



**August 11, 2016**

Mr. Dan Kowalski  
Project Manager  
Guardian Environmental Services, Inc.  
70 Albe Drive  
Newark, DE 19702

**RE:** Results of Borehole Geophysical Logging: ERT-46  
Site: Crown Cleaners Superfund Site, Village of Herrings, NY

Dear Mr. Kowalski,

In response to your request, Earth Data Northeast, Inc. ("EDN") is pleased to provide Guardian Environmental Services, Inc. ("GES") with the following summary of borehole geophysical logging services performed July 26, 2016 at the Crown Cleaners Superfund Site, located in Village of Herrings, New York.

### **Borehole Geophysical Logging**

The following suite of geophysical logs was performed (as indicated by the "X") in well ERT-46.

- Color Borehole Video Survey
- Fluid Temperature / Fluid Conductivity
- 3-Arm Caliper
- Electrical Resistivity Suite
  - Spontaneous Potential ("SP")
  - Single Point Resistance ("SPR")
  - Short (16") & Long (64") Normal Resistivity
- Natural Gamma
- Acoustic Televierer ("ATV")
- Optical Televierer ("OTV")
- Heat Pulse Flowmeter
  - Ambient conditions
  - Pumping conditions; Depth of pump: \_\_\_\_\_; Rate: \_\_\_\_\_
- Additional Tooling: \_\_\_\_\_

## Results of Borehole Geophysical Logging

The results of the borehole geophysical logging conducted in ERT-46 are summarized below. A geophysical composite graph containing the logs performed in ERT-46 is included as an attachment.

Features identified with the OTV are presented in both tabular and graphical format, referenced to True North, and are also attached. A qualitative classification of each feature, with respect to its potential aperture, was assigned according to the following criteria:

***Fracture/Feature*** – obvious, dark sinusoidal line across the entire acoustic image; usually supported by the response of the 3-arm caliper.

***Hairline Fracture/Feature*** – as above, though not as evident; generally minimal aperture noted

***Discontinuous Fracture (Hairline or otherwise)/Feature*** – shape of sinusoidal line is intact; does not span across entire acoustic image.

***Bedding/Change in Lithology*** – shape of sinusoidal line is intact, usually supported by natural gamma log and/or response of acoustic return; generally minimal aperture noted

More features may exist than could be identified. Characterization of features was aided by software provided by the geophysical tool manufacturer.

All geophysical logs presented in this report are referenced from below top of casing (“toc”).

**ERT-46**

Well diameter: nominal 8"

Total depth: 51'

Casing depth: 11.4'

Casing stick-up (above grade): 2.2'

Static water level: 39'

Field observations / Remarks:

*Rock characteristics:*

- Hairline features observed between 16'-17', & 35'-37'
- Relative changes in lithology between 27'-30' & 42'-46' (higher natural gamma).

OTV features: 25 (see attached summary table and graphical presentation)

Apparent strike: East-Southeast – West-Northwest & East-Northeast – West-Southwest

Apparent dip: North-Northeast & North-Northwest

The findings and conclusions presented in this report are the result of fieldwork, data analysis, and interpretations completed by EDN personnel as of this date. This report was prepared in response to a request from GES, using generally accepted geophysical practices, for the exclusive use of GES. No other warranty, express or implied, is made.

Additional copies of the geophysical logs are available upon request.

If you should have any further questions or comments, please feel free to contact me at (610) 524-9466 or via email at [eonuskanych@earthdatane.com](mailto:eonuskanych@earthdatane.com).

