



October 2, 2015

Mr. Bill Monahan
Monahan Gas & Oil, Inc.
12 Dos Rios
Greeley, CO 80634
Via email; artsybmon@q.com

Correct Facility
ID is #443257

Subject: Surficial Spill Report
COGCC Facility ID: ~~245790~~
COGCC Inspection Document Number: 679700051
Monahan Gas & Oil, Inc.
Fairmeadows #11-3 Facility
NESW, Sec.3, T5N, R65W
Greeley, Colorado
CGRS Project No. 1-12986-15780aa

Dear Mr. Monahan:

During the month of September, 2015 it was estimated that approximately 1.5 barrels (BBLs) of production fluid leaked from a damaged 2-inch valve on the production flow line as it enters the separator. The production stream from the Fairmeadows #11-3 wellhead is intermittent and the production fluid is scheduled to exit the wellhead for approximately nine minutes during each 24-hour period. Based on the duration of time that fluid is in transit and number of days that the valve was potentially leaking it is estimated that a total of 1.5 BBLs leaked from the pipe via a pressurized mist on three separate occasions and carried by prevailing wind southeast, south, and west across the adjacent cornfield. A minor amount of production fluid also spilled to the ground surface adjacent to the separator. Upon discovery, the well was immediately shut in and the damaged valve was replaced by Monahan Gas & Oil, Inc. A site location map is included as Figure 1, a site conditions map is included as Figure 2A and a Spill Pathway and Sample location Map is included as Figure 2B.

The leak was discovered by the landowner who manages the field adjacent to the Fairmeadows #11-3 Facility. The landowner called the Colorado Oil and Gas Conservation Commission (COGCC) who notified Monahan Gas & Oil, Inc. There was no visible standing fluid on site or in the surrounding farmland. The ground appeared to be slightly stained from the fluids and some crops showed signs of stress where the fluid was carried by wind and deposited on the tops of the stalks in three primary areas.

On September 18, 2015, CGRS completed confirmation soil screening and sampling throughout the extent of the spill area to determine the potential extent of impacts to the surface and subsurface environments. Soil screening with a photo-ionization detector (PID) was completed by CGRS at the ground surface and to depths of approximately 1-foot below ground surface (bgs) to determine the presence or absence of organic vapors.

During the surficial soil assessment, thirty-one soil locations were screened along the perceived paths of the released production fluids and around the point of release. Two soil samples (SS-1 at the surface and SS-9 at the surface) were submitted to eAnalytics Laboratory, Inc. in Loveland, Colorado in order to determine potential hydrocarbon concentrations in the source area soil. Additionally, two corn stalk samples were collected (Corn Stalk 1 & Corn Stalk 2) and analyzed for total petroleum hydrocarbons – diesel range organics (TPH-DRO) in order to document potential impacts to the corn crop. Surface soil samples SS-1 and SS-9 were submitted for analysis of benzene, toluene, ethylbenzene and total xylenes (BTEX), total petroleum hydrocarbons – gasoline range organics (TPH-GRO), TPH-DRO, pH, sodium adsorption ratio (SAR), and electrical conductivity (EC). A summary of soil screening and soil analytical data is included as Table 1.

A review of soil analytical data from soil sample SS-1 at the surface revealed concentrations of benzene and TPH-DRO in excess of COGCC maximum allowable concentrations. All other analytes from soil sample SS-1 were below COGCC maximum allowable concentrations (MACs). A review of the soil quality analytical data for SS-9 at the surface shows that concentrations of BTEX, TPH-GRO, pH, EC & SAR were below laboratory method detection limits; however, SS-9 showed elevated TPH-DRO levels that exceeded MACs.

Laboratory data from vegetation sample Corn Stalk 1 indicates TPH-DRO levels above MACs. Vegetation sample Corn Stalk 2 revealed no detectable TPH-DRO levels. The corn in sample location Corn Stalk 2 appeared to be stressed from environmental factors not associated with the spill as no production fluids appeared to have traveled to the location from the spill release point. The area near Corn Stalk 2 appears to be in a natural topographic depression and thus may have been susceptible to overwatering. Laboratory analytical data and Chain-of-custody documentation are included as Attachment A.

