

State of West Virginia
Department of Environmental Protection
Office of Oil and Gas

CBM Land Application – Application Review Form

Facility Number GP-WV-1-07-0101385 Received ^(MM/DD/YYYY) 6/3/21
Operator DIVERSIFIED GAS, INC. Evaluated 9/21/21
Facility Name TYGRET 1B & 1C Approved / /

1. Form WW-8. Submitted and properly filled out? Y N NA
2. Location and Design Map. Submitted in both hardcopy and digital format?
(Georeferenced in NAD 83) Y N NA
3. Description and Method of Land Application. Does it meet requirements
established in Form WW-8? Y N NA
4. Monitoring Plan. Does it meet requirements established in form WW-8
and GP-WV-1-07? Y N NA
5. Has the groundwater monitoring plan been submitted
according to GP-WV-1-07, H.12? (if applicable) Y N NA
6. CBM water analytical data. Is it present in the application? Y N NA
7. Background sampling. Does it meet the requirement stated in
GP-WV-1-07, H.11? Y N NA
8. Application rate calculations provided? Y N NA
9. Surface owner waiver provided? Y N NA
10. Maintenance plan provided? Y N NA

Form completed by: 
(print) ANDREW L. LOCKWOOD

**APPLICATION AND SITE REGISTRATION
FOR LAND APPLICATION OF WATER PRODUCED
FROM COALBED METHANE WELLS
TYGRET 1B AND 1C
CURRENT PERMIT #GP-WV-1-07-08101385
BOLT, RALEIGH COUNTY, WEST VIRGINIA**

**Prepared For:
Diversified Gas, Inc.
414 Summers Street
Charleston, West Virginia 24301**

**Prepared By:
Envirocheck of Virginia, Inc.
375 Mountain Lane
Tazewell, Virginia 24651**

EnviroCheck of Virginia, Inc.
375 Mountain Lane
Tazewell, Virginia 24651
276.472.2174 FAX 276.472.2425

May 10, 2021

Mr. James Martin, *Chief*
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street, SE
Charleston, West Virginia 25304

Re: *Application and Site Registration for*
Land Application of Water Produced from Coalbed Methane Well
Diversified Gas – Tygrett 1B/1C
Bolt, Raleigh County, West Virginia

Dear Mr. Martin:

On behalf of Diversified Gas, Inc. EnviroCheck of Virginia, Inc. (EC) is pleased to submit this “*Application and Site Registration for Land Application of Water Produced from Coalbed Methane Wells.*” The facility is currently permitted under General Permit #GP-WV-1-07-08101385 and DG wishes to renew this permit. Based on current and historical produced water laboratory data, this facility will not operate in the upper discharge limits of the permit (Section B). Therefore, ground water monitoring will not be required for this facility.

If you have any questions, please feel free to contact us.

Sincerely,

EnviroCheck of Virginia, Inc.



Jacob L. Rhudy, III, L.R.S. #172
Operations Manager

06/07/2024

Page 1 of ____
Form WW-8 (11-09)
Site Registration Form
1) Date: 3/21/21

Agency Use Only

2) Facility ID Number:
3) Date Received:

<u>81-01385</u>
<u>6/3/21</u>

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
APPLICATION AND SITE REGISTRATION FOR
LAND APPLICATION OF WATER PRODUCED FROM
COALBED METHANE WELL

4) Facility Operator: Diversified Production, LLC 5) Facility Name KS Harvey/Tygrett
6) Operator's Facility Number GP-WV-1-07-081-01385 7) Facility Elevation 2280'
8) Location:
(a) Watershed Breckenridge of Marsh Fork
(b) District Trap Hill (c) County Raleigh (coord 279263.28/1842177.83)
(d) Quadrangle Amette, WV (e) Coordinates NAD83¹:
9) Surface Owner*: Gilles and Raylene Caron 10) Acreage 3 tracts, approx 195.74acres
Address PO Box 396
Bolt, WV 25817

11) Designated Agent: Jeff Mast
Address 414 Summers Street
Charleston, WV 25301

DESCRIPTION OF APPLICATION AREA

12) Soil Type: Muskingum Soil Permeability: Moderate
Depth to Bedrock: approx 4' Depth to Water Table: 220
(Information from County Soil Survey Report)
13) Nearest Water Supply Distance**: City Water Type: Stream Well Spring
14) Nearest Surface Water*: 300' trib to Trough Fork
15) Nearest Occupied Dwelling: > 3/4 mile
16) Average Slope of Proposed Area of Land Application: 8%
17) Total Acreage of Proposed Application Area: approx 4-6acres

* Attach additional pages as necessary.
** If located within 2500 foot radius of the land application area.

¹ The attached topo map (See # 18 for additional requirements) shall include coordinates of boundaries for the land application area, as well as monitoring wells (if groundwater monitoring plan is proposed), monitoring markers for water, soil and vegetation sampling.

2) Facility ID Number:
3) Date Received:

081-01385
6/3/21

LOCATION AND DESIGN MAP

- 18) Attach a map on the scale of 1" = 1,000' or greater showing the acreage within the permitted site to be used for land application identifying all monitoring points, surface waters, wells, springs, natural rock outcrops and property lines in relation to the proposed area of land application within a radius of 2500 ft. The drawing shall also be sent in digital format, set up in coordinates UTM Zone 17 or 18 (as appropriate) and based on North American Datum 1983 - NAD 83. Map shall also delineate any buffer zones and show all wells involved in the discharge.

DESCRIPTION AND METHOD OF LAND APPLICATION

- 19) Provide a narrative describing the:
- (a) Number and API No. of all wells contributing to the discharge.
 - (b) Coal seam or seams being produced.
 - (c) Produced water treatment system and chemicals to be used (if any).
 - (d) Method and rate planned for land application of produced water.
 - (e) Vegetation study, to include both background and baseline conditions for the planned application area prior to any land application.
 - (f) Groundwater monitoring plan, if necessary to exceed certain discharge limits as outlined in the permit and fact sheet.
 - (g) Planned beginning date of land application.

MONITORING PLAN

- 20) Produced Water Discharge:
- (a) The point or area at which the produced water is to be discharged to the land application area is to be both identified in the narrative and shown on the design map. This discharge point or area is to be identified by a permanent marker with a sign attached identifying the discharge point.
 - (b) The groundwater, soil, and vegetation monitoring points within the land application area are to be located by permanent marker. Each monitoring point is to be identified by a unique identifier, with this identifier shown upon the design map. Further, the individual monitoring points are to be identified in the land application area by a sign attached to each permanent marker.
 - (c) A narrative is to be provided outlining the monitoring program of the land application area for contaminant concentrations in the soils within the application area, to assure that contaminants discharged are not adversely affecting soil quality. In addition, if groundwater monitoring is to be conducted, the permittee has to include a study in compliance with the requirements found in the General Permit (See GP-WV-1-07, H.12 - Other Requirements); describing the monitoring methods used to ensure that groundwater quality is not being adversely affected by the land application.
- 21) Coalbed Produced Water:
- (a) Analytical Data
Attach sampling and laboratory analysis report to include sample date, time, method of collection, sampler, date received at lab, date of analysis, and method. Provide analysis for and include anticipated range of concentrations for the parameters required in Section B of the general permit GP-WV-1-07.
 - (b) Daily Volumes
 Anticipated Based On pump size

2) Facility ID Number:
3) Date Received:

Agency Use Only
<u>91-01385</u>
<u>6/3/21</u>

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

OWNER/OPERATOR

Name: Diversified Production LLC

By: Joey Stumbo

Its: VP Operations

Date: 2.10.21

STATE OF KENTUCKY

COUNTY OF PIKE, to-wit:

I, Myra Baldwin, a Notary Public of said County, do hereby certify that Joey Stumbo, who signed the writing above for D602 bearing date the 10 of February, 2021 has this day in my said County, before me, acknowledged the said writing to be the act and deed of said corporation.

Given under my hand and official seal this the 10 day of February, 2021.

My commission expires 6-1-22

Myra Baldwin
Notary Public

{SEAL}

Page 4 of ____
Form WW-8 (11-09)
Site Registration Form
1) Date: 3/21/2021

Agency Use Only

2) Facility ID Number:
3) Date Received:

81-01385
6/3/21

VOLUNTARY SURFACE OWNER STATEMENT OF APPROVAL

I hereby state that I have reviewed this application for coverage under general permit GP-WV-1-07 for the discharge of water produced from Coalbed Methane Well(s) onto my surface land. I understand that before the permit coverage can be granted, the operator must have my consent to the application of the produced water on the surface land.

I further state that I have no objection to the planned discharge of produced water to the land surface described in these materials, and I have no objection to coverage under general permit #GP-WV-1-07 being granted.

