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November 30, 2020

Jaclyn Holbritter
Environmental Engineer, DR II
Air Force Research Laboratory
Information Directorate
150 Electronic Parkway
Rome, NY 1331

Re: 1,4-dioxane Sampling Summary
Verona Research Facility Site (NYSDEC #633046)
Verona, NY 13478

Dear Ms. Holbritter:

Lu Engineers is pleased to submit this summary letter detailing one (1) 1,4-dioxane groundwater sampling event conducted at the Verona Research Facility Site (New York State Department of Environmental Conservation [NYSDEC] Site #633046) located in Verona, New York, on October 21,2020. Sampling was performed concurrently with a NYSDEC sampling event for emerging contaminants, including per and poly-fluoroalkyl substances (PFAS) and 1,4-dioxane, which was conducted by Precision Environmental Services. Figure 1, is provided for reference. Figure 2 through 5 include well locations and associated analytical findings.

Scope of Work

A total of seven (7) wells to be sampled, based on consultation with AFRL and NYSDEC including:

- TP33/TPW-33R
- B1231-MW-03
- B1243-W05
- B1219-W06
- MW-1253IR
- B-54/B1266-W12
- TPW-14

Samples were collected from all previously agreed upon wells in accordance with applicable protocols. All well locations can be found on Figures 2 through 5.

Sampling Methods & Analysis

All samples were collected using low-flow groundwater sampling methods detailed in NYSDECs “Guidelines for Sampling and Analysis of PFAS Under Part 375 Remedial Programs; January 2020”. Before sampling, monitoring wells were purged a minimum of three (3) well volumes with peristaltic pumps utilizing high density polyethylene (HDPE) tubing. It is noted that a sample was collected at TPW-14 prior to removing three (3) volumes due to the well going dry during purging. Groundwater and well parameters were collected using PFAS-free equipment and recorded on the groundwater sampling field logs (Attachment A) throughout the purging process.

Sample bottles were filled by personnel wearing nitrile gloves, and placed into a chilled cooler with ice. QA/QC samples included one (1) equipment blank, one (1) field duplicate, and one (1) MS/MSD. All samples were relinquished to ALS Environmental, an ELAP and Department of Defense (DOD) certified laboratory for analysis of 1,4-dioxane by US Environmental Protection Agency Method 8270.

Results

No exceedances of applicable regulatory criteria were observed as a result of the sampling event. 1,4-Dioxane was detected in the sample obtained from B1243-W05 at a concentration of 0.027 micrograms per liter (µg/L). Concentrations from all other samples were below the minimum laboratory quantitation limit. Refer to Table 1 for tabulated analytical results; groundwater analytical results for each well are also indicated on the attached figures. A copy of the laboratory analytical report is included as Attachment C.

Please contact us with any questions or comments you may have.

Gregory L. Andrus, P.G., CHMM
Group Leader
Environmental Investigation/ Remediation Group

Benjamin Seifert
Geologist
Environmental Investigation/ Remediation Group

Enclosure(s):

Figures:
Figure 1– Site Location Map
Figure 2– Sample Analytical Results Map
Figure 3– Sample Analytical Results B1231
Figure 4– Sample Analytical Results B1253
Figure 5– Sample Analytical Results B1266

Tables:
Table 1–Groundwater Sample Results

Attachments:
Attachment A– Groundwater Sampling Logs
Attachment B– Photographs
Attachment C– Laboratory Analytical Report

Groundwater Sample Analytical Results
Verona Research Facility
AFRL Verona, NY

Table 1. 1,4-Dioxane Groundwater Sample Analytical Results

Analytical Parameter	Method	Units	NYSDEC Ambient GW Quality Standard	TP33/TPW-33R	B1231-MW-03	B1243-W05	MW-1253IR	B1219-W06	B-54/B1266-W12	TPW-14	Field Duplicate[1]
				10/21/2020	10/21/2020	10/21/2020	10/21/2020	10/21/2020	10/21/2020	10/21/2020	10/21/2020
Semi-volatile Organics											
1,4-dioxane	8270D	µg/L	5*	ND	ND	**0.027 J**	ND	ND	ND	ND	ND

* NYSDEC Guidance value
ND: Not detected above minimum laboratory quantitation limit
J: Value estimated, concentration is between the MRL and the MDL
1: Collected from B1231-MW-03
Result exceeds water quality standards