Sincerely,

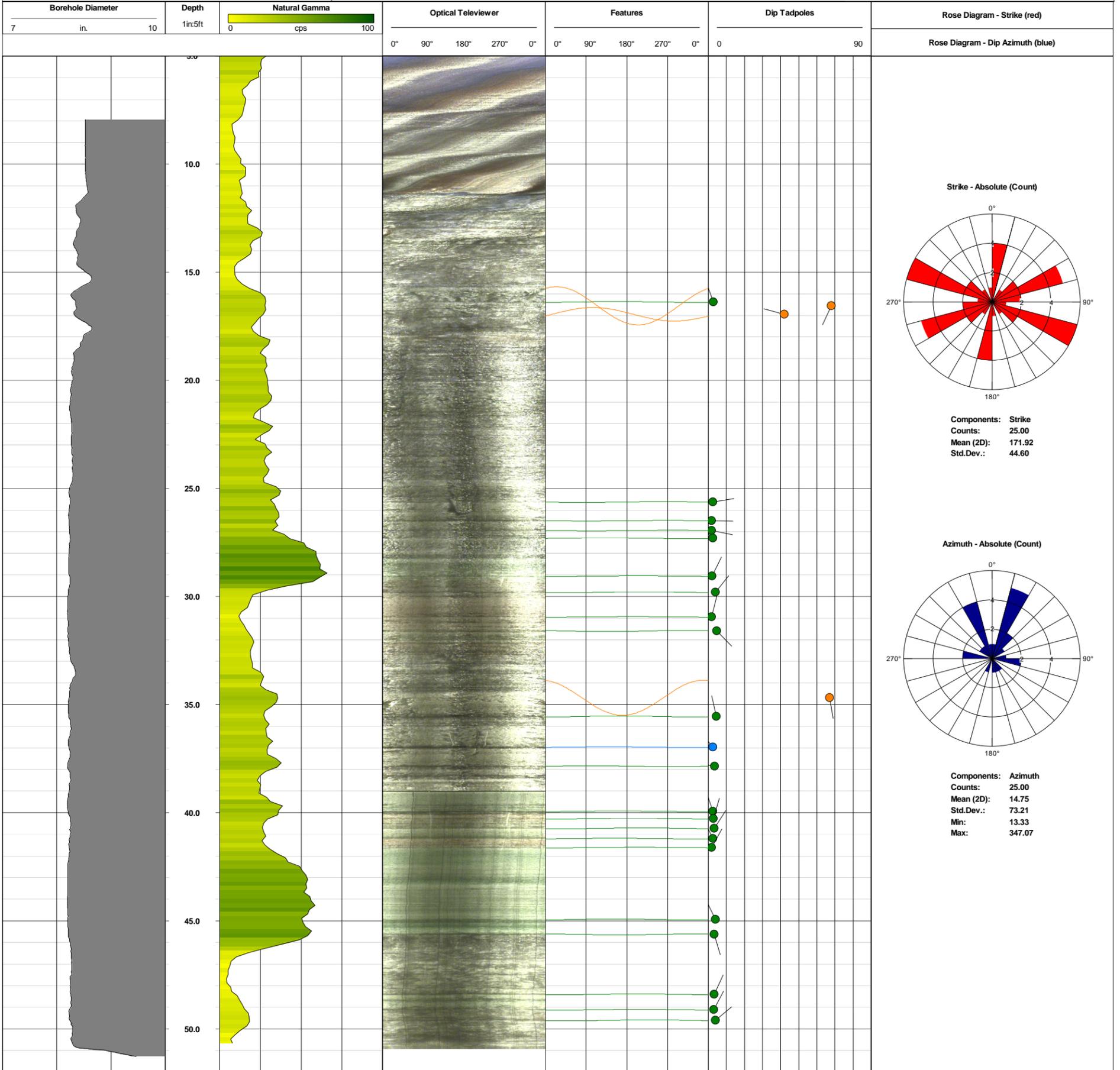


Evan Onuskanych  
Staff Geoscientist  
Earth Data Northeast, Inc.

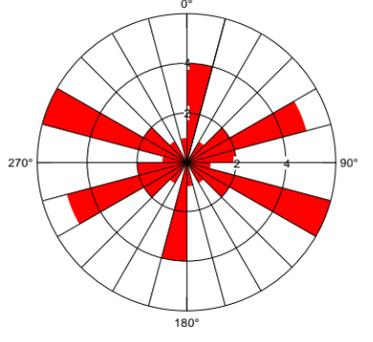
Client: **Gaurdian Environmental**  
 Location: **Crown Cleaners Site**  
 Well Name: **ERT-46**  
 Date: **07/26/16**  
 Depth Reference: **Top of Casing**  
 Magnetic Declination: **-12.97 deg**  
 North reference: **True North**

Borehole Diameter: **8" nominal**  
 Static Water Level: **39'**  
 Casing Depth: **11.4'**  
 Total Depth: **51'**

- Hairline Fracture/Feature
- Discontinuous Hairline Fracture/Feature
- Bedding/Change in Lithology

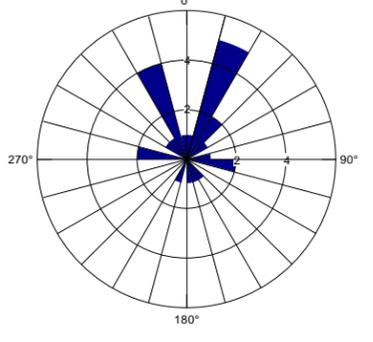


Strike - Absolute (Count)



Components: Strike  
 Counts: 25.00  
 Mean (2D): 171.92  
 Std.Dev.: 44.60

Azimuth - Absolute (Count)



Components: Azimuth  
 Counts: 25.00  
 Mean (2D): 14.75  
 Std.Dev.: 73.21  
 Min: 13.33  
 Max: 347.07

**ERT-46 OTV Feature Summary Table**  
**Crown Cleaners Superfund Site; Village of Herrings, NY**

<b>Avg. Depth of Feature (ft)</b>	<b>Dip Azimuth (deg from North)</b>	<b>Dip Angle (deg)</b>	<b>Strike (deg from North)</b>	<b>Feature Description</b>
16.4	340	3	250	Bedding/Change in Lithology
16.6	205	68	115	Discontinuous Hairline Fracture/Feature
17.0	285	42	195	Discontinuous Hairline Fracture/Feature
25.6	81	3	351	Bedding/Change in Lithology
26.5	91	2	1	Bedding/Change in Lithology
27.0	102	2	12	Bedding/Change in Lithology
27.3	313	3	223	Bedding/Change in Lithology
29.1	26	2	296	Bedding/Change in Lithology
29.8	38	4	308	Bedding/Change in Lithology
31.0	13	2	283	Bedding/Change in Lithology
31.6	136	5	46	Bedding/Change in Lithology
34.7	170	67	80	Discontinuous Hairline Fracture/Feature
35.6	347	5	257	Bedding/Change in Lithology
37.0	320	3	230	Hairline Fracture/Feature
37.9	281	3	191	Bedding/Change in Lithology
40.0	341	3	251	Bedding/Change in Lithology
40.3	16	3	286	Bedding/Change in Lithology
40.7	32	3	302	Bedding/Change in Lithology
41.2	333	3	243	Bedding/Change in Lithology
41.6	28	2	298	Bedding/Change in Lithology
44.9	334	4	244	Bedding/Change in Lithology
45.6	163	3	73	Bedding/Change in Lithology
48.4	24	3	294	Bedding/Change in Lithology
49.1	28	3	298	Bedding/Change in Lithology
49.6	50	4	320	Bedding/Change in Lithology