The levels of pH, EC, SAR, and relatively low levels of volatile organics with the exception of SS-1 at the surface and SS-9 at the surface indicate a surficial soil zone with minor impacts from the production fluid spill that occurred during early September, 2015. Based on the soil screening and analytical data CGRS recommends that Monahan Gas & Oil, Inc. excavate the ground surface in the source area per any COGCC recommendations. As required by COGCC, follow up sampling event may be required to obtain additional confirmation soil samples pending remedial activities by Monahan Gas & Oil, Inc.

Should you have any questions or require any additional information, please call me at 970-493-7780.

Sincerely,
CGRS, Inc.



Kenneth M. Rogowski
Project Manager/Scientist

Reviewed By,



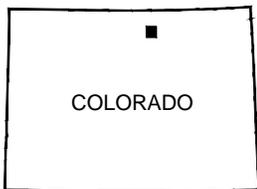
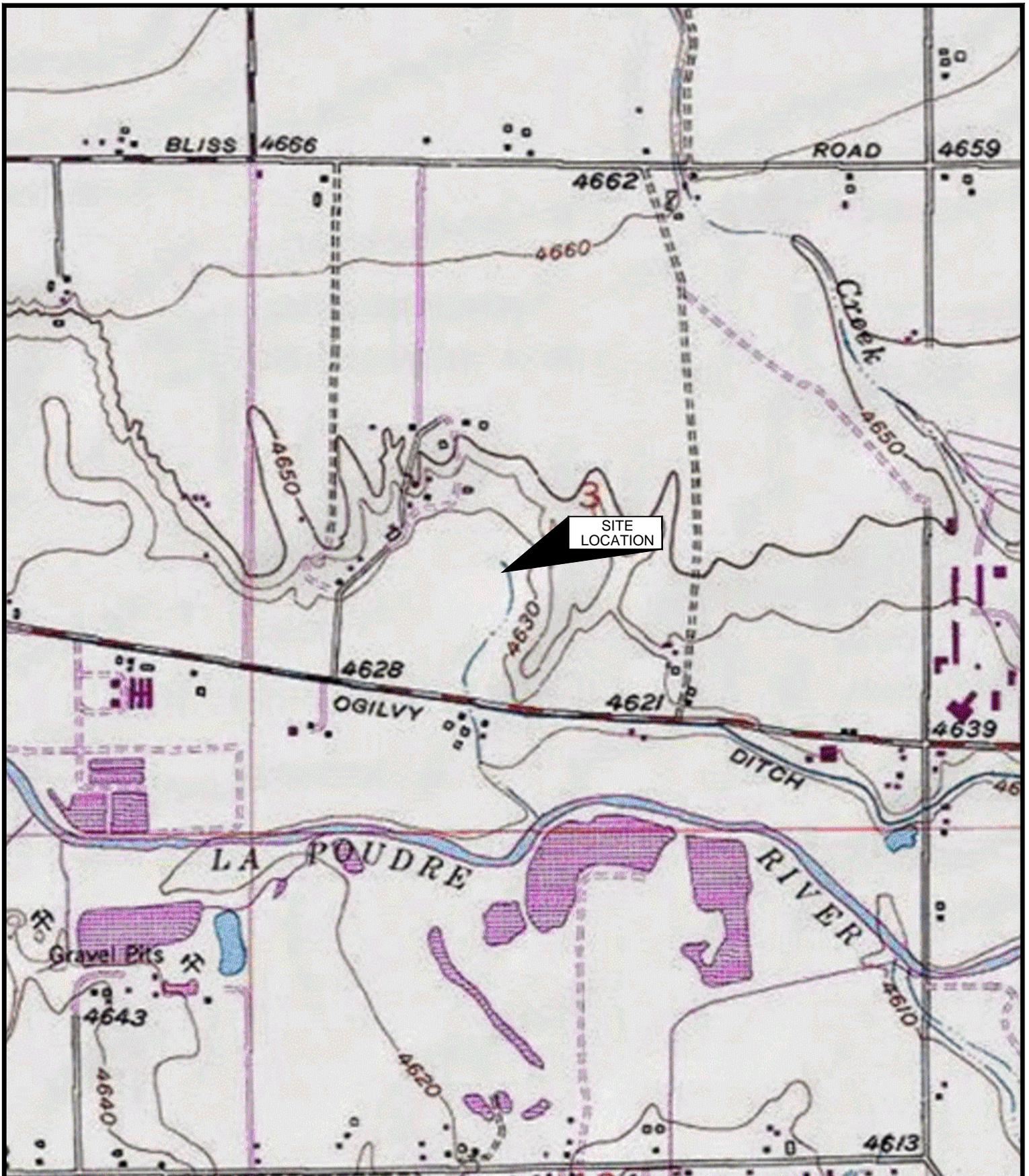
Craig S. Mulica
Associate Geologist