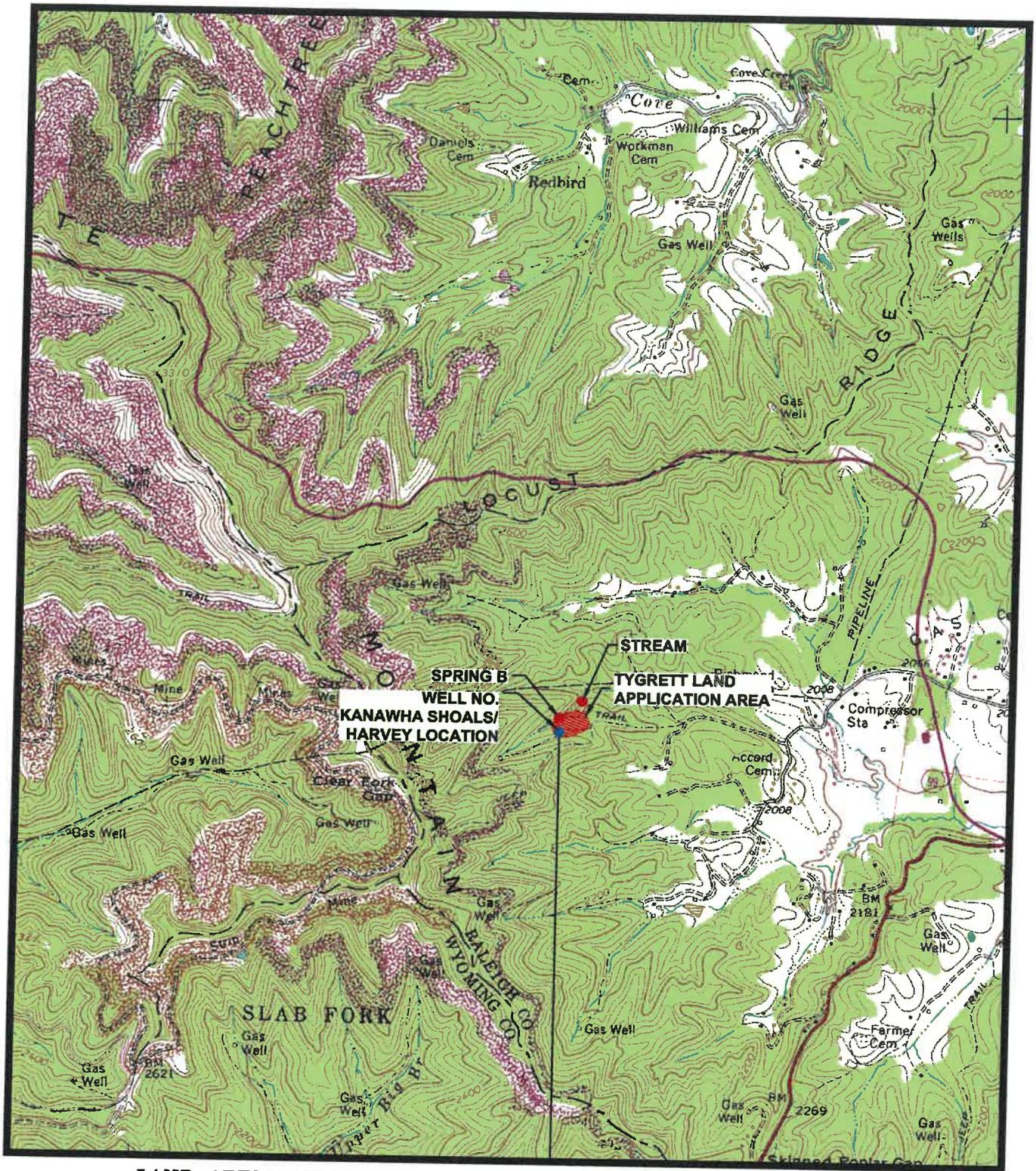
(For execution by natural person(s))

(For execution by corporation, etc.)

Raylene Caron Date: 6/1/21
(Signature)
Gilles Caron Date: 6/1/21
(Signature)

Name _____
By: _____
Its: _____
Date _____

Attachment 18
Mapping

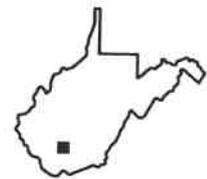


LAND APPLICATION SITE - RALEIGH COUNTY, WEST VIRGINIA
PORTION OF USGS 7.5' ARNETT, WV QUADRANGLE



SCALE 1:2,000

LOCATION MAP
WELL NO. TYGRETT



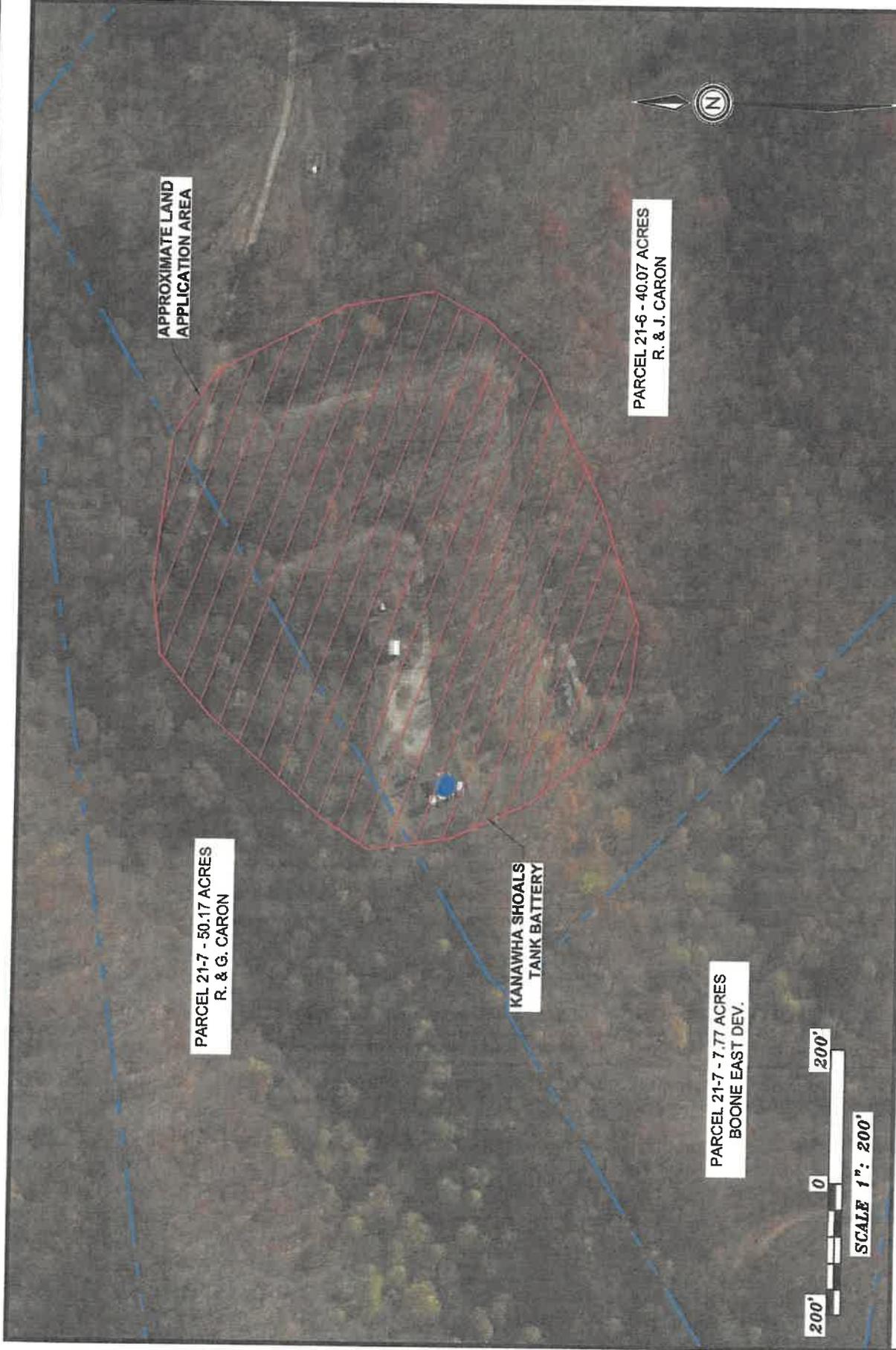
WEST VIRGINIA
QUADRANGLE
LOCATION



Envirocheck of Virginia, Inc.



06/07/2024



Envirocheck of Virginia, Inc.
 120 Lovelane Street
 Bluefield, VA 24605
 "Energy. Environmental Consulting"



LAND APPLICATION AREAS
 RALEIGH COUNTY, WEST VIRGINIA
 WELL NO. TYGRETT
SITE MAP

Attachment 19
Description and Method

Attachment 19 – Description and Method of Land Application

(a) Number and API No. of all wells to the discharge.

Response: This land application area covers three wells: Tygrett 1A, 1B, and 1C with B&C being the production wells. API numbers are as follows:

Table 1
API Well Numbers

Operator's Well No.	API No.
Tygrett 1A	081-01390
Tygrett 1B	081-01391
Tygrett 1C	081-01392

(b) Coal Seam or seams being produced.