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Contour Interval: 500-feet

Scale 1: 288,000

12,000 0 12,000 24,000 48,000

Feet

N

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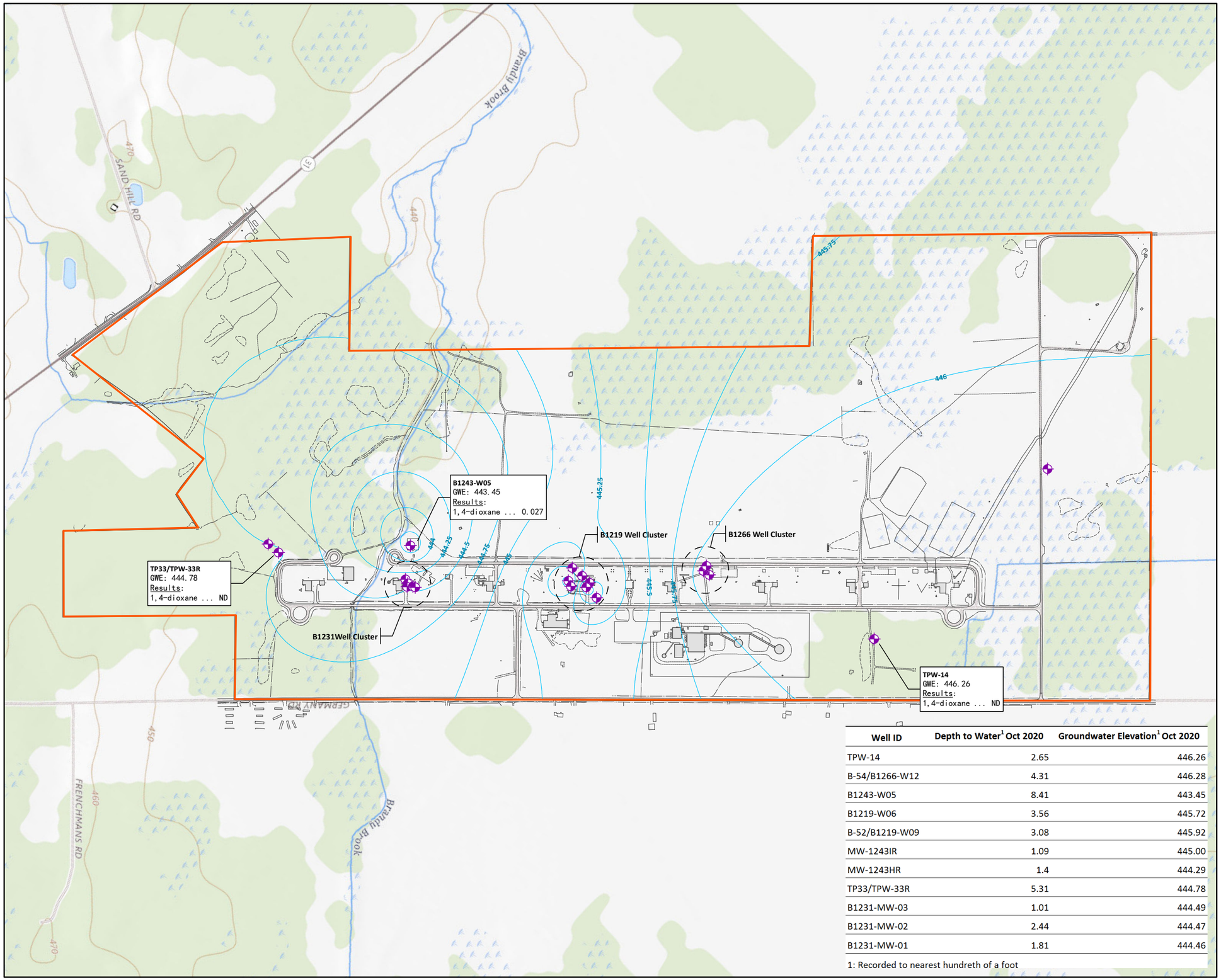
Figure 1. Site Location Map
Verona Research Facility: ULDF20207101
1,4-Dioxane Groundwater Sampling
AFRL

DATE: November 2020
PROJECT #: 13189
DRAWN/CHECKED: BGS/GLA
DATA SOURCE: ESRI Online Basemap



Well ID	Depth to Water[1] Oct 2020	Groundwater Elevation[1] Oct 2020
TPW-14	2.65	446.26
B-54/B1266-W12	4.31	446.28
B1243-W05	8.41	443.45
B1219-W06	3.56	445.72
B-52/B1219-W09	3.08	445.92
MW-1243IR	1.09	445.00
MW-1243HR	1.4	444.29
TP33/TPW-33R	5.31	444.78
B1231-MW-03	1.01	444.49
B1231-MW-02	2.44	444.47
B1231-MW-01	1.81	444.46

1: Recorded to nearest hundreth of a foot

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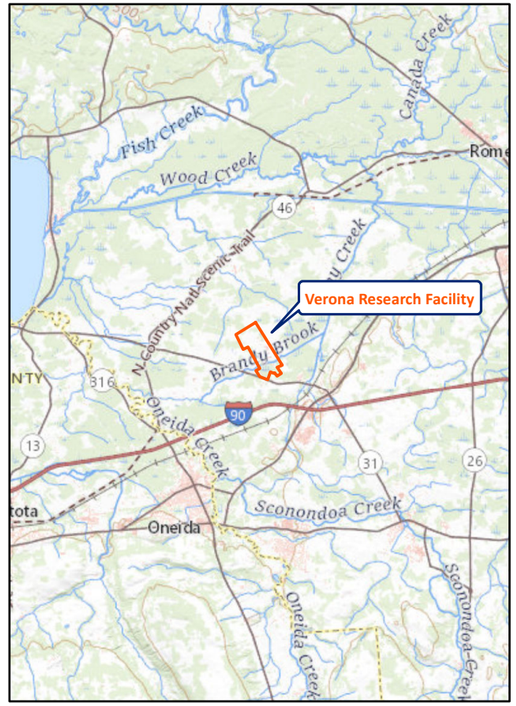