Enclosures

Figures 1, 2A & 2B
Table 1; Soil Screening and Analytical Data
Attachment A: Laboratory Analytical Data & Chain-of-Custody Documentation

ec:

Rick Allison; rick.allison@state.co.us



COLORADO

■ QUADRANGLE LOCATION



NORTH

0 1000 2000

SCALE IN FEET

FIGURE 1
SITE LOCATION MAP

MONAHAN GAS & OIL, INC.
FAIRMEADOWS 11-3
NESW, SEC.3, T5N, R65W
GREELEY, COLORADO

PROJECT:
1-12986-15780aa

DATE:
9/18/2015

DRAFT:
DRS

REVIEW:





LEGEND

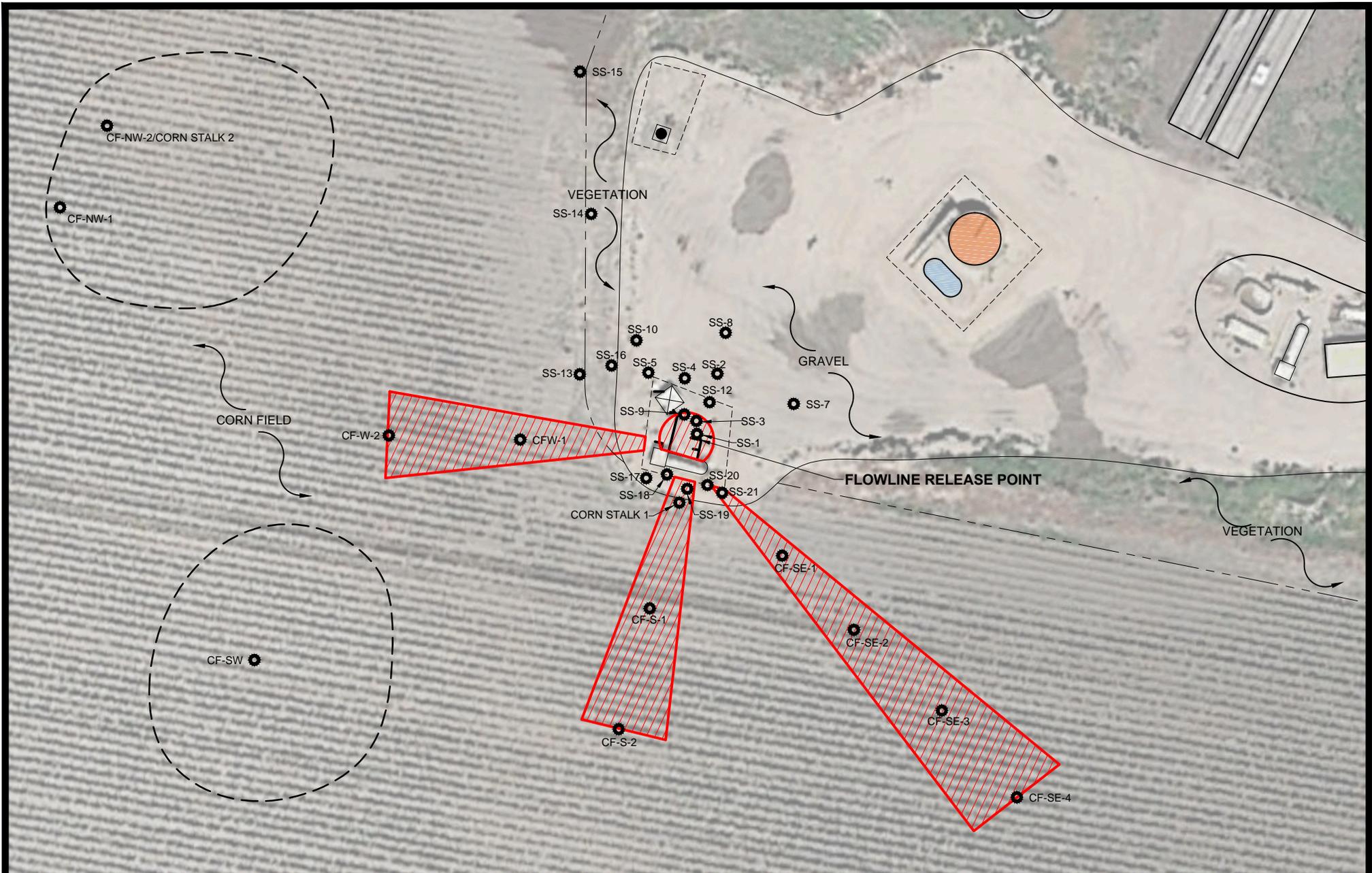
- SOIL SECONDARY CONTAINMENT BERM
- ▭ SEPARATOR
- ⊠ GAS HOUSE
- WELL HEAD
- 🌳 TREE
- 🟠 OIL TANK
- 🟢 WATER TANK