Response: These wells produces water from the Lower Beckley Seam of coal and Pocahontas No 2 and No. 3 seams.

(c) Produced water treatment system and chemicals to be used (if any).

Response: The *WATER TREATMENT SYSTEM* drawing depicts the treatment system being used to remove suspended solids from the CBM well water prior to discharge onto the land application area. Flocculant may be introduced into the CBM well water stream between the wellhead and the first holding tank if suspended solids need treatment. The flocculant is an aluminum sulfate based (AlSO₄) material¹ that attaches to the suspended solids to assist with the precipitation of these solids in the holding tank. Produced water from a 2-210 tank battery system at the B and C well to the four 400 BBL fiberglass tank battery located at the Kanawha Shoals well location with the appropriate secondary containment. The first tank is designed to remove the total suspended solids and the subsequent tanks are to clarify the well water before discharge onto the land application area. Valves are installed in the discharge line of each tank to allow water sampling prior to discharge onto the land application area. A drawing showing the tank system is attached (see drawing *WATER TREATMENT SYSTEM*).

(d) Method and rate planned for land application of produced water.

Response: This system has been designed to accommodate the maximum discharge rate (based on pump sizes) of CBM well water at a combined maximum rate of gallons per day from the B&C wells. However, these wells are currently producing gallons of water per day. The land application system for the this system has been designed to accommodate the maximum discharge rate of CBM well water at a combined maximum

¹ A Material Safety Data Sheet for the aluminum sulfate based flocculent can be provided if needed.

rate of 65,500 gallons per day. Since 2007, this CBM well has never produced that type of volume nor is it expected.

Well water will be treated in the above described tank system to remove TSS prior to placement on the land application area. The method of land application is a series of discharge points to distribute water over a wide area. From the tank system described in 19 (c) above, the water is distributed using distribution boxes (like those used in septic field applications) into three separate flow lines (see drawing *CBM WELL LAND APPLICATION*). Two of the flow lines discharge the water onto the surface, the third flow line discharges water to a subsequent distribution box. The total number of flow lines and distribution boxes are determined by the amount of well water from each well location. The series of distribution boxes is repeated as many times as necessary to distribute the water over an adequate area to prevent soil saturation and erosion.

(e) Vegetation study, to include both background and baseline conditions for the planned application area prior to and land application.

Response: Vegetation studies can be found in the Appendix to this application. The study areas are shown on the *Design Map*. The most recent spring survey of 2020 is provided. Each spring and each fall new studies will be conducted of the land application area. Each study will be compared to the previous study and a report submitted to the WV DEP Office of Oil and Gas. Land application areas have been selected based on topographical features, soil types, and vegetation studies.

(f) Ground water monitoring plan, if necessary to exceed certain discharge limits as outlined in the permit and fact sheet.

Response: Based on historical water quality, exceedance of discharge limits are not expected.

(g) Planned beginning date of land application.

Response: Been on-going since 2007.

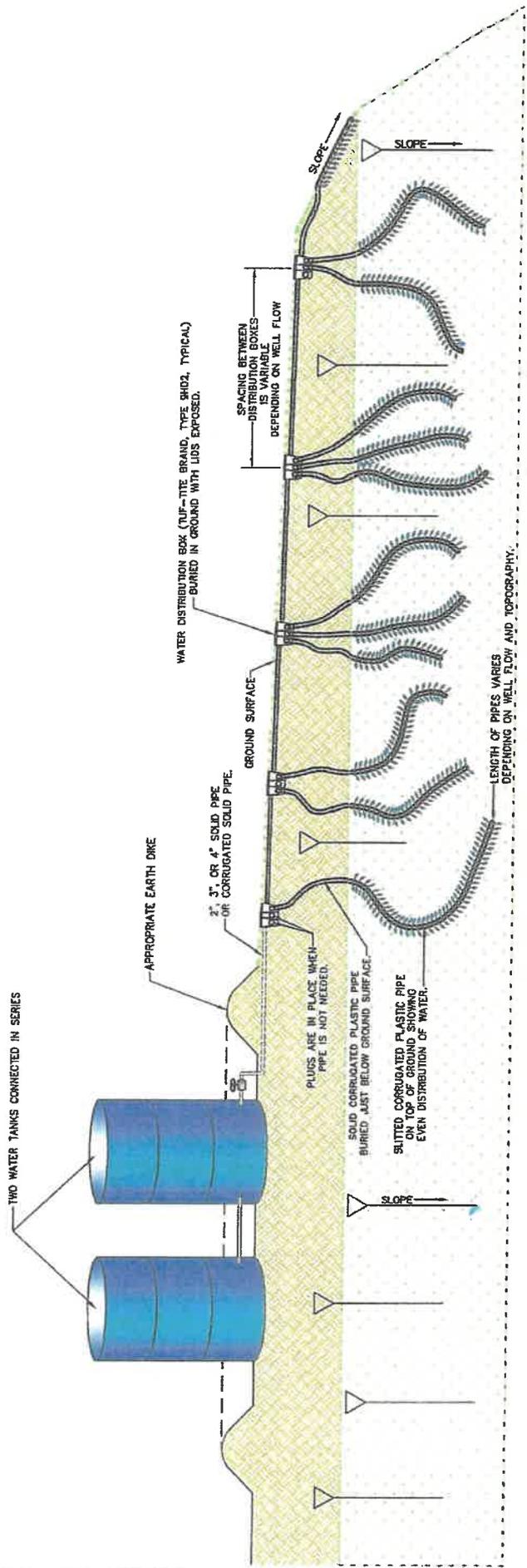
**Table 2
Groundwater Protection Sampling Plan
Springs, and Seeps**

Effluent/GW Characteristics	Measurement Frequency	Sample Type
Volume, gallons	Monthly	Calculated or Measured
Iron (Dissolved),(mg/l)	Semi-annually	Grab
Chloride,(mg/l)	Semi-annually	Grab
pH, S U	Semi-annually	Grab
Total Dissolved Solids, (mg/l)	Semi-annually	Grab
Aluminum (Dissolved), (mg/l)	Semi-annually	Grab
Sulfates (mg/l)	Semi-annually	Grab
Manganese (Dissolved), (mg/l)	Semi-annually	Grab
Mercury Total, (ug/l)	Semi-annually	Grab
Selenium (Dissolved), (mg/l)	Semi-annually	Grab
Calcium (Total)	Semi-annually	Grab
Potassium (Total)	Semi-annually	Grab
Magnesium (Total)	Semi-annually	Grab
Sodium (Total)	Semi-annually	Grab
Barium (Total)	Semi-annually	Grab

Analytical reports will be submitted semi-annually to the WV DEP Office of Oil and Gas.

Attachment 19.1
Facility Design

WATER FLOW SCHEMATIC SHOWING ENVIROCHECK'S DIAL-A-FLO WATER DISTRIBUTION SYSTEM



**Attachment 19.2
Vegetation Survey**

BASELINE VEGETATION SURVEY Tygrett (Surveyed 8/6/2020)

A forested area composed mainly of American Beech (*Fagus grandifolia*) and Red Maple (*Acer rubrum*) surrounding the wells site bench is used as the spray area for well water applied from Tygrett. This forest is a Beech-Maple association. Other tree species include Western Hemlock (*Tsuga heterophylla*), Sassafras (*Sassafras albidum*), and Shagbark Hickory (*Carya ovate*). The understory is open with and under developed herbaceous layer.



Photo 1: Beech-Maple Association



Photo 2: Open understory

The herbaceous layer is under developed in this location and the percent cover is approximately 20%. Poison Ivy (*Toxicodendron radicans*) are the most common species in this association. This foliage is shown in the photo to the right. Other herbaceous species include Virginia Creeper (*Parthenocissus quinquefolia*), Common Raspberry (*Rubus idaeus*) and Christmas Fern (*Polystichum acrostichoides*).



Photo 3: Poison Ivy

The existing vegetation was observed for visible foliar symptoms of aluminum, chloride, and metal toxicity, and overwatering due to water released from Tygrett. No vegetative stress symptoms directly related to land application were found on any herbaceous or woody plant species.

Attachment 20
Monitoring Plan

Attachment 20 – Monitoring Plan

(a) Produced water discharge area

Produced water from the tank battery will be discharged at a location depicted on the *Design Map*. This land application location will be marked as “Tygrett 1B/1C LAND APPLICATION AREA” with a sign erected on site.

(b) Groundwater, soil, and vegetation monitoring areas

See attached *Design Map* for groundwater, soil, and vegetation monitoring points and identifiers to be used.

