottles arrive in good condition?			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were correct bottles used for the analyses requested?			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was sufficient amount of sample sent in each bottle?			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were correct preservatives used?			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were all applicable sample containers checked for preservation?			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(Any samples not in accepted pH range noted on COC.)			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If applicable, was an observable VOA headspace present?			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Non Conformance Generated? (If yes see attached NCF)			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



...Green Technology through
Innovation

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