Figure 2:
Groundwater Analytical Results

Project:
Air Force Research Laboratory
Verona Research Facility: ULDF20207101

Location:
Verona Research Facility
Verona, Oneida County, NY

Legend

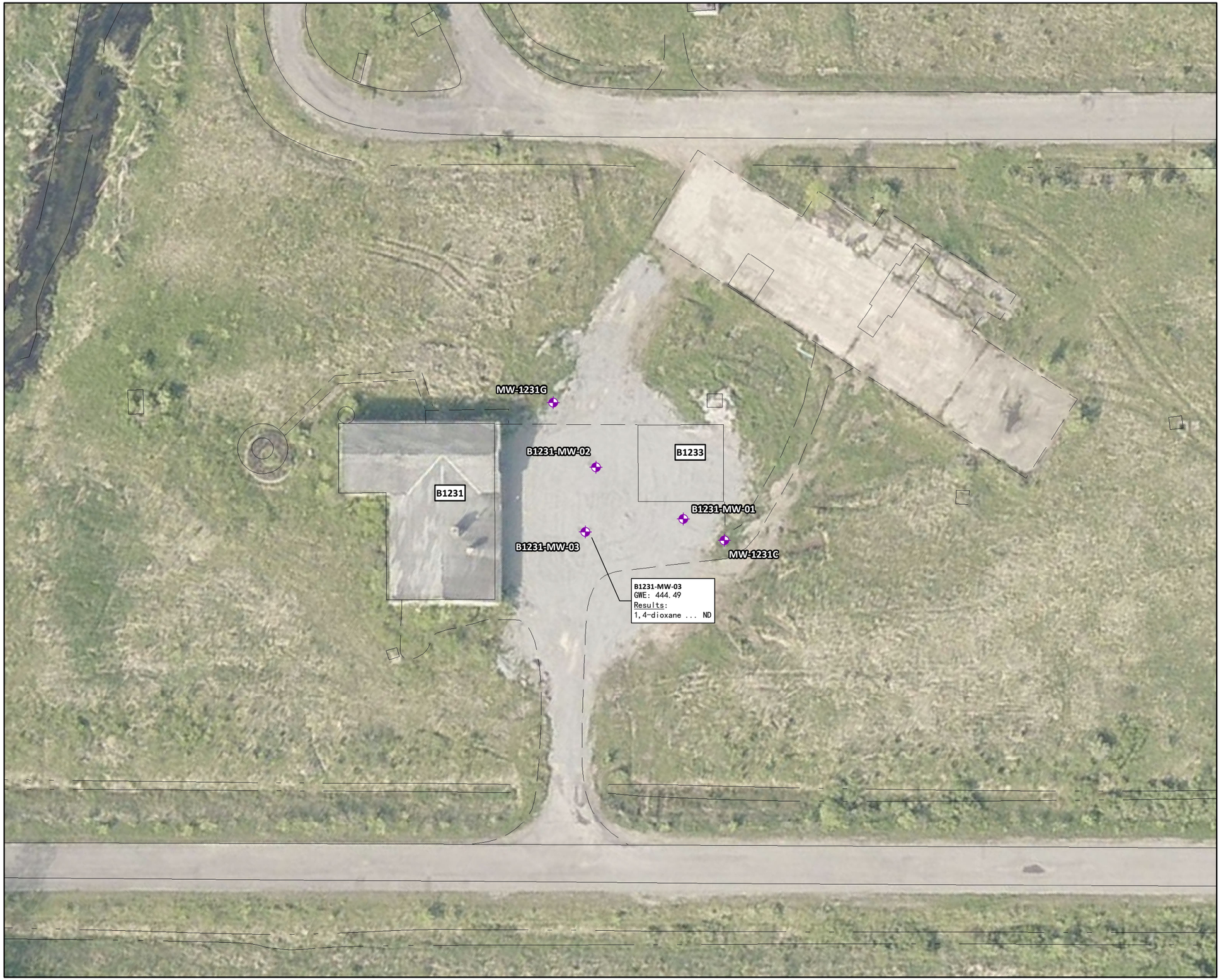
- VRF Basemap
- Site Boundary
- Monitoring Well
- Groundwater Contour (0.25 ft)

1 inch = 700 feet

0 350 700 1,400 Feet

Drawn/Checked By:	BGS/GLA
Lu Project Number:	13124-15
Date:	November 2020

Notes:
1. Coordinate System: NAD 1983 (2011) State Plane NY Central FIPS 3102 Feet
2. Basemaps from ESRI ArcGIS Online
3. Scale: 1:8,400 (original document size 11"x17")
4. ArcGIS 'Topo to Raster' used for interpolation



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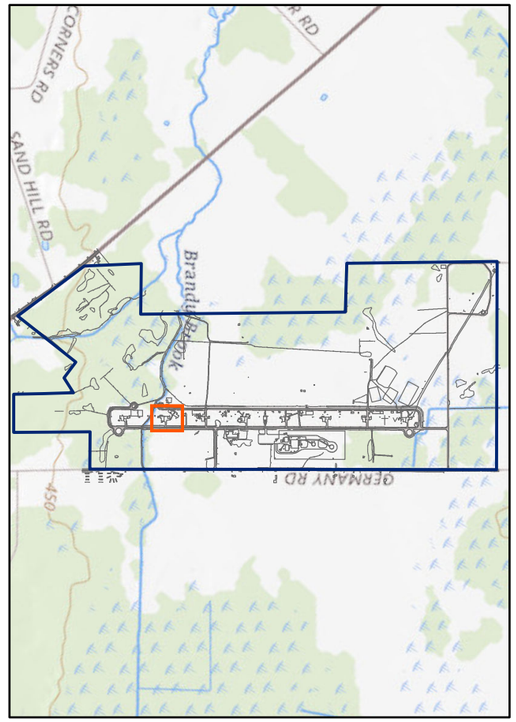

Figure 3:
Groundwater Analytical Results Building 1231

Project:
Air Force Research Laboratory
Verona Research Facility: ULDF20207101

Location:
Verona Research Facility
Verona, Oneida County, NY

AIR FORCE RESEARCH LABORATORY

VRF Basemap
Monitoring Well

1 inch = 40 feet
0 20 40 80 Feet

Drawn/Checked By: BGS/GLA
Lu Project Number: 13124-15
Date: November 2020
Notes: 1. Coordinate System: NAD 1983 (2011) State Plane NY Central FIPS 3102 Feet 2. Basemaps from ESRI ArcGIS Online 3. Scale: 1:9,600 (original document size 11"x17")

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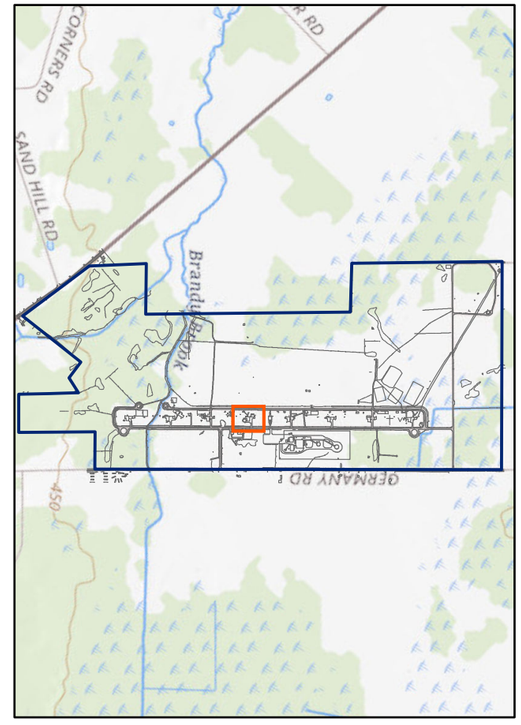