(c) Soil and groundwater monitoring program

Monitoring Plan

In accordance with the General Permit, Diversified Oil and Gas intends to monitor the ground water (via identified surface waters), surficial soils, and conduct vegetation surveys to insure compliance. All monitoring points within the land application area will be identified by permanent marker(s). To insure the disposal of CBM water is protective of water quality standards, Diversified Oil and Gas proposes to conduct the monitoring of soils, ground water, and vegetation as follows:

Soils

EVOC will randomly sample surficial soils (ASTM definition of 0-1 feet) for the same parameters as the discharged effluent. The number of samples collected will be dependent upon the size of the land application area and may also include some background samples outside of the land application area. It is not expected that deeper (> three feet) soil samples will be collected based upon the current soil horizons. The soils will be sampled on a quarterly basis and the soils data will be incorporated with the vegetation surveys and ground water monitoring data and submitted to OOG semi-annually. Furthermore, soil data will be used to substantiate that the discharge rates do not cause adverse environmental conditions based upon the soil loading calculations provided in **Attachment 22**. This data will be submitted to the OOG every six months.

Ground Water

To insure the discharge of HCBM produced water is protective of the environment, Diversified Oil and Gas proposes to monitor ground water via sampling of soil and springs and seeps down gradient of the land application area. As per the DEP Fact Sheet, Rationale and Information for General Permit for the Land Application of Water Produced from Coalbed Methane Wells (Draft 12-01-06, page 3, second paragraph), use of springs and seeps are suitable for ground water monitoring. Thus, Diversified Oil and Gas surveyed the periphery of the land application area to identify the nearest surface water sources (springs, seeps, streams) immediately topographically down-gradient of the land application area (see *Design Map*). Diversified Oil and Gas proposes to monitor

these springs, seeps, etc. on a semi-annual basis for the same analytical parameters as the discharged effluent (see **19(f)**). This data will be submitted to the OOG semi-annually.

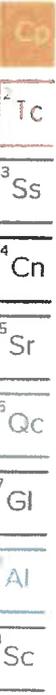
Vegetation Survey

Baseline vegetation surveys have been completed since 2007 for this site and have not had adverse effects been noted for the discharge. The most recent survey is provided in Appendix. Diversified Oil and Gas used these surveys to identify vegetative environments that are conducive to the discharged effluent. Subsequently, information from the vegetation surveys assisted with selection of an appropriate land application area. As per 19(e), Diversified Oil and Gas will conduct these vegetation surveys in the spring and fall to insure that the discharged effluent is not detrimental to the local vegetation. This data will be submitted to the OOG semi-annually.

Attachment 20.1
Summary of Surface Water Data

ANALYTICAL REPORT

June 23, 2020



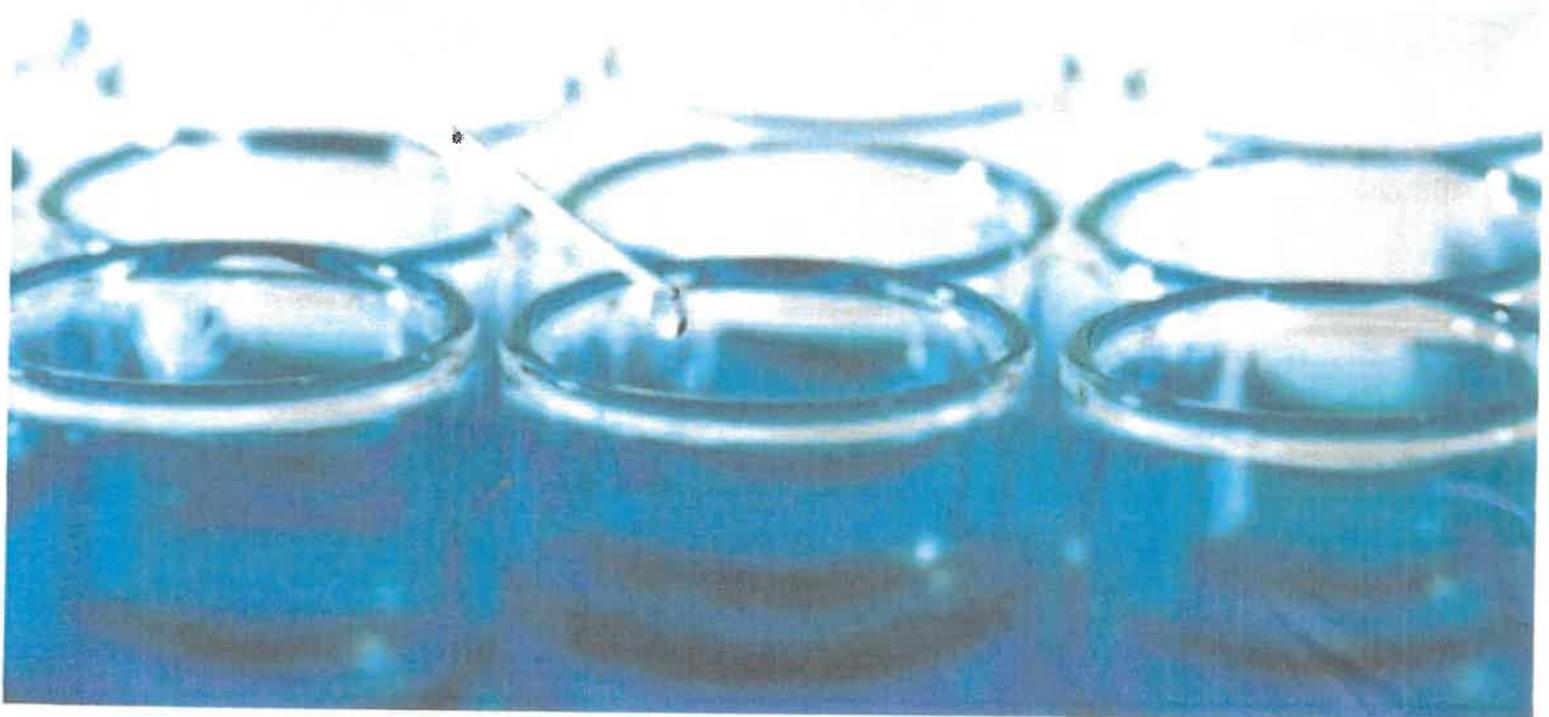
EnviroCheck of Va., Inc

Sample Delivery Group: L1229096
Samples Received: 06/13/2020
Project Number: NYTIS HARVEY/TYGRETT
Description: Nytis Creeks Fall
Site: HARVEY/TYGRETT 081-01385
Report To: Mr. J. L. Rhudy
375 Mountain Lane
Tazewell, VA 24651

Entire Report Reviewed By: *Pamela A. Langford*

Pam Langford
Project Manager

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 Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



ACCOUNT:

PROJECT:

SDG:

DATE/TIME:

PAGE:

06/07/2024

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

KS-CREEK L1229096-01 GW

Collected by: John Moratto
 Collected date/time: 06/10/20 10:30
 Received date/time: 06/13/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1493237	1	06/17/20 01:16	06/17/20 03:21	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1496370	1	06/21/20 13:10	06/21/20 13:10	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1495535	1	06/22/20 00:52	06/22/20 00:52	MCG	Mt. Juliet, TN
Mercury by Method 7470A	WG1492422	1	06/15/20 22:00	06/16/20 12:34	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495340	1	06/21/20 08:32	06/22/20 08:29	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495353	1	06/20/20 14:51	06/22/20 10:59	CCE	Mt. Juliet, TN

TYGRETT SPRING L1229096-02 GW

Collected by: John Moratto
 Collected date/time: 06/10/20 11:00
 Received date/time: 06/13/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1493237	1	06/17/20 01:16	06/17/20 03:21	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1496370	1	06/21/20 13:10	06/21/20 13:10	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1495535	1	06/22/20 01:14	06/22/20 01:14	MCG	Mt. Juliet, TN
Mercury by Method 7470A	WG1492422	1	06/15/20 22:00	06/16/20 12:36	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495340	1	06/21/20 08:32	06/22/20 08:32	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495353	1	06/20/20 14:51	06/22/20 11:02	CCE	Mt. Juliet, TN

CP

2 Tc

Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

ACCOUNT:

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06/07/2024



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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.

Pam Langford
Project Manager

Project Narrative

Dissolved metals lab filtered.