FIGURE 2A
SITE CONDITIONS MAP
 MONAHAN GAS & OIL, INC.
 FAIRMEADOWS 11-3
 NESW, SEC.3, T5N, R65W
 GREELEY, COLORADO

PROJECT: 1-12986-15780aa	DRAFT: SJK
DATE: 9/29/2015	REVIEW:





LEGEND

-  SS-1 SOIL SAMPLE LOCATIONS
-  SOIL SECONDARY CONTAINMENT BERM
-  SURFACE LAND TYPE BOUNDARY ABOVE GROUND PIPING
-  SEPARATOR
-  GAS HOUSE
-  WELL HEAD

-  APPROXIMATE SPILL PATHWAY
-  OIL TANK
-  WATER TANK
-  DEPRESSED AREAS
-  APPROXIMATE SPILL PATHWAY
-  OIL TANK
-  WATER TANK
-  DEPRESSED AREAS

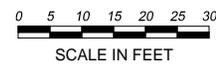


FIGURE 2B
SPILL PATHWAY & SAMPLE LOCATIONS

MONAHAN GAS & OIL, INC.
 FAIRMeadOWS 11-3
 NESW, SEC.3, T5N, R65W
 GREELEY, COLORADO

PROJECT:
 1-12986-15780aa
 DATE:
 9/30/2015

DRAFT:
 SJK
 REVIEW:



Table 1

Soil Screening and Analytical Data

Table 1 - Soil Screening and Analytical Data

Monahan Gas & Oil, Inc.
 Fairmeadows #11-3
 NESW, Sec. 3, T5N, R65W
 Greeley, Colorado

Soil Screening Location	Date	Depth (ft)	PID (ppm)	Benzene (mg/Kg)	Toluene (mg/Kg)	Etylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	TPH-GRO (mg/Kg)	TPH-DRO (mg/Kg)	pH	EC (mmhos/cm)	SAR
SS-1	9/18/2015	surface	40.5	0.028	0.319	0.031	0.510	< 50.0	2096	6.5	0.836	1.63
SS-1	9/18/2015	0.5	7.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-2	9/18/2015	surface	2.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-3	9/18/2015	0.5	39.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-3	9/18/2015	1.0	24.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-4	9/18/2015	surface	11.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-5	9/18/2015	surface	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-6	9/18/2015	surface	3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-7	9/18/2015	surface	6.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-8	9/18/2015	surface	2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-9	9/18/2015	surface	60.2	< 0.010	0.067	< 0.010	0.209	242	6258	6.4	0.416	1.06
SS-9	9/18/2015	0.5	65.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-9	9/18/2015	1.0	15.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-10	9/18/2015	surface	5.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-11	9/18/2015	surface	1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-12	9/18/2015	surface	9.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-13	9/18/2015	surface	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-14	9/18/2015	surface	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-15	9/18/2015	surface	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-16	9/18/2015	surface	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-17	9/18/2015	surface	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-18	9/18/2015	surface	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-19	9/18/2015	surface	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-20	9/18/2015	surface	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-21	9/18/2015	surface	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-SE-1	9/18/2015	surface	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-SE-2	9/18/2015	surface	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-SE-3	9/18/2015	surface	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-SE-4	9/18/2015	surface	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-S-1	9/18/2015	surface	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-S-2	9/18/2015	surface	0.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-W-1	9/18/2015	surface	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-W-2	9/18/2015	surface	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-NW-1	9/18/2015	surface	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
CF-NW-2	9/18/2015	surface	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Corn Stalk 1	9/18/2015	top 1' of stalk	3.5	NA	NA	NA	NA	NA	2469	NA	NA	NA
Corn Stalk 2	9/18/2015	top 1' of stalk	1.0	NA	NA	NA	NA	NA	< 50.0	NA	NA	NA
SENSITIVE AREA				0.17	85	100	175	500	500	6 - 9	<4	<12
MDL				0.01	0.01	0.01	0.01	50.0	50.0	NA	NA	NA