Figure 4:
Groundwater Analytical Results Building 1253

Project:
Air Force Research Laboratory
Verona Research Facility: ULDF20207101

Location:
Verona Research Facility
Verona, Oneida County, NY

Legend
- VRF Basemap
- Monitoring Well

1 inch = 40 feet
0 20 40 80 Feet

Drawn/Checked By:	BGS/GLA
Lu Project Number:	13124-15
Date:	November 2020

Notes:
1. Coordinate System: NAD 1983 (2011) State Plane NY Central FIPS 3102 Feet
2. Basemaps from ESRI ArcGIS Online
3. Scale: 1:9,600 (original document size 11"x17")

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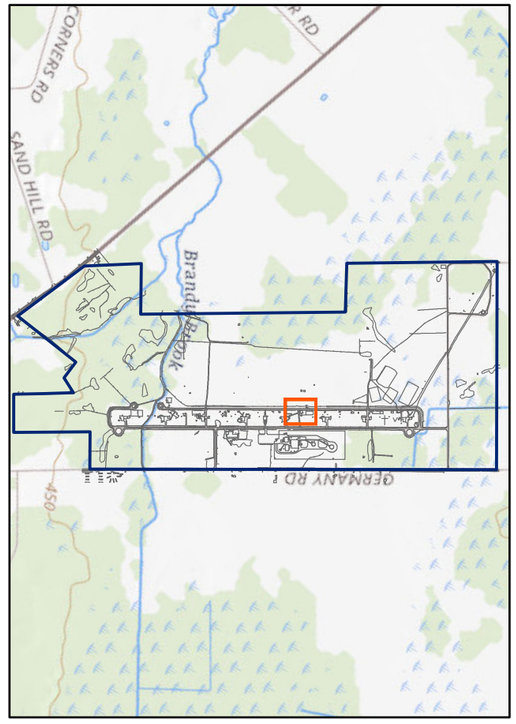

Figure 5:
Groundwater Analytical Results Building 1266

Project:
Air Force Research Laboratory
Verona Research Facility: ULDF20207101

Location:
Verona Research Facility
Verona, Oneida County, NY

AIR FORCE RESEARCH LABORATORY

VRF Basemap
Monitoring Well

1 inch = 40 feet
0 20 40 80 Feet

Drawn/Checked By:	BGS/GLA
Lu Project Number:	13124-15
Date:	November 2020

Notes:
1. Coordinate System: NAD 1983 (2011) State Plane NY Central FIPS 3102 Feet
2. Basemaps from ESRI ArcGIS Online
3. Scale: 1:9,600 (original document size 11"x17")

Low Flow Groundwater Sampling Field Record

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Project Name Verona
Job # 13124-15
Location ID TP33/TPW-33R
Field Sample ID TP33/TPW-33R
Sampling Event # _ _
Activity Time 07:45
Sample Time 08:33
Date 10/20/2020

SAMPLING NOTES

Initial Depth to Water 5.31 feet
Measurement Point North
Well Diameter 2"
Final Depth to Water 10.29 feet
Well Depth 10.3 feet
Well Integrity:
Screen Length _____ feet
Pump Intake Depth _____
Cap ✓
Total Volume Purged 2.75 gallons
PID Well Head _____
Casing ✓
[purge volume (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter]
Locked No
Volume of Water in casing – 2" diameter = 0.163 gallons per foot of depth, 4" diameter = 0.653 gallons per foot of depth
Collar ✓

PURGE DATA

Time	Depth to Water (ft)	Purge Rate (ml/min)	Temp. (deg. C)	pH (units)	Dissolved O2 (mg/L)	Turbidity (NTU)	Cond. (mS/cm)	ORP (mV)	Comments
	6.77		13.53	7.34	14.28	16.9	0.854	56.5	1 gallon purged
	9.05		12.75	7.18	23.56	16.0	0.763	52.6	2 gallons purged

Purge Observations: Highly turbid initially
Purge Water Containerized: No

EQUIPMENT DOCUMENTATION

Type of Pump: Peristaltic
Type of Tubing: ¼" HDPE
Type of Water Quality Meter: YSI Pro Plus Quatro; LaMotte 2020
Calibrated: _____

ANALYTICAL PARAMETERS

Parameter	Volumes	Sample Collected
1,4-dioxane	250mL (x2)	Yes

LOCATION NOTES

Well went dry and recovered after a 10 minute purge
QA/QC samples collected: MS/MSD

Low Flow Groundwater Sampling Field Record

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Project Name Verona
Location ID B1231
Activity Time 9:43
Field Sample ID B1231-MW-03
Sample Time 10:15
Job # 13124-15
Sampling Event # __
Date 10/20/2020

SAMPLING NOTES

Initial Depth to Water 1.01 feet
Final Depth to Water 1.02 feet
Screen Length ____ feet
Total Volume Purged 4.5 gallons
[purge volume (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter]
Volume of Water in casing – 2" diameter = 0.163 gallons per foot of depth, 4" diameter = 0.653 gallons per foot of depth

Measurement Point North
Well Depth 10.14 feet
Pump Intake Depth ____
PID Well Head ____

Well Diameter 2"
Well Integrity:
Cap ✓
Casing ✓
Locked No
Collar ✓

PURGE DATA

Time	Depth to Water (ft)	Purge Rate (ml/min)	Temp. (deg. C)	pH (units)	Dissolved O2 (mg/L)	Turbidity (NTU)	Cond. (mS/cm)	ORP (mV)	Comments
	1.01		11.92	7.40	8.93	15.7	0.506	68.1	1 gallon purged
	1.01		11.99	7.23	6.07	3.80	0.485	78.7	2 gallons purged
	1.01		11.50	7.34	3.56	2.34	0.496	74.6	3 gallons purged
	1.02		11.53	7.35	2.07	2.51	0.494	64.1	4 gallons purged

Purge Observations: Clear, no odor or sheen
Purge Water Containerized: No

EQUIPMENT DOCUMENTATION

Type of Pump: Peristaltic
Type of Tubing: ¼" HDPE
Type of Water Quality Meter: YSI Pro Plus Quatro; LaMotte 2020
Calibrated: ____