- Cn
- 2 Tc
- 3 Ss
- Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

ACCOUNT:

PROJECT:

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DATE/TIME:

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06/07/2024

Collected date/time: 06/10/20 10:30

L1229096

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	260		2.82	10.0	1	06/17/2020 03:21	WG1493237

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.89	T8	1	06/21/2020 13:10	WG1496370

Sample Narrative:

L1229096-01 WG1496370: 7.89 at 21.6C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Chloride	63.9		0.379	1.00	1	06/22/2020 00:52	WG1495535
Sulfate	12.6		0.594	5.00	1	06/22/2020 00:52	WG1495535

Mercury by Method 7470A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Mercury	U		0.000100	0.000200	1	06/16/2020 12:34	WG1492422

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum, Dissolved	U		0.0704	0.200	1	06/22/2020 08:29	WG1495340
Barium	0.0263		0.000895	0.00500	1	06/22/2020 10:59	WG1495353
Calcium	3.60		0.389	1.00	1	06/22/2020 10:59	WG1495353
Iron, Dissolved	0.422		0.0458	0.100	1	06/22/2020 08:29	WG1495340
Magnesium	1.92		0.111	1.00	1	06/22/2020 10:59	WG1495353
Manganese, Dissolved	U		0.00327	0.0100	1	06/22/2020 08:29	WG1495340
Potassium	1.26	J	0.510	2.00	1	06/22/2020 10:59	WG1495353
Selenium, Dissolved	0.0121		0.00735	0.0100	1	06/22/2020 08:29	WG1495340
Sodium	97.6		1.40	3.00	1	06/22/2020 10:59	WG1495353



ACCOUNT:

PROJECT:

SDG:

DATE/TIME:

PAGE:

06/07/2024



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	262		2.82	10.0	1	06/17/2020 03:21	WG1493237

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.83	T8	1	06/21/2020 13:10	WG1496370

Sample Narrative:

L1229096-02 WG1496370: 7.83 at 21.6C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Chloride	62.7		0.379	1.00	1	06/22/2020 01:14	WG1495535
Sulfate	11.9		0.594	5.00	1	06/22/2020 01:14	WG1495535

Mercury by Method 7470A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Mercury	U		0.000100	0.000200	1	06/16/2020 12:36	WG1492422

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum, Dissolved	U		0.0704	0.200	1	06/22/2020 08:32	WG1495340
Barium	0.0244		0.000895	0.00500	1	06/22/2020 11:02	WG1495353
Calcium	4.15		0.389	1.00	1	06/22/2020 11:02	WG1495353
Iron, Dissolved	0.296		0.0458	0.100	1	06/22/2020 08:32	WG1495340
Magnesium	2.00		0.111	1.00	1	06/22/2020 11:02	WG1495353
Manganese, Dissolved	U		0.00327	0.0100	1	06/22/2020 08:32	WG1495340
Potassium	1.50	J	0.510	2.00	1	06/22/2020 11:02	WG1495353
Selenium, Dissolved	0.00898	J	0.00735	0.0100	1	06/22/2020 08:32	WG1495340
Sodium	95.8		1.40	3.00	1	06/22/2020 11:02	WG1495353

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3540215-1 06/17/20 03:21

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1229096-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1229096-02 06/17/20 03:21 • (DUP) R3540215-3 06/17/20 03:21

Analyte	Original Result mg/l	DUP Result mg/l	Dilution %	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	262	272	1	3.75		5

Laboratory Control Sample (LCS)

(LCS) R3540215-2 06/17/20 03:21

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8240	93.6	85.0-115	

1 2 3 4 5 6 7 8 9

L1229095-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1229095-01 06/21/20 13:10 • (DUP) R3541094-2 06/21/20 13:10

Analyte	Original Result	DUP Result	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	7.16	7.16	1	0.000		1

Sample Narrative:

OS: 7.16 at 22.4C

DUP: 7.16 at 22.3C

L1230876-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1230876-01 06/21/20 13:10 • (DUP) R3541094-3 06/21/20 13:10

Analyte	Original Result	DUP Result	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	9.23	9.23	1	0.000		1

Sample Narrative:

OS: 9.23 at 22.1C

DUP: 9.23 at 22.1C

Laboratory Control Sample (LCS)

(LCS) R3541094-1 06/21/20 13:10

Analyte	Spike Amount	LCS Result	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 20.9C



Method Blank (MB)

(MB) R3541362-1 06/21/20 21:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U	0.379	1.00	1.00
Sulfate	U	0.594	5.00	5.00

L1228497-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1228497-01 06/21/20 22:31 • (DUP) R3541362-3 06/21/20 22:42

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	4.98	4.84	1	2.75		15
Sulfate	17.4	17.2	1	1.32		15

L1230878-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1230878-02 06/22/20 03:57 • (DUP) R3541362-6 06/22/20 04:29

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	18.4	18.0	1	1.92		15
Sulfate	2.29	2.27	1	1.10	J	15

Laboratory Control Sample (LCS)

(LCS) R3541362-2 06/21/20 22:09

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.9	99.7	80.0-120	
Sulfate	40.0	39.6	99.1	80.0-120	

L1230878-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1230878-02 06/22/20 03:57 • (MS) R3541362-7 06/22/20 04:40

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	18.4	70.9	105	1	80.0-120	
Sulfate	50.0	2.29	54.3	104	1	80.0-120	



Method Blank (MB)

(MB) R3539203-1 06/16/20 11:04

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.000100	0.000200

Laboratory Control Sample (LCS)

(LCS) R3539203-2 06/16/20 11:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00289	96.4	80.0-120	

Ce
Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Method Blank (MB)

(MB) R3541382-1 06/22/20 07:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum, Dissolved	U		0.0704	0.200
Iron, Dissolved	U		0.0458	0.100
Manganese, Dissolved	U		0.00327	0.0100
Selenium, Dissolved	U		0.00735	0.0100

Laboratory Control Sample (LCS)

(LCS) R3541382-2 06/22/20 07:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum, Dissolved	10.0	9.79	97.9	80.0-120	
Iron, Dissolved	10.0	9.66	96.6	80.0-120	
Manganese, Dissolved	1.00	0.986	98.6	80.0-120	
Selenium, Dissolved	1.00	0.966	96.6	80.0-120	



Method Blank (MB)

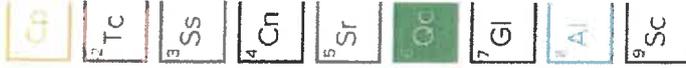
(MB) R3541389-1 06/22/20 10:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000895	0.00500
Calcium	U		0.389	1.00
Magnesium	U		0.111	1.00
Potassium	U		0.510	2.00
Sodium	U		1.40	3.00

Laboratory Control Sample (LCS)

(LCS) R3541389-2 06/22/20 10:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	0.996	99.6	80.0-120	
Calcium	10.0	10.0	100	80.0-120	
Magnesium	10.0	9.31	93.1	80.0-120	
Potassium	10.0	8.79	87.9	80.0-120	
Sodium	10.0	9.91	99.1	80.0-120	





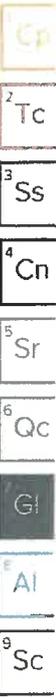
Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
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.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.



Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
T8	Sample(s) received past/too close to holding time expiration.

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ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.



Pace National 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.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.



State Accreditations

Alabama	40660	Nebraska	NE-05-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National 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. Pace National performs all testing at our central laboratory.



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Attachment 21
Coalbed Produced Water

COALBED PRODUCED WATER – ATTACHMENT 21

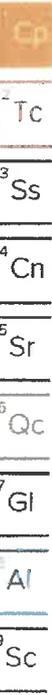
(A) Analytical Data

Produced water has been sampled since 2007 from this location. The new analytical parameters of the effluent for this facility were conducted in January 2010 for the produced water. Historical laboratory data has been submitted on a monthly basis to the OOG in the form of monthly discharge monitoring reports (DMRs). Copies of the recent analytical data is provided as **Attachment 21.1**. The analysis were conducted by Environmental Science Corporation of Mt. Juliet, Tennessee which is a WVDEP Office of Water Resources Certified Laboratory, Certificate #233.

(B) Daily Volumes

Based on a current maximum production of 2,200 BPD.

Attachment 21.1
Laboratory Data Sheets



EnviroCheck of Va., Inc

Sample Delivery Group: L1270799
Samples Received: 10/07/2020
Project Number: DGO KS-HARVEY/TYGRET
Description: DGO
Site: KS HARVEY 081-01385/01391
Report To: Mr. J. L. Rhudy
120 Lovelane Street
Bluefield, VA 24605

Entire Report Reviewed By:

Jennifer Huckaba
Project Manager

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 Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

TYGRET 08101391 L1270799-01 GW

Collected by: Frank Lampart
 Collected date/time: 09/30/20 10:20
 Received date/time: 10/07/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1555884	1	10/09/20 01:24	10/09/20 03:55	VRP	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1556367	1	10/08/20 20:45	10/08/20 20:45	WOS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1557358	1	10/12/20 03:20	10/12/20 03:20	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1557358	5	10/12/20 03:30	10/12/20 03:30	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1555909	1	10/08/20 09:05	10/09/20 10:33	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1556075	1	10/08/20 17:55	10/09/20 17:29	TRB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1556420	1	10/09/20 21:21	10/10/20 17:33	CCE	Mt. Juliet, TN

Cp

Tc

Ss

Cn

Sr

Qc

Gl

Al

Sc

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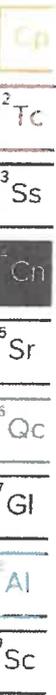
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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and 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.