Notes:
 TPH-GRO = Total petroleum hydrocarbons, gasoline range C6-C10
 TPH-DRO = Total petroleum hydrocarbons, diesel range C10-C28
 EC = Electrical Conductivity
 SAR = Soil Adsorption Ratio
 PID = Photo-ionization detector measured in parts per million

NA = Not Analyzed
 MDL = Laboratory Method detection limit
 Sensitive Area - COGCC Allowable concentrations
Boldface = Exceeds COGCC sensitive area standards

Laboratory Analytical Data & Chain-of-Custody Documentation

Test Report

eANALYTICS LABORATORY

September 23, 2015

Client: CGRS
Project: 15780aa
Lab ID: 3922
Date Samples Received: 9/18/2015
Number of Samples: 4
Sample Condition: Samples arrived intact and in appropriate sample containers
Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

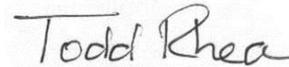
The quality control procedures associated with the requested analyses were satisfactorily passed before the samples were run.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you.

Sincerely,



Christopher Dieken
Quality Assurance Manager



Todd Rhea
Laboratory Manager

eAnalytics Laboratory

4130 Clydesdale Parkway Loveland CO 80538

Chain of Custody

eANALYTICS

LABORATORY

Chain of Custody 1

eANALYTICS LABORATORY

4130 Clydesdale Parkway Loveland CO 80538 Phone: (970) 667-6975 Fax: (970) 669-0941 www.eAnalyticsLab.com

CLIENT INFORMATION
(*New Clients please fill out completely)

Company: CGRS INC.

Project: 15780aa

Send Report To: Ken Rogowski

Send Invoice To: Ken Rogowski

Phone/Email: _____

Address: _____

ANALYSIS INFORMATION
(Select analysis by checking box on corresponding sample line)

Matrix: (S) Soil (W) Water (A) Air (O) Other	BTEX / MTBE / TVPH (EPA8260)	BTEX / TVPH (EPA8260)	LEPH (EPA8015)	Volatiles - Full List (EPA8260)	Semi-Volatiles Full List (EPA8270)	PAHs (EPA8270)	Oil & Grease (EPA9071B/1664)	TRPH (EPA418.1)	Total RCRA-8 Metals (EPA606/0707/71)	TCLP RCRA-8 Metals (EPA1111/0107/07/71)	Vapor-Soil Vapor BTEX (EPA TO-14)	Vapor-Emissions BTEX / TVPH (TO-14)	pH / Salinity	EC	SAR	DSO
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Lab ID	Sample Name	Sampling Date	Number of Containers	Matrix: (S) Soil (W) Water (A) Air (O) Other	BTEX / MTBE / TVPH (EPA8260)	BTEX / TVPH (EPA8260)	LEPH (EPA8015)	Volatiles - Full List (EPA8260)	Semi-Volatiles Full List (EPA8270)	PAHs (EPA8270)	Oil & Grease (EPA9071B/1664)	TRPH (EPA418.1)	Total RCRA-8 Metals (EPA606/0707/71)	TCLP RCRA-8 Metals (EPA1111/0107/07/71)	Vapor-Soil Vapor BTEX (EPA TO-14)	Vapor-Emissions BTEX / TVPH (TO-14)	pH / Salinity	EC	SAR	DSO
1	SS-1e Surface	9/18/15	25	X	X												X	X	X	
2	SS-9e Surface	9/18/15	25	X	X												X	X	X	
	Baseline Corn stalk	9/18/15	10																	
3	Corn stalk 1	9/18/15	10																	X
4	Corn stalk 2	9/18/15	10																	X