ANALYTICAL PARAMETERS

Parameter	Volumes	Sample Collected
1,4-dioxane	250mL (x2)	Yes

LOCATION NOTES

QA/QC samples collected:
Field duplicate

Low Flow Groundwater Sampling Field Record

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Project Name Verona
Location ID B1243
Activity Time 11:03

Field Sample ID B1243-W05
Sample Time 11:30

Job # 13124-15
Sampling Event # __
Date 10/20/2020

SAMPLING NOTES

Initial Depth to Water 8.41 feet
Final Depth to Water 13.20 feet
Screen Length ____ feet
Total Volume Purged 1 gallons
[purge volume (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter]
Volume of Water in casing – 2" diameter = 0.163 gallons per foot of depth, 4" diameter = 0.653 gallons per foot of depth

Measurement Point North
Well Depth 13.23 feet
Pump Intake Depth ____
PID Well Head ____

Well Diameter 1"
Well Integrity:
Cap ✓
Casing ✓
Locked No
Collar No

PURGE DATA

Time	Depth to Water (ft)	Purge Rate (ml/min)	Temp. (deg. C)	pH (units)	Dissolved O2 (mg/L)	Turbidity (NTU)	Cond. (mS/cm)	ORP (mV)	Comments
	9.71		14.93	7.36	3.27	—	0.643	-58.6	NTU over limit
	13.20		15.61	7.40	4.45	—	0.672	-49.8	NTU over limit

Purge Observations: Highly turbid, sulfur/septic odor
Purge Water Containerized: No

EQUIPMENT DOCUMENTATION

Type of Pump: Peristaltic
Type of Tubing: ¼" HDPE
Type of Water Quality Meter: YSI Pro Plus Quatro; LaMotte 2020
Calibrated: ____

ANALYTICAL PARAMETERS

Parameter	Volumes	Sample Collected
1,4-dioxane	250mL (x2)	Yes

LOCATION NOTES

Well went dry and recovered after a 10 minute pause

Low Flow Groundwater Sampling Field Record

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Project Name Verona
Location ID B1253
Activity Time 12:35
Field Sample ID MW-1253IR
Sample Time 13:10
Job # 13124-15
Sampling Event # _ _
Date 10/20/2020

SAMPLING NOTES

Initial Depth to Water 1.09 feet
Final Depth to Water 1.17 feet
Screen Length _____ feet
Total Volume Purged 6.5 gallons
[purge volume (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter]
Volume of Water in casing – 2" diameter = 0.163 gallons per foot of depth, 4" diameter = 0.653 gallons per foot of depth

Measurement Point North
Well Depth 14.53 feet
Pump Intake Depth _____
PID Well Head _____

Well Diameter 2"
Well Integrity:
Cap ✓
Casing ✓
Locked ✓
Collar ✓

PURGE DATA

Time	Depth to Water (ft)	Purge Rate (ml/min)	Temp. (deg. C)	pH (units)	Dissolved O2 (mg/L)	Turbidity (NTU)	Cond. (mS/cm)	ORP (mV)	Comments
	1.09		16.58	~~18.3~~ 7.79	11.00	18.3	0.446	31.8	1 gallon purged
	1.09		16.58	7.54	8.96	7.79	0.451	47.5	2 gallons purged
	1.11		16.56	7.20	8.88	7.20	0.453	52.6	3 gallons purged
	1.13		16.61	7.50	9.36	2.92	0.456	55.1	4 gallons purged
	1.15		16.78	7.46	10.43	2.40	0.459	57.5	5 gallons purged
	1.17		16.78	7.47	8.35	6.60	0.467	59.5	6 purged

Purge Observations: Clear, no odor or sheen
Purge Water Containerized: No

EQUIPMENT DOCUMENTATION

Type of Pump: Peristaltic
Type of Tubing: ¼" HDPE
Type of Water Quality Meter: YSI Pro Plus Quatro; LaMotte 2020
Calibrated: _____

ANALYTICAL PARAMETERS

Parameter	Volumes	Sample Collected
1,4-dioxane	250mL (x2)	Yes

LOCATION NOTES

Low Flow Groundwater Sampling Field Record

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Project Name Verona
Location ID B1219
Activity Time 13:30
Field Sample ID B1219-W06
Sample Time 13:50
Job # 13124-15
Sampling Event # _ _
Date 10/20/2020

SAMPLING NOTES

Initial Depth to Water 3.56 feet
Final Depth to Water 12.50 feet
Screen Length _____ feet
Total Volume Purged 0.75 gallons
[purge volume (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter]
Volume of Water in casing – 2" diameter = 0.163 gallons per foot of depth, 4" diameter = 0.653 gallons per foot of depth

Measurement Point North
Well Depth 12.54 feet
Pump Intake Depth _____
PID Well Head _____

Well Diameter 1"
Well Integrity:
Cap ✓
Casing ✓
Locked No
Collar No

PURGE DATA

Time	Depth to Water (ft)	Purge Rate (ml/min)	Temp. (deg. C)	pH (units)	Dissolved O2 (mg/L)	Turbidity (NTU)	Cond. (mS/cm)	ORP (mV)	Comments
	6.47		14.18	7.47	6.82	—	0.666	6.3	NTU over limit
	12.31		14.72	7.51	5.37	—	0.651	-1.3	NTU over limit

Purge Observations: Highly turbid
Purge Water Containerized: No

EQUIPMENT DOCUMENTATION

Type of Pump: Peristaltic
Type of Tubing: ¼" HDPE
Type of Water Quality Meter: YSI Pro Plus Quatro; LaMotte 2020
Calibrated: _____

ANALYTICAL PARAMETERS

Parameter	Volumes	Sample Collected
1,4-dioxane	250mL (x2)	Yes

LOCATION NOTES

Low Flow Groundwater Sampling Field Record

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Project Name Verona
Location ID B1266
Activity Time 14:30
Field Sample ID B-54/B1266-W12
Sample Time 15:00
Job # 13124-15
Sampling Event # _ _
Date 10/20/2020