Jennifer Huckaba
Project Manager



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Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	681	T8	2.82	10.0	1	10/09/2020 03:55	WG1555884

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.02	T8	1	10/08/2020 20:45	WG1556367

Sample Narrative:

L1270799-01 WG1556367: 8.02 at 18C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Chloride	127		1.90	5.00	5	10/12/2020 03:30	WG1557358
Sulfate	4.59	J	0.594	5.00	1	10/12/2020 03:20	WG1557358

Mercury by Method 7470A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Mercury	U		0.000100	0.000200	1	10/09/2020 10:33	WG1555909

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum, Dissolved	U		0.0704	0.200	1	10/09/2020 17:29	WG1556075
Barium	0.233		0.000895	0.00500	1	10/10/2020 17:33	WG1556420
Calcium	3.39		0.389	1.00	1	10/10/2020 17:33	WG1556420
Iron, Dissolved	0.0982	J	0.0458	0.100	1	10/09/2020 17:29	WG1556075
Magnesium	0.998	J	0.111	1.00	1	10/10/2020 17:33	WG1556420
Manganese, Dissolved	0.00356	J	0.00327	0.0100	1	10/09/2020 17:29	WG1556075
Potassium	2.71		0.510	2.00	1	10/10/2020 17:33	WG1556420
Selenium, Dissolved	U		0.00735	0.0100	1	10/09/2020 17:29	WG1556075
Sodium	254		1.40	3.00	1	10/10/2020 17:33	WG1556420



QUALITY CONTROL SUMMARY

L1270799-01

Method Blank (MB)

(MB) R3579913-1 10/09/20 03:55

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

Laboratory Control Sample (LCS)

(LCS) R3579913-2 10/09/20 03:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8480	96.4	77.4-123	

Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Gc
7 Gl
8 Al
9 Sc

06/07/2024

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WG1556367

Wet Chemistry by Method 9040C

Laboratory Control Sample (LCS)

(LCS) R3579490-1 10/08/20 20:45

Analyte	Spike Amount su	LCS Result su	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.04 at 20.6C

QUALITY CONTROL SUMMARY

L1270799-01

ONE LAB. NATIONWIDE.

Co
2 Tc
3 Ss
4 Cr
5 Sr
6 OC
7 Gl
8 Al
9 Sc

06/07/2024

ACCOUNT:

PROJECT:

SDG:

DATE/TIME:

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Method Blank (MB)

(MB) R3580526-1 10/12/20 01:08

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	0.692	J	0.379	1.00
Sulfate	U		0.594	5.00

L1270593-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1270593-01 10/12/20 02:14 • (DUP) R3580526-3 10/12/20 02:25

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	20.3	20.2	1	0.503		15
Sulfate	0.722	0.745	1	3.19	J	15

L1270841-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1270841-08 10/12/20 06:13 • (DUP) R3580526-6 10/12/20 06:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	4.03	4.11	1	2.02		15
Sulfate	2.58	2.53	1	1.80	J	15

Laboratory Control Sample (LCS)

(LCS) R3580526-2 10/12/20 01:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.3	98.3	80.0-120	
Sulfate	40.0	39.3	98.2	80.0-120	

L1270593-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1270593-01 10/12/20 02:14 • (MS) R3580526-4 10/12/20 02:36 • (MSD) R3580526-5 10/12/20 02:47

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	Dilution	Rec. Limits %	MS Rec. %	MSD Rec. %	MSD Rec. Limits	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	20.3	72.2	71.2	1	80.0-120	104	102	102		1.44	15	
Sulfate	50.0	0.722	51.7	50.9	1	80.0-120	102	100	100		1.58	15	

L1270799-01

L1270841-08 Original Sample (OS) • Matrix Spike (MS)

(OS) L1270841-08 10/12/20 06:13 • (MS) R3580526-7 10/12/20 06:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	4.03	55.5	103	1	80.0-120	
Sulfate	50.0	2.58	54.3	104	1	80.0-120	

Cd
2 Tc
3 Ss
4 Cn
5 Sr
6 Oc
7 Gl
8 Al
9 Sc

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Method Blank (MB)

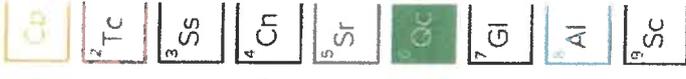
(MB) R3579659-1 10/09/20 09:48

Analyte	MB Result mg/l	MB MDL mg/l	MB RDL mg/l
Mercury	U	0.000100	0.000200

Laboratory Control Sample (LCS)

(LCS) R3579659-2 10/09/20 09:50

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00316	105	80.0-120	



Method Blank (MB)

(MB) R3579951-1 10/09/20 16:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum, Dissolved	U		0.0704	0.200
Iron, Dissolved	U		0.0458	0.100
Manganese, Dissolved	U		0.00327	0.0100
Selenium, Dissolved	U		0.00735	0.0100

Laboratory Control Sample (LCS)

(LCS) R3579951-2 10/09/20 16:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum, Dissolved	10.0	10.4	104	80.0-120	
Iron, Dissolved	10.0	10.5	105	80.0-120	
Manganese, Dissolved	1.00	0.974	97.4	80.0-120	
Selenium, Dissolved	1.00	0.992	99.2	80.0-120	

1	CP
2	Tc
3	Ss
4	Cn
5	Sr
6	Qc
7	Gl
8	Al
9	Sc

Method Blank (MB)

(MB) R3580318-1 10/12/20 01:09

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000895	0.00500
Calcium	U		0.389	1.00
Magnesium	U		0.111	1.00
Potassium	U		0.510	2.00
Sodium	U		1.40	3.00

Laboratory Control Sample (LCS)

(LCS) R3580318-2 10/12/20 01:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	0.954	95.4	80.0-120	
Calcium	10.0	9.83	98.3	80.0-120	
Magnesium	10.0	9.59	95.9	80.0-120	
Potassium	10.0	9.42	94.2	80.0-120	
Sodium	10.0	9.87	98.7	80.0-120	





Guide to Reading and Understanding Your Laboratory Report

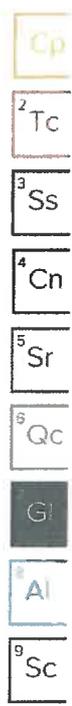
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
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.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
T8	Sample(s) received past/too close to holding time expiration.



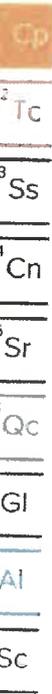
Attachment 22
Background Sampling

BACKGROUND SAMPLING – ATTACHMENT 22

Historical background laboratory data has been submitted to the WVDEP since 2007 at this facility. Vegetation, surface water, and semi-annual soils data has been submitted under separate cover to the WVDEP. An excel spreadsheet summarizing the surface water is provided in **Appendix 22.1**.

Attachment 22.1
Laboratory Data Sheets

June 22, 2020



EnviroCheck of Va., Inc

Sample Delivery Group: L1229080
Samples Received: 06/13/2020
Project Number: NYTIS 109-02401
Description: Nytis
Site: 205 B/C 109-02401
Report To: Mr. J. L. Rhudy
375 Mountain Lane
Tazewell, VA 24651

Entire Report Reviewed By:

Pam Langford
Project Manager

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 Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



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SAMPLE SUMMARY

			Collected by John Moratto	Collected date/time 06/10/20 09:00	Received date/time 06/13/20 09:00
LA KS (081-01385) L1229080-01 Solid					
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst Location
Total Solids by Method 2540 G-2011	WG1493883	1	06/17/20 16:45	06/17/20 16:58	KBC Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1495629	1	06/19/20 14:00	06/19/20 15:00	KEG Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1495855	1	06/21/20 21:05	06/22/20 04:51	ELN Mt. Juliet, TN
Mercury by Method 7471A	WG1493441	1	06/16/20 12:39	06/16/20 19:41	TCT Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1493637	1	06/16/20 16:19	06/18/20 21:40	EL Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495787	1	06/19/20 14:40	06/20/20 10:36	TRB Mt. Juliet, TN

			Collected by John Moratto	Collected date/time 06/10/20 09:15	Received date/time 06/13/20 09:00
CA KS (081-01385) L1229080-02 Solid					
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst Location
Total Solids by Method 2540 G-2011	WG1493883	1	06/17/20 16:45	06/17/20 16:58	KBC Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1495629	1	06/19/20 14:00	06/19/20 15:00	KEG Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1495855	1	06/21/20 21:05	06/22/20 06:06	ELN Mt. Juliet, TN
Mercury by Method 7471A	WG1493441	1	06/16/20 12:39	06/16/20 19:43	TCT Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1493637	1	06/16/20 16:19	06/18/20 21:47	EL Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495787	1	06/19/20 14:40	06/20/20 10:38	TRB Mt. Juliet, TN

			Collected by John Moratto	Collected date/time 06/10/20 10:00	Received date/time 06/13/20 09:00
TYGRETT LA (081-01391) L1229080-03 Solid					
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst Location
Total Solids by Method 2540 G-2011	WG1493883	1	06/17/20 16:45	06/17/20 16:58	KBC Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1495629	1	06/19/20 14:00	06/19/20 15:00	KEG Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1495855	1	06/21/20 21:05	06/22/20 06:21	ELN Mt. Juliet, TN
Mercury by Method 7471A	WG1493441	1	06/16/20 12:39	06/16/20 19:46	TCT Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1493637	1	06/16/20 16:19	06/18/20 21:50	EL Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495787	1	06/19/20 14:40	06/20/20 10:41	TRB Mt. Juliet, TN

			Collected by John Moratto	Collected date/time 06/10/20 10:15	Received date/time 06/13/20 09:00
TYGRETT CA (081-01391) L1229080-04 Solid					
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst Location
Total Solids by Method 2540 G-2011	WG1493883	1	06/17/20 16:45	06/17/20 16:58	KBC Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1495629	1	06/19/20 14:00	06/19/20 15:00	KEG Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1495855	1	06/21/20 21:05	06/22/20 06:36	ELN Mt. Juliet, TN
Mercury by Method 7471A	WG1493441	1	06/16/20 12:39	06/16/20 19:49	TCT Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1493637	1	06/16/20 16:19	06/18/20 21:53	EL Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1495787	1	06/19/20 14:40	06/20/20 10:49	TRB Mt. Juliet, TN

Co

2 Tc

Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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.