Comments: _____

Turnaround Time (Business Days)
TAT begins when sample is received by eANALYTICS

Normal (5-10 Days)
 3 Day (25%)
 2 Day (50%)
 1 Day (100%)
 Same Day (300%)

Rush analysis requires an extra charge.
If possible please inform eANALYTICS in advance for rush analysis.

Colorado OPS Project: _____ Yes / No

For eANALYTICS Use

Samples Received Intact: _____ Yes / No

Received Within Temperature Range (2-6°C): _____ Yes / No

Sample Preservative: _____ Ice / Acid / None / Other

Record of Custody

Relinquished by: [Signature] Date: 9/18/15

Company: CGRS Time: 2:50 AM

Received by: _____ Date: _____

Company: _____ Time: _____

Relinquished by: _____ Date: _____

Company: _____ Time: _____

Received by: [Signature] Date: 9/18/15

Company: eANALYTICS Time: 2:50 AM

Lab ID # 3922

eAnalytics Laboratory
4130 Clydesdale Parkway Loveland CO 80538
(970) 667-6975

Page 1 of 1



Client: CGRS Lab ID: 3922
 Project: 15780aa
 Analysis: BTEX / TPH-GRO Method: EPA8260
 TPH-DRO EPA8015

Sample Name	Benzene mg/kg	Toluene mg/kg	Ethyl- benzene mg/kg	Total Xylenes mg/kg	TPH- GRO mg/kg	TPH- DRO mg/kg	Date Sampled	Date Analyzed	Lab ID
SS-1 @ Surface	0.028	0.319	0.031	0.510	< 50	2096	09/18/15	09/22/15	3922 1
SS-9 @ Surface	< 0.010	0.067	< 0.010	0.209	242	6258	09/18/15	09/22/15	3922 2
Corn Stalk 1						2469	09/18/15	09/22/15	3922 3
Corn Stalk 2						< 50	09/18/15	09/22/15	3922 4

eANALYTICS
LABORATORY

Client: CGRS Lab ID: 3922

Project: 15780aa

Analysis: pH Method: EPA9045D
EC USDA 60 (3)
SAR USDA 60 (20B)

Sample Name	pH	EC	SAR	Date	Date	Lab ID
	su	mmhos/cm	ratio	Sampled	Analyzed	
SS-1 @ Surface	6.5	0.836	1.63	09/18/15	09/22/15	3922 1
SS-9 @ Surface	6.4	0.416	1.06	09/18/15	09/22/15	3922 2



Client: CGRS

Lab ID: 3922

Project: 15780aa

Method: EPA8260

Sample Name	Dibromo- fluoromethane % Recovery	1,2 Dichloro- ethane-D4 % Recovery	Toluene-D8 % Recovery	4-Bromo- fluorobenzene % Recovery	Date Sampled	Date Analyzed	Lab ID
SS-1 @ Surface	100	97	98	96	09/18/15	09/22/15	3922 1
SS-9 @ Surface	97	99	95	93	09/18/15	09/22/15	3922 2

eAnalytics Laboratory

4130 Clydesdale Parkway Loveland CO 80538



Client: CGRS Lab ID: 3922
 Project: 15780aa
 Analysis: BTEX / TPH-GRO Method: EPA8260
 TPH-DRO EPA8015

Sample Name	Benzene % Rec	Toluene % Rec	Ethyl- benzene % Rec	Total Xylenes % Rec	TPH- GRO % Rec	TPH- DRO % Rec	Date Analyzed	Lab ID
Laboratory Control Sample (70-130%)	89	90	92	89	104	102	09/22/15	LCS 3922 1
Method Blank	< 0.010 mg/kg	< 0.010 mg/kg	< 0.010 mg/kg	< 0.010 mg/kg	< 50 mg/kg	< 50 mg/kg	09/22/15	MB 3922 1