SAMPLING NOTES

Initial Depth to Water 4.31 feet
Final Depth to Water 10.87 feet
Screen Length _____ feet
Total Volume Purged 1 gallons
[purge volume (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter]
Volume of Water in casing – 2" diameter = 0.163 gallons per foot of depth, 4" diameter = 0.653 gallons per foot of depth

Measurement Point North
Well Depth 11.20 feet
Pump Intake Depth _____
PID Well Head _____

Well Diameter 1"
Well Integrity:
Cap ✓
Casing ✓
Locked No
Collar No

PURGE DATA

Time	Depth to Water (ft)	Purge Rate (ml/min)	Temp. (deg. C)	pH (units)	Dissolved O2 (mg/L)	Turbidity (NTU)	Cond. (mS/cm)	ORP (mV)	Comments
	5.24		15.07	8.04	8.32	—	0.601	-37.2	NTU over limit
	7.63		14.53	7.47	4.12	29.4	0.597	-57.2	0.5 gallons purged
	10.87		14.50	7.47	3.44	29.4	0.597	-58.7	1 gallon purged

Purge Observations: Initially highly turbid
Purge Water Containerized: No

EQUIPMENT DOCUMENTATION

Type of Pump: Peristaltic
Type of Tubing: ¼" HDPE
Type of Water Quality Meter: YSI Pro Plus Quatro; LaMotte 2020
Calibrated: _____

ANALYTICAL PARAMETERS

Parameter	Volumes	Sample Collected
1,4-dioxane	250mL (x2)	Yes

LOCATION NOTES

Low Flow Groundwater Sampling Field Record

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Project Name Verona
Location ID TPW-14
Activity Time 15:50
Field Sample ID TPW-14
Sample Time 16:35
Job # 13124-15
Sampling Event # _ _
Date 10/20/2020

SAMPLING NOTES

Initial Depth to Water 5.65 feet
Final Depth to Water 13.80 feet
Screen Length _____ feet
Total Volume Purged 3 gallons
[purge volume (milliliters per minute) x time duration (minutes) x 0.00026 gal/milliliter]
Volume of Water in casing – 2" diameter = 0.163 gallons per foot of depth, 4" diameter = 0.653 gallons per foot of depth

Measurement Point _____
Well Depth 13.81 feet
Pump Intake Depth _____
PID Well Head _____

Well Diameter 2"
Well Integrity:
Cap ✓
Casing ✓
Locked No
Collar No

PURGE DATA

Time	Depth to Water (ft)	Purge Rate (ml/min)	Temp. (deg. C)	pH (units)	Dissolved O2 (mg/L)	Turbidity (NTU)	Cond. (mS/cm)	ORP (mV)	Comments
	8.43		13.28	7.33	15.89	—	0.716	26.0	1 gallon purged
	11.71		13.34	7.28	6.49	—	0.673	2.3	2 gallons purged
	13.80		13.03	7.29	4.16	—	0.657	0.1	3 gallons purged

Purge Observations: Highly turbid
Purge Water Containerized: No

EQUIPMENT DOCUMENTATION

Type of Pump: Peristaltic
Type of Tubing: ¼" HDPE
Type of Water Quality Meter: YSI Pro Plus Quatro; LaMotte 2020
Calibrated: _____

ANALYTICAL PARAMETERS

Parameter	Volumes	Sample Collected
1,4-dioxane	250mL (x2)	Yes

LOCATION NOTES

Well went dry and recovered after a 10 minute pause. Sampled @ 3 gallons because well started to go dry again

Photo 1. Facing North of Site from Highway 31

Photo 2. TP33/TPW-33R

Photo 3. B1231-MW-03

Photo 4. B1243-W05

Photo 5. B1219-W06

Photo 6. B-54/B1266-W12

Photo 7. MW-1253IR

Photo 8. TPW-14

November 02, 2020 Service Request No:R2009966

Mr. Greg Andrus
LU Engineers
339 East Avenue
Suite 200
Rochester, NY 14604

Laboratory Results for: Verona

Dear Mr.Andrus,

Enclosed are the results of the sample(s) submitted to our laboratory October 22, 2020
For your reference, these analyses have been assigned our service request number **R2009966.**

All testing was performed according to our laboratory's quality assurance program and met the requirements of the TNI standards except as noted in the case narrative report. Any testing not included in the lab's accreditation is identified on a Non-Certified Analytes report. All results are intended to be considered in their entirety. ALS Environmental is not responsible for use of less than the complete report. Results apply only to the individual samples submitted to the lab for analysis, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s), and represented by Laboratory Control Sample control limits. Any events, such as QC failures or Holding Time exceedances, which may add to the uncertainty are explained in the report narrative or are flagged with qualifiers. The flags are explained in the Report Qualifiers and Definitions page of this report.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger
Project Manager

CC: Ben Seifert

ADDRESS 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
PHONE +1 585 288 5380 | FAX +1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: LU Engineers
Project: Verona
Sample Matrix: Water

Service Request: R2009966
Date Received: 10/22/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Eight water samples were received for analysis at ALS Environmental on 10/22/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

No significant anomalies were noted with this analysis.