Pam Langford
Project Manager



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	77.8		1	06/17/2020 16:58	WG1493883

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	5.77	T8	1	06/19/2020 15:00	WG1495629

Sample Narrative:

L1229080-01 WG1495629: 5.77 at 22.8C

Wet Chemistry by Method 9056A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Chloride	U		11.8	25.7	1	06/22/2020 04:51	WG1495855
Sulfate	U		16.6	64.3	1	06/22/2020 04:51	WG1495855

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Mercury	U		0.0231	0.0514	1	06/16/2020 19:41	WG1493441

Metals (ICP) by Method 6010D

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Aluminum	17100		10.5	12.9	1	06/18/2020 21:40	WG1493637
Barium	62.7		0.309	0.643	1	06/18/2020 21:40	WG1493637
Calcium	149		38.6	129	1	06/18/2020 21:40	WG1493637
Iron	25700		6.43	12.9	1	06/18/2020 21:40	WG1493637
Magnesium	2190		26.4	129	1	06/18/2020 21:40	WG1493637
Manganese	355		0.315	1.29	1	06/18/2020 21:40	WG1493637
Potassium	1400		26.9	129	1	06/18/2020 21:40	WG1493637
Selenium	0.832	J	0.793	2.57	1	06/18/2020 21:40	WG1493637
Sodium	57.7	J	42.7	129	1	06/20/2020 10:36	WG1495787



Collected date/time: 06/10/20 09:15

L1229080

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	74.4		1	06/17/2020 16:58	WG1493883

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	5.23	T8	1	06/19/2020 15:00	WG1495629

Sample Narrative:

L1229080-02 WG1495629: 5.23 at 22.7C

Wet Chemistry by Method 9056A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Chloride	U		12.4	26.9	1	06/22/2020 06:06	WG1495855
Sulfate	U		17.3	67.2	1	06/22/2020 06:06	WG1495855

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Mercury	0.0316	J	0.0242	0.0538	1	06/16/2020 19:43	WG1493441

Metals (ICP) by Method 6010D

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Aluminum	19700		11.0	13.4	1	06/18/2020 21:47	WG1493637
Barium	74.0		0.323	0.672	1	06/18/2020 21:47	WG1493637
Calcium	198		40.3	134	1	06/18/2020 21:47	WG1493637
Iron	24700		6.72	13.4	1	06/18/2020 21:47	WG1493637
Magnesium	2160		27.6	134	1	06/18/2020 21:47	WG1493637
Manganese	244		0.329	1.34	1	06/18/2020 21:47	WG1493637
Potassium	1550		28.1	134	1	06/18/2020 21:47	WG1493637
Selenium	1.22	J	0.830	2.69	1	06/18/2020 21:47	WG1493637
Sodium	61.6	J	44.6	134	1	06/20/2020 10:38	WG1495787



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	80.4		1	06/17/2020 16:58	WG1493883

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	5.29	T8	1	06/19/2020 15:00	WG1495629

Sample Narrative:

L1229080-03 WG1495629: 5.29 at 22.6C

Wet Chemistry by Method 9056A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Chloride	U		11.4	24.9	1	06/22/2020 06:21	WG1495855
Sulfate	U		16.1	62.2	1	06/22/2020 06:21	WG1495855

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Mercury	0.0280	J	0.0224	0.0498	1	06/16/2020 19:46	WG1493441

Metals (ICP) by Method 6010D

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Aluminum	18500		10.2	12.4	1	06/18/2020 21:50	WG1493637
Barium	69.0		0.299	0.622	1	06/18/2020 21:50	WG1493637
Calcium	136		37.3	124	1	06/18/2020 21:50	WG1493637
Iron	33700		6.22	12.4	1	06/18/2020 21:50	WG1493637
Magnesium	1920		25.5	124	1	06/18/2020 21:50	WG1493637
Manganese	273		0.305	1.24	1	06/18/2020 21:50	WG1493637
Potassium	1490		26.0	124	1	06/18/2020 21:50	WG1493637
Selenium	1.33	J	0.768	2.49	1	06/18/2020 21:50	WG1493637
Sodium	57.8	J	41.3	124	1	06/20/2020 10:41	WG1495737



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	81.6		1	06/17/2020 16:58	WG1493883

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	5.37	T8	1	06/19/2020 15:00	WG1495629

Sample Narrative:

L1229080-04 WG1495629: 5.37 at 22.7C

Wet Chemistry by Method 9056A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Chloride	U		11.3	24.5	1	06/22/2020 06:36	WG1495855
Sulfate	U		15.8	61.3	1	06/22/2020 06:36	WG1495855

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Mercury	0.0309	J	0.0221	0.0490	1	06/16/2020 19:49	WG1493441

Metals (ICP) by Method 6010D

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
Aluminum	20900		10.1	12.3	1	06/18/2020 21:53	WG1493637
Barium	76.7		0.294	0.613	1	06/18/2020 21:53	WG1493637
Calcium	108	J	36.8	123	1	06/18/2020 21:53	WG1493637
Iron	25800		6.13	12.3	1	06/18/2020 21:53	WG1493637
Magnesium	2110		25.1	123	1	06/18/2020 21:53	WG1493637
Manganese	196		0.300	1.23	1	06/18/2020 21:53	WG1493637
Potassium	1530		25.6	123	1	06/18/2020 21:53	WG1493637
Selenium	U		0.757	2.45	1	06/18/2020 21:53	WG1493637
Sodium	U		40.7	123	1	06/20/2020 10:49	WG1495787



Method Blank (MB)

(MB) R354011-1 06/17/20 16:58

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1229080-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1229080-02 06/17/20 16:58 • (DUP) R354011-3 06/17/20 16:58

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	74.4	73.8	1	0.818		10

Laboratory Control Sample (LCS)

(LCS) R354011-2 06/17/20 16:58

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	



L1229080-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1229080-04 06/19/20 15:00 • (DUP) R3540803-2 06/19/20 15:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	SU 5.37	SU 5.32	1	0.935		1

Sample Narrative:

OS: 5.37 at 22.7C
DUP: 5.32 at 22.9C

L1229097-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1229097-06 06/19/20 15:00 • (DUP) R3540803-3 06/19/20 15:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	SU 8.53	SU 8.50	1	0.352		1

Sample Narrative:

OS: 8.53 at 22.8C
DUP: 8.5 at 22.7C

Laboratory Control Sample (LCS)

(LCS) R3540803-1 06/19/20 15:00

Analyte	Spike Amount	LCS Result	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	SU 10.0	SU 9.98	99.8	99.0-101	

Sample Narrative:

LCS: 9.98 at 21.8C

Method Blank (MB)

(MB) R3541223-1 06/21/20 23:06

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chloride	U		9.20	20.0
Sulfate	U		12.9	50.0

L1228720-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1228720-01 06/22/20 00:23 • (DUP) R3541223-3 06/22/20 00:37

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	U	U	1	0.000		15
Sulfate	U	U	1	0.000		15

L1229079-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1229079-03 06/22/20 04:06 • (DUP) R3541223-4 06/22/20 04:21

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	U	U	1	0.000		15
Sulfate	U	U	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3541223-2 06/21/20 23:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	200	210	105	80.0-120	
Sulfate	200	203	102	80.0-120	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Gc
7 Gl
8 Al
9 Sc

Method Blank (MB)

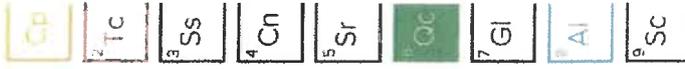
(MB) R3539410-1 06/16/20 18:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3539410-4 06/16/20 21:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.579	116	80.0-120	



Method Blank (MB)