Approved by _____ Date 11/02/2020

SAMPLE DETECTION SUMMARY

CLIENT ID: B1243-W05			Lab ID: R2009966-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
1,4-Dioxane	0.027	J	0.027	0.040	ug/L	8270D

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: LU Engineers **Service Request:**R2009966
Project: Verona/13124-15

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R2009966-001	TP33/TPW-33R	10/21/2020	0833
R2009966-002	B1231-MW-03	10/21/2020	1015
R2009966-003	B1243-W05	10/21/2020	1130
R2009966-004	MW-1253IR	10/21/2020	1310
R2009966-005	B1219-W06	10/21/2020	1350
R2009966-006	B-54/B1266-W12	10/21/2020	1500
R2009966-007	TPW-14	10/21/2020	1635
R2009966-008	Field Duplicate	10/21/2020	

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

004161

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Project Name: Verona	Project Number: 13124 - 15
Project Manager: Greg Andrus	Report CC: Ben Seifert
Company/Address: Lu Engineers 339 East Avenue Suite 200 Rochester NY 14604	
Phone #: 585 - 385 - 7417	Email: gregandrus@luengineers.com bseifert@luengineers.com
Sampler's Signature:	Sampler's Printed Name: Ben Seifert

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs ○ 8260 ○ 624 ○ CLP	GC/MS SVOAs ○ 8270 ○ 625	GC VOAs ○ 8021 ○ 601/602	PESTICIDES ○ 8081 ○ 608	PCBs ○ 8082 ○ 608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	1,4 - dioxane 8270 SIM
TP33/TPW-33R		10/21/2020	08:33	Ground Water	2								
TP33/TPW-33R-MS			09:00										
TP33/TPW-33R-MSD			09:00										
B1231-MW-03			10:15										
B1243-WD5			11:30										
MW-1253IR			13:10										
B1219-WD6			13:50										
B-54/B1266-W12			15:00										
TPW-14			16:35										
Field Duplicate		↓	—	↓	↓								

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

REMARKS/ ALTERNATE DESCRIPTION

SPECIAL INSTRUCTIONS/COMMENTS
Metals
- Analysis required at Department of Defense certified laboratory
- Need Category B deliverables in addition to EQUIS + ERPIMS data format
- Quote No. 200817 from Michael Chevalier

See QAPP ☐

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 1 day ____ 2 day ____ 3 day
____ 4 day ____ 5 day
✓ Standard (10 business days-No Surcharge)

REQUESTED REPORT DATE

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
✓ III. Results + QC and Calibration Summaries Category B?
____ IV. Data Validation Report with Raw Data

Edata ✓ Yes ____ No

INVOICE INFORMATION
PO # 13124-15
BILL TO: Greg Andrus

STATE WHERE SAMPLES WERE COLLECTED NY

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	Signature:	Signature:	Signature:	Signature:	Signature:
Printed Name: Ben Seifert	Printed Name: Daniel Ward	Printed Name:	Printed Name:	Printed Name:	
Firm: Lu Engineers	Firm: ALS	Firm:	Firm:	Firm:	
Date/Time: 10/22/2020 12:20	Date/Time: 10/22/2020 1220	Date/Time:	Date/Time:	Date/Time:	

R2009966 5
LU Engineers
Verona

Distribution: White - Lab Copy; Yellow - Return to Originator

Cooler Receipt and Preservation Check Form

R2009966 5
LU Engineers
Verona

Project/Client Lu Eng. Folder Number .

Cooler received on 10/22/2020 by: dlw COURIER: ALS UPS FEDEX VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	Y NA	5a	**Perchlorate** samples have required headspace?	Y N NA
2	**Custody papers** properly completed (ink, signed)?	Y N	5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y N NA
3	Did all bottles arrive in good **condition** (unbroken)?	Y N	6	Where did the bottles originate?	ALS/ROC CLIENT
4	Circle: **Wet Ice Dry Ice Gel packs** present?	Y N	7	Soil VOA received as:	Bulk Encore 5035set NA

8. Temperature Readings Date: 10/22/2020 Time: 1730 ID: IR#7 IR#10 From: Temp Blank Sample Bottle

Observed Temp (°C)	4.9C						
Within 0-6°C?	Y N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: Standing Approval Client aware at drop-off Client notified by:

All samples held in storage location: Room by dlw on 10/22/20 at 1730
5035 samples placed in storage location: by on at within 48 hours of sampling? Y N

Cooler Breakdown/Preservation Check**: Date: 10/23/2020 Time: 1505 by: dlw

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? YES NO
10. Did all bottle labels and tags agree with custody papers? YES NO
11. Were correct containers used for the tests indicated? YES NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO N/A
13. Air Samples: Cassettes / Tubes Intact Y / N with MS Y / N Canisters Pressurized Tedlar® Bags Inflated N/A

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-			**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).			
		HCl	**	**						

Bottle lot numbers: 090720-15MC
Explain all Discrepancies/ Other Comments:

HPROD	BULK
HTR	FLDT
SUB	HGFB
ALS	LL3541

Labels secondary reviewed by: JL
PC Secondary Review: dlw 10/26/20 *significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: LU Engineers **Service Request:** R2009966
Project: Verona/13124-15

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R2009966-001.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2024	R-002 / AFELSER	
R2009966-001.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2024	R-002 / AFELSER	
R2009966-001.03					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-001.04					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-001.05					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-001.06					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-002.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2024	R-002 / AFELSER	
R2009966-002.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-003.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	

Client: LU Engineers **Service Request:** R2009966
Project: Verona/13124-15

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	8270D				
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2024	R-002 / AFELSER	
R2009966-003.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-004.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2025	R-002 / AFELSER	
R2009966-004.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-005.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2025	R-002 / AFELSER	
R2009966-005.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-006.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2024	R-002 / AFELSER	
R2009966-006.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-007.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: LU Engineers **Service Request:** R2009966
Project: Verona/13124-15

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	8270D				
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2024	R-002 / AFELSER	
R2009966-007.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
R2009966-008.01					
	8270D				
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	
		10/26/2020	1207	In Lab / AFELSER	
		10/26/2020	2024	R-002 / AFELSER	
R2009966-008.02					
		10/23/2020	1459	SMO / GLAFORCE	
		10/23/2020	1459	R-002 / GLAFORCE	

Miscellaneous Forms

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REPORT QUALIFIERS AND DEFINITIONS

U	Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
J	Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).
B	Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
E	Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
E	Organics- Concentration has exceeded the calibration range for that specific analysis.
D	Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
*	Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
H	Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.
#	Spike was diluted out.
+	Correlation coefficient for MSA is <0.995.
N	Inorganics- Matrix spike recovery was outside laboratory limits.
N	Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
S	Concentration has been determined using Method of Standard Additions (MSA).
W	Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
P	Concentration >40% difference between the two GC columns.
C	Confirmed by GC/MS
Q	DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).
X	See Case Narrative for discussion.
MRL LOQ	Method Reporting Limit. Also known as: Limit of Quantitation (LOQ) The lowest concentration at which the method analyte may be reliably quantified under the method conditions.
MDL	Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).
LOD	Limit of Detection. A value at or above the MDL which has been verified to be detectable.
ND	Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratoryôs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: LU Engineers **Service Request:** R2009966
Project: Verona/13124-15

Sample Name: TP33/TPW-33R **Date Collected:** 10/21/20
Lab Code: R2009966-001 **Date Received:** 10/22/20
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

Sample Name: B1231-MW-03 **Date Collected:** 10/21/20
Lab Code: R2009966-002 **Date Received:** 10/22/20
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

Sample Name: B1243-W05 **Date Collected:** 10/21/20
Lab Code: R2009966-003 **Date Received:** 10/22/20
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

Sample Name: MW-1253IR **Date Collected:** 10/21/20
Lab Code: R2009966-004 **Date Received:** 10/22/20
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

Sample Name: B1219-W06 **Date Collected:** 10/21/20
Lab Code: R2009966-005 **Date Received:** 10/22/20
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

Client: LU Engineers
Project: Verona/13124-15
Service Request: R2009966

Sample Name: B-54/B1266-W12
Lab Code: R2009966-006
Sample Matrix: Water
Date Collected: 10/21/20
Date Received: 10/22/20

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

Sample Name: TPW-14
Lab Code: R2009966-007
Sample Matrix: Water
Date Collected: 10/21/20
Date Received: 10/22/20

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

Sample Name: Field Duplicate
Lab Code: R2009966-008
Sample Matrix: Water
Date Collected: 10/21/20
Date Received: 10/22/20

Analysis Method	Extracted/Digested By	Analyzed By
8270D	AFELSER	AFELSER

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9034 Sulfide Acid Soluble	9030B
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7199	3060A
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction
For analytical methods not listed, the preparation method is the same as the analytical method reference.	

Sample Results

ALS Environmental—Rochester Laboratory
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Semivolatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
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Phone (585) 288-5380 Fax (585) 288-8475
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Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20 08:33
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	TP33/TPW-33R	**Units:**	ug/L
Lab Code:	R2009966-001	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/27/20 01:47	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	106	70 - 130	10/27/20 01:47	

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20 10:15
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	B1231-MW-03	**Units:**	ug/L
Lab Code:	R2009966-002	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/27/20 02:38	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	91	70 - 130	10/27/20 02:38	

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20 11:30
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	B1243-W05	**Units:**	ug/L
Lab Code:	R2009966-003	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	**0.027 J**	0.040	0.027	0.027	1	10/27/20 02:55	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	117	70 - 130	10/27/20 02:55	

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20 13:10
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	MW-1253IR	**Units:**	ug/L
Lab Code:	R2009966-004	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/27/20 03:12	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	113	70 - 130	10/27/20 03:12	

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20 13:50
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	B1219-W06	**Units:**	ug/L
Lab Code:	R2009966-005	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/27/20 03:29	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	106	70 - 130	10/27/20 03:29	

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20 15:00
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	B-54/B1266-W12	**Units:**	ug/L
Lab Code:	R2009966-006	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/29/20 13:45	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	94	70 - 130	10/29/20 13:45	

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20 16:35
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	TPW-14	**Units:**	ug/L
Lab Code:	R2009966-007	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/29/20 14:03	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	90	70 - 130	10/29/20 14:03	

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20
Sample Matrix:	Water	**Date Received:**	10/22/20 12:20
Sample Name:	Field Duplicate	**Units:**	ug/L
Lab Code:	R2009966-008	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/27/20 04:21	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	123	70 - 130	10/27/20 04:21	

QC Summary Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
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Semivolatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
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www.alsglobal.com

Client: LU Engineers **Service Request:** R2009966
Project: Verona/13124-15
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
1,4-Dioxane by GC/MS

Analysis Method: 8270D
Extraction Method: EPA 3535A

Sample Name	Lab Code	1,4-Dioxane-d8 70-130
TP33/TPW-33R	R2009966-001	106
B1231-MW-03	R2009966-002	91
B1243-W05	R2009966-003	117
MW-1253IR	R2009966-004	113
B1219-W06	R2009966-005	106
B-54/B1266-W12	R2009966-006	94
TPW-14	R2009966-007	90
Field Duplicate	R2009966-008	123
Method Blank	RQ2012986-01	94
Lab Control Sample	RQ2012986-02	94
Duplicate Lab Control Sample	RQ2012986-03	101
TP33/TPW-33R MS	RQ2012986-06	113
TP33/TPW-33R DMS	RQ2012986-07	127

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	10/21/20
Sample Matrix:	Water	**Date Received:**	10/22/20
		Date Analyzed:	10/27/20
		Date Extracted:	10/26/20

Duplicate Matrix Spike Summary
1,4-Dioxane by GC/MS

Sample Name:	TP33/TPW-33R	**Units:**	ug/L
Lab Code:	R2009966-001	**Basis:**	NA
Analysis Method:	8270D		
Prep Method:	EPA 3535A		

		Matrix Spike			Duplicate Matrix Spike					
		RQ2012986-06			RQ2012986-07					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1,4-Dioxane	ND U	10.8	10.0	108	12.9	10.0	129	70-130	18	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Analytical Report

Client:	LU Engineers	**Service Request:**	R2009966
Project:	Verona/13124-15	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ2012986-01	**Basis:**	NA

1,4-Dioxane by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	ND U	0.040	0.027	0.027	1	10/26/20 20:52	10/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	94	70 - 130	10/26/20 20:52	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: LU Engineers
Project: Verona/13124-15
Sample Matrix: Water

Service Request: R2009966
Date Analyzed: 10/26/20

Duplicate Lab Control Sample Summary
1,4-Dioxane by GC/MS

Units:ug/L
Basis:NA

			Lab Control Sample			Duplicate Lab Control Sample				
			RQ2012986-02			RQ2012986-03				
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1,4-Dioxane	8270D	9.70	10.0	97	9.61	10.0	96	70-130	<1	30