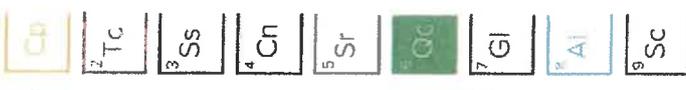
(MB) R3540366-1 06/18/20 21:16

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aluminum	U		8.20	10.0
Barium	U		0.240	0.500
Calcium	U		30.0	100
Iron	U		5.00	10.0
Magnesium	U		20.5	100
Manganese	U		0.245	1.00
Potassium	U		20.9	100
Selenium	U		0.617	2.00

Laboratory Control Sample (LCS)

(LCS) R3540366-2 06/18/20 21:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	1000	1060	106	80.0-120	
Barium	100	108	108	80.0-120	
Calcium	1000	1080	108	80.0-120	
Iron	1000	1070	107	80.0-120	
Magnesium	1000	1090	109	80.0-120	
Manganese	100	106	106	80.0-120	
Potassium	1000	1020	102	80.0-120	
Selenium	100	101	101	80.0-120	



Method Blank (MB)

(MB) R3540906-1 06/20/20 09:13

Analyte	MB Result mg/kg	MB MDL mg/kg	MB RDL mg/kg
Sodium	U	33.2	100

Laboratory Control Sample (LCS)

(LCS) R3540906-2 06/20/20 09:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sodium	1000	1020	102	80.0-120	

Co
2 Tc
3 Ss
4 Cn
5 Sr
6 Oc
7 Gf
8 Al
9 Sc

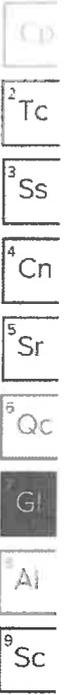


Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this Information provided, and as the samples are received.

Abbreviations and Definitions

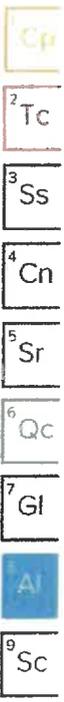


(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
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.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The Identification of the analyte is acceptable; the reported value is an estimate.
T8	Sample(s) received past/too close to holding time expiration.



Pace National 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.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.



State Accreditations

Alabama	40660	Nebraska	NE-05-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ¹⁶	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ¹⁴	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TND03	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

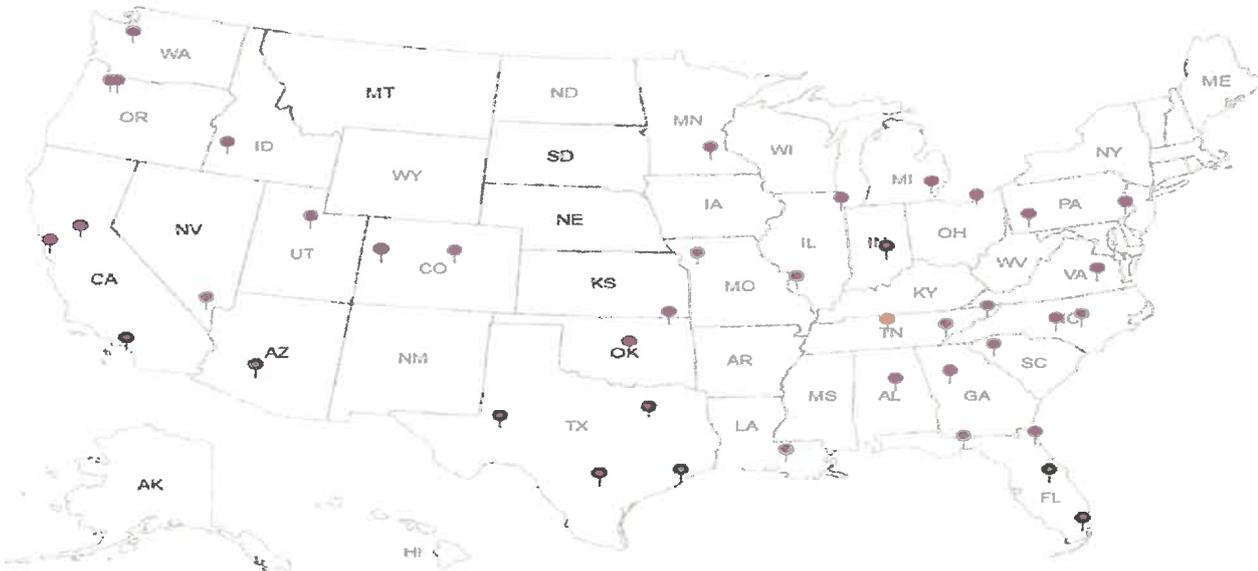
Third Party Federal Accreditations

A2LA - ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA - ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National 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. Pace National performs all testing at our central laboratory.



ACCOUNT:

PROJECT:

SDG:

DATE/TIME:

PAGE:

06/07/2024

EnviroCheck of V3/3/2016
375 Mountain Lane
Tazewell, VA 24651

EnviroCheck of Va, Inc
375 Mountain Lane
Tazewell, VA 24651

Report to:
JL Rhudy, III
 Email To:
jl@e2covirginia.com

Project:
Nytis
 Description:
278-701-3093

Client Project #:
Nytis 081-01385
 City/State:
Ravencraft, WV

Site/Facility ID #:
081-01385 KS/Tygett
 P.O. #:
081-01385 KS/Tygett

Collected by (pmt):
JL Rhudy
 Collected by (signature):
[Signature]

Rush? (Lab MUST Be Notified)
 Same Day Five Day
 Next Day 5 Day (Rad Only)
 Two Day 10 Day (Rad Only)
 Three Day

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
LA KS (081-01385)	Grab	SS	1'	6-10-20	9:00 AM	1
CA KS (081-01385)	Grab	SS	1'	6-10-20	10:30 AM	1
Tygett LA (081-01391)				6-10-20	10:00 AM	1
Tygett CA (081-01391)				6-10-20	10:30 AM	1

Analysis / Container / Preservative	Pres Chk
Al, Ba, Ca, Mn, Mg, K, Na, Hg, Fe, Se	
ph	
sulfates	
chlorides	

Remarks:
 SS - Soil AIR - Air F - Filter
 GW - Groundwater B - Blossay
 WW - Waste Water
 DW - Drinking Water
 OT - Other

Accnum:
 Templater:
 Prelogini:
 TSH:
 PR:

Shipped Via:
 Remarks:
 1-4 OZ
 1-4 OZ
 1-4 OZ
 1-4 OZ

Sample # (See back)
 000: Seal Present/Intact: NP
 001: Sample/Receptor:
 002: Sample Arise intact:
 003: Correct Corrosion Used:
 004: Sufficient volume sent:
 005: I.L. Applicable:
 006: 2000 Receptor:
 007: Preservation Correct/Checked:
 If preservation required by Legn: Date/Time

Face Analytical
 12065 Lebanon Rd
 Mount Airy, NC 27122
 Phone: 615-758-5858
 Phone: 800-767-5859
 Fax: 615-758-5859

Tracking # (75000027876)
 Received by (Signature):
[Signature]
 Received by (Signature):
[Signature]
 Received for lab by (Signature):
[Signature]

Temp: 4.0 °C HCL / MeqH
 Date: 6-10-20 SR
 Bottles Received: 4
 Date: 6-10-20 Time: 9:00

Attachment 23
Calculations

CALCULATIONS – ATTACHMENT 23

The Tygrett will be utilizing approximately 4 acres or 1,552,914 ft². It is expected that the land application area will utilize approximately 70% of that area or 48,787 ft². The projected drainage area of the Tygrett is much larger (see **Topographic Map, Attachment 18**). The system will discharge 31,500 gallons/day or 1,312 gallons/hour or 22 gpm. The general soils in this area are the Pineville-Berks association which has a moderate permeability 0.6” to 2.0” per hour and moderately slow permeability of 0.2” to 0.6” per hour (Soil Survey of Wyoming County). Permeability is by definition, the quality of soil that enables water or air to move downward through the profile. Any volume greater than the effective permeability would likely cause runoff and erosion. At this facility, produced water will be discharged at 22 gpm. The calculated inches/hour discharged at this facility.

$$22 \text{ gpm} \quad \times \quad \frac{60 \text{ min}}{\text{hour}} \quad \times \quad \frac{1 \text{ ft}^3}{7.48 \text{ gallons}} \quad = \quad 176 \text{ ft}^3 / \text{hour}$$

Applied

$$\begin{aligned} \text{Volume} \quad & \frac{176 \text{ ft}^3 / \text{hour}}{48,787 \text{ ft}^2} \text{ (land application area)} \\ & = \quad 0.0036 \text{ ft/hour} \\ & = \quad 0.0036 \text{ ft} / \text{hour} \times 12 \text{ inches} / \text{ft} \\ & = \quad 0.04 \text{ inches} / \text{hour} \end{aligned}$$

Thus, the volume applied at the land application area is much lower than the published permeability based on soil type. Therefore, runoff and erosion should not occur at this site.